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Ability of two preparation techniques to shape root canal assessed by micro-computed tomography

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Aim: The purpose of this study was to evaluate and compare the root canal shaping efficacy of ProTaper rotary files and standard stainless steel K-files using micro-computed tomography.

Material and Methods: Sixty extracted upper second premolars were selected and divided into two groups of 30. Before preparation, all samples were scanned by micro-computed tomography. Thirty teeth were prepared with the ProTaper system and the remaining 30 with stainless steel files. After preparation, the untouched surface and root canal straightening were evaluated with micro-computed tomography. The percentage of untouched root canal surface was calculated in the coronal, middle and apical parts of the canal. We also calculated straightening of the canal after root canal preparation. Results from the two groups were statistically compared using the ratio t-test and χ^2 test.

Results: Although ProTaper rotary files left less untouched root canal surface compared with manual preparation, the difference was not statistically significant ($p > 0.05$). Similarly, there was no statistical difference in root canal straightening after preparation between the techniques ($p > 0.05$).

Conclusions: Neither manual nor rotary techniques completely prepared the root canal, and both techniques caused slight straightening of the root canal.

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