

**A Comparative Study on the Shaping Ability of Three
Endodontic Rotary Nickel-Titanium Systems and Stainless-
Steel hand K-flexofile in Simulated Curved Canals.**

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By

Hamid Kasim Mohammed

B.D.S

Supervised by

Prof.Dr.Abdul-Karim J. Al-Azzawi

B.D.S., M.Sc.

May

Jumada I

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Abstract

This study was conducted to compare shaping ability of stainless steel hand K-flexofile and three rotary endodontic nickel-titanium systems (ProFile, GT and ProTaper) .Eighty simulated curved canals of 40° curvature were divided into four groups and prepared to an apical size 25 using a crown-down technique for NiTi instruments and a balance force technique for K-flexofile. Following parameters were evaluated: total canal diameter, outer and inner transportation, centering ability, canal aberrations, changes of working length, time of preparation, fracture and permanent deformation. Measurements were carried out at five different levels. Pre-and postoperative images of the canals were taken at 40X magnification. An assessment of the canal shape was determined using Photoshop CS2 soft ware.

Considering canal diameter, ProTaper widened the canals more effectively at all levels except at the apical two levels which was less than K-flexofiles. The direction of transportation was usually toward the inner aspect at the coronal and middle parts of the canal and toward the outer aspect apically. ProFile achieved better centering ability at levels 1, 2 and 4; while GT was the best at levels 3 and 5. ProTaper showed relatively low centering ability, but still better than K-flexofiles .With respect to the canal aberration, more zips and ledge were created with K-flexofiles followed by ProTaper. Two ProFiles (8.3%) were separated compared with four instruments of GT (16.6%), and six files with ProTaper (30%). None of the K-flexofiles fractured, but four files (11.12%) deformed when using these instruments. The shortest time for instrumentation was achieved with ProTaper (7.304 min.) and the longest for GT (8.309 min.).

Within the limitation of this study, rotary NiTi instruments maintained the original curvature significantly better than K-flexofiles.