

Effect of exposure time and distance of the light curing unit on the surface hardness of resin cement

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ABSTRACT

Background: Nowadays, ceramic is the main choice for indirect tooth restoration. Cement plays important role in properties of restoration, especially in fragile material like ceramic.

Objective: This study aimed to evaluate the effect of exposure time and distance of light curing unit on the effectiveness of polymerization of resin cement, assessed by microhardness.

Methods: The dual cured resin cement was inserted into a circular slot in a rectangular metal mold. Then a mylar strip was placed on top of the dual cure resin cement, followed by a ceramic disc that was placed over the rectangular metal mold. Finger pressured was then applied to the ceramic disc. After that, the light curing unit tip was positioned over the upper surface of the ceramic and cured with different times and distances. Specimens were divided into 10 groups. Each specimen was evaluated using a microindentation tester, five indentations were accomplished with a 50-g load applied for 30 seconds. The data were analyzed statistically with two-way ANOVA at 95% significant level.

Results: The results revealed that the closer the distance and the longer the curing time, the greater the surface hardness. The group with 0-mm curing distance and 60-s curing time had significantly superior hardness when compared to other groups. There were significant difference between each distance and curing time.

Conclusion: Both decreasing the distance between the light curing unit tip and the resin cement and increasing the curing time resulted in significantly higher cement's surface hardness.

Keywords: Polymerization, Resin cement, Surface microhardness

INTRODUCTION

Currently, there is an increased demand for esthetic restorations, especially all-ceramic restoration. Therefore, the properties of dental ceramic have been much improved in terms of esthetic, biocompatibility, chemical stability and high compressive strength.¹ The objective of indirect restorations is to restore the morphology of destroyed tooth, providing wear resistance for weakened tooth and longer longevity than direct restorations.²

Longevity of the restoration is one of the most important criteria in choosing the material whereas the restoration success is defined as the demonstrated ability of a restoration to perform as expected, The length that restoration survives is often used as a measure of clinical performance.

There are many factors that are involved in longevity of the restoration; such as patient's oral hygiene, oral habits, dentist's skill and material factors.³ Failure of the restoration is mostly caused by improper biomechanics and tooth preparation, improper cementation techniques, and improper luting agents. Thus luting procedure is a