

**Shaping Ability of Three Rotary NiTi
Systems Mtwo K3 ProTaper in
Simulated Curved Canals.
(A comparative study)**

**A thesis submitted to the council of the College of Dentistry at the
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Abstract

This study was conducted to compare the shaping ability of three rotary endodontic nickel-titanium systems (Mtwo, K3 and ProTaper). Seventy five simulated curved canals of 40° curvature were divided into three groups and prepared to an apical size 30 using a single length technique for Mtwo and a crown-down technique for K3 and ProTaper instruments. Following parameters were evaluated:

- Total canal diameter.
- Outer and inner transportation.
- Centering ability.
- Canal aberrations.
- Changes of working length.
- Time of preparation.
- Instruments fracture.

The Measurements were carried out at five different levels. Pre-and postoperative images of the canals were taken at 40X magnification. An assessment of the canals shape was determined using Photoshop CS2 soft ware. The data were analyzed statistically using ANOVA and Student's t-test at 5% significant level.

Considering canal diameter, ProTaper widened the canals more effectively at all levels except at the apical level which was less than K3. The direction of transportation was usually toward the inner aspect at the middle part of the canal and toward the outer aspect at the coronal and apical parts. Mtwo achieved better centering ability at all levels than ProTaper and K3. K3 showed better centering ability than ProTaper at all levels except at the end point of preparation. Considering the canal aberration, more zips associated with elbow were created with ProTaper followed by K3; using Mtwo no aberration were resulted. In term of working length changes, no significant differences were detected between the

three rotary systems. The shortest time for instrumentation was achieved with Mtwo system and the longest time for ProTaper system. Four ProTapers instruments (9.52%) were separated, while neither Mtwo nor K3 were fractured.

Within the limitation of this study, Mtwo rotary instruments maintained the original curvature significantly better than K3 and ProTaper.

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