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Evaluation of smearOFF, a novel endodontic irrigant on removal of canal wall smear layer

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Aim: The aim of the present *in vitro* study was to evaluate the canal wall smear layer removal ability of SmearOFF, 7% maleic acid (MA) and 18% ethylenediaminetetraacetic acid (EDTA).

Methods: Forty single-rooted human teeth were subjected to root canal instrumentation and were irrigated with 2.5% sodium hypochlorite (NaOCl) between each instrument change. Samples were then divided into four groups based on final irrigation regimen: [1] SmearOFF + 2.5% NaOCl, [2] 7% MA + 2.5% NaOCl, [3] 18% EDTA + 2.5% NaOCl, and [4] 0.9% saline (negative control). After irrigation, the teeth were split longitudinally and examined by scanning electron microscopy (SEM). SEM images were then captured and subjected to Image J software analysis to quantify the smear layer removal via measuring the amount of open dentinal tubules. The open tubule percentage (OTP) was then calculated among the experimental irrigants.

Results: EDTA removed smear layer less efficiently when compared to SmearOFF and MA in all the thirds of the root canal system ($p < 0.02$). There was no significant difference between SmearOFF and MA in removal of smear layer from the coronal, middle and apical thirds ($p > 0.06$). In the negative control group (saline), all specimens were heavily smeared in the coronal, middle and apical thirds of the root canal system. However, no statistical significance difference was observed when comparing EDTA and saline ($p > 0.06$).

Conclusion: SmearOFF and 7% MA had better canal wall smear layer removal capability when compared to 18% EDTA. There was no difference between 18% EDTA and saline.

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