In vitro Accuracy Assessment of Electronic Apex Locator: RSUpex

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Abstract

Aim: To evaluate the accuracy of RSUpex, a newly developed electronic apex locator (EAL), by comparing it with a standard apex locator (Root ZX). **Methodology:** Forty single-root lower premolar human teeth with completed apex formation were embedded in alginate model, which simulated tooth-surrounding tissue. The working length (WL) of each tooth was determined by using both Root ZX and RSUpex. The actual working length of each tooth was determined under a microscope. **Results:** The working lengths determined by both electronic apex locators varied ±0.5 mm from the apical foramen, which were within the acceptable criteria. The WLs measured by Root ZX and RSUpex were 0.5 mm short of the apical foramen (AF) of 28 canals (70 %) and 22 canals (55 %) respectively. Eleven canals (27.5 %) and 17 canals (42.5.5 %) were beyond the AF respectively for Root ZX and RSUpex, while WLs of 1 canal (2.5 %) from both EALs were at the AF. The intra-class correlation coefficient of both devices was 0.988, which indicates excellent accuracy. **Conclusion:** The accuracy of RSUpex in working length determination is comparable with Root ZX. Further studies are needed to evaluate the success of RSUpex in clinical settings.

Keywords: Alginate model, Electronic apex locators, Root ZX, RSUpex