

Evaluation of polymerization shrinkage and depth of cure of silorane based composite resin and methacrylate based composite resin by comparative study



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Abstract

Objectives: composites constitute the majority of direct tooth coloured restorations since they can replace the biological tissue. The major drawbacks of composite resin relate to polymerization shrinkage. This study aimed to compare the polymerization shrinkage and depth of cure among three different types of composite resin.

Methods: fifteen premolar teeth for each group were collected and cavities prepared on the buccal surface to depths of 1.5 mm, with diameter of 3 mm, using a diamond cylindrical bur with water coolant. Then each of the fifteen cavities was filled with one type of composite resin according to the manufacturer's instructions. After that the specimens were stored in deionized water for one week. Subsequently, the marginal gaps were observed and measured by using a light microscope with a reticular measuring ocular. To test the depth of cure, fifteen samples for each group were prepared using metal molds of 6 mm length and 4 mm diameter. The test materials were light cured, then the specimens were removed from the mold and the uncured material was gently removed with a plastic spatula. The height of cured material was then measured with a micrometer and the values were divided by 2, this value being recorded as a depth of cure.

Results: The descriptive statistics for the degree of polymerization shrinkage among the three groups clearly indicated that the P90 had the lowest value for shrinkage, with significant difference among the groups. Regarding the depth of cure, the Sigma clearly showed the highest value, with significant difference among the groups.

Conclusion: Silorane composite resin produced less polymerization shrinkage in comparison with methacrylate composites resin. The depth of cure of methacrylate composite resin was greater in comparison with that of silorane composite resin.