

Comparison between Hand and Rotary  
Protaper Instrument with Hand K-flexofile  
in Preparation of  
Curved Simulated Root Canals

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## Abstract

This study was conducted to compare between endodontic nickel-titanium hand and rotary Protaper with stainless-steel hand K-flexofile. Forty five simulated curved canals of 40° curvature were divided into three groups and prepared to an apical size 25 using a crown-down technique for rotary Protaper and a Balance force technique for hand instruments. Following parameters were evaluated: (1) Total canal diameter. (2) Outer and inner transportation. (3) Centering ability. (4) Canal abe

rrations, (5) Changes of working length. (6) Time of preparation. (7) Fracture and permanent deformation. Measurements were carried out at five different levels. Pre-and postoperative images of the canals were taken at 40X. An assessment of the canal shape was determined using Photoshop CS2 software.

In term of total canal diameter, NiTi files (hand and rotary ProTaper) widened the canals more effectively at all levels except at the apical two levels which were 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. Hand ProTaper got superior centering ability at all levels.; while rotary ProTaper showed better centering ability in comparison to K-flexofiles at all levels except the first two levels, all tested instruments showed loss of working length .In regard to the canal aberration, more elbow and ledge were created with K-flexofiles followed by rotary ProTaper ;while hand ProTaper exhibit less aberration. The shortest time for instrumentation was achieved with rotary ProTaper followed by hand ProTaper and K-flexofiles respectively.

Four rotary Protaper were separated (26.66%) compared with two hand ProTaper (13.33%). None of the K-flexofiles fractured. The high incidence of permanent deformation was resulted with K-flexofiles (16.66%); while no deformation was occurred in NiTi groups.