

The effect of gutta-percha removal using nickel-titanium rotary instruments

Jeong-Hun Jeon*, Ho-Keel Hwang

Department of Conservative Dentistry, College of Dentistry, Chosun University, Gwangju, Korea

I. Objectives

The purpose of this study was to quantify the amount of remaining gutta-percha/sealer on the walls of root canals when three types of nickel-titanium rotary instruments and a hand instrument were used to remove these materials.

II. Material and Methods

Forty extracted mandibular premolars were prepared by step-back method and obturated with gutta-percha and sealer. Gutta-percha removal for group 1 was done using hand file with chloroform, group 2 using Protaper, group 3 using Profile and group 4 using K3.

The following factors were evaluated : Time taken to reach working length, total time for gutta-percha removal and number of fractured instruments. Radiographs were taken and the teeth were split longitudinally. Roots were divided into apical, middle and coronal parts and scored on a scale of 0 (no debris) to 3 (50% of walls covered with debris) from radiographs and stereomicroscope. The mean time taken in the four groups were compared by one-way ANOVA and Tukey test. The mean scores of each group in each canal level were compared by Kruskal-Wallis and Mann-Whitney test.

III. Results

1. In the time taken to reach working length, the group 3 was the fastest and followed by group 4, group 1 and group 2. But there were no significant difference among groups ($p>0.05$).
2. In the total time for gutta-percha removal, group 3 was the fastest and followed by group 4, group 2 and group 1. And there was significant difference between nickel-titanium rotary instruments and hand instrument ($p<0.05$).
3. In the evaluation of remained gutta-percha in the coronal 1/3, there were significant difference between group 1, 3, 4 and group 2 ($p<0.05$). There were significant difference between group 3 and group 2, 4 in the apical 1/3 ($p<0.05$). But there were no significant difference among groups in the middle 1/3.

IV. Conclusions

Instrumentation using nickel-titanium rotary instrument groups was faster than that using hand instrument group. The effect of gutta-percha removal using Profile group was better than that using Protaper and K3 group.