

# Effect of Irrigation Protocols on Smear Layer Removal in Primary Teeth Endodontic Therapy

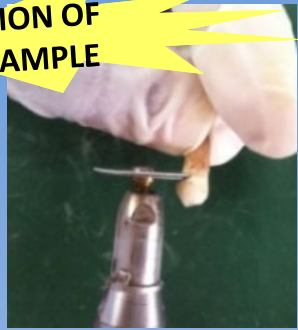
Dr. Neetu Jain, Dr. Shalini Garg, Dr. Abhishek Dhindsa, Dr. Suma Sogi, Dr. Ashish loomba, Dr. Gundeep Singh  
 MAHARISHI MARKANDESHWAR COLLEGE OF DENTAL SCIENCES AND RESEARCH, MULLANA, AMBALA (INDIA)

**Aim:** Scanning electron microscopic (SEM) analysis of the effect of chelating agent and EndoActivator on smear layer removal from root canals of primary teeth

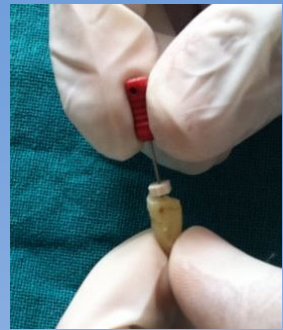
## Material and Methods

### PREPARATION OF TOOTH SAMPLE

Extracted human primary teeth were selected



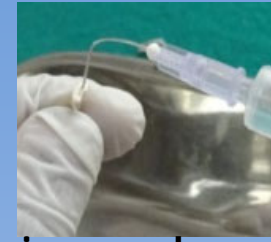
While decoronating



BMP by K files



Irrigation using syringe and endoactivator



While sectioning root



Sectioned root

### Irrigants used

### PREPARATION OF TOOTH SAMPLE BEFORE SEM

Group 1 - Sodium Hypochlorite + Citric acid + Normal saline using EndoActivator (n=5)

Group 2 - Sodium Hypochlorite + Normal saline + Citric acid (n=5)

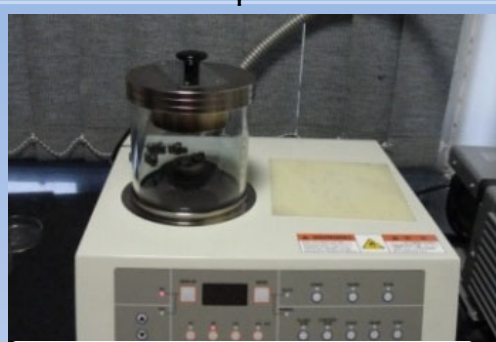
Group 3 - Sodium Hypochlorite + Normal saline using EndoActivator (n=5)

Group 4 - Sodium Hypochlorite + Normal Saline (n=5)

Group 5 - Normal saline (control) (n=5)



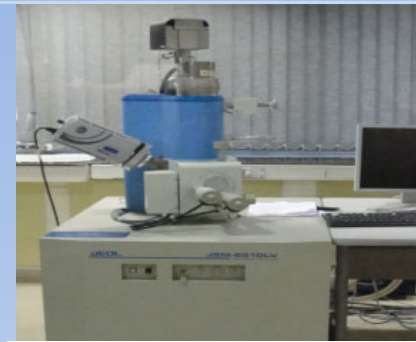
Specimen coded and mounted on metal stub



Sputter coating with gold



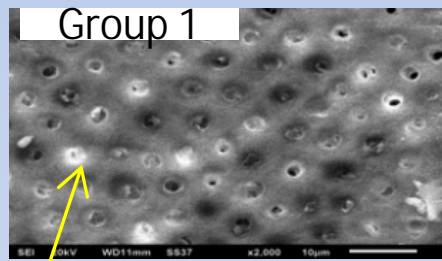
Specimen after gold coating



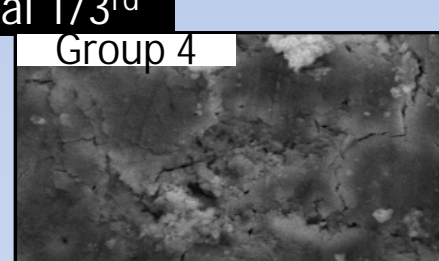
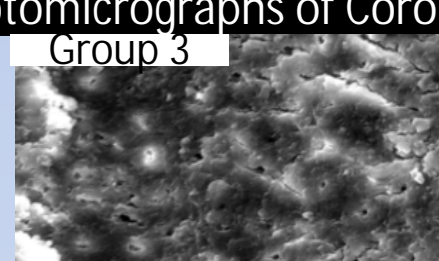
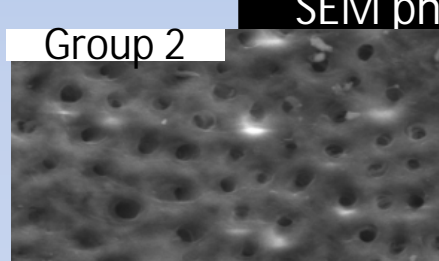
SEM analysis

## Results

### SEM photomicrographs of Coronal 1/3<sup>rd</sup>

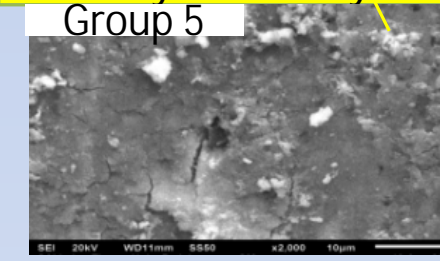
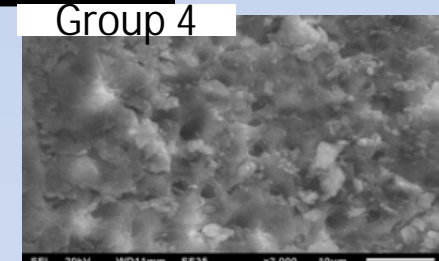
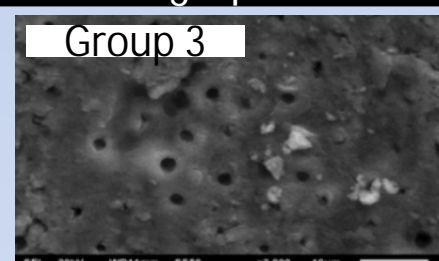
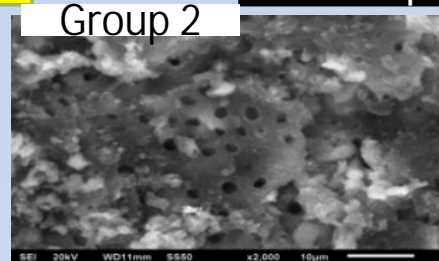
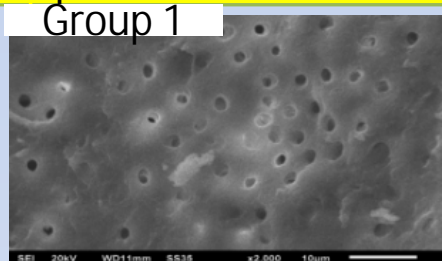


Open dentinal tubules

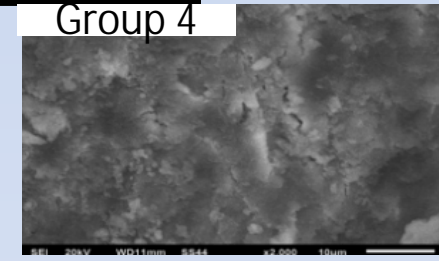
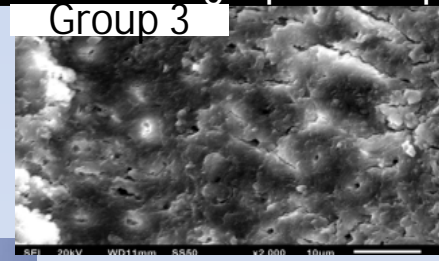
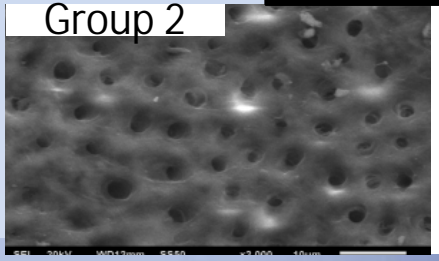
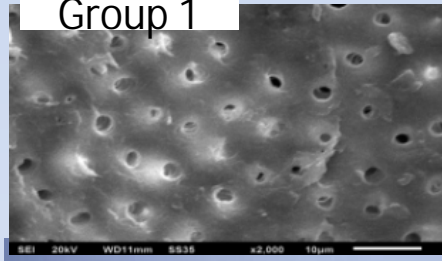


Heavy smear layer

### SEM photomicrographs of middle 1/3<sup>rd</sup>



### SEM photomicrographs of Apical 1/3<sup>rd</sup>



### Scoring criteria

1= No smear layer, 2= Moderate smear layer, 3= Heavy smear layer

Ref : Torabinejad et al . JOE 2003;29:170-5

Comparison of efficacy of smear layer removal in ascending order

Group 1 > Group 2 > Group 3 > Group 4 > Group 5

### Abbreviations:

SEM = Scanning electron microscopy

n= no. of teeth in each group



**Conclusion :** Effective removal of smear layer by both citric acid and EndoActivator shows promising use for the biomechanical preparation of primary teeth root canals.

### References :

1. Uroz-Torres D, González-Rodríguez MP, Ferrer-Luque CM. Effectiveness of the EndoActivator System in removing the smear layer after root canal instrumentation. J Endod 2010;36:308-11.
2. De Gregorio C, Estevez R, Cisneros R, Heilborn C, Cohenca N. Effect of EDTA, sonic, and ultrasonic activation on the penetration of sodium hypochlorite into simulated lateral canals: An *in vitro* study. J Endod 2009;35:891-5.