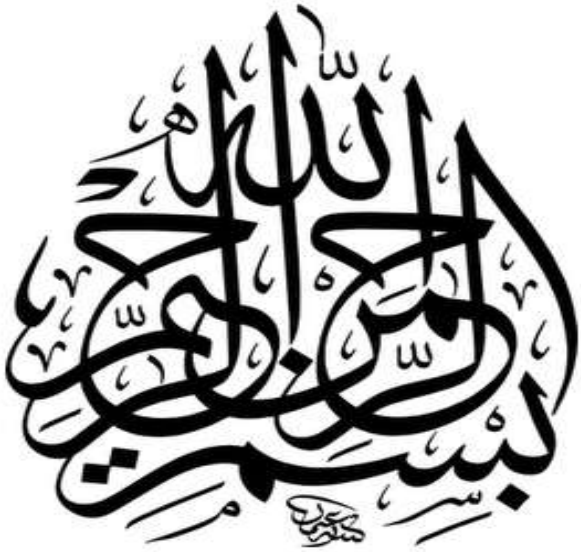
Contents

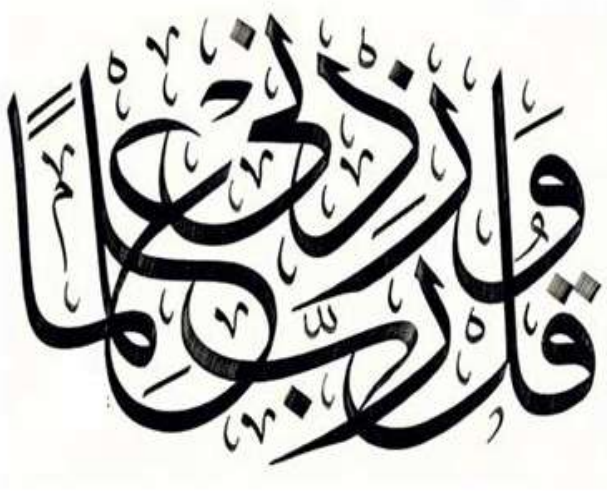
List of Abbreviations

1-	**Bis- GMA**	Bisphenol A- glycidyl methacrylate.
2-	**CAD/CAM**	Computer-aided designing/ Computer-aided manufacturing (machining).
3-	**FPD(s)**	Fixed partial denture(s).
4-	**Hz**	Hertz.
5-	**µ**	Micron.
6-	**MMA**	Methyl methacrylate.
7-	**NaCl**	Sodium chloride.
8-	**NaOH**	Sodium hydroxide.
9-	**Ni-Cr**	Nickel-chromium.
10-	**N**	Newton.
11-	**OH^- ions**	Hydroxyl ions.
12-	**PE**	Polyethylene.
13-	**PEMA**	Poly ethyl methacrylate.
14-	**PMMA**	Poly methyl methacrylate.
15-	**TCML**	Thermal cycling and mechanical loading.
16-	**VLC**	Visible light curing.
17-	**VPS**	Vinyl polysiloxane.

List of Tables

List of Figures





سورة طـــه

آية ١١٤

تقييم مقاومة الكسر و الإنطباق الداخلي لنوعين من التركيبات المؤقتة في بيئات مختلفة الرقم الهيدروجيني

رسالة مقدمة

إلى كلية طب الأسنان- جامعة عين شمس

للحصول على درجة الماجستير في تخصص

التيجان و الجسور

مقدمة من

الطبيبة/ نرمين محمد غريب ابراهيم

بكالوريوس طب الفم و الأسنان ٢٠٠٢

دبلوم التيجان والجسور ٢٠٠٦

كلية طب الأسنان

جامعة عين شمس

٢٠١٢

المشرفـتــان

د./ جيهان فاروق محمد يونس

أستاذ مساعد بقسم التيجان والجسور

كلية طب الأسنان

جامعة عين شمس

د./مروة محمد وحش

مدرس بقسم التيجان والجسور

كلية طب الأسنان

جامعة عين شمس

Evaluation of Fracture Resistance& Internal Fit of Two Types of Provisional Restorations under Different pH Environments

Thesis

Submitted to the Faculty of Dentistry

Ain Shams University

In Partial Fulfillment of the Requirements of Master Degree in Crown and Bridge

By

Nermin Mohamed Gharieb Ibrahim

BDS (2002)
HDD (2006)
Ain Shams University

Faculty of Dentistry
Ain Shams University

2012

Supervisors

Dr. Jihan Farouk Mohamed Younis

Assistant Professor, Crown and Bridge Department,

Faculty of Dentistry

Ain Shams University

Dr. Marwa Mohamed Wahsh

Lecturer, Crown and Bridge Department,

Faculty of Dentistry

Ain Shams University

Acknowledgements

"Let all our gratefulness be directed to Allah the All Mighty"

First of all, I would like thank **Dr/ Amina M. Hamdy,** Assistant Professor of Crown and Bridge Head of Crown and Bridge Department, Faculty of Dentistry, Ain Shams University for her consistent support to the external postgraduate students in the Crown and Bridge Department.

Secondly, I would like to show my greatest appreciation to **Dr/ Jihan Farouk M. Younis,** Assistant Professor of Crown and Bridge, Faculty of Dentistry, Ain Shams University for her valuable scientific and emotional assistance for this research to look the way it has become.

Also, I want to thank **Dr/ Mohammed Adel El-Demellawy,** Assistant Professor of Crown and Bridge, Faculty of Dentistry, Ain Shams University for his unforgettable help and also for his continuous scientific guidance.

Special thanks to **Dr/ Marwa Mohamed Wahsh,** Lecturer of Crown and Bridge Department, Faculty of Dentistry, Ain Shams University for her kind support and precious follow up and supervision over this work.

Countless thanks to my father **Dr/ Mohamed Gharieb,** Professor of Microbiology, Faculty of Education, Ain Shams University for his invaluable scientific suggestions in the part outside the field of dentistry.

Finally, I really want to express my deepest gratitude to **Dr/Radwan Abd El-Aziz,** Assistant Professor of Geology, Faculty of Education, Ain Shams University for the time and effort he spent helping my research to be done as soon as possible.

Dedication

I would like to dedicate this piece of work to my family members who helped me till the end;

my father who supported me scientifically throughout this thesis,

my mother who supported me emotionally till I finished my work,

my brothers who are sharing this life with me.

I also send the spirit of the current research to the soul of my grandfather whom I'm sure he would be happy if he was still among the living.

Nermin Mohamed

The oral cavity is a complex environment where the dental materials are in contact with different chemical media. In the oral environment, a number of acids are produced by bacterial metabolism and consequently a pH variation is observed. It can be assumed that saliva, food components, and beverages can degrade and age dental restorations. In addition, the alkaline pH can lead to degradation of the resins used for fabrication of provisional restorations [1-3].

Provisional crowns and fixed partial dentures are an integral part of the prosthodontic treatment. They must meet esthetic, mechanical, and biological requirements especially when they are placed in the oral environment for a relatively long period of time such as during an extensive prosthodontic treatment or during the assessment of the results of periodontal and endodontic therapies [4-8].

The terms *provisional*, *interim*, or *transitional* have been routinely used interchangeably in the dental literature. The use of the term *temporary*, on the other hand, is controversial and is considered inappropriate by some authors because provisional restorations serve many functions, and "temporary" treatment may be interpreted as one of lesser importance or value [9].

To facilitate plaque removal, an interim fixed restoration must have good marginal fit, proper contours, and a smooth well-finished surface. This is particularly important when the crown margins are placed apical to the free gingival margin in order to maintain the gingival health and in addition to protect the tooth structure from physical, chemical, bacterial, and thermal injuries [10-12].

Provisional crowns and fixed partial dentures are subjected to heavy and consistent loading by mastication, and mechanical failure of the provisional restoration frequently occurs. One of the most common failure modes of the restorations which may lead to severe economic loss and patient discomfort is fracture. The materials used for temporary restorations must have adequate strength particularly for long term service inside the oral cavity. The mechanical strength properties of the material are an important factor for the

clinical success of provisional crown and fixed partial dentures to resist the functional and non-functional loads [13, 14]. This *in vitro* study was designed to assess the importance of the pH changes on the fracture resistance and the internal fit of two commonly used provisional materials.