

Comparison of the Effect of ProTaper and Gates-Glidden Drills On the Remaining Root Dentin Thickness at the Coronal Region of the Root

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Abstract:

Background and Aim: The purpose of this study was to evaluate residual dentin thickness of the root and the area of the canal lumen in the coronal region of the mesiobuccal and mesiolingual canals of the lower first molars after canal preparation with the common method of using hand files and Gates Glidden drills or ProTaper rotary files, by Spiral Ct-Scan.

Materials and Methods: In this experimental randomized controlled study, primary images of mesial canals of 12 lower first mandibular molars were taken using Spiral CT-scan. The dentin thickness at the areas of 1,3 and 5 millimeter sections and lumen area at the same sections were measured. Samples were randomly divided into two groups. In one group the mesibuccal canal was prepared with ProTaper system and the mesiolingual canal with hand files and Gates Glidden drills. In the second group vice versa. Afterwards, images were taken from the same sections and Measurements were performed. The results were assessed using independent- T test.

Results: In this study the remaining dentin thickness at the danger zone (distolingual/distobuccal) at the 5 millimeter section was significantly larger in the canals that were prepared with the ProTaper system than those prepared with hand instrumentation and Gates Glidden drills ($P=0.04$). Moreover, there was a statistical difference in the amount of dentin removed at the one millimeter sections on the distal areas ($P=0.025$) and danger zones ($P=0.027$) and in the 3 millimeter section of the danger zone ($P=0.002$). There was no statistically significant difference in the prepared lumen area between the two different approaches ($p>0.05$).

Conclusion: According to the results of this study ProTaper system is a safer method compared to hand instrumentation and Gates Glidden drills, to be used for preparation of mesial canals of the lower first molars with 10-35 degrees and approximately equal radius.

Key words: Ni-Ti Rotary instrument, dentin, Gates Glidden, ProTaper