

Quality of working length radiographs taken and used by dental postgraduate trainees during endodontic treatment

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Assessment of the precise location of the radiographic apex of a root canal is a necessity for successful endodontic therapy. The universally accepted method of working length (WL) determination is by radiographic means. Radiographs of acceptable quality are crucial for this purpose and proper radiographic techniques should be adopted to achieve maximum diagnostic quality. The purpose of this study was to identify the frequency and type of radiographic errors observed in WL radiographs taken and used by the dental postgraduate trainees.

Intraoral periapical (IOPA) WL radiographs (338) following the bisected angle technique taken by restorative dentistry postgraduates at the first attempt were analyzed using the SPSS statistical software. 196 radiographs were taken using conventional X-ray equipment and were processed using the automatic processor. 132 radiographs were taken using the digital X-ray equipment and radiovisiography (RVG) sensor. These were assessed under standard viewing conditions and 2.5 magnifications.

Each radiograph was analyzed for the presence or absence of technical errors. Analyzed technical errors were improper horizontal angle, improper vertical angle, improper positioning, improper processing and presence of artifacts. Errors resulted were horizontal overlapping, elongations and foreshortening, missing of crown or apex of the tooth, cone cut and presence of fingerprints. Among analyzed WL radiographs, 298 were presented with errors. Errors found were in 162 and 126 radiographs in the conventional and digital systems respectively.

Improper film positioning was the commonest error in both types of radiographs (52.8%) followed by underexposure (19.8%) and elongation (15%). Higher number of errors in conventional radiographs was due to improper fixing (29.4%) and improper contrast (17.3%). Statistically significant differences were observed in radiographs with horizontal overlapping (0.029) and cone cut (0.036). In conventional radiographs significant difference was observed in over-exposed film (0.048).

In conclusion, high number of errors was found in WL radiographs taken by dental postgraduate trainees.