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*A Comparison of Cone Beam Computed Tomography,
Dental Panoramic and Digital Peri-apical Radiography
in the Detection of Chemical and Mechanical Created
Peri-implant Cervical Bone Defects*

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Abstract

Background

In dental practice, radiography is the most common technique used to diagnose peri- implantitis . Intraoral and panoramic radiographs provide a two dimensional image of the peri-implant bone. In cases in which three dimensional visualization of the bone is required , cone beam computed tomography may be alternative.

Aim of study

The purpose of the present study was to compare the diagnostic potentials and actual advantages of perapical, dental panorama and CBCT imaging systems in detecting chemically and mechanically simulated defects around dental implants with different sizes.

Materials and Method:

Forty implants were placed in bovine ribs and divided into two groups: (1) control group and (2) test group. The test group was divided into four subgroups, T1 (4 hours of acid exposure) , T2 (12 hours of acid exposure) ,T3 (0.45 mm peri-implant space) and T4 (0.7 mm peri-implant space). The defect sites were randomly assigned to the groups . Cone beam computed tomography, dental panoramic and digital peri apical images were acquired. One oral and maxillofacial surgeon and two oral and maxillofacial radiologists evaluated the presence of defects, and their findings were compared with direct visual evaluation. Confidence in diagnosing the presence or absence of a peri-implant radiolucency was recorded on a five-point scale.

Results:

Cone beam computed tomography were better at diagnosing a peri-implant bone defect (22 true positive and 8 true negative results) when the compared with PAN and PA. As the peri-implant space increase,

there was no significant difference in diagnostic accuracy between the three imaging methods. Accuracy of CBCT (71,88%) and PAN (65,62) was better than PA (43,75%).The sensitivity of PAN (80,%) better than CBCT (73,33%) and PA (65%).

Conclusions: Within the limitations of this study, Dependent on these results the CBCT are a reliable, and effective method of detecting circumferential peri-implant bone defects and performed significantly better than PAN and PA.