

سامية محمد مصطفى



شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم



سامية محمد مصطفى



شبكة المعلومات الجامعية



شبكة المعلومات الجامعية التوثيق الالكتروني والميكرو فيلم



سامية محمد مصطفى



شبكة المعلومات الجامعية

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



سامية محمد مصطفى



شبكة المعلومات الجامعية



بعض الوثائق الأصلية تالفة



سامية محمد مصطفى



شبكة المعلومات الجامعية



بالرسالة صفحات لم ترد بالأصل



*EVALUATION OF COMPOSITE RESIN RESTORATIONS
FOLLOWING KINETIC AND MECHANICAL CAVITY
PREPARATION IN PERMANENT AND PRIMARY TEETH*

Thesis
Submitted to the Faculty of Dentistry
Alexandria University
In Partial Fulfillment of the Requirements for

Doctor Degree

Of

Pediatric Dentistry

By

Niveen Samir Ibrahim Bakry

(B.D.S, Alex. Univ., 1991; M.Sc., Pediatric Dentistry, 1996)
Assistant Lecturer, Pediatric Dentistry Dept.,
Faculty of Dentistry, Alexandria University

*FACULTY OF DENTISTRY
ALEXANDRIA UNIVERSITY
2000*

B

141-V

SUPERVISORS

Prof. Dr. Medhat Abd-Alla

*Professor of Pedodontics
Pedodontic Department
Faculty of Dentistry, Alexandria University*

Prof. Dr. Essam H. Osman

*Professor of Dental Biomaterials
Biomaterials Department
Faculty of Dentistry, Alexandria University*

Dr. Mona El-Kateb

*Assistant Professor of Pedodontics
Pedodontic Department
Faculty of Dentistry, Alexandria University*

*To My Father, Mother, Brother
My Husband
And My Two Lovely Children*

Acknowledgement

First and foremost, thanks is due to God, the most beneficial and merciful.

I would like to express my sincerest gratitude and appreciation to Prof. Dr. Medhat Abdallah, Professor of Pedodontics and Oral Public Health Department, Faculty of Dentistry, Alexandria University, for his constant encouragement and enthusiasm, his efforts and unlimited help are indeed beyond the capability of words.

I am greatly indebted to Prof. Dr. Essam Osman, Professor and Head of Dental Biomaterials, Faculty of Dentistry, Alexandria University. He has been generous with his time, extensive knowledge and above all, moral support.

I am very grateful to Dr. Mona El-kateb, Assistant Professor of Pediatric Dentistry and Dental Public Health, Faculty of Dentistry, Alexandria University, for her valuable advice and constant support in supervising this study.

I would also like to express my appreciation and thanks to all the staff members of the Pediatric Dentistry Department, for their encouragement and cooperation throughout my work.

Last but not least, my deepest gratitude is to my Father; Prof. Dr. Samir Bakry, My Mother, My Husband, and My Children; without whom, this work would have never been completed.

Table of Contents

Chapter		Page
I	Introduction	1
II	Review of Literature	4
III	Aim of the Work	32
IV	Materials and Methods	33
V	Results	59
VI	Discussion	117
VII	Summary and Conclusion	127
VIII	Recommendations	132
IX	References	133
	Protocol of Thesis	
	Arabic Summary	

List of Figures

Figure N ^o .	Title	Page
1	KCPS Prepjet Unit.	37
2	(a) Protective eye glasses, (b) 27 μm aluminum oxide particles.	37
3	Z100 Restorative System.	38
4	A bilateral pair of mandibular first permanent molars and second primary molars with pit and fissure caries.	38
5	6E Cass I cavity prepared with air-abrasion technique.	39
6	E6 Class I cavity prepared mechanically.	39
7	6E acid etching.	40
8	6E application of Scotchbond primer.	40
9	6E application of Scotchbond adhesive.	41
10	Composite restoration completed.	41
11	Data Collecting Chart.	45
12	Impression materials used for producing resin replica. (a) Optosil (light body). (b) Xantopren (light body). (c) Activator.	46
13	Replica (epoxy resin) of 6E prepared with air-abrasion and E6 prepared mechanically.	46
14	JEOL Coating Apparatus.	47
15	Scanning Electron Microscope (JSM-5300).	47
16	Thermocycling Machine.	51
17	To the right, a copper mounting cylinder in apposition to a split Teflon disc bored with a 3-mm diameter hole and positioned flushed with the end of the cylinder. To the left, copper cylindrical mold with the invested tooth.	57

List of Figures

Figure N ^o .	Title	Page
18	A diagram of copper cylinder and resin-encased enamel specimen with the split Teflon ring in position an the bonding / composite button completed.	57
19	Universal Testing Machine.	58
20	A diagram illustrating cross-sectional sample for shear bond test.	58
21	Baseline bilateral first permanent molars and second primary molars restored with Z100 composite. Left side 6E↑ were prepared with air-abrasion technique. Right side ↑E6 were mechanically prepared.	61
22	Bilateral first permanent molars and second primary molars restored by Z100 composite after 6 months recall period.	61
23	Bilateral first permanent molars and second primary molars restored by Z100 composite after 12 months recall period.	62
24	Percentage of different ratings of restorations of teeth prepared with air-abrasion or mechanically at baseline.	68
25	Percentage of different ratings of restorations of teeth prepared with air-abrasion or mechanically at 6 months.	69
26	Percentage of different ratings of restorations of teeth prepared with air-abrasion or mechanically at 12 months.	70
27	After "48 hours" SEM photomicrograph of replica of permanent first molar prepared with air-abrasion technique (×750).	72
28	After "48 hours" SEM photomicrograph of replica of primary second molar prepared with air-abrasion technique (×750).	72
29	After "48 hours" SEM photomicrograph of replica of permanent first molar prepared mechanically (×750).	73
30	After "48 hours" SEM photomicrograph of replica of primary second molar prepared mechanically (×750).	73

List of Figures

Figure N ^o	Title	Page
31	After "6 months" SEM photomicrograph of replica of permanent first molar prepared with air-abrasion technique (×750).	74
32	After "6 months" SEM photomicrograph of replica of primary second molar prepared with air-abrasion technique (×750).	74
33	After "6 months" SEM photomicrograph of replica of permanent first molar prepared mechanically (×750).	75
34	After "6 months" SEM photomicrograph of replica of primary second molar prepared mechanically (×750).	75
35	After "12 months" SEM photomicrograph of replica of permanent first molar prepared with air-abrasion technique (×750).	76
36	After "12 months" SEM photomicrograph of replica of primary second molar prepared with air-abrasion technique (×750).	76
37	After "12 months" SEM photomicrograph of replica of permanent first molar prepared mechanically (×750).	77
38	After "12 months" SEM photomicrograph of replica of primary second molar prepared mechanically (×750).	77
39	Showing means and standard deviations of microleakage scores for different techniques of cavity preparation.	84
40	Air-abraded and acid-etched permanent tooth showing absence of marginal leakage.	85
41	Air-abraded and acid-etched permanent tooth showing marginal leakage of score 1.	85
42	Air-abraded and acid-etched permanent tooth showing marginal leakage of score 2.	86
43	Air-abraded and acid-etched primary tooth showing absence of marginal leakage.	86

List of Figures

Figure N ^o .	Title	Page
44	Air-abraded and acid-etched primary tooth showing marginal leakage score 1.	87
45	Air-abraded permanent tooth showing absence of marginal leakage.	87
46	Air-abraded permanent tooth showing marginal leakage of score 2.	88
47	Air-abraded permanent tooth showing marginal leakage score 3.	88
48	Air-abraded permanent tooth showing marginal leakage of score 4.	89
49	Air-abraded primary tooth showing absence of marginal leakage.	89
50	Air-abraded primary tooth showing marginal leakage of score 3.	90
51	Air-abraded primary tooth showing marginal leakage of score 4.	90
52	Mechanically prepared permanent tooth showing marginal leakage of score zero.	91
53	Mechanically prepared permanent tooth showing marginal leakage of score 1.	91
54	Mechanically prepared permanent tooth showing marginal leakage of score 2.	92
55	Mechanically prepared permanent tooth showing marginal leakage of score 3.	92
56	Mechanically prepared primary tooth showing marginal leakage of score zero.	93
57	Mechanically prepared primary tooth showing marginal leakage of score 2.	93

List of Figures

Figure N ^o .	Title	Page
58	Mechanically prepared primary tooth showing marginal leakage of score 3.	94
59	SEM of air-abraded and acid-etched permanent enamel surface showing regular type I etching pattern (×3,500).	97
60	SEM of air-abraded and acid-conditioned permanent dentin surface showing opened dentinal tubules (×3,500).	97
61	SEM of air-abraded and acid-etched primary enamel surface showing rough surface with type I etching pattern (×3,500).	98
62	SEM of air-abraded and acid-conditioned primary dentin surface showing rough surface with opened dentinal tubules (×3,500).	98
63	SEM of air-abraded permanent enamel surface showing numerous pores and microroughness (×3,500).	99
64	SEM of air-abraded permanent dentin surface showing dentinal tubules partially covered with smear layer (×3,500).	99
65	SEM of air-abraded primary enamel surface showing regular rough surface (×3,500).	100
66	SEM of air-abraded primary dentin surface showing rough surface covered with smear layer except for few opened dentinal tubules (×3,500).	100
67	SEM of acid-etched permanent enamel surface showing type II etching pattern (×3,500).	101
68	SEM of acid-conditioned permanent dentin surface showing opened dentinal tubules (×3,500).	101
69	SEM of acid-etched primary enamel showing regular type II etching pattern (×3,500).	102