Efficacy of XP-Endo Finisher in Mandibular Molars: Micro CT Analysis

**Objectives**: To investigate the percentage of root canal surface instrumentation by XP-endo Finisher NiTi file (XPF) in mandibular molars, using Micro-Computed Tomography (µCT) imaging.

**Methods**: Thirty-seven mandibular molars were scanned using µCT scans at a high resolution of 26µm. Twenty-four molars were selected and divided into 2 groups based on stratified randomisation of canal space volume, canal anatomy, degree of curvature and canal dimensions. Molars were scanned with µCT at 20µm resolution pre-preparation and post-preparation. Group-1 was prepared using XP-endo Shaper (XPS). Group-2 was prepared using ProTaper Next (PTN). Both groups were then prepared using XPF. A single operator undertook all the preparation. Images were reconstructed in three-dimensions, to allow analysis using Materialise package. Data were recorded and analysed in SPSS-22 software using Univariate analysis and descriptive statistics.

**Results**: The results showed difference in canal space volume between pre and post preparation in mesial roots with a mean of $= 166618.14 \mu m^3$, SD = 158807.3 with XPF-in XPS group compared with mean= 183219.26 $\mu m^3$, SD = 202804 with XPF-in PTN group. In distal roots group 1 showed a mean = 903514.64, SD = 2400513.8 compared with a mean = 999308.34, SD = 2722310.4 in group 2. The mean percentage of root canal wall instrumentation with XPF in XPS group was $= 5.5\%$, SD = 3.4 in mesial roots and 6.7$, SD = 5.7$, in distal roots. For XPF in PTN group the percentage was mean= 5.9$, SD = 5 in mesial roots and mean= 5.6$, SD = 5.6 in distal roots. There was no statistically significant effect on percentage of instrumentation or difference in volume with XPF when used after XPS or PTN.

**Conclusions**: Within the limitations of the study, XPF used as a finisher file after XPS and PTN improved the percentage of root canal wall instrumentation without significant further loss of root dentine.

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