

# Root canal preparation with the NiTi systems K3, Mtwo® and ProTaper®

Sonntag D, Ott M, Kook K, Stachniss V, Australian Endo J 2007; 33: 73-81

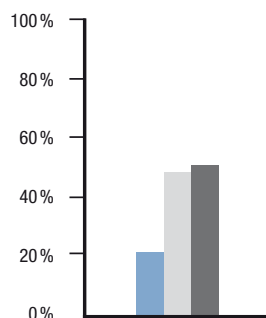
**Aim:** The aim of this paper was to examine the result of rotary root canal preparation with the nickel-titanium (NiTi) systems K3, ProTaper® (Dentsply Maillefer, Ballaigues, Switzerland) and Mtwo®.

**Materials and Methods:** One hundred and fifty curved artificial root canals and 60 mesial canals of human mandibular molars were selected. In the group of curved artificial canals, all canals were prepared to size 35/.04 taper with the three systems. In the group of human mandibular molars, the teeth with mature root canals were radiographed with silver points inserted in bucco-lingual and in mesio-distal positions.

**Results:** In the artificial root group, one K3 instrument separated. Mtwo® (20 %) showed significantly ( $P = 0.003$ ) fewer zips than K3 (46.9 %) or ProTaper® (50 %) (figure 4). There were no significant differences in ledge and elbow formation. K3 and Mtwo® had the lowest percentage of canal transportation. There was no significant difference regarding the preparation length or the condition of the apical foramina following the preparation. Canals prepared with K3 (26.5 %) were significantly ( $P < 0.001$ ) less tapered than ProTaper® (62 %) and Mtwo® (82 %) (figure 5). In the human mandibular molar group, one Mtwo® and one ProTaper® instrument separated. No significant differences were found in the preparation length, transportation or taper.

**Conclusions:** The three systems tested, K3, Mtwo® and ProTaper®, achieved good preparation results.

Figure 4  
Zips occurred during  
the preparation of  
150 artificial root canals



■ Mtwo® ■ K3 ■ ProTaper®

Figure 5  
Percentage of 150 conically  
prepared root canals. A canal  
was characterised as conical  
if the diameter increased over  
the whole gradient from apical  
to coronal. All three groups  
showed among one another  
significant differences.

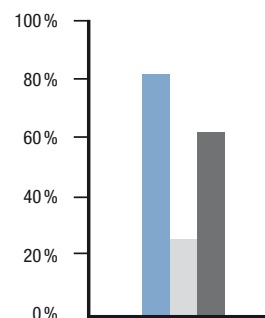


Figure 6  
When inserting the file  
20/.06 in mb I the profile  
of the cutting edges and  
the wide space for dentine  
removal are clearly visible.



Figure 7  
Due to the profile of the  
cutting edges the dentine  
chips adhered to the file and  
are efficiently transported out  
of the canal to the coronal part.

