MICROLEAKAGE IN CLASS V COMPOSITE RESTORATIONS AFTER CHLORHEXIDINE GLUCONATE PRE-TREATMENTS

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DIEGO BETANCOURT[1,4], MARTHA PARRA[2], PAULA BALDIÓN[3,4]

[1] MSc Ciencias Odontológicas, [2]Odontóloga, [3]PhD Ingeniería-Ciencia y Tecnología de Materiales, Universidad Nacional de Colombia.
[4]Associate Professor, Universidad Nacional de Colombia

The penetration of fluids, bacteria, molecules and ions through the interface of restorative material and cavity wall, which is not clinically detectable is known as microleakage. This phenomenon can produce marginal staining, recurrent caries, pulpal damage and loss of restoration.

Obtaining an adequate gingival seal in dentin is still a major problem To evaluate the marginal seal and the performance of hybrid layer, the leakage test reveals the adaptation of restoration to cavity wall by dye penetration.

Several factors affect the hybrid layer stability. One of them, is the degradation of exposed collagen by matrix metalloproteinases (MMP's) activity. It has been proposed that the pre-treatment with chlorhexidine gluconate (CHX) on acid-etched dentin may be a strategy to prevent the degradation of collagen fibrils. As a result, in addition to its known disinfectant effect, CHX acts as a MMP´s inhibitor.

Objective

To evaluate the CHX´s effect on marginal sealing of composite restorations in class V cavities, when it is unintentionally applied to enamel during the adhesive process.

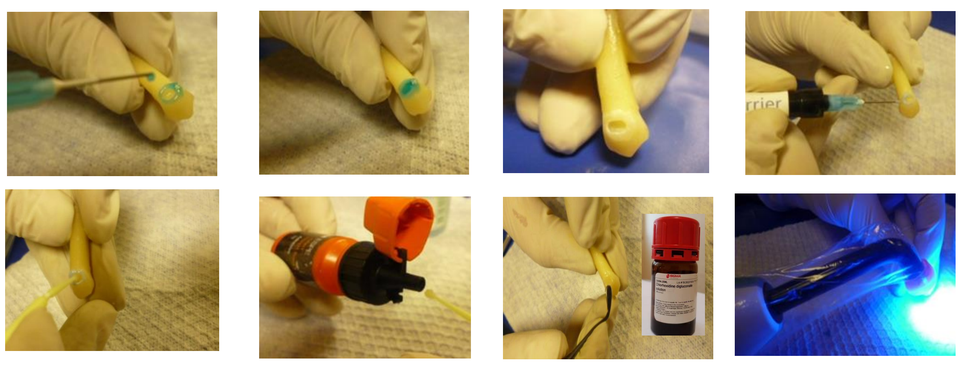
Methods

50 human premolars were collected with previous informed consent. Standardized class V cavities were conducted and the samples were randomly allocated into 5 groups to perform the resin fillings according to each treatment.

Standarized class V cavities

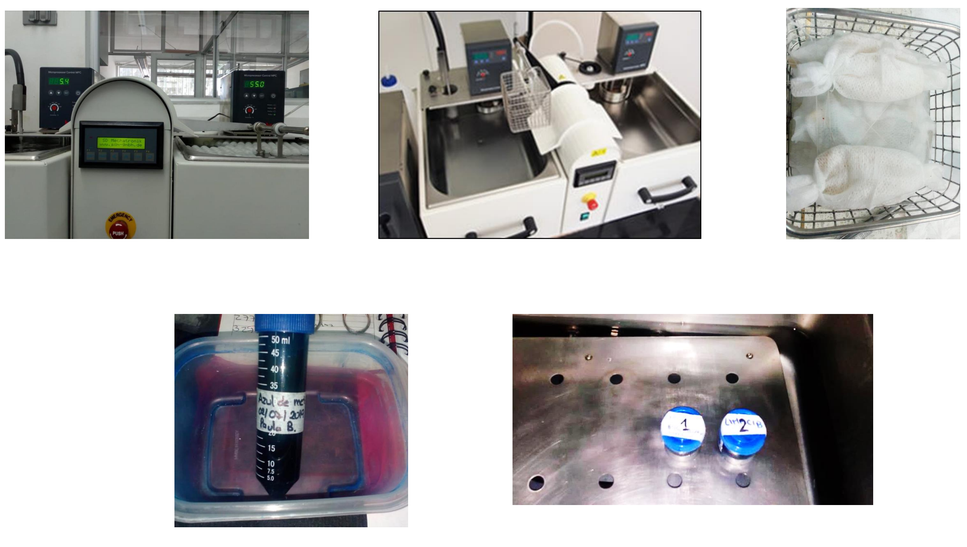
Group	Treatment
1- Control (-)	Conventional E&R adhesión
2- 0.012%CHX E	0.12%CHX dentin-enamel
3- 0.012%CHX D	0.12%CHX enamel barrier
4- 2%CHX E	2%CHX dentin-enamel
5- 2%CHX D	2%CHX enamel barrier

Test groups

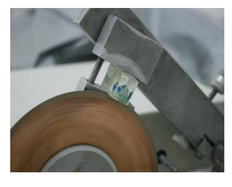


Adhesive protocol with CHX pre-treatment using a barrier to protect the enamel

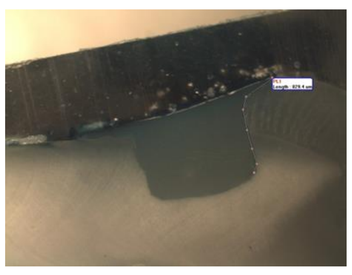
The samples were embedded in an epoxy resin die up to 1mm of cementoenamel junction; all teeth were thermocycled for 5000 cycles (5 – 55°C) with a exposition time of 20s and transfer time of 5s. Later the teeth were immersed in 1%methylene blue for 24h at 37°C.





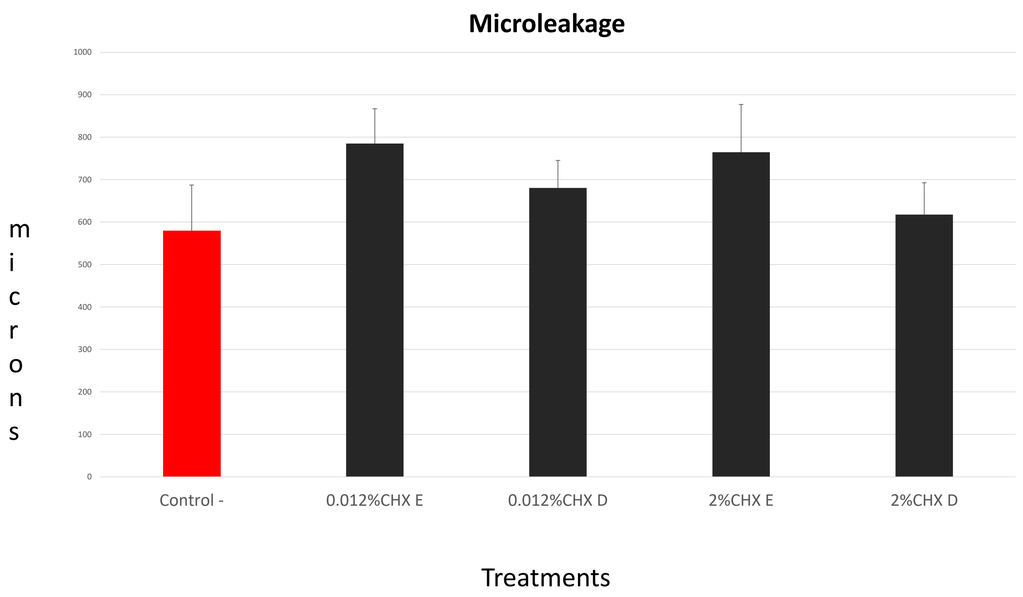


The specimens were sectioned using a water-cooling diamond saw (Isomet, Buehler LTD, Lake Bluf, IL. USA) from facial to lingual and dye penetration was evaluated under stereomicroscopy at 30X with the software Motic 2.0. The dates were recorded in a 1 to 3 scale. Data analysis was performed with ANOVA ($p<0.05$) by SPSS statistics package.


Results and Discussion

The control (-) group showed the lowest value for microleakage while the highest mean was for 2%CHX D group.



When comparing the experimental groups, the highest microleakage was seen in the groups where CHX was applied on dentin and enamel. However the statistic test showed that there is no significant difference between the means of the groups.

The results are consistent with those reported in previous studies.

In this study, the adhesive protocol did not wash the CHX, which was integrated in the interface.

According with the results, the CHX applied on enamel and dentine is prone to increase the microleakage when compare with CHX applied on dentin only, regardless of CHX concentration.

Conclusion

The CHX did not affect the ability to seal the composite restorations to the cavity walls, and could be used in a adhesive protocol.

Recommendations

To evaluate microleakage of composite restorations with CHX pretreatment in an adhesive protocol washing the CHX

Aknowlegment

Faculty of Dentistry Universidad Nacional de Colombia.
Limacib, Laboratory for Dental Materials Assay, FOUN

Conflicts of interests

The authors declare that they have no competing interests.