

**Republic of Iraq**  
**Ministry of Higher education**  
**and Scientific Research**  
**University of Baghdad**  
**College of Dentistry**



**The influence of canal taper on the efficacy of  
activated EDTA with and without surfactant as a  
final irrigation protocol on the smear layer removal  
from the mesial molar canals (An in vitro study)**

A Thesis

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## **Abstract**

A total of 80 freshly extracted human maxillary and mandibular molar teeth were collected from local health care centers and private clinics and used in this study. Samples length were set to 16mm measuring from the apex to the midpoint of the crown middle third by partially decorwning them. Access opening were established and enough coronal chamber space were checked using periodontal prob. Working length for each root was determined using k file size 10. The degree of root canal curvature obtained using the method described by Schneider, Canals with curvature over 33\* were excluded. For the purpose of standardization and to ensure closed canal system during irrigation, all teeth were embedded in a plastic tube filled with heavy body silicon to about 3mm of the crown. The samples had been randomly divided into two main groups (n=40) according to root canal preparation files (Ts1,Ts2) of 2Shape (Micro Mega, France), and then each main group was further divided into five subgroups (n=8) according to the used final irrigation protocol as following: Group A (n=40)(Ts2), Group B (n=40) (Ts1).

SubgroupA1andB1(n=8): Distilled water.

SubgroupA2andB2(n=8):EDTA.

SubgroupA3andB3(n=8):EDTA+Endoactivator.

SubgroupA4andB4(n=8):EDTA+Surfactant.

SubgroupA5andB5(n=8):EDTA+Surfactant+Endoactivator.

At this research, the mesio-buccal canals were instrumented manually using #10 and #15 K files until the latter was loose, the canal was irrigated using 1 ml of 5.25% NaOCl during initial instrumentation. After that canal preparation had been done as following:

-(Group A) (n=40) canals were enlarged to an apical size 25/06 (TS2).

-(Group B) (n=40) canals were enlarged to an apical size 25/04 (TS1).

final irrigation protocol were done as following: (A1, B1 with 5 ml distilled water),( A2, B2 with 1.5 ml of 17% EDTA),( A3, B3 with 1.5 ml of

17% EDTA and 30 sec. of sonic activation in 2-3 mm strokes using EndoActivator),(A4, B4 with 1.5 ml of 17% EDTA and surfactant) and (A5, B5 with 1.5 ml of 17% EDTA and surfactant and 30 sec. of sonic activation in 2-3 mm strokes using EndoActivator). The data was statistically analyzed using Kruskal Wallis and Mann-Whitney U tests using IBM SPSS Statistics (Version24). The significance level was set  $< 0.05$ . None of the instrumentation groups demonstrated completely clean root canal surfaces. There was no significant difference in smear layer removal efficiency between group A(Ts2)and B(Ts1) at all the thirds, which reveals that the file taper show no effect on the amount of smear layer removal when all the other factors are controlled. The introduction of EDTA as a final irrigation solution demonstrated a considerable improvement in smear layer removal at all the canal thirds, while using surfactant with EDTA did not improve its smear layer removal property. Sonic activation of EDTA with EndoActivator exhibited improvement in smear layer removal at all the thirds especially in group B (Ts1).



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من قبل

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