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A comparison of shaping ability of four nickel–titanium rotary instruments in simulated root canals

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The purpose of this study was to compare the root canal shaping ability of four nickel-titanium rotary instruments. Forty eight simulated curved root canals were instrumented in plastic with the Crown-down technique using the ProTaper™, the ProFile, the GT™, and the Quantec. Canals were instrumented until apical canal were up to size 30 by one operator. Each instrument was used only once and instrumentation time was measured. Pre- and post-instrumentation canal images were observed under stereomicroscope, stored in a computer using a CCD camera and miro VIDEO Studio 200 program, and were traced and analyzed using AutoCAD[®]2000 program. Change of canal curvature was measured with Schneider method. The enlargement of canals were computed by superimposing the post-instrumentation over the pre-instrumentation images, and the canal dimension was measured at inner and outer sides of the curvature at 1, 2, 3, 5, 7, and 10 mm levels from the apex. Data were analyzed using one-way ANOVA followed by Duncan's multiple range test. The ProTaper™ took significantly less time in completing instrumentation, and removed more material than did other instruments at all levels ($P<0.01$). The ProTaper™ straightened the canal curvature while the ProFile and the Quantec accentuated its curvature ($P<0.01$).

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COMPARISON OF ULTRASONIC AND SONIC ROOT END PREPARATIONS USING BACTERIAL LEAKAGE MODEL

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The purpose of this study was to compare ultrasonic with sonic root end preparations using anaerobic bacterial leakage model. Forty eight single rooted teeth were instrumented with Profile using crown down technique to .06 black and obturated with GP cone and AH26 root canal sealer using warm vertical condensation technique. The apical 3mm of each root was resected. The teeth were randomly divided into two experimental groups of 20 teeth each and two control groups of four teeth as follows; Group 1 (20 teeth): retrograde preparation using ultrasonic tip; Group 2 (20 teeth): retrograde preparation using sonic tip; Group 3 (4 teeth): negative control; Group 4 (4 teeth): positive control. Freshly mixed super EBA cement was placed into the root-end cavity. Apical leakage was evaluated using anaerobic bacterial leakage model with *Fusobacterium nucleatum* (VPI 10197) for 45days. All the teeth in the positive control group exhibited bacterial leakage within 48h, whilst the apical chamber of teeth in the negative control group remained uncontaminated throughout the test period. 80%(n=16) of the ultrasonically prepared group showed leakage after 45days, while 75%(n=15) of the sonically prepared group showed leakage after the same time. Analysis of the data yielded no statistically significant differences in leakage among the groups ($p>0.05$)