A STUDY TO COMPARE THE CLEANING EFFICIENCY OF THREE DIFFERENT IRRIGATION DEVICES AT DIFFERENT ROOT CANAL LEVELS (AN IN VITRO STUDY)

A Thesis
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Abstract

This in vitro study was conducted to compare and evaluate the efficiency of Maxi-I-probe (conventional irrigation system), Vibringe (sonic irrigation system) and Endovac (apical negative pressure irrigation system) in removing of dentin debris at three levels of root canals and to compare the percentage of dentin debris among the three levels for each irrigation system.

Forty-five extracted premolars with approximately straight single root canals were randomly distributed into 3 test groups of 15 teeth each. All canals were prepared with Protaper Universal hand files to size #F4, 0.5 mm from the anatomical apex and irrigated with 2.5% NaOCl 1ml between files, 5ml for 60 seconds as a final irrigant by different irrigation devices; group one, by using conventional system (5 ml syringe with a 28 gauge maxi-I-probe needle); group two, by using Vibringe sonic irrigation system and group three, by using the Endovac, which uses negative pressure to deliver irrigating solutions to working length. After the final irrigation, the roots were split longitudinally and photographed with a digital camera. The roots were magnified to x100, A percentage of debris was calculated for the apical 0-3, 3- 6 and 6-9 mm. The percentage of debris was calculated by dividing the pixels of debris at each level by the total pixels representing the entire area of the canal in Adobe Photoshop CS2. Data were analyzed statistically by ANOVA and LSD at 5% significant level.

The Endovac or Vibringe irrigation devices resulted in significantly cleaner canals than conventional irrigation systems at all levels. The Endovac system produced significantly cleaner canals than Vibringe system at 3-9mm levels from working length while there was no significant at apical 0-3mm.The apical three millimeters showed a greater amount of debris than the 3-9 millimetres from the working length, regardless of the irrigation device used.