

Comparison of different root filling techniques using a glass ionomer sealer

Language: English

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Date/Event/Venue:
11.05.2000-13.05.2000
ConsEuro 2000, Annual Meeting of the European Societies of Operative Dentistry
Bologna, Italien

Objective

The aim of the present study was to compare the density of root canal fillings using a glass ionomer sealer (Endion™) and a zinc oxide eugenol sealer (TubliSeal™) comparing different application techniques.

Material and Methods

The root of 60 human extracted teeth were prepared up to ISO size 40 in a step back technique (two steps) and divided into two groups of 30 teeth each (glass ionomer sealer and zinc oxide eugenol sealer). In each group always 10 teeth were filled with different techniques (paste-filling, central cone technique, lateral condensation). All teeth were stored in a physiological saline solution. After coating the root surface with nail polish (leaving the apical area uncovered) and dye penetration the teeth were demineralized, cleared in methyl salicylate and examined with a light microscope (Fig.1, 5). Analysis of variance (ANOVA) with subsequent Scheffé-Test ($\alpha = 0.05$) were used for statistical analysis of the ink penetration depth (Fig. 3).

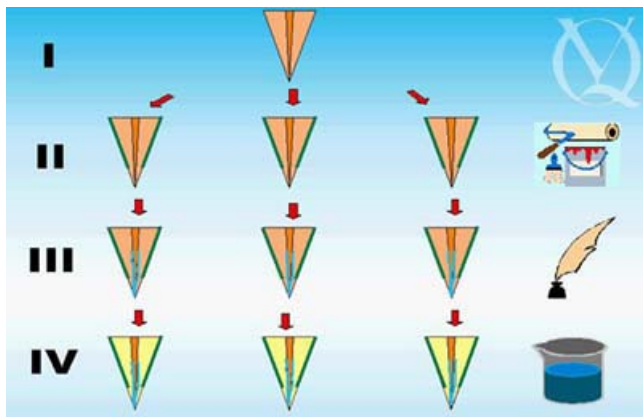


Fig. 1: Dye penetration and clearing of the teeth. Dividing 30 teeth into 3 groups [I]; coating the surface with nail polish [II]; dye penetration for 24 hours [III] and clearing the teeth after demineralisation with methyl salicylate [IV]

Results

Regarding the zinc oxide sealer (used with lateral condensation and central cone technique) the ink-penetration values were statistically significant lower than those related to the glass ionomer sealer (applied with the paste-filling and the central cone technique). Using TubliSeal™ statistically significant higher penetration values appeared with the paste filling technique compared with lateral condensation and central cone technique (Fig. 2-4).

	E	T	EC	TC	EL	TL
\bar{x}	1,91	2,01	1,79	0,83	1,38	0,91
σ	0,87	1,44	0,76	0,48	0,77	0,74

C	CI	S	C	CI	S	C	CI	S	C	CI	S
E:T	1,06 -0,85	-									
E:EC	0,84 -1,07	-	T:EC	0,73 -1,18	-						
E:TC	-0,12 -2,03	+	T:TC	-0,23 -2,14	+	EC:TC	-0,01 -1,92	+	TC:EL	1,51 -0,40	-
E:EL	0,43 -1,48	-	T:EL	0,32 -1,59	-	EC:EL	0,64 -1,37	-	TC:TL	1,04 -0,87	-
E:TL	-0,04 -1,95	+	T:TL	-0,14 -2,06	+	EC:TL	0,08 -1,83	-	EL:TL	0,49 -1,42	-

Fig. 2, 3: Scheffé-test for multiple comparisons (C) with confidence intervals (CI) and significance (S). Median values (\bar{x}) and standard deviations (σ). Canal filled with Endion™ (E) and TubliSeal™ (T); Central cone technique used with Endion™ (EC) and TubliSeal™ (TC); Lateral condensation used with Endion™ (EL) and TubliSeal™ (TL).

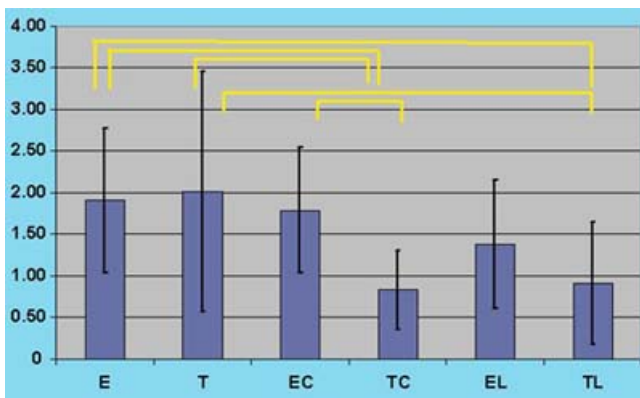


Fig. 4: Median values (\bar{x}) and standard deviations (σ). Abbreviations according to fig. 2, 3. Significant correlations ($\alpha=0.05$) marked with yellow lines.

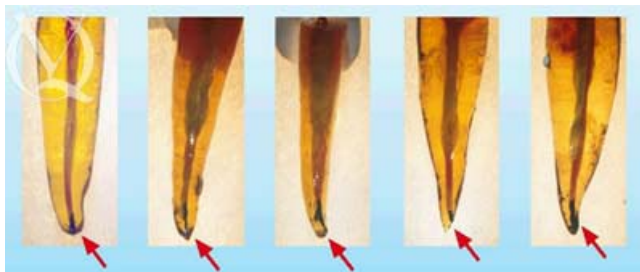


Fig. 5: Histological samples of demineralized and cleared teeth. Zone of ink penetration marked with red arrows.

Discussion and Conclusions

The present study indicates that apical density of root canal fillings can not be increased using a glass ionomer sealer (compared to a zinc oxide sealer). A paste-filling should neither be done with a glass ionomer sealer nor with a zinc oxide sealer.

This Poster was submitted on 24.07.00 by ZA Oliver Graefen.

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Aim of the Study

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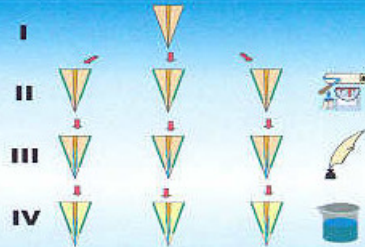


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	E	T	EC	TC	EL	TL
\bar{x}	1,91	2,01	1,79	0,83	1,38	0,91
σ	0,87	1,44	0,76	0,46	0,77	0,74

C	S	C	S	C	S	C	S	C	S	C	S	A		
E/T	1,06	0,94	-	-	-	-	-	-	-	-	-	-		
EC/T	0,84	1,07	-	T,EC	0,78	1,18	-	-	-	-	-	-		
EC/TC	0,13	0,55	-	T,TC	0,35	0,14	-	EC,TC	0,01	1,30	-	TC,EL	1,61	0,45
EL/TL	0,43	1,48	-	T,EL	0,30	1,55	-	EC,EL	0,94	1,37	-	TC,TL	1,04	0,87
E,TL	0,54	1,65	-	T,TL	0,14	0,58	-	EC,TL	0,39	1,85	-	EL,TL	0,48	1,42

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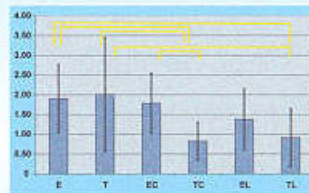


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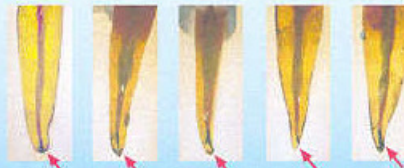


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Conclusion

The present study indicates that apical density of root canal fillings can not be increased using a glass ionomer sealer (compared to a zinc oxide sealer). A paste-filling should neither be done with a glass ionomer sealer nor with a zinc oxide sealer.

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