

**A Study To Compare The Efficiency Of
Different Irrigation Systems For Macro Debris
Removal In Instrumented Canals
(An In Vitro Study)**

A Thesis
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Abstract

This in vitro study was conducted to evaluate and compare the efficiency of four irrigation systems Maxi-I-probe, Endoactivator (sonic irrigation system), P5 Newtron Satelec (passive ultrasonic irrigation) and Endovac (apical negative pressure irrigation) in removing debris at three regions of instrumented root canals and to compare the percentage of debris among the three regions for each irrigation system.

Forty extracted premolars with single straight root canals were divided into four test groups with 10 teeth each. All the samples 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 systems; group one, by using conventional system introducing 5 ml syringe with a 30 gauge max-I-probe needle; group two, by using the conventional system and irrigation activation by Endoactivator, group three, which uses the Satelec passive ultrasonic irrigation activation with conventional system and group four by using the Endovac, which uses negative pressure to deliver irrigating solutions to working length.

After the final irrigation, the roots were decoronated by horizontal splitting then splitted longitudinally and photographed with a digital Microscope to 100X to detect and calculate the debris in each region; apical, middle and coronal 0-3, 3-6 and 6-9 respectively.

The percentage of debris was calculated by dividing the pixels of debris at each region by the total pixels occupying the entire area of the canal in Adobe

Photoshop CS5. Data were analyzed statistically by ANOVA and LSD at 5% significant region.

The Endovac, Endoactivator and Satelec irrigation devices resulted in significantly cleaner canals than conventional irrigation systems at all regions. There was no significant between Endoactivator and Satelec at the apical third. The Endovac canals were best cleaned. The apical region showed a greater amount of debris than the middle and coronal regions regardless of the irrigation device used.