

Effect of four different final irrigants on pH changes of external root surface at different times

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Abstract

Background and Aim: Smear layer acts as a physical barrier that hinders full effectiveness of Ca(OH)₂ via interacting with the transfusion of hydroxyle and calcium ions through dentinal tubules. The purpose of this study was to measure the pH changes of the external root surface of human teeth due to hydroxyle ion diffusion using different chelating agents.

Materials and Methods: In this in vitro study, 96 anterior maxillary teeth were prepared to a master apical size of #40 4%. Samples were randomly divided into 4 experimental groups of 12, group1: EDTA17% + NaOCl 1.3%; group2: Citric acid 20% + NaOCl 1.3%; group3: Noni + EDTA17%; group4: NaOCl 1.3% + MTAD; and 4 control groups. After removing the smear layer, Ca(OH)₂ was placed in experimental samples. Root canal surface pH was measured for 30 days. Data were analyzed using t-test, one way ANOVA and Tuckey multiple comparisons.

Result: Noni+ EDTA showed the highest average of PH among experimental (pH=8.02) and control (pH=7.61) groups ($p \leq 0.036$), followed by MTAD+ NaOCl, EDTA+ NaOCl & Citric acid+ NaOCl, respectively. (pH=7.73, 7.64, 7.65)

Conclusion: It was concluded that Noni + EDTA17% promoted greater hydroxyle ion transfusion and subsequent alkalization in the outer surface of the root due to better omission of smear layer.

Keywords: Calcium hydroxide, Hydroxyl ion, Chelating agents, Smear layer