The Effect of root canal irrigation solution on flexural strength of dentin

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Abstrak

Objectives: This study was to investigate the effect of a variety of root canal irrigation solutions on flexural strength of dentin. Materials and Methods: Fifty intact, extracted human mandibular third molars were used in this study. Each tooth was sectioned using diamond cutting disc to create dentin bar (1x1 mm, with 7 mm in length). All dentin bars were randomly assigned into 5 groups of 10 each. Group 1, dentin bars were immersed in 5% NaOCL; group 2, in 2.5% NaOCL; group 3, in 15% EDTA; group 4, in 0.2% chlorhexidine gluconate (CHX); and group 5, in saline (as control) respectively. Each group was immersed for 2 hours. Each dentin bar was subjected to a three-point bend using MTS Universal Testing Machine to test the flexural strength. Data were analyzed using one way Anova, followed by Turkey's test performed at the 0.05 level of significance. Results: All irrigation solution have an effect on the flexural strength ($P<0.05$). EDTA caused the greatest effect on dentin mechanical properties, which revealed the lowest flexural strength (100.64 ± 7.23). In contrast, 0.2% CHX generated the least influence on dentin mechanical properties, which demonstrated the greatest flexural strength (189.85 ± 6.44). Conclusion: Root canal irrigation solution can induce effect on flexural strength of dentin. Chlorhexidine gluconate demonstrates the best irrigation solution since it has a slight effect on dentin mechanical properties, particularly flexural strength.