Results: There are no current applicable results for this research presentation.

Discussion: The diagnosis and staging of MRONJ is currently based on patient history and clinical findings. Panoramic and intraoral radiographs help make an overall assessment. However, the presence or extent of necrotic changes may be underestimated on panoramic radiographs, complicating differentiation of MRONJ from dental disease. Although cone beam computed tomography (CBCT) provides improved visualization of the MRONJ lesion, criteria to identify patients who would benefit from this modality are lacking. Certain radiographic parameters seen in stage 0 MRONJ may predict progression to clinical bone exposure. Thus, imaging findings play an important role in evaluating the extent of disease, facilitating staging, and determining subsequent management. This report provides a review of the literature pertaining to the value of CBCT imaging in MRONJ management. Guided by these data, we propose an imaging protocol to facilitate clinical decision making and appropriate application of CBCT imaging.

DOUBLE CONTOUR SIGN IN TEMPOROMANDIBULAR JOINTS IN CONE BEAM COMPUTED TOMOGRAPHY: A CASE SERIES.

J. BRINER J., K. BRINER K., M. BRINER M., and A. BRINER, UNIVERSIDAD FINIS TERRAE, PROVIDENCIA, SANTIAGO, CHILE; UNIVESITY OF FLORIDA COLLEGE OF DENTISTRY, GAINESVILLE, FL

Clinical Presentation: A double contour of the cortical border in the temporomandibular joints (TMJs) is a rare sign that can be seen in the mandibular condyles and/or in the glenoid cavity. This sign can be attributed to several causes and may have different clinical manifestations and management.

Differential Diagnosis: Subcortical erosion, incipient formation of subchondral cysts, and crescent sign were considered. Movement artifacts may sometimes create a false-positive sign.

Diagnosis and Management: Double contour of the TMJs can be better visualized on *cone beam computed tomography*. Because it is a nonspecific sign, it must be correlated with a complete medical history to be linked to a specific diagnosis.

Discussion: Double contour of the components of the TMJs can represent a sign of active pathosis and be a sign of bone remodeling in asymptomatic patients. Magnetic resonance imaging and clinical studies have shown a strong correlation between double contour and disk dislocation. It is important that the radiologist identify this sign and its clinical significance, with the purpose of helping the clinician in diagnosis and management.

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RETROPHARYNGEAL INTERNAL CAROTID ARTERY: A REVIEW OF 3 CASES

M. BRINER, R. JAGTAP, M. HANSEN, and D. KASHTWARI, UNIVERSITY OF FLORIDA COLLEGE OF DENTISTRY, GAINESVILLE, FL

Introduction: The internal carotid artery (ICA) can take multiple pathways as it extends from the carotid bifurcation to the skull base. An aberration of its normal pathway may place the ICA in a retropharyngeal position in close proximity to the posterior pharyngeal wall.[1-3] Radiographic classification is based on its proximity to the pharynx and/or pathway.[1,4,5] We present a series of 3 cases of retropharyngeal ICAs with the goal of reporting and classifying these variations.

Case Presentation: Case 1: Retropharyngeal right ICA. Minimum distance to the pharyngeal wall was approximately 4.9 mm (high risk of vascular injury) with a tortuous pathway.
Case 2: Bilateral retropharyngeal ICA. ICAs were in contact with the posterior pharyngeal wall (very high risk of vascular injury). The left had a kinking pathway, and the right was tortuous. Case 3: Bilateral retropharyngeal ICA. Minimum distances of the right and left ICAs to the posterior pharyngeal wall were approximately 3.5 mm and 3.3 mm, respectively (high risk of vascular injury). The right had a kinking pathway and the left was tortuous.

Discussion: Closeness of the vessel to the retropharyngeal wall increases the risk of surgical and nonsurgical complications.[1,6] It is worth noting that the position of the artery is not constant and can change in position over time.[7] It is important for oral and maxillofacial radiologists to have knowledge of the anatomy and variations of the ICA. This enables clinicians to take necessary precautions to reduce complications if performing any procedure in the region.

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QUALITY ASSURANCE IN DIGITAL IMAGING: IT REALLY DOES MATTER

A.K. BUCHANAN, S.M. KALATHINGAL, and R

HANCOCK, THE DENTAL COLLEGE OF GEORGIA AT AUGUSTA UNIVERSITY, AUGUSTA, GA

Background: The importance of quality assurance (QA) measures in intraoral digital imaging has been recognized by the American Dental Association. These standards are specific for the image receptor (including acquisition software), the x-ray unit, and the computer monitor.[1] Given the multiple aspects involved with digital imaging, it is crucial to establish a quality assurance (QA) protocol that ensures the use of appropriate exposure factors for optimal diagnostic yield.

Materials and Methods: Six brand new DIGORA Optime PSP plates (Soredex/Orion Corp., Helsinki, Finland) were used to assess the effects of software settings on dynamic range. The exposure parameters required to achieve optimal diagnostic yield and a wide dynamic range were 63 kV, 8 mA, and 0.2 seconds. Varying gamma values (0.8, 1.0, and 1.3) and sharpness filters (0, 15, 30, 40, 50, and 60) were adjusted to assess their effects on dynamic range. A radiographic phantom capable of measuring spatial resolution, dynamic range, and contrast resolution was used to assess image quality.

Results: The sharpness and gamma settings did not affect dynamic range.

Discussion: *Dynamic range* is defined as the range of x-ray intensities captured simultaneously by the image receptor.[1] When using the dental digital quality assurance (DDQA) radiographic phantom, when all 7 steps in the stepwedge are visible, it confirms that the image receptor is capable of acquiring a wide dynamic range. A wide dynamic range is necessary to accurately assess caries and periodontal disease.[1] The fact that the dynamic range was unaffected by software adjustment is an important and crucial finding. This demonstrates that as long as proper exposure factors are used, the sharpness and gamma settings, within the adjustments made in this study, do not affect dynamic range. Likewise, it validates the importance of using a suitable radiographic phantom to determine the appropriate exposure factors for the intraoral imaging device.

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ASSESSMENT OF CBCT IMAGE ARTIFACTS GENERATED BY IMPLANTS LOCATED IN THE EXOMASS

H. DEMIRTURK KOCASARAC, D.Q. FREITAS, G. USTAOGLU, M.L. OLIVEIRA, and L.J. KOENIG, MARQUETTE UNIVERSITY, MILWAUKEE, WI; UNIVERSITY OF CAMPINAS, PIRACICABA, BRAZIL; BOLU ABANT IZZET BAYSAL UNIVERSITY, BOLU, TURKEY

Background: Currently, use of a small cone beam computed tomography (CBCT) field of view (FOV) has increased for several diagnostic purposes. However, smaller FOVs cause an indirect increase of the exomass, defined as the area outside of the FOV but between the source of x-rays and the image receptor. Metallic objects in the exomass generate artifacts that result in inconsistent image reconstructions.

Objective: The aim of this study was to evaluate the effect of artifacts arising from implants in the exomass on CBCT images.

Study design: Using titanium, titanium−zirconium and zirconium implants, 4 × 5 cm and 8 × 5 cm FOV images were acquired with the Planmeca ProMax, with or without metal artifact reduction (MAR), at 80 and 90 kVp. On each axial image, 3 rectangular regions of interest (ROIs) of 3.6 × 12 mm were delineated and standardized for all images as: region 1: closest to the implant; region 2: in the middle; and region 3: furthest from the implant. The standard deviation was determined from the ROI histograms and considered to be the measure of artifact. Effects of FOV size, implant type, MAR, kVp, region, and their interactions were assessed.

Results: The zirconium implant produced the most artifacts, followed by the titanium−zirconium and titanium implants, especially in region 1. The 8 × 5 cm FOV created more artifact than the 4 × 5 cm FOV when an implant was present. However, FOV size did not influence the amount of artifact when a zirconium implant or no MAR was used; 90 kVp produced fewer artifacts than 80 kVp, and MAR decreased the artifact only in the 8 × 5 cm FOV, 90 kVp, and zirconium and titanium−zirconium implant settings.

Conclusion: Implants in the exomass generated noticeable artifacts. Consideration should be given to imaging parameters that reduce artifacts, especially in the presence of a zirconium implant.

A COMPARISON OF CONTEMPORARY PORTABLE X-RAY SYSTEMS

J. DILLON, B. JOHNSON, A. BROOME, A. MOL, and E. PLATIN, UNIVERSITY OF NORTH CAROLINA ADAMS SCHOOL OF DENTISTRY, CHAPEL HILL, NC

Background: There is substantial evidence for a cumulative dose-related response to ionizing radiation in the form of cancer development years after initial exposure. Therefore, this study focused on effective dose (E), a quantity with direct correlations to biologic risk from dental x-ray exposures.

Objectives: The purpose of this study was to measure doses and calculate (E) from adult full-mouth examinations (FMXs) by using handheld and conventional wall-mounted x-ray sources with both circular and rectangular collimation (RC).

Materials and Methods: A human tissue-equivalent phantom and optically stimulated luminescent dosimeters were used to measure dose from simulated FMXs (n = 18) at 24 head/neck tissue sites. The parameters were 70 kV/7 mA (0.84 mAs and 1.34 mAs) for Conventional Circular and RC handheld device; 60 kV/2.5 mA (2.16 mAs) for NOMAD Circular and RC handheld device; and 60 kV/2.0 mA (1.98 mAs) for Xray2 Go Circular (XTG) handheld device. Analysis of variance (ANOVA) and Tukey's HSD ("honest significant difference") statistics demonstrated significant relationships.

Results: The FMX E (μSv) values were: NOMAD RC (6.9); XTG (16.7); NOMAD Circular (17.4); and Conventional Circular (26.3). For circular techniques, the handheld device E was significantly lower than the conventional unit for both devices ($P < .0001$). With RC, E was significantly lower than all circular techniques ($P < .0001$). Significant differences in E were found for all modality combinations except NOMAD Circular and XTG ($P = .8329$). Operator groin exposure was significantly higher (60%−90%) than thyroid, chest, and trigger hand exposures, which were indistinguishable from ambient background levels, for all handheld modalities ($P < .0001$).

Discussion: Handheld device E was at least 34% less than conventional circular and as much as 74% less with the use of RC. Operator exposure to the groin can increase significantly from overangulating the handheld sources; however, the addition of RC can reduce this exposure by as much as 76%.