

## **A comparison of mesial root canals of mandibular first molar shaping with two engine-driven instruments and the stepback technique using microcomputed tomograph**

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### **I. Objectives**

Microcomputed tomography (MCT) made it possible to investigate the morphology of root canals more accurate. The aim of this study was to compare the effects of four root canal shaping methods, the profile system, the ProTaper system, a combination of these, and stainless steel K-files, in the shaping of the mesial root canals of extracted human mandibular first molars, three-dimensionally using MCT.

### **II. Materials and Methods**

Eight extracted mandibular first molars were scanned using MCT before and after the root canals were instrumented. Two specimens were prepared using the Profile system and another two specimens were prepared using the ProTaper system according to manufacturers recommendation. In two specimens, apical shaping was done with a .04 Profile system after coronal flaring with a ProTaper S- series (Sx, S1, S2). The remaining specimens were shaped by a stepback technique with a conventional K-file and Gates Glidden burs. The change in the canal volume, the canal surface area, the remaining dentin thickness to the furcation, the cross sectional root canal shape, and the appearance of the root canal before and after the shaping image was evaluated.

### **III. Results**

There was few specific difference among the above four techniques, but the ProTaper files had a tendency to removed more dentin particularly at the apical area.

### **IV. Conclusions**

Further studies with MCT are required to fully understand the characteristics of root canal shaping techniques.