

**The effect of thermocycling on microleakage  
analysis of bulk filled base composite in  
comparison to incrementally placed  
nanohybrid composite in class II MOD  
restorations**

**(An in vitro study)**

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# Abstract

This in vitro study was conducted to evaluate the effect of thermocycling on the microleakage analysis of occlusal and cervical margins of standardized class II MOD cavity filled with bulk filled composite restorations (SDR bulk filled base composite and X-tra base bulk filled base composite) in comparison to incrementally placed (Grandio) nanohybrid composite and to evaluate the difference in microleakage between enamel and dentin margins for the three groups of materials.

Forty eight extracted maxillary first premolar teeth were prepared with standardized MOD cavities. The specimens were divided into three groups of sixteen teeth each according to the material used:

- Group Grandio: Filled by Grandio material by oblique incremental filling technique.
- Group SDR: Filled by SDR material in 4mm bulk filling+Grandio occlusal layer.
- Group X-tra base: Filled by X-tra base material in 4mm bulk filling+ Grandio occlusal layer.

Each group was subdivided into two subgroups (of eight samples each) according to whether to be thermocycled or not.

All the groups were immersed in 2% methylene blue dye for 24 hours, blocked in clear acrylic and sectioned longitudinally into four sections .Microleakage was estimated by determining dye penetration by using scoring system under stereomicroscope.

The statistical analysis of the results showed that:

- Thermocycling significantly increased the amount of microleakage at the occlusal margin only in Grandio nanohybrid composite with oblique incremental restorative group in comparison to bulk filled base materials experimental groups.

- The use of SDR bulk filled material before and after thermocycling reduced the amount of microleakage at the occlusal and cervical enamel margins with significant difference in comparison to all the experimental groups.
- Grandio incrementally restored group had non significant difference in amount of microleakage to X-tra base material group before thermocycling at the occlusal and cervical enamel margin while it had a significant increase in comparison to it after thermocycling.
- None of the experimental groups had significantly reduced the amount of microleakage at the dentin margin before or after thermocycling.
- There was a non significant difference between enamel and dentin margins for Grandio incrementally filled group and x-tra base bulk filled group before and after thermocycling and in SDR bulk filled group after thermocycling. The exception was SDR group before thermocycling, microleakage significantly increased in dentin margin in comparison to enamel margin.