

Comparison between digital intraoral radiography (PSP) and Cone Beam CT images in detection internal root resorption (in-vitro study)

Mehr Ali Zade S¹, Talayi Pour AR², Mehrvarzar Far P³, Edalat M,⁴ Sharifi S⁵

¹Assistant Professor, Oral and Maxillofacial Radiology Dept, Dental Branch, Islamic Azad University, Tehran, Iran.

² Professor, Oral and Maxillofacial Radiology Dept, and Member of Cranio Maxillofacial Research Center, Islamic Azad University, Dental Branch, Tehran, Iran

³Associate Professor, Endodontics Dept, Dental Branch, Islamic Azad University, Tehran, Iran.

⁴ Post Graduated Student, Oral and Maxillofacial Radiology Dept, Dental Branch, Islamic Azad University, Tehran, Iran.

⁵ Assistant Professor, Oral and Maxillofacial Radiology Dept, Dental Branch, Jondi Shapoor University, Ahwaz, Iran.

Abstract

Background and Aim: Root resorption is one of the most difficult diagnostic problems in endodontic treatment. Since successful treatment depends on early diagnosis of this pathology, using several diagnostic methods such as radiographic images based on films, digital images and advanced diagnostic techniques such as Cone Beam CT are important. Therefore, in this study, we compared digital radiography images with PSP detector with CBCT images in diagnosis of these lesions.

Materials and Methods: In this in-vitro study, 45 single rooted intact teeth were sectioned in mesiodistal direction and internal resorption in the apical, middle and cervical region of tooth was made. Both group teeth were imaged with digital periapical radiographies (Digora ® Optime PSP System / Sordex) and CBCT (Newtom VGi -Italy). Analysis of periapical and CBCT images of the teeth at each site were evaluated by an experienced observer. Positive and negative predictive values for each imaging technique were calculated using T-Test; and chi-square test was used to compare two different imaging techniques and the location of the resorption by using SPSS 19 software.

Result: In overall, CBCT images showed significantly higher agreement ($p < 0.000$) and less errors (false positive+ false negative) rather than images from periapical digital systems. Also in diagnosis of internal resorption in apical region the relative risk in digital images is four times greater than that obtained from CBCT images.

Conclusion: According to this study, it seems, CBCT images compared with digital periapical radiography, have less errors in the detection of internal root resorption lesions, especially in apical region,

Keywords: Root resorption, Digital dental radiography, Cone Beam Computerized tomography