

VPro™ StreamClean™

J Endod. 2009 Oct;35(10):1408-11.

Acoustic hypochlorite activation in simulated curved canals.

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INTRODUCTION: It was the goal of this study to compare different NaOCl activation schemes regarding a desired and an untoward outcome. Ultrasonic tips and a currently marketed sonic system were used in conjunction with a 2.5% sodium hypochlorite solution. Necrotic pulp tissue dissolution in simulated accessory canals and transportation of the main canal were assessed.

METHODS: Epoxy resin models (10 per group) with a curved simulated main root canal and two simulated accessory canals filled with necrotic bovine pulp tissue were irrigated passively with one of three ultrasonic setups (straight stainless steel files, prebent stainless steel files, or nickel-titanium tips) or a sonic device in conjunction with a plastic tip. Activation was performed four times for 30 seconds with replenishment of the NaOCl solution in between. All the files/tips had a 2% taper and a 0.15-mm tip diameter according to the manufacturer. Data from superimposing and analyzing digital photos before and after treatment were statistically analyzed using one-way analysis of variance followed by Bonferroni's correction for multiple comparisons ($\alpha < 0.05$).

RESULTS: Passive ultrasonic irrigation (PUI) in all the groups dissolved significantly more tissue than sonic activation ($p < 0.05$). No detectable canal transportation with sonic activation was observed. The difference in this outcome was not significant compared with ultrasonically activated nickel-titanium tips, whereas the straight stainless steel files caused significantly more ledging compared with these setups ($p < 0.05$).

CONCLUSION: Under the current conditions, PUI with a nickel-titanium tip promoted superior tissue-dissolving effects over sonic irrigant activation while maintaining simulated canal anatomy.

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Evaluation of a sonic device designed to activate irrigant in the root canal.

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INTRODUCTION: The aims of this study were to evaluate the removal of dentin debris from the root canal by sonic or ultrasonic activation of the irrigant and the physical mechanisms of sonic activation by visualizing the oscillations of the sonic tip, both inside and outside the confinement of the root canal.



Patent Pending

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METHODS: Roots of 18 canines were embedded, split, and prepared into standardized root canals. A standard groove was cut on the wall of one half of each root canal and filled with the same amount of dentin debris before irrigation procedures. The removal of dentin debris was evaluated after different irrigation procedures. The oscillations of the sonic tip were visualized *ex vivo* by using high-speed imaging at a time scale relevant to the irrigation process, and the oscillation amplitude of the tip was determined under 20x magnification.

RESULTS: After irrigation, there was a statistically significant difference between the experimental groups ($P < .0001$). Without irrigant activation, the grooves were still full of dentin debris. From the ultrasonic activated group, 89% of the canals were completely free of dentin debris, whereas from the sonic group, 5.5%-6.7% were ($P = .0001$). There was no significant difference between the sonic activation groups.

CONCLUSIONS: Activation of the irrigant resulted in significantly more dentin debris removal; ultrasonic activation was significantly more efficient than sonic activation. The oscillation amplitude of the sonically driven tips is 1.2 +/- 0.1 mm, resulting in much wall contact and no cavitation of the irrigant.

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Final rinse optimization: influence of different agitation protocols.

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INTRODUCTION: This study examined the effect of different root canal irrigant agitation protocols in the penetration of an endodontic irrigant into dentinal tubules.

METHODS: Fifty-six human single-rooted teeth were shaped with nickel-titanium instruments, and a final rinse of 5% sodium hypochlorite labeled with 0.2% alizarin red was performed. Specimens were assigned to 7 groups ($N = 8$) and submitted to the following rinse activation protocols: no agitation (control group), K-File or gutta-percha agitation, or different sonic (EndoActivator [Advanced Endodontics, Santa Barbara, CA] and Plastic Endo, Lincolnshire, IL) and ultrasonic (Satelec [Acteon group, Merignac, France] and EMS, Nyon, Switzerland) agitations. Specimens were sectioned at 1, 3, and 5 mm from the apex in 1-mm-thick slabs, ground, and prepared for fluorescence microscopy at 100x with a wavelength of 450 milliseconds. Irrigant penetration into dentinal tubules was analyzed by using Kruskal-Wallis analysis of variance followed by post-hoc comparisons.

RESULTS: Groups were ranked in the following order: control = K-file = gutta-percha < EndoActivator = Plastic Endo < Satelec = EMS. At 1 mm from the apex, the highest score was found for the EMS group compared with the control, K-file, gutta-percha, EndoActivator, and Plastic Endo groups, whereas no difference was found with the Satelec group.

CONCLUSION: The results support the use of an ultrasonic agitation to increase the effectiveness of the final rinse procedure in the apical third of the canal walls.

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Catalog Information:

| Description | Thread Style | Quantity | Item # | Price |
|------------------------|--------------|----------|--------|----------|
| VPro™ StreamClean™ Kit | Acteon* | - | 407960 | \$225.00 |
| VPro™ StreamClean™ Kit | EMS* | - | 502960 | \$225.00 |
| Silicone Bypass | | | | |
| Handpiece Adapters | Acteon* | 2 | 407975 | \$ 49.00 |
| Handpiece Adapters | EMS* | 2 | 502975 | \$ 49.00 |