A Comparative Study of Working Length Determination by an Apex Locator and Radiograph by Bisecting – Angle Technique

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Abstract

This study compares between the bisecting-angle technique using conventional x – ray and the electronic measuring device called Root ZX for estimation of the tooth working length for endodontic therapy. The study is performed on 83 root canals in 78 patients, they were grouped into 33 males and 50 females their age range between (20 –70) years old. All the teeth working length have been measured from the incisal edge to the apical constriction.

The working length is measured by Root ZX apex locator, a file was attached to the apex locator, it was advanced until the machine indicates that it's 0.5mm from anatomical apex, the file length was noted using a rubber stop to mark how far it has been inserted, repeating the measurement 3 times to over get the percentage of error which is ± (0.5 – 1) mm.

Then while the file was in its place in the canal a radiograph was taken by bisecting angle technique with the use of AGFA films and conventional x –ray source, after obtaining the radiograph, and evaluation was made for the location of the end of the file from the radiographical apex to evaluate the reading of the Root ZX so either the reading of Root ZX is ± (0.5 - 1) mm or the same of the radiographic.

The measurements have been tabulated and the statistical analysis of the results with the use of student – t –test have been performed and arranged in tables. Results have shown that, there was a statistical significant difference between the Root ZX and bisecting-angle

technique. As conclusion, this clinical study showed that the electronic measuring device Root ZX was dependable because clinically there was non significance difference between the readings of both techniques because the difference between the measurments of both techniques were ± (0.5 –1) mm and the C.D.J. anatomically varies between (0.5 – 1) mm so this range doesnot cause errors in working length measurment.