

Special Lecture I

Time dependent effects of EDTA for smear layer removal on microhardness of root canal dentine

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I. Objectives

The purpose of this study was to evaluate the effects of EDTA on microhardness of root canal dentine according to different working time.

II. Materials and Methods

Forty recently extracted, intact single root teeth were used. Debris and soft tissue remnants on the root surface were cleaned with scaler and stored in saline at 4°C until used. All selected roots were similar in size and shape.

1. Preparation of teeth

The crown of the teeth were removed at the level of the CEJ, using a water-cooled diamond bur. The crown down technique was used to endodontic preparation using Ni-Ti files (Protaper™) and ATR Technika motor. During instrumentation, the root canals were irrigated with 3ml of purified water.

Each root was sectioned transversely into three dentin segments each 3mm long, the three sections of each root were then mounted horizontally, apart from each other, with auto curing acrylic resin. Dentin surfaces of the mounted specimens were then polished gradually with carborundum paper disc under running water.

2. Determination of microhardness

For evaluation of Vickers microhardness, Vickers diamond microhardness tester (HM-122, Akashi, Japan) was used with 300g and impression time of 10 s. Each root segment received two series of 4 indentations made near the pulp canal before and after treatment.

3. Irrigation phase

The specimens were divided into four groups; group 1: 10 roots saline treatment, group 2: 10 roots 17% EDTA 1min, group 3: 10 roots 17% EDTA 5 min, group 4: 10 roots 17% EDTA 10 min. The microhardness of the dentine was re-assessed.

The data was statistically analyzed by using 'Repeated measures of ANOVA', 'Scheffe multiple comparison'.

III. Results

1. No statistical difference was found between before and after VHN value within group 1 (control) & group 2 (EDTA 1 min).
2. Statistical difference was found between before and after VHN value within group 3 (EDTA 5 min) and group 4 (EDTA 10 min) ($p < 0.05$).
3. VHN value was site related but, for microhardness reduction, no statistical difference was found according to site.
4. No significant difference of VHN value before treatment among different groups was found, but significant difference after treatment among different groups was found ($p < 0.05$).
5. No statistical difference of VHN value after treatment was found between groups 1 and 2, using Scheffe multiple comparison analysis. No statistical difference of VHN value after treatment was found among group 2, 3, 4, using Scheffe multiple comparison analysis.

Poster Presentation II

IV. Conclusions

According to this study, 1 min treatment of EDTA is recommended to remove smear layer.

