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Case Challenge
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An Expansile Mass of the Right Posterior Mandible

Molly Rosebush, DDS; John R. Kalmar, DMD, PhD; Peter Larsen, DDS; Carl M. Allen, DMD, MSD

The following Case Challenge is provided in conjunction with the American Academy of Oral and Maxillofacial Pathology.

Case Summary

A 67-year-old female presented with an asymptomatic swelling involving the right retromolar region.

After you have finished reviewing the available diagnostic information, make the diagnosis.

Diagnostic Information

History of Present Illness

The lesion was identified by the patient's general dentist during a routine dental examination two weeks earlier. No pain, paresthesia, or other symptoms were associated with the enlargement. The patient denied any history of trauma, recent dental treatment, or previous oral lesions.

Past Medical History

The patient's medical history was notable for hypertension, a benign thyroid lesion, and multiple spinal surgeries which she described as "fusions." She also reported sensitivity to codeine. Her daily medications included condesartan cilexetil (32 mg) for hypertension, atorvastatin calcium (40 mg), and aspirin (81 mg).

Clinical Examination Findings

Extraoral examination showed no evidence of facial asymmetry or lymphadenopathy. Intraorally, a firm, expansile mass of the right retromolar area was noted. The swelling was more prominent lingually, although buccal expansion was also evident. (Figure 1) The overlying mucosa was intact and displayed a slightly bluish color. No palpable thrill was detected, and adjacent teeth were non-mobile.

Radiographic Findings

The panoramic radiograph revealed a well-defined, 1.5 x 3.5 cm multilocular radiolucency involving the posterior mandible and the anterior aspect of the ascending ramus. Marked thinning of the superior portion of the posterior alveolar process and expansion of the soft tissue were also evident. (Figure 2)

Computed tomography (CT) images showed significant expansion of both the lingual cortical plate (Figure 3) and posterior alveolar process. (Figure 4)

Figure 1. A somewhat lobular expansion with a bluish tinge is seen in the right retromolar area.

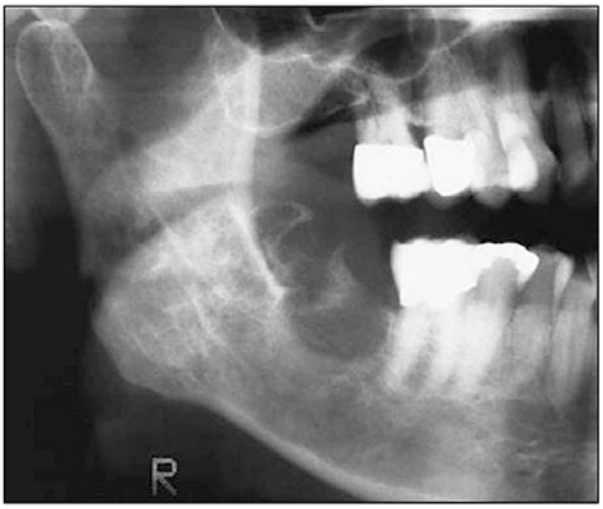

Figure 2. A relatively well-defined, multilocular radiolucency is noted in the right posterior mandible.

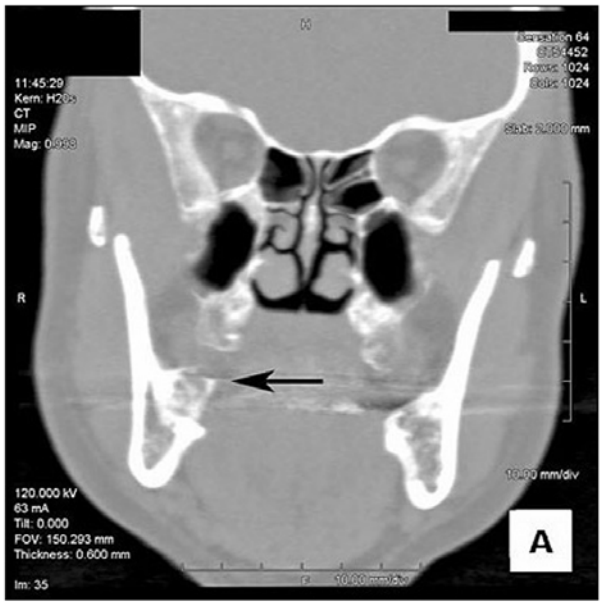

Figure 3. This cut of a coronal CT image shows a radiolucent, multilocular lesion with occlusal and lingual expansion of the right posterior alveolar process.

Unequivocal perforation of the cortical plates was not apparent, although the bone appeared markedly thinned. The internal aspect of the lesion had an irregular, mixed radiolucent/ radiopaque appearance.

Histopathologic Findings

Microscopic examination of the biopsy specimen showed an unencapsulated neoplastic proliferation of squamous epithelial cells intermingled with plump basophilic cells containing foamy cytoplasm, consistent with mucin. (Figures 5 and 6)

The presence of small cystic spaces was also apparent. Histochemical tissue staining with the mucicarmine method demonstrated affinity of the cytoplasm of the basophilic cells for mucicarmine. (Figure 7)

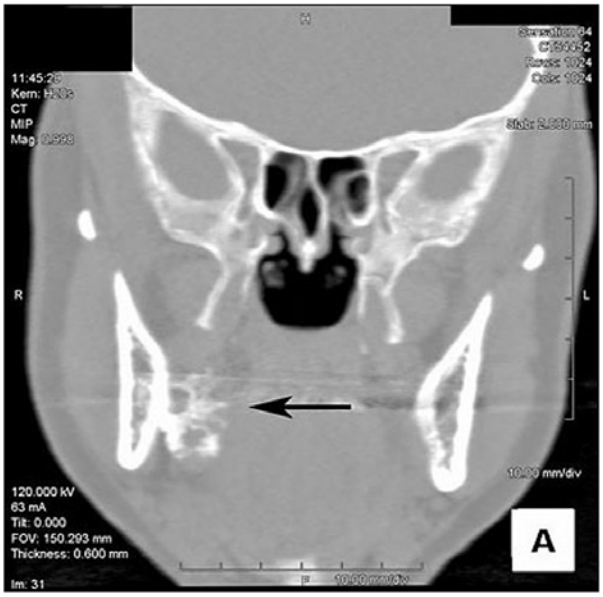

Figure 4. This cut of a coronal CT image shows prominent lingual extension of the lesion.

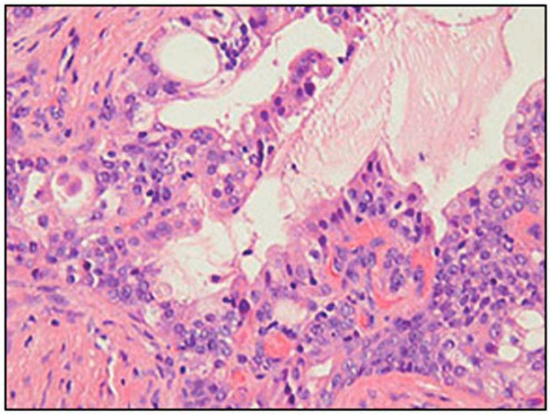

Figure 6. This high-power photomicrograph shows squamous and basaloid epithelial cells that sometimes form small cystic spaces. Scattered plump cells with pale, basophilic cytoplasm are also noted. (Hematoxylin and eosin)

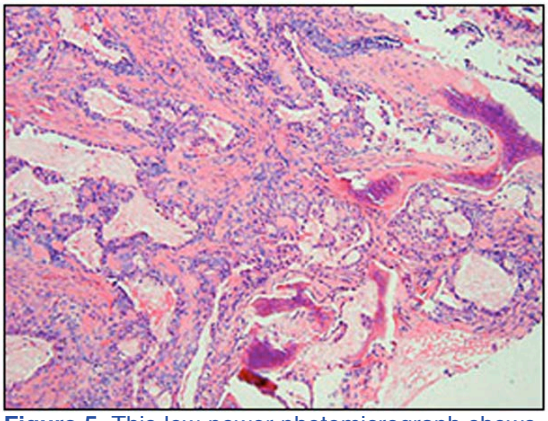

Figure 5. This low-power photomicrograph shows an unencapsulated proliferation of epithelial cells that are arranged in nests. (Hematoxylin and eosin)

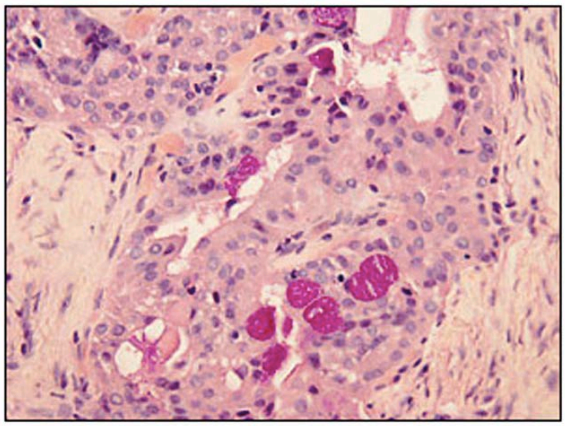

Figure 7. This high-power photomicrograph demonstrates the plump, basophilic cells have cytoplasmic affinity for mucicarmine, identified by themagenta-colored staining of these cells.

Can you make the diagnosis?

A 67-year-old female presented with an asymptomatic swelling involving the right retromolar region.

Select the Correct Diagnosis

A. Odontogenic Keratocyst
B. Central Giant Cell Granuloma
C. Ameloblostoma
D. Central Mucoepidermoid Carcinoma
E. Odontogenic Myxoma

Odontogenic Keratocyst

Choice A. Sorry, this is not the correct diagnosis.

Although the posterior mandible is a common location for the odontogenic keratocyst, and this lesion often appears as a multilocular, expansile radiolucency, the histopathologic findings would not be consistent with this diagnosis. The odontogenic keratocyst has a uniform, stratified squamous epithelial lining with palisading of the basal cell layer and luminal parakeratin production.

Please re-evaluate the information about this case.

Central Giant Cell Granuloma

Choice B. Sorry, this is not the correct diagnosis.

The central giant cell granuloma certainly may present as a multilocular, expansile radiolucency, but this lesion is usually seen in a younger age group. Furthermore, the histopathologic features of vascular granulation tissue associated with numerous, benign, multinucleated giant cells are not seen in this specimen.

Please re-evaluate the information about this case.

Ameloblostoma

Choice C. Sorry, this is not the correct diagnosis.

Ameloblastoma would certainly be a prime consideration in the differential diagnosis, as this lesion often presents in the posterior mandible as a multilocular, expansile radiolucency. Microscopically, however, the characteristic islands of epithelium having central areas, resembling stellate reticulum and palisading of the nuclei at the periphery of the tumors islands, were not seen.

Please re-evaluate the information about this case.

Central Mucoepidermoid Carcinoma

Choice D. Congratulations! You are correct.

The bluish tinge of the expanded alveolar process might be a clinical clue suggesting this uncommon tumor. However, the diagnosis was established by the typical histopathologic features showing a mixture of neoplastic squamous ("epidermoid") cells and mucous cells.

Discussion

Central mucoepidermoid carcinoma is a rare intraosseous malignancy, comprising only about 2% to 4% of all cases of mucoepidermoid carcinoma.[2] The vast majority of mucoepidermoid carcinomas occur in the salivary glands, most commonly the parotid and the minor glands. Although many salivary gland neoplasms can occur centrally (within bone), mucoepidermoid carcinoma is the most common, accounting for approximately two-thirds of all cases.[2,3] Middle-aged adults are most often affected, and there is a slight predilection for females. Central mucoepidermoid carcinoma is three times more likely to present in the mandible than the maxilla, usually in the posterior/ramus region.[1]

Clinically, central mucoepidermoid carcinoma typically presents as an asymptomatic swelling. Pain, paresthesia, trismus, and tooth mobility are reported less often. It may also be found incidentally on radiographs, which generally show a well-defined unilocular or multilocular radiolucency. Bony expansion may occur, although the cortical plates often remain intact. An impacted tooth and/or odontogenic cyst is associated with 30-50% of reported cases.[4]

Central and soft-tissue mucoepidermoid carcinomas show similar histopathologic features. Microscopic examination reveals a mixture of squamous and mucus-producing cells. Mucicarmine staining confirms the presence of mucus-producing cells within the lesion. Mucoepidermoid carcinomas are normally categorized as low, intermediate, or high-grade neoplasms based on certain histopathologic characteristics of the tissue. The majority of central mucoepidermoid carcinomas are low-grade tumors.[1]

The pathogenesis of central mucoepidermoid carcinoma is controversial. Probably the most widely accepted theory is the neoplastic transformation of odontogenic epithelium. This concept is supported by the fact that central mucoepidermoid carcinomas are frequently associated with odontogenic cysts and unerupted teeth. Additionally, mucus-producing cells are a common finding within the lining of dentigerous and other odontogenic cysts.[1]

Central mucoepidermoid carcinomas should be treated with radical surgical resection. Adjunctive radiation therapy and/or neck dissection is typically reserved for high-grade tumors. The recurrence rate with aggressive local resection is reported to be 13%, compared to 40% for conservative treatment such as enucleation and curettage.[5] About 9% of lesions metastasize, usually to regional lymph nodes.[4] Overall, prognosis is good. Approximately 10% of patients die from this disease, typically due to local recurrence of the lesion.[1]

Odontogenic Myxoma

Choice E. Sorry, this is not the correct diagnosis.

The odontogenic myxoma often will present as an expansile, multilocular radiolucency in the posterior mandible, although this patient is somewhat older than average for this condition. The histopathologic findings of stellate fibroblastic cells set in a myxoid, hypocellular background were not seen in this situation, however.

Please re-evaluate the information about this case.

References

1. Neville BW, Damm DD, Allen CM, et al. Oral and Maxillofacial Pathology, 2nd edition. W.B. Saunders Company, 2002, pp 420-3.
2. Pires FR, Paes de Almeida O, Lopes A, Elias da Cruz Perez D, Kowalski LP. Central mucoepidermoid carcinoma of the mandible: report of four cases with long-term follow-up. Int J Oral Maxillofac Surg. 2003 Aug; 32(4): 378-82.
3. Winkle MR, Harrington PC, Marionan N. Central mucoepidermoid carcinoma of the mandible. Am J Otolaryngol. 1999 May-Jun; 20(3): 169-71.
4. Simon D, Somanathan T, Ramdas K, Pandey M. Central mucoepidermoid carcinoma of the mandible - A case report and review of the literature. World J Surg Oncol. 2003 Feb 25; 1(1): 1
5. Namin AK, Moshref M, Shahoon H, Mashhadi A, Khojasteh A. Intraosseous mucoepidermoid carcinoma of the maxilla in a teenager: a case report and review of literature. Oral Surg Oral Med Oral Path Oral Radiol Endod. 2005 Dec; 100(6): e93-6. Epub 2005 Nov 2.

About the Authors

Note: Bio information was provided at the time the case challenge was developed.

Molly Rosebush, DDS

Dr. Rosebush is a third-year resident in the Oral and Maxillofacial Pathology graduate program of the College of Dentistry at The Ohio State University in Columbus, OH, USA.

Email: rosebush.3@osu.edu

John R. Kalmar, DMD, PhD

Dr. Kalmar is a Clinical Professor and the Director of the Oral and Maxillofacial Pathology residency program at The Ohio State University, College of Dentistry, in Columbus, OH, USA.

Peter Larsen, DDS

Dr. Larsen is Professor of Oral and Maxillofacial Surgery at the Ohio State University, College of Dentistry, in Columbus, Ohio.

Carl M. Allen, DMD, MSD

Dr. Allen is a Professor and serves as the Director of Oral and Maxillofacial Pathology in the College of Dentistry at Ohio State University in Columbus, OH.

Email: allen.12@osu.edu