

**PARAPHARYNGEAL AND RETROPHARYNGEAL SPACES: NORMAL ANATOMY AND CASE DISCUSSION.**

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**Background:** An appreciation of the complex anatomy of potential spaces and fascial planes of the neck is vital to understanding lesions and their potential complications. The involvement of the parapharyngeal space (PPS) and the retropharyngeal space (RPS) poses significant diagnostic and therapeutic problems. The PPS extends from the skull base to the superior cornu of the hyoid bone, connecting posteromedially with the retropharyngeal space, inferiorly with the submandibular space, and laterally with the masticator space. The carotid sheath courses through this space into the chest. RPS lies between the visceral division of the middle layer of the deep cervical fascia around the pharyngeal constrictors and the alar division of the deep layer of deep cervical fascia posteriorly. PPS contains mainly fat and the pterygoid venous plexus, whereas the RPS contains retropharyngeal lymphatics.

**Clinical and Radiologic Findings:** We outline the normal anatomy of the PPS and the RPS on images derived from cone beam computed tomography (CBCT), medical computed tomography (CT), and magnetic resonance imaging (MRI) data sets. Then we present unique case studies exhibiting pharyngeal retention cyst in the tonsil, Tornwaldt cyst in the nasopharynx, nasopharyngeal carcinoma with invasion of the PPS, incidental retropharyngeal internal carotid arteries that can be mistaken for a pseudomass, large goiter with retropharyngeal extension, retropharyngeal air in barotrauma, and retropharyngeal lymphadenopathy occupying the PPS.

**Discussion/Conclusions:** Displacement of the PPS laterally implicates a lesion in the pharyngeal mucosa posteriorly, the masticator space anteriorly, and the carotid space anterolaterally. Medial displacement implies that the lesion resides in the parotid space. Infection may enter the retropharyngeal airspace directly, as with traumatic perforations of the posterior pharyngeal wall or esophagus, or indirectly, from the parapharyngeal space. A fundamental skill set is required for the diagnosis and management of these potentially life-threatening illnesses.

**References**

- 1 Anderson JC, Homan JA. Radiographic correlation with neck anatomy. *Oral Maxillofac Surg Clin.* 2008;20:311-319.
- 2 Brito-Mutunayagam S, Chew YK, Sivakumar K, Prepageran N. Parapharyngeal and retropharyngeal abscess: anatomical complexity and etiology. *Med J Malaysia.* 2007;62:413.
- 3 Osborn TM, Assael LA, Bell RB. Deep space neck infection: principles of surgical management. *Oral Maxillofac Surg Clin.* 2008;20:353-365.

**POTENTIAL IDENTIFICATION OF PREVIOUSLY UNRECOGNIZED GARDNER SYNDROME DURING RADIOLOGIC EXAMINATION: A CASE REPORT.**

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**Background:** Familial adenomatous polyposis coli (FAP) is an autosomal dominant inherited disorder characterized

by the development of multiple colonic adenomas with high risk for malignant transformation. FAP is caused by mutation of the adenomatous polyposis coli (APC) gene, a tumor suppressor. Several APC codon mutations result in a spectrum of intra- and extra-colonic manifestations. Gardner syndrome is a subset of FAP with potential extraintestinal findings, including epidermoid and sebaceous cysts, lipomas, supernumerary and impacted teeth, odontomas, jaw osteomas, and desmoid tumors/desmoplastic fibromas. Desmoplastic fibromas are benign aggressive neoplasms with potential tissue morbidity.

**Discussion/Conclusions:** A 15-year-old Caucasian male was referred to the oral and maxillofacial radiology clinic for radiologic evaluation of a left posterior mandibular radiolucency. The patient complained of pain at the site. His medical and dental histories were positive for biopsy of multiple epidermoid cysts, a fibrous tissue mass on the lower back, and 2 odontomas. Thus far, the patient had not been identified to be at risk for Gardner syndrome. Panoramic and cone beam computed tomography (CBCT) radiographs were made and showed nonuniform hyperdensities throughout the jaws, impacted teeth, and a well-defined, multilobular, radiolucent lesion at the angle of the left mandible demonstrating expansion. Impressions favored a benign aggressive entity of the left mandibular angle, and biopsy was recommended. The biopsy results were consistent with desmoplastic fibroma. Surgical resection was performed. Based on the collective findings, the diagnosis of Gardner syndrome was proposed. The patient was referred for genetic counselling and genetic testing for himself and his immediate family members. The results of molecular diagnosis are pending. Identification of FAP-related clinical and radiographic manifestations is crucial to early identification of FAP, which has important considerations in periodic evaluation for colon neoplasms and surgical prophylaxis. Early referral by an attentive radiologist can increase the opportunity for more effective disease management.

**References**

- 1 Galiatsatos P, Foulkes WD. Familial adenomatous polyposis. *Am J Gastroenterol.* 2006;101:385-398.
- 2 Rammohan A, Wood JJ. Desmoid tumour of the breast as a manifestation of Gardner's syndrome. *Int J Surg Case Rep.* 2012;3:139-142.
- 3 Hauben EI, Jundt G. Desmoplastic fibroma of bone: an immunohistochemical study including -catenin expression and mutational analysis for -catenin. *Hum Pathol.* 2005;36:1025-1030.

**RADIOGRAPHIC BONE CHANGES IN MULTIPLE MYELOMA PATIENTS WHO DEVELOPED MEDICATION-RELATED OSTEONECROSIS OF THE JAW: A CASE CONTROL STUDY.**

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**Background:** Medication-related osteonecrosis of the jaw (MRONJ) is a severe adverse effect caused by antiresorptive medications, which are used for multiple myeloma (MM) patients. Currently, new evidence suggests that there are early radiographic changes in the bone of patients that eventually will develop into clinical MRONJ. The detection of early bone changes may be important in early diagnosis and prevention of MRONJ by drug cessation.

**Objective(s):** The aim of this study was to evaluate the radiographic changes in the jaws of patients with MM who developed MRONJ compared with those in whom MRONJ did not develop.

**Study Design:** A retrospective study was performed for MM patients who were referred to the oral medicine clinic at the University of Florida College of Dentistry from 2006 to 2018. The patient information and radiographs (panoramic and intraoral radiographs) were retrieved from their dental chart (axiUm). For evaluating the cortical border, the mental index (MI), panoramic mandibular index (PMI), and mandibular cortical index (MCI) were measured. The bone density ratio was measured by using Image J 1.51 j8 (NIH, Bethesda, MD) in 5 locations in the bone and 1 in the dentin.

**Results:** Of 87 patients with MM who were examined, 48 were females (56%), and 38 were males (44%). The mean age was 63.97 years. In total, 29 were diagnosed with MRONJ. Our study indicated that patients with MRONJ had denser bone compared with patients without MRONJ ( $t$  test  $P < .0001$ ). In addition, classifying the cortical border with the MCI showed that the association between MRONJ and the thickness and the sharpness of the cortical border is considered to be statistically significant (Fisher's test,  $P = .0003$ ). The MI and PMI differences between the 2 groups were not statically significant.

**Discussion/Conclusions:** The increase of radiographic bone density was significantly related to the development of MRONJ in patients with MM. The cortical border thickness and sharpness should be evaluated as prognostic factors for development of MRONJ in patients on antiresorptive medications.

#### References

- 1 Rosella D, Papi P, Giardino R, Cicalini E, Piccoli L, Pompa G. Medication-related osteonecrosis of the jaw: clinical and practical guidelines. *J Int Soc Prev Community Dent.* 2016;6:97104.
- 2 Gönen ZB, Yillmaz Asan C, Zararsiz G, Kiliç E, Alkan A. Osseous changes in patients with medication-related osteonecrosis of the jaws. *Dentomaxillofac Radiol.* 2018;47:20170172.
- 3 Jowitt N, MacFarlane T, Devlin H, Klemetti E, Horner K. The reproducibility of the mandibular cortical index. *Dentomaxillofac Radiol.* 1999;28:141-144.

#### RADIOLOGIC EVALUATIONS IN HISTOPATHOLOGICAL GRAY ZONES. H.I. VREEBURG, S. MALLYA. UNIVERSITY OF CALIFORNIA AT LOS ANGELES, LOS ANGELES, CA

**Background:** Generally, histopathologic examination provides the final diagnosis of osseous lesions in the jaws. Occasionally, the histopathology of such lesions may be equivocal. In these situations, analysis of the radiographic features become the dominant source of information on the nature of the lesion and can tip the scales of diagnostic possibilities. We illustrate this scenario with a case of a patient presenting with a maxillary swelling 18 years post-radiation therapy, and with radiographic features that were characteristic of osteosarcoma. However, histopathologic examination yielded no evidence of malignancy, posing important challenges to therapeutic decision making.

**Discussion/Conclusions:** A 69-year-old male presented with progressive bony growth in the posterior maxilla and recent

onset of numbness. Eighteen years ago the patient received 60 Gy of radiation to treat a mucoepidermoid carcinoma. Radiologic evaluation, including panoramic radiography and cone beam computed tomography (CBCT), showed a progressive, fast-growing bony lesion with expansile, invasive, and sclerotic changes that were highly suspicious of osteosarcoma, which is a radiation-induced neoplasm. In contrast, multiple biopsies showed chronically inflamed cellular infiltrates with atypical bony trabeculation, but no evidence of malignancy. Based on this information, a diagnosis of idiopathic reactive bone growth was adopted, and resulted in conservative management of the patient.

This case illustrates a scenario where the radiographic and histopathological features are contradictory. We discuss the contributions of the oral and maxillofacial radiologist, including identification of potential biopsy sites that may be representative of the lesion, and recommend an appropriate radiographic follow-up examination with careful monitoring of the radiologic features that could change the diagnostic or treatment planning decision process.

#### References

- 1 Cooper JS, Fu K, Marks J, Silverman S. Late effects of radiation therapy in the head and neck region. *Int J Radiat Oncol Biol Phys.* 1995;31:1141-1164.
- 2 Sorace J, Aberle DR, Elimam D, Lawvere S, Tawfik O, Wallace WD. Integrating pathology and radiology disciplines: an emerging opportunity? *BMC Med.* 2012;10:100.
- 3 Wei-Wei L, Qiu-liang W, Guo-hao W, Zhi-hua C, Zong-yuan Z. Clinicopathologic features, treatment, and prognosis of postirradiation osteosarcoma in patients with nasopharyngeal cancer. *Laryngoscope.* 2005;115:1574-1579.

#### SEQUENTIAL CHANGES POST-SCLEROTHERAPY OF A LARGE MANDIBULAR INTRAOSSEOUS HEMANGIOMA. K.M.

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**Background:** Intraosseous hemangiomas of the jaws are rare entities, for which the origin is still being debated. Some believe them to be hamartomatous lesions derived from mesodermal cells that undergo endothelial differentiation, while others believe they are true neoplasms. Clinical features reported are swelling, facial asymmetry, mobile teeth, and audible bruits. Patients may report pain, paresthesia, or a sensation of pulsation. The majority of the reported cases in the literature have been treated with en block resection. In this case presentation sclerotherapy was implemented as the primary treatment for a large, albeit low-flow, lesion, in part because of the patient's objection to extensive surgery.

**Discussion/Conclusions:** A 59-year-old female was referred to our clinic for treatment of a histopathologically confirmed intraosseous vascular malformation diagnosed 5 years earlier. She presented with mild swelling of the left mandible, pain on chewing, and paresthesia in that region. A pantomograph revealed a large, partially loculated, radiolucent area in the left mandible; the lesion had approximately doubled in size since her initial visit. Multidetector computed tomography (MDCT) revealed an expansile lesion with effacement of the buccal cortex. Root resorption of multiple associated teeth was present. Spiral computed tomography (CT) angiography demonstrated an