



Comparison of root canal preparation by three Ni-Ti instruments

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The aim of this study was to compare the effects of three Ni-Ti instruments on leaning ability by evaluating the volumetric and morphological changes in the apical 6 mm of the root canals before and after preparation, using three-dimensionally reconstructed root canals of extracted human teeth. Forty-five teeth were used in this study. They were opened the chambers and removed the all pulp remnants ultrasonically. Subsequently, the canal wall was coated with silver paste and prepared using ProTaper, ProFile and GT rotary files according to the manufacturers instructions. Before and after root canal preparation, all the specimens were scanned with micro computed tomography and examined the differences in dentine volume removed, canal straightening, the proportion of the unchanged area and canal transportation. Quantitative analysis revealed that instrumentation increased in canal volume ranging between 0.081 and 1.866 mm³. On average, the large apical preparation produced by ProTaper demonstrated smaller proportions of unchanged surface areas compared to the two other instruments in small canals. But in large canals like maxillary central incisor, the preparation of ProTaper instruments was not enough. ProTaper instrument was tended to increase more in canal volume as compared with the other two instruments but unchanged area was no significant difference. These results showed that three instruments had similar preparation ability and micro computed tomography in combination with the coated wall of root canal using silver paste is a nondestructive and valuable tool to study root canal geometry and changes after preparations in detail.

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