IN VITRO EVALUATION OF DIFFERENT DENTAL MATERIALS USED AS INTRACORONAL BARRIER

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INTRODUCTION

Sealing of the root canal entrance is an effective method of reducing micro leakage in an endodontically treated teeth. Although studies support the effectiveness of coronal barriers (CB), there is no universal protocol that incorporates it as part of the Endodontic Treatment.

OBJETICTIVES

In order to assess what is the best material to be used as CB, when applied on the entrance of the root canal after filling, an *in vitro* micro-leakage study was carried with four materials.

MATERIALS AND METHODS

70 single root teeth were prepared (cleaned and polished and had their coronal part separated) and immerse in distillate water 3 degree for the period of 7 days. Following, their were randomly separated in 4 trial groups (n=15) and 2 control groups (n=5). The instrumentation was done Reciproc® system (R25) and for the root canal filling was used Adseal® sealing and single cone Reciproc® system (R25) using McSpadden technique modified, whitch promote thermomplastification of gutta-percha using a McSpadden gutta-condensor #40.

Removal of the coronal part of gutta-pecha (3mm depth) was done using a warm periodontal explorer by a dragging technique.

This space was later filled with the materials chosen: *LC Fuji II*®, *Ionoseal*®, *GrandioSO*® and *GrandioSO flow*® (using the instructions of the manufacture).

The teeth were, then, thermoclicled (500 cycles, with a temperature of 5°-55°C, with baths during 20 seconds), varnished (Nail polish My Label Beauty® – Nº 25) and after that immerse in dye, metileno blue solution 2%, during 3 hours. After drying, they were sectioned (slices of 1mm) and evaluated with a 15X magnifier.

The data was analysed statistically , using IBM SPSS Statistics 22, using $\alpha = 0.05$. ANOVA and Tukey HSD tests were used.

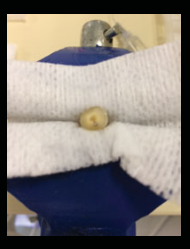

Figure 1: Tooth stabilized in a mini vise.

Figure 2: Filling with chosen materials.

Figure 3: Roots inside Eppendorf tubes immerse in distillate water

Figure 3: Imersion in methylene blue 2%

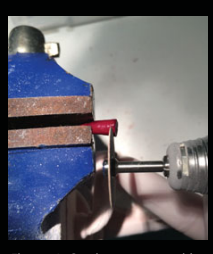

Figure 4: Cutting process with a extra fine Diamond disc.

RESULTS AND DISCUSSION

LC Fuji II® was the material that had the best results, but with value not statistically significate (p>0.05) in relation to the nanoparticle composites: universal and flow.

Ionoseal® was the material that showed the highest leakage, and when compared to the other groups, the difference was statically (p<0.05). However, between the groups *GC Fuji II LC*®, *GrandioSO*® *Flow* and *GrandioSO*®, there was no significantly differences.

The results of *Ionoseal*® can be due to the large quantity of resin in the formulation when compare to glass particles. When this material is used according to the manufacture instructions (without etch and bond), produce an inferior result than the other materials. Kodadadi et al. (2014)* study suggest that when using *Ionoseal*® it should be incorporated in the protocol a bonding system, because then it had the results similar to the others materials that he studied (Fissurit®, GrandioSo® and LC Fuji II®).

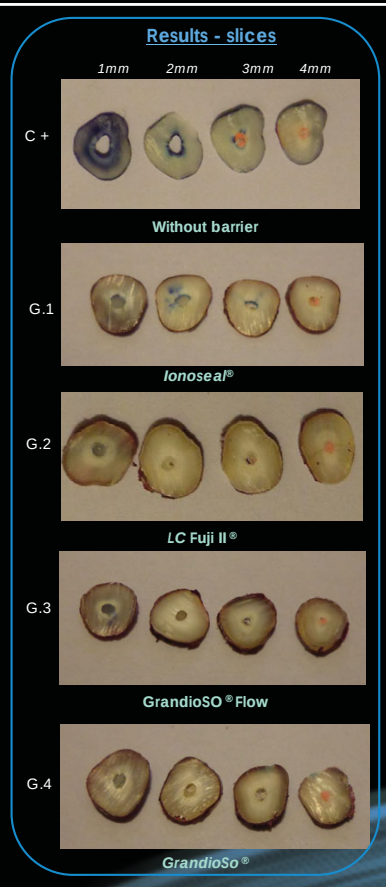

Figure 6: Sample slices

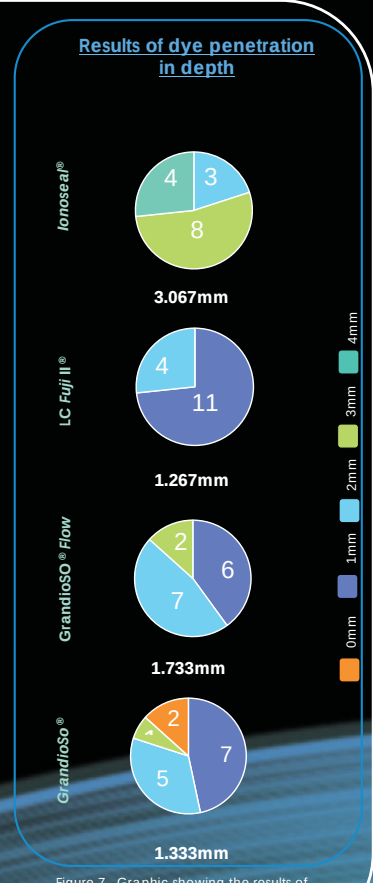

Figure 7 . Graphic showing the results of dye penetration

* Khodadadi, E. et al. (2014). Evaluation of microleakage of Ionoseal filling material as a fissure sealant agent. *Caspian Journal of Dental Research*; 2014; 3; pp. 39-45.

CONCLUSION

The intraorifice barrier are essential as an additional barrier to prevent micro-leakage, so there is no reinfection of the root canal when exposed to the oral environment. The results of this research showed that the *LC Fuji II*®, *GrandioSO*® *Flow* and *GrandioSO*® universal are indicated as coronal sealer, promoting a secondary barrier .

CLINICAL IMPLICATIONS

Ionoseal®, due its fomulation (high contente of resin), its suggested using a bonfding system as na imprtant step to improve the coronal sealing, in the future, its necessary more reaseaches regarding this resin modified glass ionomer.

KEY WORDS

coronal sealing; coronal barrier; endodontic sealing; endodontic infiltration; endodontic leakage; micro-leakage; canal reinfection.

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