

DIAMETRAL TENSILE STRENGTH, SHEAR BOND STRENGTH AND SEM OF RESIN MODIFIED LUTING GLASS IONOMER MODIFIED WITH ZIRCONIA

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ABSTRACT

The present study was done to evaluate the effect of addition of zirconia powder in 1%, 2% and 3% weight on a resin modified glass ionomer. SEM, diametral tensile and shear bond strength to dentin were evaluated. It was found that, addition of 3% zirconia to the powder of glass ionomer resulted in a significant increase of diametral tensile and shear bond strength of cement to dentin. SEM showed integration of zirconia powder between the glass powder and resin matrix resulted in improvement of strength properties.

INTRODUCTION AND REVIEW OF LITERATURE:

Dental cements are intermediary material placed between tooth and restoration glass ionomer cement is used due to adhesion properties to mineralized dental tissues and good mechanical properties. The disadvantages of glass ionomer cements are its high solubility within the first 24 hours and low mechanical properties. Therefore resin modified glass ionomer was developed^(1,2).

Resin modified glass ionomer have been developed, such materials undergo both an acid base reaction as well as curing by light. These materials are known as dual cure and tri-cure glass ionomer^(3,4,5,6).

Resin modified glass ionomer cement harden by an acid-base reaction between fluoro-alumino silicate glass powder and an aqueous solution of polyacrylic acid modified with methacrylate groups. These cements are termed resin modified

or hybrid glass ionomer^(7,8,9,10,11).

Jones 1992⁽¹²⁾, stated that the ideal requirements of dental cement include long working time, rapid set at oral temperature, low viscosity, low film thickness, low solubility, high compressive and tensile strength, adhesion to tooth structure and restorations, anticariogenic biocompatibility, translucent and radiopacity.

Luting cements must withstand masticatory and parafunctional stresses. They must maintain their integrity while transferring stresses from crowns and fixed bridges to tooth structures. The localized stress are probably contributed to initiation of cement failure at the cement-tooth interface⁽¹³⁾.

In resin modified materials the tensile and flexural strength, the fracture toughness and wear resistance have been improved⁽¹⁴⁾. The main function of luting cement is to provide a nonpermeable seal around the margins of the restoration⁽¹⁵⁾.

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