

measure dose produced during simulated posterior bitewing examinations (n = 4). Optically stimulated luminescent dosimeters were used to measure x-ray dose at 24 head and neck tissue/organ sites of interest. Dosimetry was acquired by using a tissue equivalent phantom simulating the anatomy of an average adult male (AtomMax Model 711 HN, CIRS Inc., Norfolk, VA). Exposure parameters used were 70 kV/7 mA (0.7 mAs) and 0.12 mAs for s-IOT and conventional (KaVo FOCUS, Charlotte, NC), respectively. Analysis of variance (ANOVA) and Tukey's HSD ("honest significant difference") statistics on dose were utilized to demonstrate significant data relationships.

Results:

Effective dose by modality (μSv)	Dose (μSv)
Modality	
Rectangular Conventional with Sensor	1.1
Rectangular Conventional without sensor	4.6
s-IOT with sensor	5.9
s-IOT without sensor	11.9
Circular Conventional with sensor	8.2
Circular Conventional without sensor	15.7

Sensor-present doses were significantly lower than sensor-absent for all modalities ($P = .0001$). Significant differences in E were found for all modality combinations with the exception of s-IOT sensor-present modalities vs conventional rectangular sensor-absent modalities ($P = .0482$).

Discussion: Unadjusted s-IOT dose was 26% less than conventional-circular exposures and 61% greater than conventional-rectangular for sensor-absent exposures. Unadjusted sensor-present s-IOT dose was 28% less than conventional-circular exposures and 81% greater than conventional-rectangular exposures. Despite a 4-fold increase in mAs for s-IOT imaging compared with conventional imaging, E from s-IOT imaging was at least 26% less than the current most commonly implemented bitewing technique, conventional-circular, while providing substantially greater diagnostic yield in the form of 3-dimensional (3-D) information.

JOURNEY OF THE NOTOCHORD: LINKING EMBRYOLOGY TO RADIOLOGIC INTERPRETATION OF THE CRANIOCERVICAL

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Background: The notochord is a mesoderm-derived cylindrical midline structure and a defining feature found in all chordates. In vertebrates, the notochordal process represents the initial embryologic axial skeleton and plays important structural and signaling roles in the development of the vertebral column, nervous system, and skull base. Besides persisting postnatally as the nucleus pulposus of the intervertebral disks, the remaining notochord typically regresses during fetal development after completion of its principal tasks. However, remnants of the notochord can persist along its developmental path within the cranio-cervical region. These remnants present as a spectrum of entities, ranging from anatomic variants, benign tumors, and malignant neoplasms of notochordal origin. Radiologists who interpret imaging in the area along the embryologic path of the notochord should be knowledgeable about its development and be able to recognize its wide array of potential pathologies.

Discussion: This presentation will review notochord embryology and the anatomic and pathologic relevance of notochordal remnants and demonstrate the vast range of imaging features and behavioral properties of these postnatal remnants in the area of the posterior cranial base and cervical spine. We present 3 cases of inferior median clival canal, a notochordal anatomic variant typically discovered as an incidental finding. Also known as *canalis basilaris medianus*, this notochord remnant manifests as a narrow, well-defined corticated canal passing through the sagittal plane of the clivus. Depending on its course and extent, 2 groups with 6 subtypes have been described. We also present imaging features of pathologic abnormalities, including Tornwaldt cyst, benign remnant echordosis physaliphora, and chordoma, a notochord malignancy. Awareness of the full spectrum of pathologic consequences of persistent notochord tissue, recognition of their imaging features, and directing appropriate referral add to the value provided by an oral and maxillofacial radiologist.

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OSTEOBLASTOMA VS OSTEOID OSTEOOMA:

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Clinical Presentation: Case 1: A 17-year-old male presented 3 months –after third molar extraction with progressively worsening pain in the lower left extraction site. Clinical examination was unremarkable. Computed tomography (CT) showed a 12 × 10 × 11 mm, well-demarcated, circular, nonexpansile, mixed-density lesion with a sclerotic border and surrounded by a radiolucent rim. Lingual cortical bone defect was noted.

Case 2: A 37-year-old male presented with progressively worsening pain in the left posterior mandible and preauricular area. CT showed a 16 × 21 mm well-defined, expansile, mixed-density lesion with a soft tissue capsule, which was surrounded by a sclerotic band. Unusual features included buccal/lingual expansion, new bone apposition, and soft tissue edema in the masseter muscle. Clinically, the site was significant for swelling.

Differential Diagnosis: Given the radiographic findings and the presence of pain, osteoblastoma and osteoid osteoma

were considered in the differential diagnoses in both cases. Case 1 included cementoblastoma and foreign body reaction. In case 2, osteosarcoma was considered because of the apparent expansion. Because of the lesion size, osteoid osteoma was considered unlikely.

Diagnosis and Management: Both patients were initially managed pain with nonsteroidal anti-inflammatory drugs (NSAIDs), but the symptoms continued to worsen. Case 1 was treated with enucleation, curettage, and extraction of tooth #18. Case 2 was treated with excisional biopsy and extraction of tooth #17. Histologic reports rendered a final diagnosis of osteoblastoma in both cases.

Discussion: Osteoblastoma is rare, especially in the maxillofacial region. We present 2 unusual and distinct cases of osteoblastoma. In case 1, there was large cortical perforation with no expansion, whereas in case 2, the lesion was expansile with no perforation. To the best of our knowledge, soft tissue edema and new bone apposition, as seen in case 2, have not been reported previously.

A CASE OF OSTEOPETROSIS: UNUSUAL MAXILLOFACIAL PRESENTATION AND SUCCESSFUL DENTAL IMPLANT RESTORATIONS

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Clinical Presentation: A patient presented with malaligned and rotated, missing, unerupted, and partially erupted/maldeveloped teeth seeking care to improve her masticatory function. She had impaired hearing and vision, but no neurologic symptoms. A panoramic radiograph, a lateral cephalometric radiograph, and a medical CT scan were reviewed. The radiographic examination revealed a skeletal Class III relationship. Sclerosis related to osteopetrosis was seen throughout the maxilla, cranial base, and cervical spine. A train track–like radiopaque formation was noted bilaterally within the mandibular inferior alveolar canals. No symptoms related to inferior alveolar nerve impairment were noted.

Differential Diagnosis: Multiple impacted and malformed teeth were unusual presentations, leading to the diagnosis of osteopetrosis. Other syndromes, such as cleidocranial dysostosis and Gardner syndrome, can also have similar features.

Diagnosis and Management: The treatment comprised a maxillary overdenture and an implant-supported mandibular prosthesis. Despite the increased risk of failed osseointegration, the implants placed in the mandible have been successful for greater than 8 years.

Discussion: Osteopetrosis is a disorder characterized by impaired osteoclast function, leading to hyperdense, hypovascular, brittle bone. When considering dental implant placement in a patient with osteopetrosis, one must be wary of the increased possibility of bone fracture or osteomyelitis and the decreased likelihood of successful osseointegration because of hypovascularity. This case report describes successful osseointegration of multiple dental implants supporting a fixed mandibular

prosthesis with long-term survival. Therefore, implant placement should not be excluded on the basis of an osteopetrosis diagnosis alone. Rather, one should evaluate the sclerosis radiographically in relation to intended implant sites.

ODONTOGENIC MYXOMA: A CASE REPORT AND LITERATURE REVIEW

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Background: Odontogenic myxoma (OM) is a rare intraosseous neoplasm that is benign but locally aggressive. It is derived from the mesenchymal portion of the tooth germ. Even though it is a benign lesion, it can cause considerable morbidity because of its invasive nature. Therefore, it is important to delineate the margins of OM to achieve a better treatment outcome. We present the case of a mandibular odontogenic myxoma in a 72-year-old male patient, whose chief complaint was swelling and pain on the lower left side of the face. The patient underwent imaging at Tokyo Medical and Dental Hospital for further evaluation.

Objective: The aim of this report is to present a case of odontogenic myxoma in an older patient, with computed tomography (CT) and magnetic resonance imaging (MRI) characteristics of OM and a literature review.

Materials and Methods: CT was performed with a 64-row multidetector CT (MDCT) scanner (Somatom Sensation 64, Siemens Healthcare, Erlangen, Germany) and magnetic resonance imaging (MRI) was performed with a 3 T MRI unit (Magnetom Spectra, Siemens Healthcare, Erlangen, Germany) with a 16-channel head and neck coil.

Results: The initial panoramic study showed a poorly defined lytic lesion in the left ramus in close proximity to the inferior alveolar canal. CT revealed a hypodense lesion with a thinned out buccal cortex and a disrupted lingual cortex. Axial T1-weighted MRI showed a well-demarcated, low-intensity lesion in the posterior left mandible. An axial T2-weighted sequence displayed a well-defined, hyperintense mass. In a fat-suppressed T2 scheme, the lesion was even more conspicuous. The mass further displayed a high mean apparent diffusion coefficient value of $1.74 \times 10^{-3} \text{ mm}^2/\text{s}$. Aneurysmal bone cyst, central hemangioma, odontogenic myxoma, and central giant cell granuloma were considered as differential diagnoses. After histopathologic evaluation, a definitive diagnosis of odontogenic myxoma of the left mandible was made. The lesion was treated with segmental mandibulectomy. The distribution of odontogenic myxoma by age, gender, and imaging modality was studied retrospectively in the literature review. patient age range was 0 to 80 years, and there was a male predilection. Mean ages of female and male patients were 40.5 years and 56.75 years, respectively. The distribution of imaging modalities was 40% for conventional methods, 45% for CBCT/CT and 15% for MRI.

Discussion: In the present study, MRI features, such as the hyperintense signal on T2-weighted images and low-signal intensity on T1-weighted images, were consistent with those of cases reported in the literature. Although CT could delineate the lesion and its extent, MRI was more effective in accurately delineating margins and determining the extent of the tumor for better guidance of the surgical procedure. MRI should, therefore, be considered the imaging modality of choice for diagnosis and margin delineation of