

Accuracy of Small Field of View CBCT in Determining Endodontic Working Length

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Abstract : An *in vitro* study was carried out to evaluate the feasibility of small field of view (FOV) cone beam computed tomography (CBCT) in determining endodontic working length. The objectives were to determine the accuracy of CBCT in measuring the estimated preoperative working lengths (EPWL), endodontic working lengths (EWL) and file lengths. Access cavities were prepared in 27 molars. For each root canal, the baseline electronic working length was determined using an EAL (Raypex 5). The teeth were then divided into overextended, non-modified and underextended groups and the lengths were adjusted accordingly. Imaging and measurements were made using the respective software of the RVG (Kodak RVG 6100) and CBCT units (Kodak 9000 3D). Root apices were then shaved and the apical constrictions viewed under magnification to measure the control working lengths. The paired t-test showed a statistically significant difference between CBCT EPWL and control length but the difference was too small to be clinically significant. From the Bland Altman analysis, the CBCT method had the widest range of 95% limits of agreement, reflecting its greater potential of error. In measuring file lengths, RVG had a bigger window of 95% limits of agreement compared to CBCT. Conclusions: (1) The clinically insignificant underestimation of the preoperative working length using small FOV CBCT showed that it is acceptable for use in the estimation of preoperative working length. (2) Small FOV CBCT may be used in working length determination but it is not as accurate as the currently practiced method of using the EAL. (3) It is also more accurate than RVG in measuring file lengths.

Keywords : accuracy, CBCT, endodontics, measurement

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