The effect of different light curing systems on the bond strength of resin cement through CAD/CAM ceramic veneers

Dr. Alaa El Araby [a]***, Dr. Abdulaziz Al-Kheraif*** [b]***, Dr. Mohamed I. Hashim*** [c]

[a] *Associate Professor, Dept. of Restorative Dental Sciences, College of Dentistry, King Saud University Riyadh, KSA. On leave from Alexandria University, Faculty of Dentistry.*

[b] *Assistant Professor, Faculty of Applied Medical Science King Saud University Riyadh, KSA.*

[c] *Assistant Professor, Faculty of Applied Medical Science King Saud University Riyadh, KSA. On leave from Faculty of Dental Medicine (Girls Branch), Al-Azhar University Cairo, Egypt.*

ABSTRACT

High-intensity chair-side curing units have recently become commercially available. Among these new units, plasma-arc lights (PAC) and light emitting diodes (LEDs), with an energy peak at wavelengths between 460 and 480 nm are expected to allow efficient polymerization of most types of composite resin in a shorter time compared to commonly use conventional quartz-tungsten-halogen (QTH) lights. The success of ceramic veneer is greatly determined by the strength and durability of the bond between the three different components of the bonded veneers which are the tooth surface, the luting resin, and the ceramic veneer. The resin cement combination was exposed to three different photo polymerization units.

The bond strength of the light-cured resin was evaluated by shear tests and SEM observations of the fracture surfaces. Statistically significant differences were found between the bond strength of veneers exposed to LED or conventional lights and PAC unit ($P < 0$-001). There was no significant difference in the mean shear bond strength values between the halogen and LED lights regardless the shade or the thickness of the ceramic veneers. It was found that plasma-arc curing for 6 s was not sufficient to obtain bond strengths similar to those of specimens polymerized with LED or halogen light for 40 s, whereas the plasma-arc was not sufficient to achieve similar failure patterns for darker-shade porcelain of 2 mm thickness. The bond strength achieved by LED or halogen lights was found to be relatively unaffected by the shade or translucency of the ceramic veneers.

Key words: Ceramic laminate veneer, resin curing, plasma-arc light, LED