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Changes in the temperature of a bulk-fill composite resin during polymerization**Ryan Jin-Young Kim**

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During composite restoration, exothermic reactions of the composite resin and radiant heat from the light-curing unit contribute to inevitable heat generation. Temperature changes were evaluated during polymerization of a light-cured composite resin at multiple sites in real-time. Class-1 cavities were prepared (3 mm depth; 0.5 mm remaining dentin thickness to the pulp cavity) in extracted third molars, filled with a bulk-fill composite (SureFil SDR Flow, Dentsply). The specimens were placed in a 36.5 °C in a water bath, then eight thermocouples were used to measure temperatures at the bottom center (BC), middle center (MC), top center (TC), bottom corner (BE), middle corner (ME) and top corner (TE) of the cavity, at the pulpal side of the dentin within the pulp chamber (PD) and in the curing light (CL) tip during light curing. The maximum temperature values differed among the measurement sites. Although the temperature of the curing light increased until the curing light was turned off at 20 s, a rapid temperature rise occurred at the beginning of light curing in all measurement sites except for PD and the maximum temperatures were recorded during the early stage of light curing. The highest mean temperatures were measured at TC (74.9 °C) and PD exhibited the lowest mean temperatures of 42.0 °C. More heat was generated at the center than at the corner and at the top than at the bottom of the composite resin.

Biography

Ryan Jin-Young Kim has completed his PhD and currently working as an Assistant Professor at the Seoul National University School of Dentistry, South Korea..

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