Effect Of Different Adhesive Resin Cement Viscosities And Cementation Techniques On Cervical Marginal Adaptation And Microleakage Of Non-Metal Crown

THESIS

Research Project submitted to the faculty of Oral and Dental Medicine, Cairo University, in partial fulfillment of the requirements for the master degree
In
(Fixed Prosthodontics)

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2005

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بسم الله الرحمن الرحيم

وَقُلِ ٱعْمَلُوا۟ فَسَيَرَى ٱللَّهُ عَمَلَكُمْ وَرَسُولُهُۥ وَٱلْمُؤْمِنُونَ ۖ
وَسَتُرَدُّونَ إِلَىٰ عَـٰلِمِ ٱلْغَيْبِ وَٱلشَّهَـٰدَةِ
فَيُنَبِّئُكُم بِمَا كُنتُمْ تَعْمَلُونَ ﴿١٠٥﴾

صدق الله العظيم
سورة التوبة

Acknowledgement

I would like to express my endless gratefulness to Gracious God for helping me to achieve this work.

I would like to acknowledge, with all the feelings of love and appreciation, the devoted efforts of ***Dr. Ashraf Hussien Sherif,*** *. Professor of Fixed Prosthodontic and Vice Dean for Students Affairs, Faculty of Oral and Dental Medicine, Cairo University, for his considerable support, valuable supervision and help. I have to admit that his suggestions and support made all the problems facing me easier to be solved, even his criticism was always valuable and extremely helpful to me during the course of this research.*

I can not find sufficient words to express my gratitude to ***Dr. Eman Mohamed Anwar*** *, Assistant professor of Fixed Prosthodontics, Faculty of Oral and Dental Medicine, Cairo University for her valuable guidance and encouragement. I would like to express my deepest gratitude and great appreciation also, for her sharing in the practical part of the thesis and offering unlimited help and encouragement throughout the study.*

I would like to express my heart full thanks and deep gratitude to ***Dr. Amina Mohamed Hamdy****, Assistant Professor of Oral of fixed Prosthdontics, Ain Shams University, for her valuable stimulating guidance, cooperation and assistance during the laboratory work of this study.*

I would like to express my deep thanks and sincere gratitude to Prof. **Dr. Ahmed Zaki Maher***, Professor and Chairman of Fixed Prosthodontics Department, Faculty of Oral and Dental Medicine, Cairo University.*

I am deeply grateful to my brother for his help and encouragement.

Finally, I would like to thank all colleagues in Misr University for Science and Technology for their help and encouragement during the course of this work.

DEDICATION

To the meaning of my life

To my eternal love.

To my Father.

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INTRODUCTION

One of the most frequent causes of failure of crowns and fixed prostheses is the incomplete seating of the restoration.[133]

Crown seating is a complex process involving the interaction between variables associated with tooth preparation, crown fabrication process, cement type,and manipulation[21] as well as cementation technique.[46,62,111,117]

Many methods have been introduced to facilitate complete seating of crowns and are classified into two main groups: The first group involves modification of the tooth preparation and crown construction to provide space for the cement or to allow its rapid escape [15,31,45,105,120,134] , the other group involves modification of the luting procedure either by altering the choice of the cement,[78,148] composition of the cement,[130] mixing procedure, or technique of load application during crown seating.

The complete seating of full coverage restoration during cementation is hindered by the inability of the cement to flow from the internal surface of the crown, and by the film thickness of the luting material itself.[152] The composition and viscosity of the cements also have definite influence on final seating.[130]

The practice of fixed prosthodontic has changed dramatically with the introduction of innovative materials and techniques. Adhesive resin systems are examples of these changes.[113]

At present, a large number of commercial adhesive composite resin cements are available and they differ according to their filler content, viscosity, working time, chemical composition and polymerization mechanism.[78, 141] The viscosity of composite resin is in general reduced through the reduction of the filler content, and / or the composition of the monomers, and / or type of filler. However, the mechanical properties and wear resistance are dependent on the filler content.[122]

The development of adhesive composite resin cement has taken place in parallel with the development of adhesive cementation techniques for tooth colored inlays, onlays, and ceramic crowns.[78]

Several cementation devices and techniques have been recommended for the application and maintenance of forces during seating of the fixed restorations.[70] Many static[63,66,68,116] and dynamic[8,19,62,70,101,142] loading procedures have been used. A wide array of mechanical devices are recommended for the application of dynamic loads.[114] One of the possible methods of enhancing the seating of the crowns is the application of oscillating forces.[64] The use of vibration to alter the flow of thixotropic materials has long been used by industries. The original procedure described in the dental literature involves the use of ultrasonic scaler.[146]

Ultrasonic hand pieces allows vibrations with high frequencies transmitted through accurate and sophisticated ultrasonic tips which vibrate in one longitudinal plane and eliminates any spurious, lateral vibrations.

The effect of oscillation upon the flow properties of a cement is dependant upon the rheological characteristics of the cement.[64]

However, the application of the new cementation techniques for luting fixed prostheses is not yet established compared to the conventional manual techniques. So, the present study is concerned with the evaluation of such techniques in conjunction with adhesive resin cement of different viscosities and tooth preparations with two different convergence angles.

AIM OF THE STUDY

The aim of the present study is to evaluate the effect of some different cementation techniques on cervical marginal accuracy and microleakage of one type of non-metal crowns (Ceramic Optimized Polymer (CEROMER) / Fiber Reinforced Composite system (FRC)**)** luted with adhesive resin cements with different viscosities, using two different convergence angles.