

Clinical Performance and Bacterial Plaque Counts Adjacent to Two Types of Space Maintainers

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By:

Ola Mohamed Ali Mahmoud Abd El-Geleel

Assistant lecturer

Pediatric Dentistry & Dental Public Health Department

Faculty of Dentistry

Ain-Shams University

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Supervisors

Prof. Dr. Amr Mahmoud Abd El-Aziz

Professor and Head of the
Pediatric Dentistry & Dental Public Health Department
Faculty of Dentistry
Ain- Shams University

Dr. Noha Samir Kabil

Associate Professor of Pediatric Dentistry & Dental Public Health
Faculty of Dentistry
Ain- Shams University

Dr. Makram Fahmy Attalah

Associate Professor of Microbiology and Immunology
Faculty of Medicine
Ain-Shams University

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ
﴿قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا
مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ﴾
صَدَقَ اللَّهُ الْعَظِيمُ

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This research is dedicated to

My precious family

*“Thank you for your never ending love
& support. . . .”*

Table of Contents

Title	Page No.
1. List of Figures	i
2. List of Tables	v
3. Introduction	1
4. Review of Literature	3
5. Aim of the Study	47
6. Patients and Methods	48
7. Results	79
8. Discussion	104
9. Summary	122
10. Conclusions	126
11. Recommendations	128
12. References.....	129
13. Appendix- I {List of abbreviations}.....	151
14. Appendix - II {Parent's consent form}.....	152
15. Appendix – III {Child's assent form}	158
16. Appendix- IV {Examination chart}.....	161
17. Appendix-V {Patients' instructions}	170
18. Arabic Summary.....	172

LIST OF FIGURES

<u>Figure No.</u>	<u>Title</u>	<u>Page No.</u>
(1&2)	Pre-operative photos showing badly decayed bilateral lower first primary molars	50
(3)	Bilateral periapical radiographs showing decayed lower first primary molars beyond repair	51
(4)	Ribbon Kit{ Ribbon 2mm width, Ribbon scissors, disposable tin foil}	54
(5)	Tin foil contoured to embrasures used as a template	55
(6)	Tin foil template & cut Ribbon segments	55
(7)	Rubber dam field isolation	56
(8)	Buccal& Lingual acid etching	57
(9)	Ribbon segment wetted with resin turns clear	58
(10)	Application of bonding agent to the etched enamel surface	58
(11)	Securing composite application on treated tooth surfaces	59
(12)	Single Ribbon segment ofRibbon(A) SM	60
(13)	Double Ribbon segments ofRibbon(B) SM	60

LIST OF FIGURES

(14& 15)	Ribbon fibers coated with Filtek Z350 Flowable composite	61
(16 & 17)	Checking occlusion and detecting premature contacts	62
(18 & 19)	Finished Ribbon SM {Ribbon A}	63
(20 & 21)	Finished Ribbon SM {Ribbon B}	63
(22)	Finished Ribbon SM showing gingival tissue clearance	64
(23- 25)	Bilateral space maintainers	65
(26)	Labeled transport medium in sterile test tubes	71
(27)	Prepared MitisSalivarius Agar plate	74
(28)	Prepared Cadmium Sulfate Fluoride AcridineTrypticase Agar plate	76
(29)	Oxoid anaerobic system	77
(30)	incubator set at 37 °C	77
(31)	Blue colonies of S. mutans grown on mitissalivarius agar culture medium	78
(32)	Cream colonies of Actinomyces spp. grown on CFAT culture medium	78

LIST OF FIGURES

(33)	Bar chart representing success and failure rates of the two types of space maintainers	80
(34)	Bar chart representing causes of space maintainers' failures	82
(35)	Cement loss & occlusal caries of abutment	83
(36)	Demineralization spot recovered after removal of a loose band	83
(37)	Debonding at the FRC-Enamel interface	87
(38)	Debonding at the FRC-Enamel interface, coinciding with the emergence of the permanent successor tooth	84
(39)	Gingival overgrowth blocking the clearance area	85
(40)	Fractured Ribbond framework	85
(41)	Kaplan-Meier curve for cumulative survival of space maintainers in relation to space maintainer types	87
(42)	Bar chart representing mean (PI) at the three scoring sites	90
(43)	Line chart representing changes by time in mean PI scores	92
(44)	Bar chart representing mean (GI) at the three scoring sites	94

LIST OF FIGURES

(45)	Line chart representing changes by time in mean GI scores	96
(46)	Bar chart representing mean Log₁₀ CFU of S. mutans in the three sites	98
(48)	Line chart representing changes by time in mean Log₁₀ CFU of S. mutans counts	100
(49)	Bar chart representing mean Log₁₀ CFU of Actinomyces spp. at the three sampling sites	101
(50)	Line chart representing changes by time in mean Log₁₀ CFU of Actinomyces spp. counts	103

LIST OF TABLES

<u>Table No.</u>	<u>Title</u>	<u>Page No.</u>
(1)	Distribution of Ribbond Fiber Reinforced Composite and Band and Loop SMs in the study sample	52
(2)	Descriptive statistics of demographic data in the study group	79
(3)	Success and failure rates of Band & Loop and Ribbond space maintainers	80
(4)	Causes of space maintainer failures	81
(5)	Results of Cox regression model for predictors of space maintainer success	86
(6)	Comparison between mean survival times (months) of different space maintainers	87
(7)	Mean $\pm$ standard deviation (SD) values and results of comparison of (PI) scores between the scoring sites	90
(8)	Mean $\pm$ standard deviation (SD) values and results of comparison of (PI) scores between different time periods at each site	92
(9)	Mean $\pm$ standard deviation (SD) values and results of comparison of (GI) scores between different scoring sites	94

LIST OF TABLES

(10)	Mean $\pm$ standard deviation (SD) values and results of comparison of (GI) scores between different time periods at each site	96
(11)	Mean $\text{Log}_{10} \pm$ standard deviation (SD) values and results of comparison of <i>S. mutans</i> counts between the sampling sites	98
(12)	Mean $\text{Log}_{10} \pm$ standard deviation (SD) values and comparison of <i>S. mutans</i> counts change by time at each sampling site	99
(13)	Mean $\text{Log}_{10} \pm$ standard deviation (SD) values and results of comparison of <i>Actinomyces</i> spp. counts between different sampling sites	101
(14)	Mean $\text{Log}_{10} \pm$, standard deviation (SD) values and results of comparison of <i>Actinomyces</i> spp. count change by time at each sampling site	102

INTRODUCTION

Introduction

The premature loss of primary teeth due to caries, trauma, ectopic eruption, or other causes may lead to undesirable tooth movements of primary and/or permanent teeth including loss of arch length. Arch length deficiency can produce or increase the severity of malocclusions with crowding, rotations, ectopic eruption, crossbite, excessive overjet, excessive overbite, and unfavorable molar relationships.^[1]

Protection of dental arch relations in the event of premature loss of teeth can be ensured with placement of space maintainers,^[2] thus, reducing the prevalence and severity of consequent malocclusion.^[3]

Different kinds of appliances can be used for space maintenance depending on the child's stage of dental development, dental arch, involved missing teeth, occlusion, patient's age, ability to cooperate and to tolerate an appliance.^[4]

The most common type of space maintainers used in the case of premature loss of a primary molar is the band and loop (B&L) space maintainer.^[2] B&L SM is easy and economical to produce, requires little chair time, and adapts easily to accommodate changing dentition.^[5] B&L SMs, however, have several disadvantages: they require a cast or model, laboratory time, and a second visit for placement; they tend to become decemented and embedded in gingival tissue and promote caries formation; they are

INTRODUCTION

unable to prevent rotation and tipping of abutment teeth; and they may be the source of metal allergy.^[4-6]

These disadvantages in addition to the rising interest in esthetic dentistry augmented by advances in technology, have led to the development of newer materials & designs in the fabrication of space maintainers such as direct bonded (**DB**) SMs, fiber-reinforced composite (**FRC**) SMs, and prefabricated SMs.^[7]

Although there has been increased interest in fiber-reinforced composite resins (FRCRs) in dentistry and they have been developed for diverse dental applications in the past years,^[8] however, (FRCRs) their use in the pediatric dental market is still limited.

Several studies were conducted in the past years testing FRCR SMs as potential alternatives for the conventional metallic space maintainers. However, to date no study has tested the clinical efficiency in terms of the appliances survival rates linked to the microbiological set up of plaque surrounding these appliances compared to their metallic counterparts; where plaque deposits adjacent to fixed appliances constituted a contributing factor to the appliance failure in terms of demineralization of abutment teeth as well as causing irritation of gingival tissues.

Review of Literature

Review of Literature

The transition from primary dentition to the permanent dentition is a complex phenomenon, which is composed of a variety of physiological adaptations of occlusion during this period. The exfoliation of the primary teeth, the permanent teeth eruption and the occlusion though independent, occur in a harmonious sequence.^[9]

Dental arch segment consisting of primary canine, primary first and second molar makes up the so called “supporting zone”, the range of which represents the sum of mesiodistal diameters of these teeth. The main function of the supporting zone during eruption of first permanent molars and replacement of incisors is to maintain space for permanent teeth (canines and premolars).^[10]

Early loss of deciduous teeth may compromise the “harmonic state” of the dental arches which comes from the balanced evolution of maxillary growth and dentitional change.^[11] As it is considered a major factor causing the loss of space for permanent elements, resulting in crowding of teeth. Secondary crowding refers to the crowding that is caused mainly by environmental factors. The premature loss of deciduous teeth is the most common contributing factor. Other factors include interproximal caries and fillings with improper contact points.^[12]

The dental profession is concerned with the prevention and the effective interception of developing occlusion.^[13] In this premise eruption guidance is a very important practice at the primary and
