

Comparison of the depth of cure of two flowable dental composites polymerized at variable increment thickness and voltage

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Objectives: Aim of this study is to compare the depth of cure of two composite materials (SDR & Filtek Bulk-fill) cured at variable increment depths (2, 4 and 6 mm) and voltages (180 and 200 volts).

Materials & Methods: Each sample of the composite material was packed in a mold of 2 mm, 4 mm and 6 mm in a dark room and curing light (quartz-tungsten-halogen) of optimal intensity (above 300 m W/cm²) was exposed for 20 seconds at two different voltages on each specimen. The specimens were then removed out of the mold and the composite on the non-exposed end was then scraped with a flat plastic instrument. The remaining composite represented the set material and was measured using a digital vernier caliper. The reading was divided by half to follow the ISO 4049 method of measuring depth of cure. Student's t test, factorial design ANOVA and multiple regression analysis were applied. Level of significance kept at 0.01.

Results: The mean depth of cure of SDR and Filtek Bulk-fill were 1.93 ± 0.82 and 1.77 ± 0.65 mm. Lowering the voltage from 220 to 180 volts reduced the depth of Filtek Bulk-fill from 1.87 ± 0.74 to 1.67 ± 0.54 mm whereas; the depth of cure of SDR remained unchanged at 1.93 mm at the two voltages. The adjusted R² for the depth of cure was 0.93 when the increment thickness, voltage and restorative material were taken together in the regression model.

Conclusions: There was no statistically significant difference between SDR and Filtek Bulk-fill for the depth of cure at 2 and 4 mm increments. However, at 6 mm increment, the SDR cured significantly deeper than the Filtek. SDR showed consistent depth of cure at lowered voltage compared to Filtek. Around 91% variation in the depth of cure of these composites materials is explained by increment thickness alone.

Biography

Sadia Tabassum has completed her BDS in 2011 from Army Medical College, Rawalpindi and has been currently working as Resident in Aga Khan University, Karachi.

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