

ABSTRACT

INTRODUCTION:

Success of root canal treatment depends on proper cleaning and shaping and three dimensional obturation. Mechanical instrumentation produces an amorphous irregular smear layer. Irrigating solutions and chelating agents have been used in removal of smear layer. EDTA is a potent calcium chelator and Chitosan is a biopolymer derived from chitin which possess chelating property. This study was designed to compare the ability of smear layer removal by Diode Laser and Ultrasonic activation of EDTA and Chitosan.

AIM AND OBJECTIVES:

To compare the efficacy of Ultrasonically activated and Diode Laser activated EDTA and Chitosan on smear layer removal by using Scanning Electron Microscope.

- To evaluate the efficacy of Chitosan on smear layer removal
- To compare the efficacy of Chitosan and EDTA
- To compare the efficacy of Ultrasonic and Diode laser activation of chelating agents.

METHODOLOGY:

75 human mandibular single rooted premolars were collected. The crowns were sectioned to a standard length of 14 mm and instrumented up to the working length. The samples were randomly divided into 3 groups – Group A-Control (Normal saline), Groups B (Ultrasonically activated) and Group C (Laser activated). Group B and Group C were further divided into 2 Subgroups –SubGroup1- EDTA, Sub Group 2 -Chitosan .

The roots were split longitudinally and placed in 2% glutaraldehyde for 24 hours. After incubation, the samples were prepared for Scanning Electron Microscopic analysis and photographs were taken at coronal, middle and apical levels. Data were collected, analysed using SPSS software and subjected to One-way ANOVA and Post hoc tests.

RESULTS:

Diode laser activated EDTA had the highest efficacy of smear layer removal at the coronal third. In the middle and apical third, ultrasonically activated EDTA had the highest efficacy. Normal saline had the least efficacy as compared to the other groups throughout the length of the specimen.

CONCLUSION:

Chitosan can be used as an alternative for the removal of smear layer considering the drawbacks of EDTA but further studies using higher concentrations of Chitosan and in vivo studies need to be carried out to support the results of this study.

KEY WORDS:

Smear layer, Diode laser, Ultrasonics, EDTA, Chitosan