

**Republic of Iraq
Ministry of Higher Education
And Scientific Research
University of Baghdad
College of Dentistry**



Evaluation of Fracture Strength of Monolithic Zirconium Crown cemented with Different Types of Luting Agents (in Vitro Comparative Study)

**A thesis Submitted to the Council of the College of Dentistry
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Abstract

The longevity of fixed partial denture depends on the type of luting cement used with tooth preparation. The clinician's understating of various cements, their advantages and disadvantages is of utmost importance. In recent years, many luting agents cements have been introduced claiming clinically better performance than existing materials due to improved characteristics.

This study was planned with an aim to evaluate fracture strength of cemented monolithic zirconium crown using different types of luting agents.

thirty-two sound maxillary first premolar teeth of comparable size and shape freshly extracted for orthodontic purposes were selected and collected to be used in this in vitro study.

Standardized preparation for full contour zirconia crown restorations was carried out with the following preparation features: Deep chamfer finishing line of 1.0 mm depth , total axial tapered of 6 degrees and axial height 4 mm.

~~The teeth~~The preparation were ,then, scanned directly using digital intra-oral scanner technique (Apollo DI Sirona). Full contour zirconia crown restorations were then fabricated using Sirona In-Lab MC X5 milling device.

Teeth were divided into four groups according to the types of luting agents used (n=8): Group 1:control group(no cement),group 2:GIC

conventional (SDI), Group 3: Theracem self-adhesive resin cement, group 4: Duo-link universal adhesive.

The results of this study revealed that the least fracture resistance of monolithic zirconium crown recorded in group 2 (2272.50N) \pm SD (454.27), while the highest fracture resistance recorded in group 4 (3318.75 N) \pm SD (574.74) -respectively.

Comparison of significance among the different groups using one-way ANOVA test showed a statistically highly significant differences ($p < 0.01$). Further, comparison between each two groups using Student's t-test revealed the difference between G1(control group) and G2(GIC group) was statically non significance different while the difference between G1(control group) and G3(self-adhesive) and also between G3 and G4(Duo-link adhesive) was statically significance furthermore the difference between G1(control group) and G4(Duo-link adhesive), also between G2(GIC) and G4(Duo-link adhesive) was highly significant difference.

There is Non statistical -significance differenace we are see between (GIC group and Theracem group) because of $P > 0.05$.

As a conclusion Duo-link (Bisco) universal adhesive provide more resistance to fracture than others, follow by theracem self-adhesive resin cement and lastly GIC conventional (SDI).

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