

Contents

Title	Page No.
List of Abbreviations	ii
List of Tables	iii
List of Figures	v
Introduction	1-2
Review of Literature	3-34
Aim of Study	35
Materials& Methods	36-57
Results	58-70
Discussion	71-81
Summary	82-83
Conclusion	84
Recommendations	85
References	86-99
Arabic Summary	

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

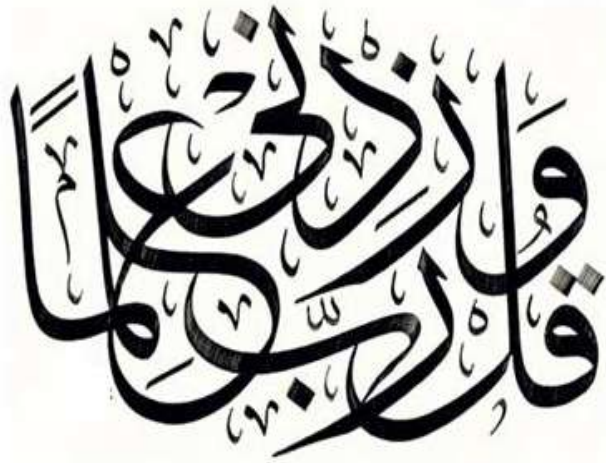
Table No.	Table Name	Page No.
1	Materials used through the study, their description, their composition, and their manufacturer.	36-37
2	Factorial Experimental Design.	50
3	Two-way ANOVA results for the effect of different variables on fracture resistance (N).	58
4	Comparison between the fracture resistance (N) of the two provisional crown types regardless of pH environment.	59
5	Comparison between the fracture resistance (N) and the different pH environments regardless of provisional crown type.	60
6	Comparison between the fracture resistance (N) with different interactions.	61
7	Two-way ANOVA results for the effect of different variables on the vertical gap distance (μ).	62
8	Comparison between the vertical gap distance (μ) of the two provisional crown types regardless of pH environment.	63

9	Comparison between the vertical gap distance (μ) with different pH environments regardless of provisional crown type.	64
10	Comparison between the vertical gap distance (μ) with different interactions.	65
11	The results of the correlation between fracture resistance (N) and gap distance (μ).	66

List of Figures

Figure No.	Figure Name	Page No.
1	The master die inside the arthlon base.	37
2	A schematic diagram showing the standardized dimensions of the die& the base.	38
3	A split mold and its supporting metal ring.	39
4	Top view of the split mold seated on the base.	39
5	The injected rubber base impression left for complete setting.	41
6	The rubber base impression after complete setting.	41
7	An epoxy resin die after retrieval from the rubber base impression.	42
8	The split mold for making provisional crowns, unassembled.	43
9	The split mold assembled and snugly fitted around the master die (Top View).	44
10	A schematic diagram showing the negative space formed around the master die.	45
11	A split mold removed with the Duralay crown inside.	46
12	A Cool Temp provisional crown; A: before, B: after removal from the master die.	48
13	Showing the cementation of a provisional crown using a loading device.	49
14	The pH meter calibrated and adjusted at pH 7.	51
15	Eight glass beakers containing the provisional crowns labeled and covered with aluminum foil.	52
16	The glass beakers placed inside the incubator.	52
17	The universal testing machine measuring the fracture resistance of a provisional sample.	53
18	Showing the clear acrylic resin block; A: during setting, B: after removal.	55
19	Showing a sectioned resin block with the cemented provisional crown in the center.	55

20	Stereomicroscopic examination of a provisional crown.	56
21	A micro- graph showing the twelve measuring points.	57
22	Bar chart representing mean fracture resistances (N) for comparison between the two provisional crown types.	59
23	Bar chart representing mean values of fracture resistance (N) with different pH environments.	60
24	Bar chart representing mean fracture resistances (N) for comparison between different interactions.	62
25	Bar chart representing mean the vertical gap distances (μ) for comparison between the two provisional crown types.	63
26	Bar chart representing mean values of the vertical gap distance (μ) with different pH environments.	64
27	Bar chart representing mean the vertical gap distances (μ) for comparison between different interactions.	66
28	A stereomicrograph showing the vertical gap distance of the “Duralay/Distilled Water”.	67
29	A stereomicrograph showing the vertical gap distance of the “Duralay/Citric Acid”.	67
30	A stereomicrograph showing the vertical gap distance of the “Duralay/Sodium Hydroxide”.	68
31	A stereomicrograph showing the vertical gap distance of the “Duralay/ Lactic Acid”.	68
32	A stereomicrograph showing the vertical gap distance of the “CoolTemp/Distilled Water”.	69
33	A stereomicrograph showing the vertical gap distance of the “CoolTemp/Citric Acid”.	69
34	A stereomicrograph showing the vertical gap distance of the “CoolTemp /Sodium Hydroxide”.	70
35	A stereomicrograph showing the vertical gap distance of the “CoolTemp/Lactic Acid”.	70



سورة طه

آية ١١٤

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

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الطبيبة/ نرمين محمد غريب ابراهيم

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كلية طب الأسنان

جامعة عين شمس

٢٠١٢

المشرفتان

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

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

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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

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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

INTRODUCTION

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.