ABSTRACT

TOPIC OF THE STUDY: CLINICAL SUCCESS OF TWO WORKING LENGTH DETERMINATION TECHNIQUES - A RANDOMIZED CONTROLLED TRIAL

Objective: To determine the clinical success of two working length determination techniques using Electronic apex locator (Root ZX mini) and Radiographic method.

Materials and methods: In this study, 83 teeth from 64 patients were randomly divided into groups; Group A: Electronic apex locator and Group B: Radiographic technique. A pre-operative radiograph was taken using customized tube positioners. After standard isolation and access cavity preparation, WL determination was carried out using Electronic apex locator in group A where as in group B pre-operative radiograph was used. After standardized cleaning and shaping technique, master cone verification radiograph was taken as the primary outcome and adjustments were accordingly made. After obturation, post-operative radiograph was taken. Differences in the end point of obturation and calculated working length were taken as the secondary outcome. Patients were recalled after 3 months. Clinical and radiographic evaluation of success was assessed as tertiary outcome.

Results: Accuracy of fit of master cone as verified by the radiograph (0.5mm short of radiographic apex) was the primary outcome. The frequency of under extension was not statistically significantly different between the 2 groups. Frequency of over extension and accurate fit was significantly different between the 2 groups. When absolute values of under extension was analysed, there was a statistically significant difference among the 2 groups. However, there was no significant difference between the 2 groups for absolute values of over extension.
The accuracy of obturation (0.5mm short of radiographic apex) as verified by the post obturation radiograph was the secondary outcome assessed. It was not significantly different between the 2 groups. The tertiary outcome of success rate of endodontic treatment after 3 months of obturation was assessed by presence or absence by clinical symptoms of disease and radiographic evidence of reduction or increase in peri-apical lesion. There was no significant difference in the clinical outcome of endodontic treatment. There was no significant difference in the lesion reduction between the 2 groups. However, 1 tooth in Group A (Electronic apex locator) developed a lesion.

**Conclusion:** The new radiographic technique showed greater frequency of over estimation than Electronic apex locator. It was similar to Electronic apex locator in the under estimation. However, there was no statistical difference in the long term success or the absolute values of over estimation. Hence, the new single radiographic technique for working length determination can be used as an alternative to Electronic apex locators.

**Keywords:** Working length, radiographic technique, Root ZX mini, Electronic apex locator, tube positioner, follow up, success, long term.