

Efficacy of Cone-Beam Computed Tomography compared to Conventional Periapical Radiography in Detecting Strip Root Perforations

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Abstract

Background and Aim: Early diagnosis of strip root perforation is a critical factor which has considerable impact on the treatment prognosis. The current study assessed the sensitivity, specificity and accuracy of cone-beam computed tomography (CBCT) compared to conventional periapical radiography (PA) in detecting the strip root perforations.

Materials and Methods: The mesial root canals of 97 extracted human mandibular molar teeth were assessed in this diagnostic in-vitro study. The Distal wall of the mesiolingual canals were thinned in the danger zone. Then strip perforations were created randomly in 51 teeth. PA images (3 horizontal angles: 20 mesial, orthoradial and 20 distal) and CBCT were taken and they were evaluated by two observers. Accuracy, sensitivity and specificity of each method were calculated. Data were analyzed statistically by the Chi-square and Fisher's exact tests (significance level=0.05).

Result: The sensitivity, specificity and accuracy of CBCT method in detecting strip perforations were 90.1, 100 and 94.8, respectively, and for the PA method they were 70.5, 69.5 and 70.1. The difference between PA and CBCT was statistically significant ($P < 0.05$)

Conclusion: It can be concluded that CBCT was superior to PA in detecting strip root perforations, and that conventional radiography was not efficient enough to detect strip root perforation.

Keywords: Cone-beam computed tomography; Conventional periapical radiography; Strip root perforation