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RESEARCH ARTICLE

EVALUATION OF PERIODONTAL BONE LOSS USING DIGITAL INTRAORAL RADIOGRAPHY AND CONE BEAM COMPUTED TOMOGRAPHY

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ABSTRACT

Aim: The objective of this study was to compare Radiovisiography (RVG) with Cone beam computed tomography (CBCT) imaging in detecting periodontal bone loss by comparing measurements of the distance from the cemen to enamel junction (CEJ) to the alveolar crest (AC) and thereby exploring the diagnosticvalues of RVG and CBCT in the determination of periodontal bone loss. **Materials and Methods:** This study incorporated 50 adult patients having periodontal disease determined by intra oral examination of these patients, standardized digital intraoral periapical radiographic images and CBCT images were obtained. The images thus obtained were analyzed by a single examiner for the distance between the CEJ and AC for selected sites. **Statistical Analysis Used:** The data collected was subjected to the independent 't' test. **Results:** Statistical analysis showed statistically significant difference between alveolar bone loss measurements on RVG and CBCT in the following teeth 12,26,34,35 & 47 with a P value of 0.008, 0.015, 0.010, 0.019 & 0.05 respectively, while no statistically significant difference was seen in the remaining teeth with a Pvalue > 0.05. **Conclusion:** It was concluded from this study that the 2 methods (RVG & CBCT) differ when detecting the distance from the CEJ to AC, with CBCT having a superior image recording capabilities compared to RVG and also allowed for an analysis of the buccaland lingual/palatal surfaces and an improved visualization of the morphology of the defect.

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INTRODUCTION

The periodontium is a dynamic and unique part of the human body, which providessupport and nutrition for the teeth. The alveolus, periodontal ligament, cementum, andsupporting gingiva are all parts of the periodontium (Micheal, 2014). Periodontitis is defined as "an inflammatory disease of the supporting tissues of the teeth caused by specific microorganisms or group of specific microorganisms, resulting in progressive destruction of the periodontal ligament and alveolar bone withpocket formation, recession, or both (Rajiv Saini, 2009). The diagnosis, treatment planning and prognosis of periodontal disease is based onthe correct assessment of the bone condition. Information derived from probing thegingival tissues in association with diagnostic imaging provides guidelines forassessing the alveolar bone height and checking for the presence of vertical bone defects (K de Faria Vasconcelos, 2012). Radiographs play an essential adjunctive role in the diagnostic process. Radiographic examination of periodontal bone is used to assess the degree and pattern of bone losswith respect to the cemento-enamel junction (Sudhanshu Agrawal, dipti singh. Clinical Applications Of Cone-Beam Computed Tomography In Periodontics). Currentlyperiapical radiographs and bitewing radiographs are widely used to detect bone loss, furcation defects, presence of calculus and any presence of lesions in the apical periodontium. Bitewing radiographs are routinely used to obtain the best view of early interproximal and vertical bone loss (Andre Mol, 2000). They are the most suitable in diagnosing periodontal diseases because they are easily acquired, cheap and provide high-resolution images. However these methods are limited by overlapping anatomical structures, difficulty in standardization and by underestimating the size and occurrence of bone defects (K de Faria Vasconcelos, 2012). Linear measurements from conventional radiographs frequently underestimated bone loss compared to clinical probing. Therefore, the need arises for a clear and undistorted view of the periodontal structures to make an accurate diagnosis and evaluate periodontal bone changes over a period of time. This would require the use of a three dimensional modality which would also enable making accurate and reproducible linear measurement of the alveolar bone on a 1:1 ratio. This pursue for three-dimensional information has led to exploring the value of CT for assessment of alveolar bone height. The routine application of 3-D CT for periodontal tissues is currently not indicated, because it is time consuming, has high radiation exposure and expensive (Andre Mol, 2004).

AIM: To compare RVG with CBCT imaging in detecting periodontal bone loss by comparing measurements of the

distance from CEJ to AC and there by exploring the diagnostic values of RVG and CBCT in the determination of periodontal bone loss.

MATERIALS AND METHODS

This study was an In vivo, Cross Sectional Single Blind Study that included 50 patients that were referred for a radiographic evaluation of periodontal disease. The digital intraoral radiographs and CBCT images were obtained from these patients.

Inclusion criteria

- Good quality sample images with medium density and contrast.
- Sample images with centralization of the region to be assessed.
- Visualization of the CEJ.

Exclusion criteria

1. Sample images presenting interproximal overlap in periapical radiography.
2. Metallic restorations with scatter effects of metal restorations in CBCT images.
3. Images having coronal destruction comprising the CEJ.

Method of collection of data

Intraoral examination of the patients with an existing periodontal disease was done. The periodontal pockets were examined using a William's probe for confirmation ofthe pockets. The patients were informed about the study protocol, risks and benefits of the diagnostic and therapeutic procedures and consent was obtained. After the completion of initial periodontal examination standardized digital intra oralperiapical radiographic images were obtained using a sensor holder device (Flow Dental, sensibles universal sensor holder) to which the RVG(KODAK RVG 5100)sensor is attached, incorporating the paralleling cone technique. CBCT images were obtained using CS 9300 Care stream software (KODAK) CBCT scanner with an amorphous, silicon flat panel image detector and a cylindrical volume of reconstruction of up to 18x24cms.While obtaining the digital intraoral radiographs and CBCT images the safety precautions were taken as specified. The images thus obtained were analysed by a single examiner, who selected the teeth and surfaces to be analyzed in both imaging modalities. Each tomogram was selected separately for each distance measured since end points, such as the alveolar crest and the deepest point of the defect, could be viewed in different slices. Before measuring, the examiner converted the images from pixels into millimeters using the real dimensions of the digital intraoral radiography and CBCT.

The images were analysed at different times, thereby characterizing a blind study of the results. The sites were measured by the examiner first on digital intraoral radiographs and later on CBCT with the help of the ruler in the Image Tool software (University of Texas Health Science Centre, San Antonio, TX). In the digital intraoral radiographs the distance from the CEJ to the AC was measured in the mesial and distal surfaces and the highest value was noted. Whereas, in CBCT the distance from the CEJ to the AC was measured in 4 surfaces (buccal, lingual/palatal, mesial and distal surfaces), noting the highest value.

RESULTS

Analysis was done based on number of teeth present for comparison using both the techniques. The data thus was subjected to Independent 't'-TEST, it is as follows:-When comparing the measurements of the distance between the CEJ and the AC, it was observed that statistically significant difference exists between alveolar bone loss measurements on digital intraoral radiographs and CBCT in several regions in the mouth. The results for the following teeth 12,26,34,35 & 47 comparing the measurements of the distance between the CEJ and the AC, showed a p-value of0.008, 0.015, 0.010, 0.019 & 0.05 respectively, which was statistically significant. In this study, while comparing the distance between the CEJ and the AC between digital intraoral radiography and CBCT for the remaining teeth showed a p-value>0.05 which was not statistically significant.

DISCUSSION

The diagnosis of periodontal disease is primarily based on clinical examination. The clinical findings of periodontal osseous destruction can be confirmed by radiographic examination, but the radiographs on its own cannot help in diagnosing the disease.[6]Among two-dimensional (2D) radiographic diagnostic methods, bitewing and peri apical radiographs are the most suitable because they are easily acquired, cheap and provide high-resolution images. However, these methods are limited by overlapping anatomical structures, difficulty in standardization and by underestimating the size and occurrence of bone defects.[3]Radiographic digital imaging systems have been developed in recent times, which act as an adjunct in the precise diagnosis of periodontal disease. Khocht et al stated that digital radiography offers many advantages over conventional methods. It eliminates the need for film and film developing, and it allows for lower radiation exposure. Immediate observation of radiographic images is yet another advantage of digital radiography. The generated image is further available for evaluation on a computer screen and can be manipulated digitally to enhance viewing. In addition, digital tools are available to record electronic measurements and to cut, paste and colorize the image.

The image can be easily filed on and retrieved from the hard disk or removable storage medium, or the images can be transferred electronically to third party carriers.RVG is also useful in educating and motivating the patient. It also allows the clinician to change contrast, enlarge images, place color enhancements or superimpose various textures on images.[6]The drawbacks of digital radiography include cost of the devices as well as converting previous records to digital, which are very high, thickness and rigidity of sensor that makes the patient uncomfortable, loss or breakage of sensor, which can prove very costly (Satvinder Singh, 2015). Digital images besides improving diagnostic interpretation are still 2D images (K de Faria Vasconcelos, 2012). The major disadvantage with this technique is the projection of alveolar bone on a 2-dimensional (2-D) plane where many anatomical structures may overly lesions in the trabecular bone. Limited differentiation between the buccal and lingual alveolar bone also makes the topography and extent of bone lesions or dehiscences impossible to evaluate with certainty.[7]Cone beam CT (CBCT) is still underused for periodontal diagnosis. [3]3D CT technique came into scenario of periodontal disease diagnosis, to

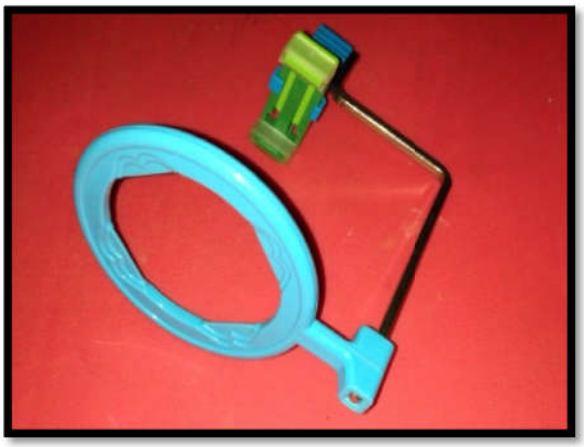


Fig.1. Universal sensor holder along with XCP instrument used in the study

Fig. 1. Universal sensor holder along

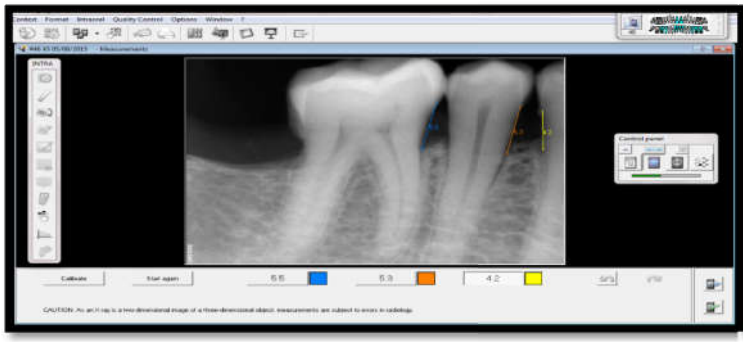


Fig. 3. Measurement of alveolar bone loss in Radiovisiography (RVG) obtained image

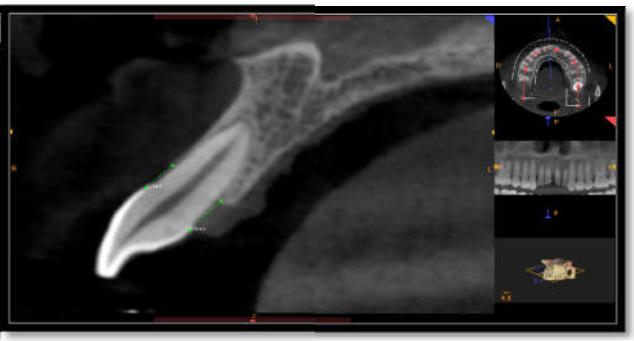
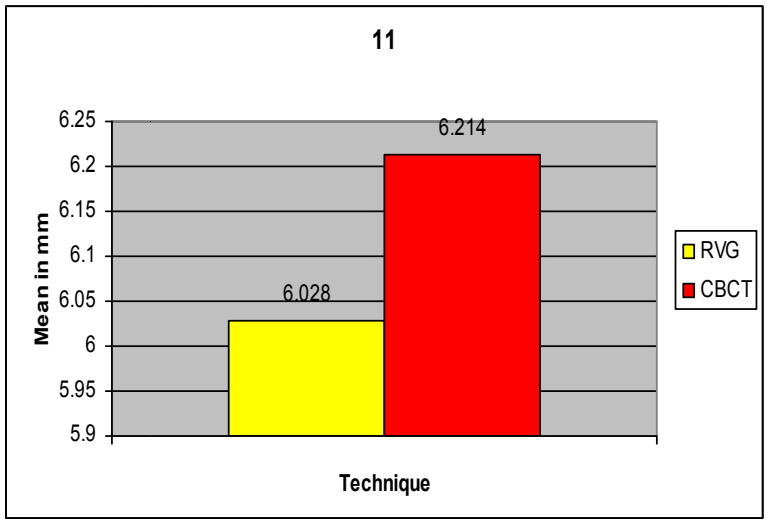


Fig. 4. Measurement of alveolar bone loss in Cone Beam Computerized Tomography obtained images

Graph 1. Correlation between rvg and cbct findings of maxillary right central incisor



The mean score for 11 (upper right central incisor) for bone loss from CEJ to AC using RVG was 6.028±0.1.7901 & 6.214±0.1.7301 (MEAN ± SD) for CBCT. This difference was not statistically significant.

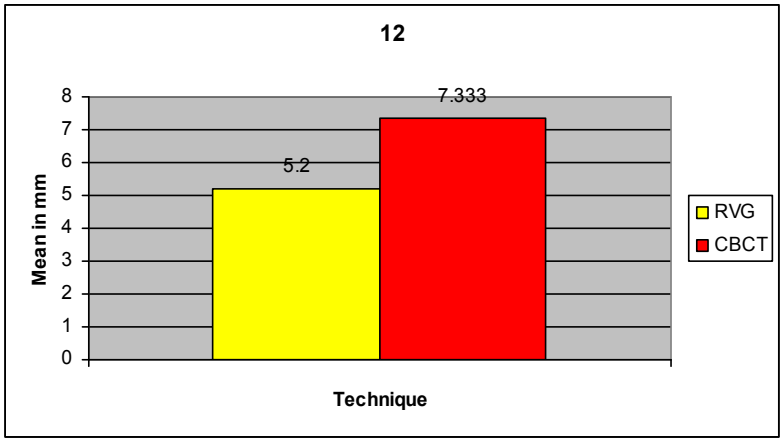
Table 2. Correlation between rvg and cbct findings of maxillary right lateral incisor

Tooth	Techniques	N	Mean	Std. Deviation (SD)	P value
12	RVG	3	5.200	0.7000	0.008*
	CBCT	3	7.333	0.3055	

Table 3.Correlation between rvg and cbct findings of maxillary right second premolar

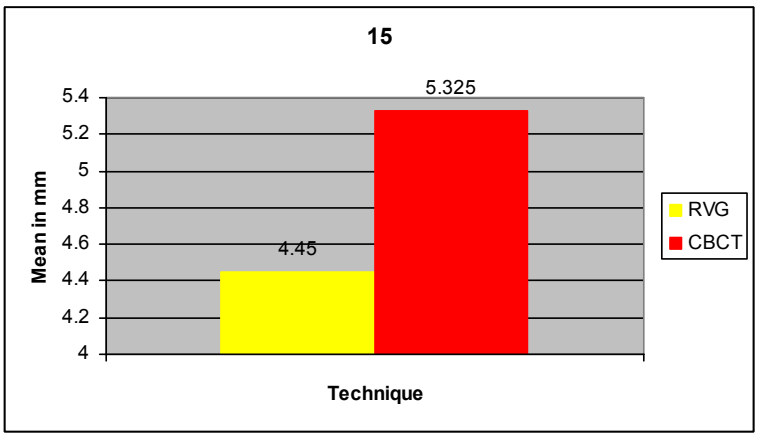
Tooth	Techniques	N	Mean	Std. Deviation(SD)	P value
15	RVG	8	4.450	0.8347	0.204
	CBCT	8	5.325	0.8995	

Graph 2. Correlation between rvg and cbct findings of maxillary right lateral incisor



The mean score for 12 (upper right lateral incisor) for bone loss from CEJ to AC using RVG was 5.200±0.700 & 7.333±0.3055 (MEAN ± SD) for CBCT. This difference was highly statistically significant.

Graph 3. Correlation between rvg and cbct findings of maxillary right second premolar

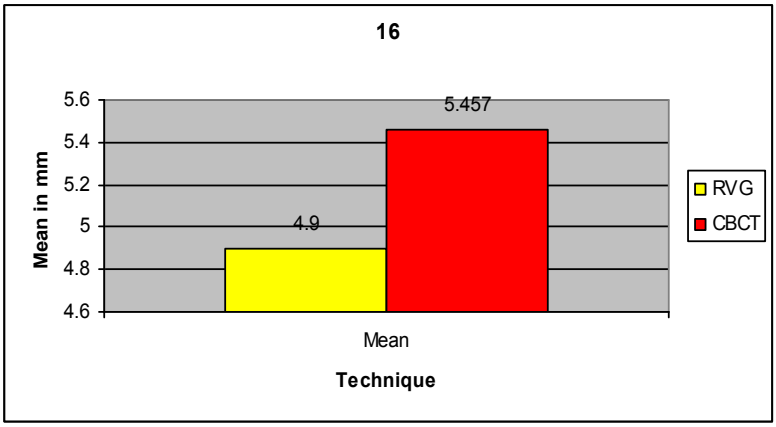


The mean score for 15 (upper right 2nd pre- molar) for bone loss from CEJ to AC using RVG was 4.450±0.8347 & 5.325±0.8995 (MEAN ± SD) for CBCT. This difference was **not** statistically significant.

Table 4. Correlation between rvg and cbct findings of maxillary right first molar

Tooth	Techniques	n	Mean	std. deviation (sd)	P value
16	RVG	8	4.900	0.7746	0.204
	CBCT	8	5.475	0.9423	

Graph 4. Correlation between rvg and cbct findings of maxillary right first molar

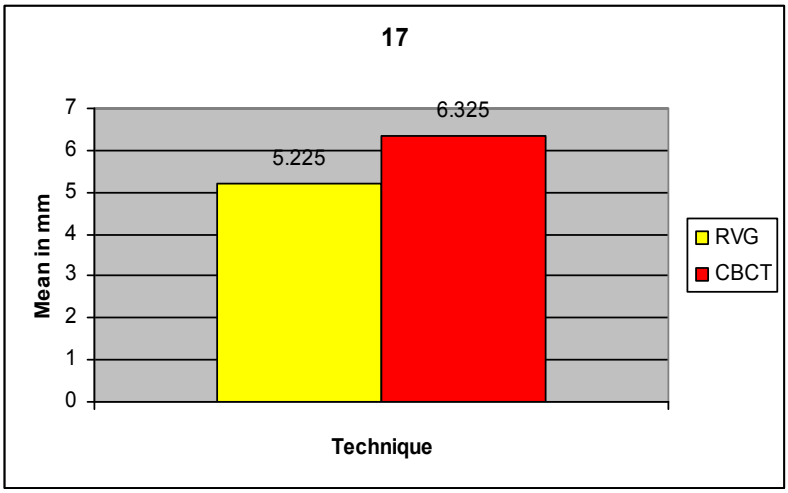


The mean score for 16 (upper right 1st molar) for bone loss from CEJ to AC using RVG was 4.900±0.7746 & 5.475±0.9423 (MEAN ± SD) for CBCT. This difference was **not** statistically significant.

Table 5. Correlation between rvg and cbct findings of maxillary right second molar tooth

Tooth	Techniques	N	Mean	Std.Deviation(SD)	P value
17	RVG	4	5.225	1.1871	0.407
	CBCT	4	6.325	2.1608	

Graph 5. Correlation between rvg and cbct findings of maxillary right second molar tooth

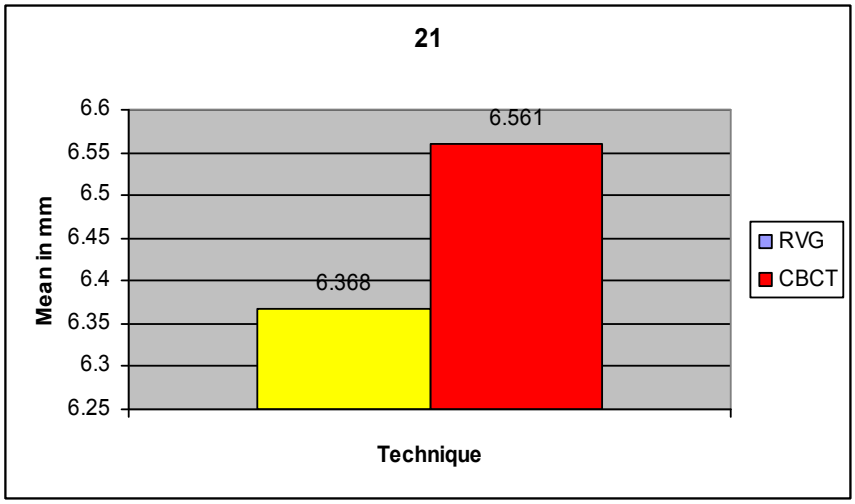


The mean score for 17 (upper right 2nd molar) for bone loss from CEJ to AC using RVG was 5.225±1.1871 & 6.325±2.1608 (MEAN ± SD) for CBCT. This difference was **not** statistically significant.

Table 6. Correlation between rvg and cbct findings of maxillary left central incisor

TOOTH	TECHNIQUES	N	MEAN	Std.DEVIATION(SD)	P value
21	RVG	44	6.368	1.8329	0.629
	CBCT	44	6.561	1.9016	

Graph 6. Correlation between rvg and cbct findings of maxillary left central incisor

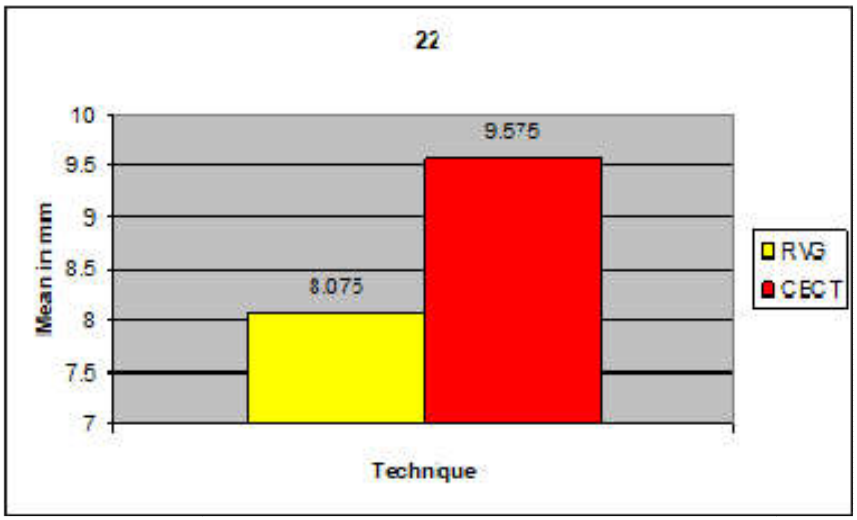


The mean score for 21 (upper left central incisor) for bone loss from CEJ to AC using RVG was 6.368±0.1.8329 & 6.561±0.1.9016 (MEAN ± SD) for CBCT. This difference was not statistically significant.

Table 7. Correlation between rvg and cbct findings of maxillary left lateral incisor

Tooth	Techniques	n	Mean	std.Deviation(sd)	P value
22	RVG	4	8.075	2.7451	0.485
	CBCT	4	9.575	2.9500	

Graph 7. Correlation between rvg and cbct findings of maxillary left lateral incisor

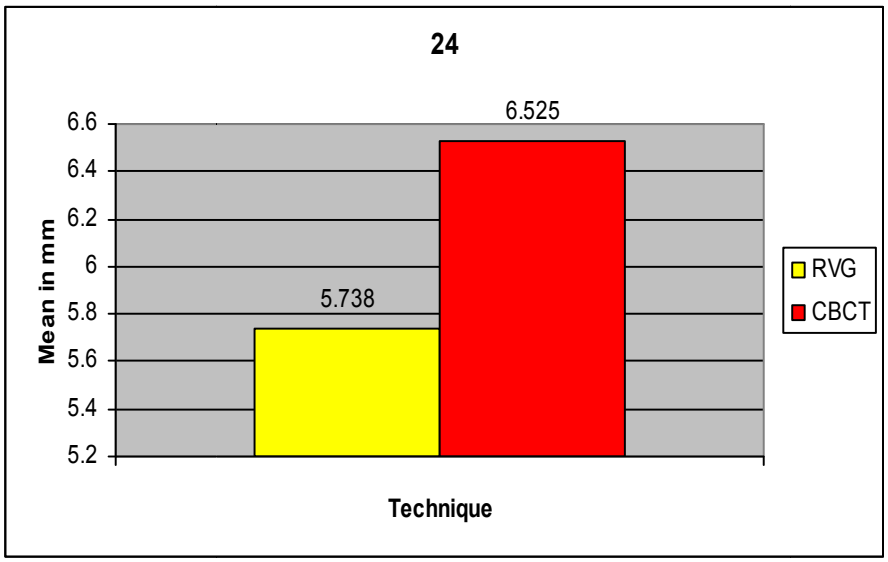


The mean score for 22 (upper left lateral incisor) for bone loss from CEJ to AC using RVG was 8.075±2.7451 & 9.575±2.9500 (MEAN ± SD) for CBCT. This difference was **not** statistically significant.

Table 8. Correlation between rvg and cbct findings of maxillary left first premolar

Tooth	Techniques	N	Mean	Std. Deviation(SD)	P value
24	RVG	8	5.738	1.8400	0.362
	CBCT	8	6.525	1.4801	

Graph 8. Correlation between rvg and cbct findings of maxillary left first premolar

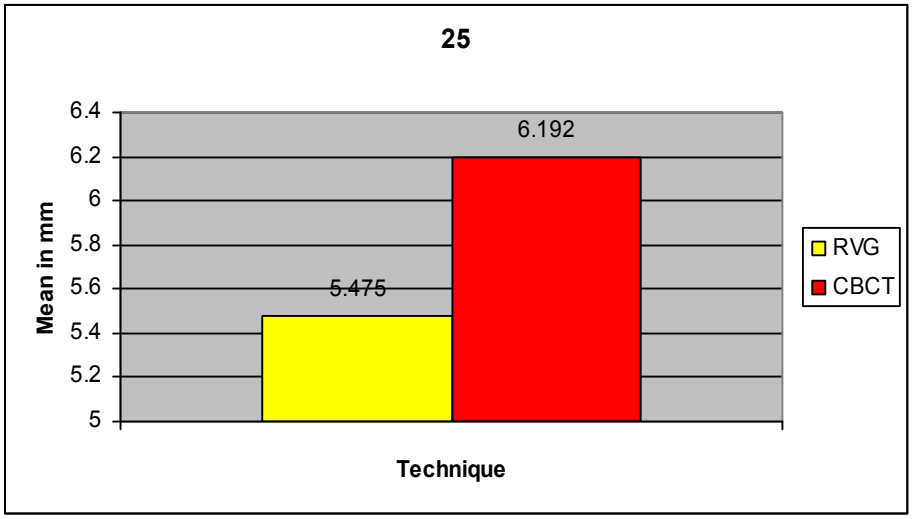


The mean score for 24 (upper left 1st pre- molar) for bone loss from CEJ to AC using RVG was 5.738±1.8400 & 6.525±1.4801 (MEAN ± SD) for CBCT. This difference was **not** statistically significant.

Table 9. Correlation between rvg and cbct findings of maxillary left second premolar

Tooth	Techniques	N	Mean	Std. Deviation(SD)	P value
25	RVG	12	5.475	1.8670	0.363
	CBCT	12	6.192	1.9148	

Graph 9. Correlation between rvg and cbct findings of maxillary left second premolar

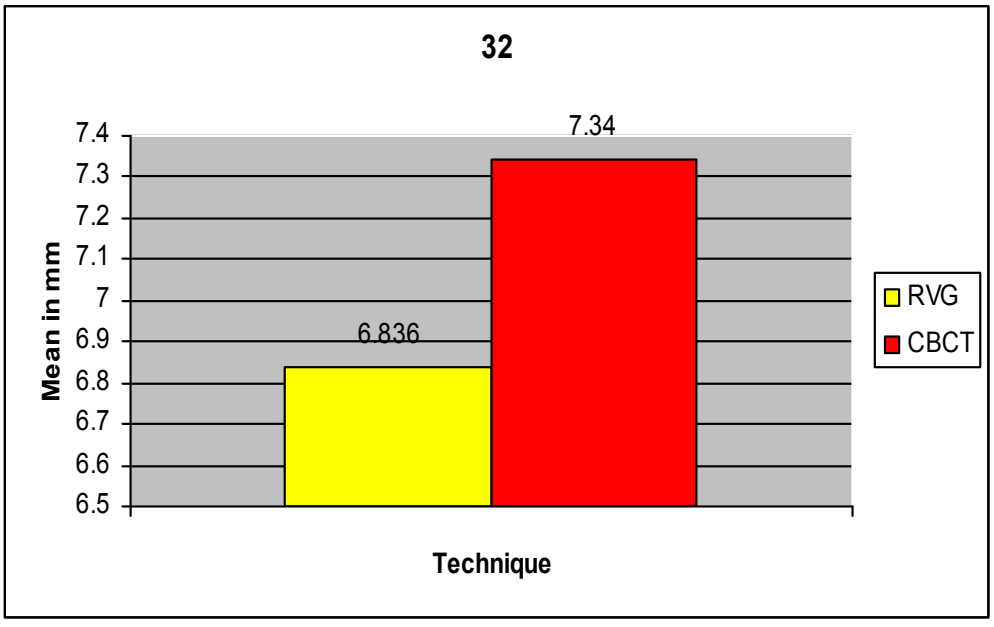


The mean score for 31 (lower left central incisor) for bone loss from CEJ to AC using RVG was 7.09±2.294 & 7.90±2.382 (MEAN ± SD) for CBCT. This difference was **not** statistically significant.

Table 12. Correlation between rvg and cbct findings of mandibular left lateral incisor

Tooth	Techniques	N	Mean	Std. Deviation(SD)	P value
32	RVG	42	6.836	1.7769	0.182
	CBCT	42	7.340	1.6575	

Graph 12. Correlation between rvg and cbct findings of mandibular left lateral incisor

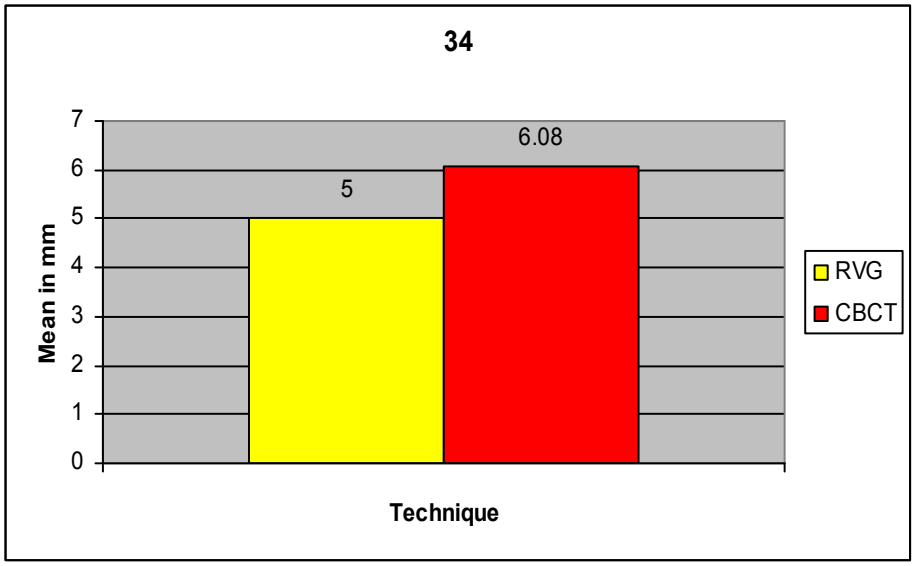


The mean score for 32 (lower left lateral incisor) for bone loss from CEJ to AC using RVG was 6.836±1.7769 & 7.340±1.6575 (MEAN ± SD) for CBCT. This difference was **not** statistically significant.

Table 13. Correlation between rvg and cbct findings of mandibular left first premolar

Tooth	Techniques	N	Mean	Std.Deviation(SD)	P value
34	RVG	20	5.0	0.939	0.010*
	CBCT	20	6.08	1.528	

Graph 13. Correlation between rvg and cbct findings of mandibular left first premolar

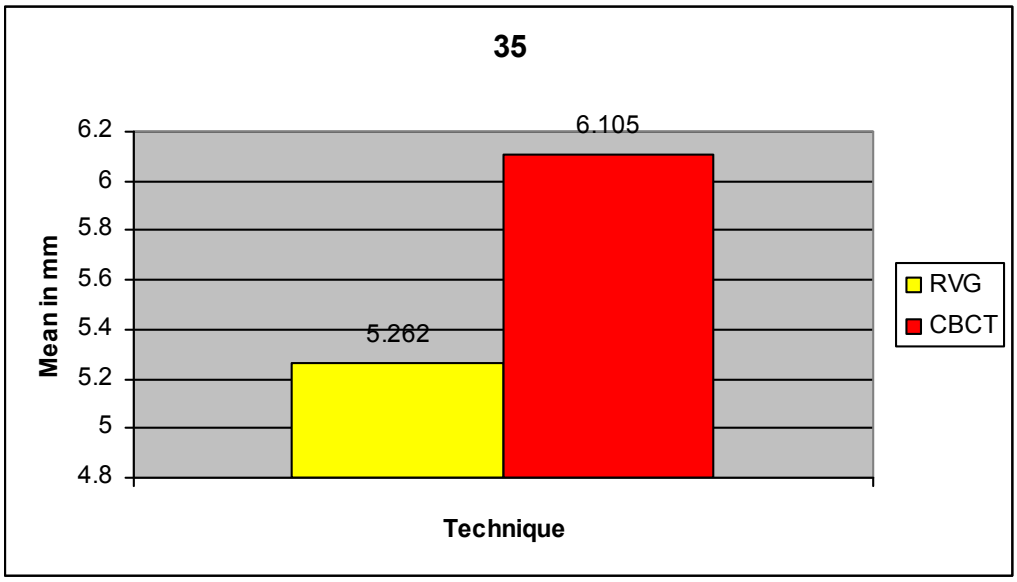


The mean score for 34 (lower left 1st premolar) for bone loss from CEJ to AC using RVG was 5.0±0.939 & 6.08±1.528 (MEAN ± SD) for CBCT. This difference was statistically significant.

Table 14. Correlation between rvg and cbct findings of mandibular left second premolar

Tooth	Techniques	N	Mean	Std. Deviation(SD)	P value
35	RVG	39	5.262	1.3920	0.019*
	CBCT	39	6.103	1.6895	

Graph 14. Correlation between rvg and cbct findings of mandibular left second premolar

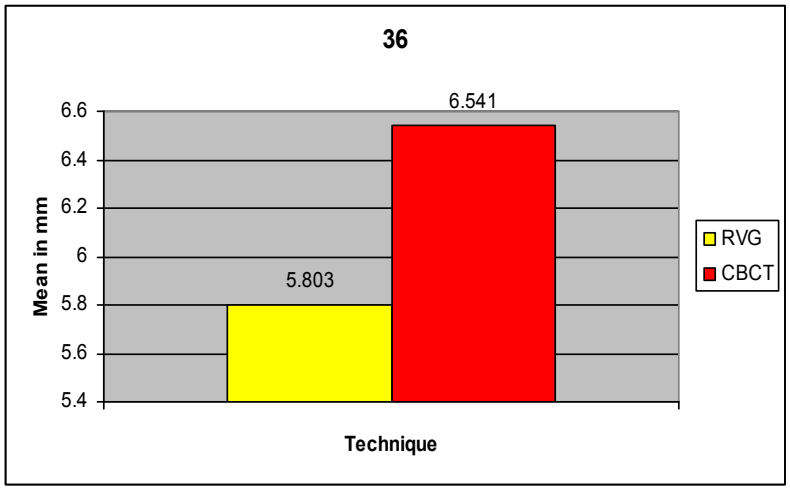


The mean score for 35 (lower left 2nd premolar) for bone loss from CEJ to AC using RVG was 5.262±1.3920 & 6.103±1.6895 (MEAN ± SD) for CBCT. This difference was statistically significant.

Table 15. Correlation between rvg and cbct findings of mandibular left first molar

TOOTH	TECHNIQUES	N	MEAN	Std.DEVIATION(SD)	P value
36	RVG	34	5.803	1.9029	0.110
	CBCT	34	6.541	1.8497	

Graph 15. Correlation between rvg and cbct findings of mandibular left first molar

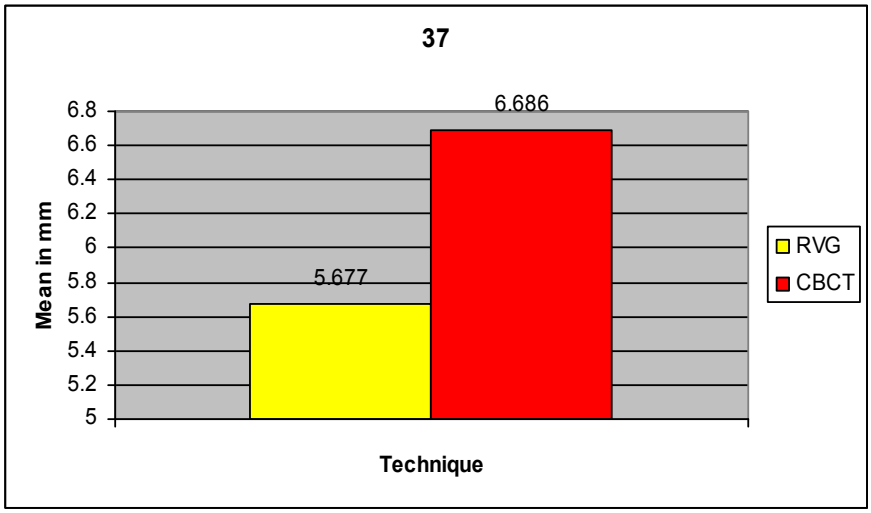


The mean score for 36 (lower left 1st molar) for bone loss from CEJ to AC using RVG was 5.803±1.9029 & 6.541±1.8497 (MEAN ± SD) for CBCT. This difference was not statistically significant.

Table 16. Correlation between rvg and cbct findings of mandibular left second molar

Tooth	Techniques	N	Mean	Std. Deviation(sd)	P value
37	Rvg	22	5.677	2.0727	0.085
	Cbct	22	6.686	1.7041	

Graph 16. Correlation between rvg and cbct findings of maxillary left second molar



The mean score for 37 (lower left 2nd molar) for bone loss from CEJ to AC using RVG was 5.677±2.0727 & 6.686±1.7041 (MEAN ± SD) for CBCT. This difference was not statistically significant.

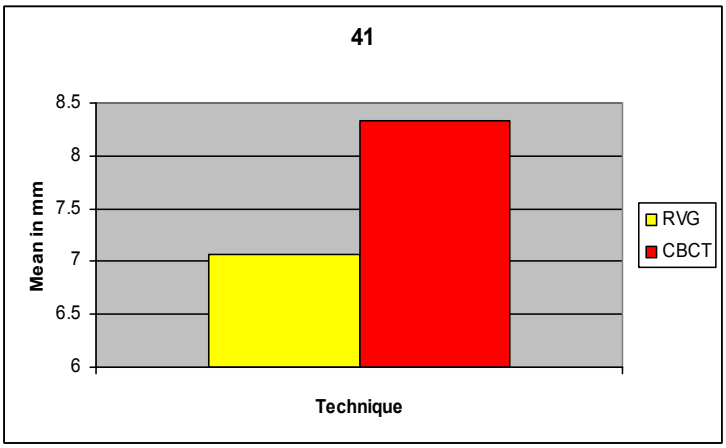
Table 17. Correlation between rvg and cbct findings of mandibular right central incisor

Tooth	Techniques	N	Mean	Std. Deviation(SD)	P value
41	RVG	18	7.061	1.6863	0.089
	CBCT	18	8.328	1.5601	

Table 18. Correlation Between Rvg and Cbct Findings Of Mandibular Right Lateral Incisor

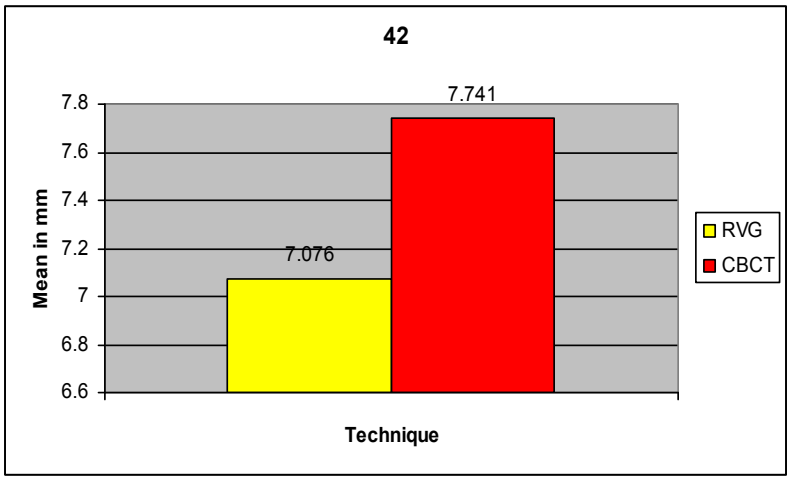
Tooth	Techniques	N	Mean	Std. Deviation(sd)	P value
42	RVG	34	7.076	1.9470	0.182
	CBCT	34	7.741	2.1166	

Graph 17. Correlation between rvg and cbct findings of mandibular right central incisor



The mean score for 41 (lower right central incisor) for bone loss from CEJ to AC using RVG was 7.061±1.6863 & 8.328±1.5601 (MEAN ± SD) for CBCT. This difference was not statistically significant.

Graph 18. Correlation between rvg and cbct findings of mandibular right lateral incisor

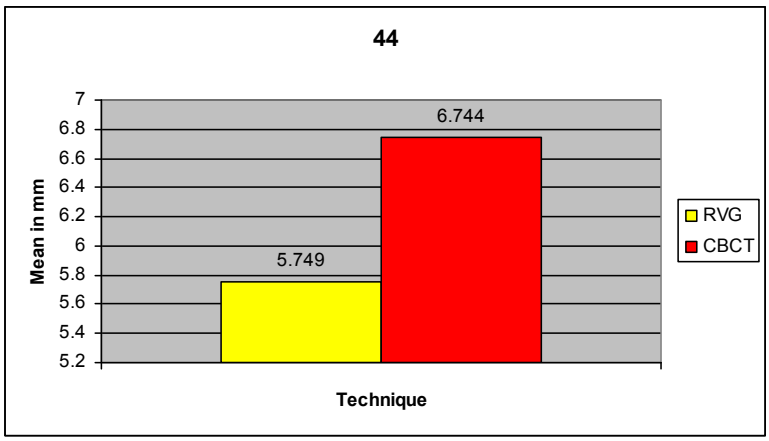


The mean score for 42 (lower right lateral incisor) for bone loss from CEJ to AC using RVG was 7.076±1.9470 & 7.741±2.1166 (MEAN ± SD) for CBCT. This difference was not statistically significant.

Table 19. Correlation between rvg and cbct findings of mandibular right first premolar

TOOTH	TECHNIQUES	N	MEAN	Std.DEVIATION(SD)	P value
44	RVG	16	5.794	1.3458	0.204
	CBCT	16	6.744	2.5987	

Graph 19. Correlation between rvg and cbct findings of mandibular right first premolar

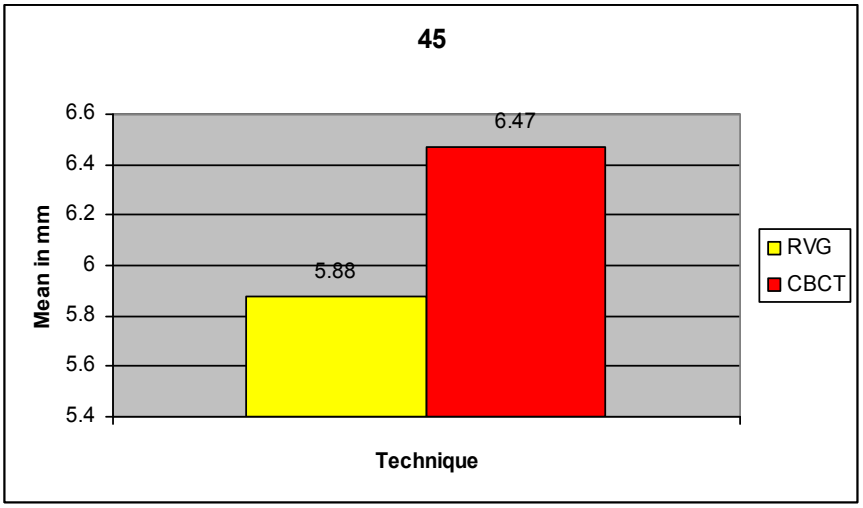


The mean score for 44 (lower right 1st pre molar) for bone loss from CEJ to AC using RVG was 5.794±1.3458 & 6.744±2.5987 (MEAN ± SD) for CBCT. This difference was not statistically significant

Table 20. Correlation between rvg and cbct findings of mandibular right second premolar

TOOTH	TECHNIQUES	N	MEAN	Std.DEVIATION(SD)	P value
45	RVG	35	5.88	2.429	0.291
	CBCT	35	6.47	2.191	

Graph 20. Correlation between rvg and cbct findings of mandibular right second premolar

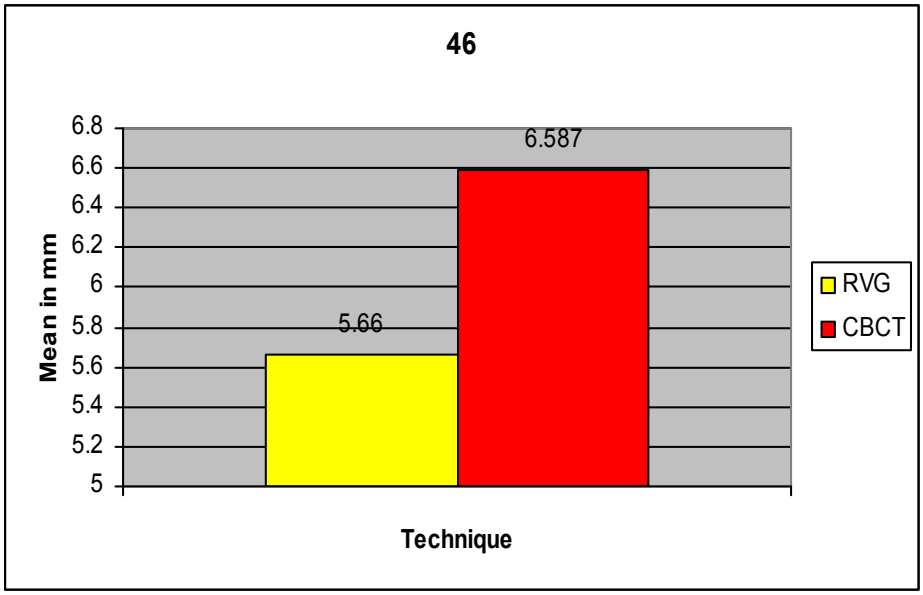


The mean score for 45 (lower right 2nd pre molar) for bone loss from CEJ to AC using RVG was 5.88±2.429 & 6.47±2.191 (MEAN ± SD) for CBCT. This difference was **not** statistically significant.

Table 21. Correlation between rvg and cbct findings of mandibular right first molar

TOOTH	TECHNIQUES	N	MEAN	Std.DEVIATION(SD)	P value
46	RVG	15	5.660	1.9134	0.227
	CBCT	15	6.587	2.1879	

Graph 21. Correlation between rvg and cbct findings of mandibular right first molar

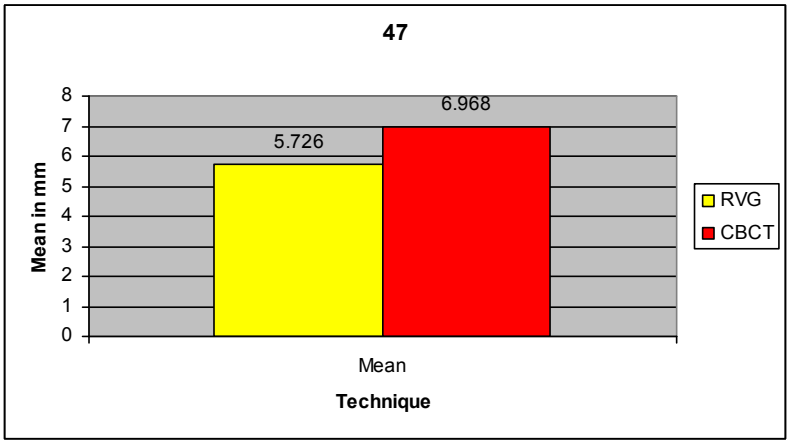


The mean score for 46 (lower right 2nd molar) for bone loss from CEJ to AC using RVG was 5.660±1.9134 & 6.587±2.1879 (MEAN ± SD) for CBCT. This difference was **not** statistically significant.

Table 22. Correlation between rvg and cbct findings of maxillary right second molar

TOOTH	TECHNIQUES	N	MEAN	Std.DEVIATION(SD)	P value
47	RVG	19	5.726	2.0390	0.05*
	CBCT	19	6.958	1.8518	

Graph 22. Correlation between rvg and cbct findings of maxillary right second molar



The mean score for 47 (lower right 2nd molar) for bone loss from CEJ to AC using RVG was 5.726±2.0390 & 6.958±1.8518 (MEAN ± SD) for CBCT. This difference was just statistically significant.

encounter the problems faced by 2D imaging techniques. The mesio-distal and bucco-lingualdimension are easily identified on CT so that all infra alveolar bony defects can bearranged according to the number of surrounding bony walls into one, two andthree-walled bony defects.[8] When compared with periapical and panoramic images,CBCT has also shown an absence of distortion and overlapping and the dimensions it presents are compatible with the actual size. The perception of images acquired usingCBCT in the evaluation of alveolar bone loss and periodontal bone defects could leadto a new approach in the evaluation of patients with periodontal disease and prove tobe an excellent resource when deciding on the most appropriate therapy.[3]Studies comparing 2D and 3D imaging methods used in the diagnosis of periodontal disease have been carried out in the past.[3]A study was conducted to assesses the accuracy of intraoral periapical (IOPA) and radiovisiography (RVG) radiographs in detection of interproximal alveolar bone loss. The study included the measurement of Interproximal alveolar bone loss in 23patients with moderate to severe periodontitis, using digital vernier caliper for IOPA and linear measurement tool inbuilt in RVG system, from radiographs taken with standardized techniques which were compared with the surgical readings. 106interproximal sites were measured in IOPA, RVG radiographs and compared with IS method. Paired t test results showed significant difference in bone levels between thesy stems.

A contingency analysis of categorical bone levels (early, moderate &advanced) also showed significant differences in the imaging systems. The study concluded that overall radiographic assessment of inter proximal bone loss by either IOPA or RVG radiographs shows no total agreement in comparison with IS measurements, although it was found that both conventional and digital radiographs are of use in interproximal bone loss assessment but in different similarities (Deepa, 2012). But most of the studies were in vitro. This study was an in vivo attempt to compare digital intraoral radiography a 2Dimaging technique with CBCT which is a 3D imaging technique for measuring the distance between the CEJ and AC in periodontally compromised teeth. To assess the consistency of the overall difference in the measurements between digital intraoral radiographs and CBCT paired t- test was computed for all the teeth in the mouth. When comparing the measurements of the distance between the CEJ and the AC, it was observed that statistically significant difference exists between alveolar bone loss measurements on digital intraoral radiographs and CBCT in several regions in the mouth. The results for the following teeth 12,26,34,35 & 47 comparing the measurements of the distance between the CEJ and the AC, showed a p-value of0.008, 0.015, 0.010, 0.019 & 0.05 respectively, which was statistically significant. This was in agreement with the study of Mol and Balasundaramin human skulls, which showed that the measurements of the CBCT were slightly more accurate than those made in conventional intraoral radiographs (Mol, 2008). K de Faria Vasconcelos found in his study that there were differences between the two methods, RVG and CBCT when the distance between the cementoenameljunction (CEJ) and the alveolar crest (AC) were measured.[3]A study was conducted to compare the diagnostic values of radiovisio graph (RVG)and computed tomography (CT) images in comparison with direct surgical measurements for the determination of periodontal bone loss. The study includedthirty-one vertical defects for direct measurements during surgery with a periodontal probe. RVG and CT images were taken prior to the surgery. Similar measurements were done on their images and compared with the direct surgical values. The results showed that the mean difference (in mm) of RVG and CT scan in vertical defects, and intrabony component was 0.814, 0.474 and 0.073, 0.066 respectively. Intra class correlation of CT scan (0.997 and 0.990) was highest with the smallest length of 95%confidence interval. CT scan furthermore depicted maximum agreement with thesurgical value. CT scan overestimated in the maximum percentage of sites in verticaldefects. CT scan outscored over RVG in evaluation of the osseous defects. The studyconcluded that CT scan demonstrated more precise and clinically useful images of theos seous defects closer to the gold standard.[11] A study aimed to compare the diagnostic accuracy of cone-beam computed tomography (CBCT) unit with digital intraoral radiography technique for detecting periodontal defects was conducted. The study material comprised 12 dry skulls with maxilla and mandible. Artificial defects (dehiscence, tunnel, and fenestration) were randomly created on anterior, premolar and molar teeth separately using burs on the dry skulls. In total 14 dehiscences, 13 fenestrations, eight tunnel and 16 without periodontal defect were used in the study. Each tooth with and without defects were imaged at various vertical angles using each of the following modalities: a Planmeca Promax Cone Beam CT and a Digoraphotostimulable phosphor plates. Specificityand sensitivity for assessing periodontal defects by

each radiographic technique were calculated. Chi-square statistics were used to evaluate differences between modalities. Kappa statistics assessed the agreement between observers. The Kappa values for detecting defect son anterior teeth was the least, following premolar and molar teeth both CBCT and intraoral imaging. The study concluded that CBCT has the highest sensitivity and diagnostic accuracy for detecting various periodontal defects among the radiographic modalities examined (Nilsun Bagis, 2015). In our study, while comparing the distance between the CEJ and the AC between digital intraoral radiography and CBCT for the remaining teeth showed a p-value>0.05 which was not statistically significant. This was not in accordance with the studies conducted by Mol and Balasundarm and K de Faria Vasconcelos who observed that there was significant difference between the two methods when detecting the height of the alveolar bone crest (K de FariaVasconcelos, 2012; Deepa, 2012). Our study thereby, reinforced the fact that while both imaging modalities are useful when diagnosing periodontal bone loss, CBCT offers significant advantages over digital intraoral radiography in detecting and locating bone defects. And hence, request for CBCT is justified for the periodontal surgical planning of patients with severe periodontal disease, such as aggressive peridontitis, and especially for regenerative or mucogingival surgical planning because these surgical procedures are costly and difficult to plan. K de Faria Vasconcelos et al in his study emphasized that periapical radiographs result in lower radiation doses to the patient and are less costly and should be indicated for simpler cases.[3] Therefore, information acquired from the clinical examination is of vital importance when choosing the most appropriate method for diagnosing periodontal disease.

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