

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

## **THESIS**

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

وَقُلِ أَعْمَلُوا فَسِرِّي اللَّهِ عَمَلَكُمْ وَرَسُولُهُ وَالْمُؤْمِنُونَ  
وَسَرُّدُونِ إِلَىٰ عِلْمِ الْغَيْبِ وَالشَّهَادَةِ  
فَيُنَبِّئُكُمْ بِمَا كُنْتُمْ تَعْمَلُونَ ﴿١٠٥﴾

صدق الله العظيم  
سورة التوبة

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# *DEDICATION*

*To the meaning of my life*

*To my eternal love.*

*To my Father.*

## **LIST OF CONTENTS**

	<b>Page</b>
<b>Introduction .....</b>	<b>1</b>
<b>Review of Literature .....</b>	<b>4</b>
<b>Aim of the study .....</b>	<b>35</b>
<b>Materials and Methods .....</b>	<b>36</b>
<b>Results .....</b>	<b>68</b>
<b>Discussion .....</b>	<b>104</b>
<b>Summary and Conclusion. ....</b>	<b>119</b>
<b>References .....</b>	<b>122</b>
<b>Arabic Summary .....</b>	

## **LIST OF TABLES**

<b>Tables</b>		<b>Page</b>
1	Samples grouping.	39
2	Mean marginal gap measurement (in micron) as affected by the tested cement viscosities at 10 degree convergence angle.	70
3	Mean marginal gap measurement (in micron) as affected by the cementation techniques at 10 degree convergence angle.	70
4	Mean marginal gap (in micron) as affected by the interaction between the cement viscosities and cementation techniques at 10 degree convergence angle.	70
5	Mean marginal gap measurements (in micron) as affected by the cement viscosities at 20 degree convergence angle.	75
6	Mean marginal gap measurements (in micron) as affected by the cementation techniques at 20 degree convergence angle.	75
7	Mean marginal gap measurements (in micron) as affected by cement viscosities and cementation techniques at 20 degree convergence angle.	75
8	Mean marginal gap measurements (in micron) as affected by the tested convergence angles.	81
9	Mean marginal gap measurements (in micron) as affected by the interaction between the convergence angle and cement viscosity.	81
10	Mean marginal gap measurements (in micron) as affected by the interaction between the convergence angles and cementation techniques.	81
11	Mean marginal gap measurements (in micron) as affected by the tested convergence angles, cement viscosities and cementation techniques.	82
12	Microleakage mean score for each sample, the mean & standard deviation for each subgroup.	90

13	Mean microleakage scores as affected by cement viscosities at 10 degree convergence angle.	93
14	Mean microleakage scores as affected by cementation techniques at 10 degree convergence angle.	93
15	Mean microleakage scores as affected by the interaction between the cement viscosities and cementation techniques at 10 degree convergence angle.	93
16	Mean microleakage score as affected by cement viscosities at 20 degree convergence angle.	94
17	Mean microleakage score as affected by the inter action between the cement viscosities and cementation techniques.	94
18	Mean microleakage scores as affected by cement viscosities and cementation techniques at 20 degree convergence angle.	94
19	Mean microleakage score as affected by convergence angles.	94



### **LIST OF FIGURES**

<b>Figures</b>		<b>Page</b>
1	Variolink II.kit (high, low viscosities).	37
2	Variolink II ultra kit (Ultra high viscosity).	37
3	Photograph showing some samples of group I with 10 degree convergence angle.	40
4	Photograph showing some samples of group II with 20 degree convergence angle.	40
5	Diagram showing the dimensions of the prepared tooth.	41
6	Photograph of the prepared tooth (note the occlusal step).	41
7	Rubber base impression in the brass special tray.	43
8	Type IV dental stone working die.	45
9	The working die painted with die spacer.	45
10	Rubber base impression of the painted working die.	46
11	Silicon key covering the die surfaces below the finish line.	46
12	Vectris single placed on the occlusal surfaces ready to be cured in Vecris VS 1 unit framework former.	48
13	The polymerized Vectris core on the die.	48
14	The finished Vectris core on the master die.	49
15	Vectris core covered with Targis base.	49
16	Split Teflon mold and outer plastic ring for crown standardization.	50
17	The assembled mold.	50
18	Crown former adjusted to the Vectris core.	52
19	Finished Targis / Vectris crown on the tooth.	52
20	Diagram of the metal jig showing its dimensions and components.	54
21	Sample mounted in the metal jig.	54
22	Cervical vertical marginal discrepancy measurement before cementation for Targis/Vectris crown.	55
23	Component parts of the loading device. A: Base portion B: Metallic cylinders C: T-shaped metallic part D: 3 kg load.	58
24	Diagram showing the assembled loading device	60

25	Photograph showing the sample in place in the loading device.	60
26	The ultrasonic hand piece with specially designed tip.	61
27	A specially designed holder for the ultrasonic hand piece.	63
28	The tooth removed from the Lichman's dye.	66
29	The tooth sectioned into two halves to score the extent of dye penetration along the wall of the tooth.	66
30	Diagram showing the scale used for evaluation of dye penetration.	67
31	Histogram showing the mean marginal gap measurements (in micron) as affected by the tested cement viscosities at 10 degree convergence angle.	71
32	Histogram showing mean marginal gap measurements (in micron) as affected by the cementation techniques at 10 degree convergence angle.	72
33	Histogram showing mean marginal gap (in micron) as affected by the inter action between the cement viscosities and cementation techniques at 10 degree convergence angle.	73
34	Histogram showing mean marginal gap measurements (in micron) as affected by tested the cement viscosities at 20 degree convergence angle.	76
35	Histogram showing mean marginal gap measurements (in micron) as affected by the cementation techniques at 20 degree convergence angle.	77
36	Histogram showing mean marginal gap measurements (in micron) as affected by cement viscosities and cementation techniques at 20 degree convergence angle.	78
37	Histogram showing mean marginal gap measurements (in micron) as affected by the tested convergence angles.	83
38	Histogram showing mean marginal gap measurements (in micron) as affected by the interaction between the convergence angle and cement viscosity.	84
39	Histogram showing mean marginal gap measurements (in micron) as affected by the interaction between the convergence angle and cementation techniques.	85
40	Histogram showing mean marginal gap measurements (in micron) as affected by the tested convergence angles, cement viscosities and cementation techniques.	86
41	Photograph showing the sectioned tooth showing score "0" microleakage	91

	No die penetration.	
42	Photograph showing the sectioned tooth showing score “1” microleakage. Die penetration to 1/3 of the axial wall.	91
43	Photograph showing the sectioned tooth showing score “2” microleakage. Die penetration to 2/3 of the axial wall.	92
44	Photograph showing the sectioned tooth showing score “4” microleakage. Die penetration over the occlusal surface.	92
45	Histogram showing mean microleakage score as affected by cement viscosities at 10 degree convergence angle.	95
46	Histogram showing mean microleakage score as affected by cementation techniques at 10 degree convergence angle.	96
47	Histogram showing mean microleakage score as affected by the interaction between the cement viscosities and cementation techniques.	97
48	Histogram showing mean leakage score as affected by cement viscosities at 20 degree convergence angle.	98
49	Histogram showing mean microleakage score as affected by cementation techniques at 20 degree convergence angle.	99
50	Histogram showing mean microleakage score as affected by cement viscosities and cementation techniques at 20 degree convergence angle.	100
51	Histogram showing mean microleakage scores as affected by the convergence angle.	101

## **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.

# INTRODUCTION

One of the most frequent causes of failure of crowns and fixed prostheses is the incomplete seating of the restoration.<sup>(133)</sup>

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

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<sup>(15,31,45,105,120,134)</sup>, the other group involves modification of the luting procedure either by altering the choice of the cement,<sup>(78,148)</sup> composition of the cement,<sup>(130)</sup> 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.<sup>(152)</sup> The composition and viscosity of the cements also have definite influence on final seating.<sup>(130)</sup>

The practice of fixed prosthodontic has changed dramatically with the introduction of innovative materials and techniques. Adhesive resin systems are examples of these changes.<sup>(113)</sup>

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.<sup>(78, 141)</sup> 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.<sup>(122)</sup>

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.<sup>(78)</sup>

Several cementation devices and techniques have been recommended for the application and maintenance of forces during seating of the fixed restorations.<sup>(70)</sup> Many static<sup>(63,66,68,116)</sup> and dynamic<sup>(8,19,62,70,101,142)</sup> loading procedures have been used. A wide array of mechanical devices are recommended for the application of dynamic loads.<sup>(114)</sup> One of the possible methods of enhancing the seating of the crowns is the application of oscillating forces.<sup>(64)</sup> 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.<sup>(146)</sup>

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.<sup>(64)</sup>

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.