

Painful Mandibular Mass Associated with a Molar

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

Case Summary

A 28-year old male had undergone extraction of tooth #17 secondary to pain and swelling in the area. He continued to experience symptoms for 6 months, developing a large painful mass of the left posterior mandible with facial swelling.

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

Diagnostic Information

History of Present Illness

The patient had a presumed acute inflammatory episode associated with the mandibular left third molar (tooth #17). He had mild pain and swelling in the area and was treated by extraction of the tooth. During the next six months he continued to experience progressive enlargement and pain at the extraction site. An attempt to incise and drain the area was performed, but no purulence could be obtained. Subsequently, the patient was referred to an oral and maxillofacial surgeon for evaluation and management.

Past Medical History

His medical history included nasal surgery (unspecified condition), depression, and recent involuntary weight loss. The patient smoked one pack of cigarettes per day (15 year-pack history), consumed at least two alcoholic beverages per day, used smokeless tobacco, and used crack cocaine.

Clinical Examination Findings

The patient exhibited left facial swelling (Figures 1, 2). Intraoral examination revealed a firm mass involving the left posterior mandibular region (Figures 3, 4). The lesion occupied the retromolar pad, buccal vestibule, and mandibular ridge. Lingual alveolar expansion was also palpable in the floor of the mouth. The surface of the lesion appeared lobulated with a purple/gray coloration, and areas of ulceration were noted which were focally covered by a white pseudomembrane. No bruit or thrill was perceived. Tooth #18 exhibited Class I mobility. The remainder of the intraoral examination revealed generalized mild gingival recession and gingivitis. The patient did not report paresthesia. The rest of the head and neck examination failed to reveal other skin, ocular, or scalp abnormalities or cervical lymphadenopathy.

Radiographic Findings

A panoramic radiograph of the area (Figure 5) was taken at the time of biopsy. An irregular radiolucent defect was observed in the left posterior mandible, at the site of the extracted tooth #17. The margins of the lesion were irregular and poorly defined in focal areas. The lesion approximated tooth #18, which showed



Figure 1. The patient exhibits left facial asymmetry.



Figure 2. Oblique view of the patient's face showing left asymmetry.



Figure 3. Photograph of the patient's intraoral lesion.



Figure 4. Oblique view of the patient's intraoral lesion.

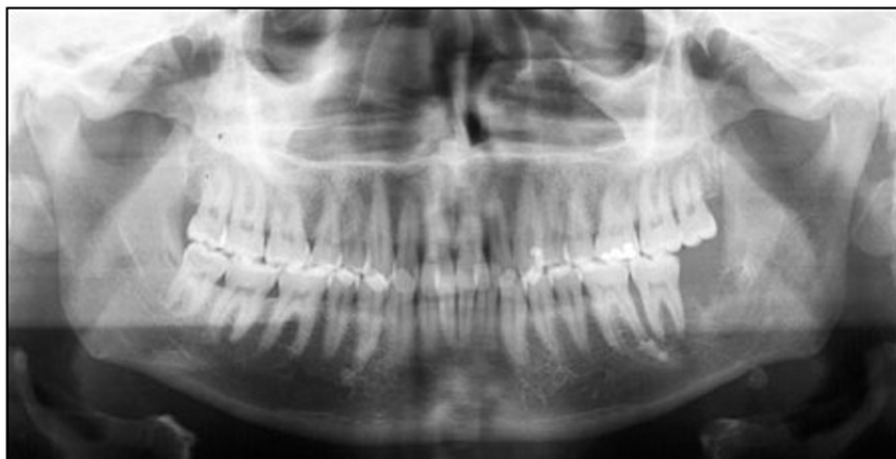


Figure 5. The panoramic radiograph at the time of presentation to the oral and maxillofacial surgeon showed an ill-defined radiolucent lesion distal to tooth #18.

loss of the lamina dura on the distal aspect. A CT scan demonstrated buccal and lingual cortical expansion with perforation.

Incisional Biopsy and Photomicrographs

Following informed consent and local anesthesia, a 14-gauge needle was inserted into the lesion, but an aspirate could not be obtained during this procedure. An incisional biopsy was then taken from the attached gingiva, buccal to tooth #18, and the specimen was submitted for histopathologic examination. Microscopic examination revealed partially ulcerated oral mucosa infiltrated by sheets of pleomorphic neoplastic cells that appeared to be associated with the surface epithelium. (Figure 6)

The tumor cells had pleomorphic and hyperchromatic nuclei, prominent nucleoli, large numbers of mitotic figures, and melanin pigment within the cytoplasm (Figures 7, 8). Large areas of necrosis were also present. No keratinization or intercellular bridges were identified.

Immunohistochemical stains for S-100 and HMB-45 were strongly and diffusely reactive within the neoplastic population (Figures 9, 10).

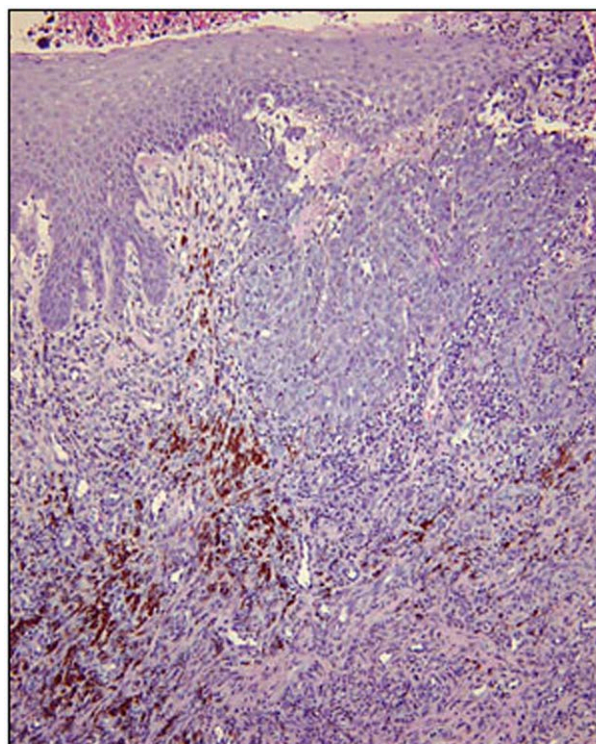


Figure 6. Low-magnification photomicrograph of the biopsy specimen exhibiting the neoplastic population closely associated with the surface epithelium. There is no evidence of keratinization, but the tumor cells show deposition of a pigmented material within the cytoplasm (H&E stain).

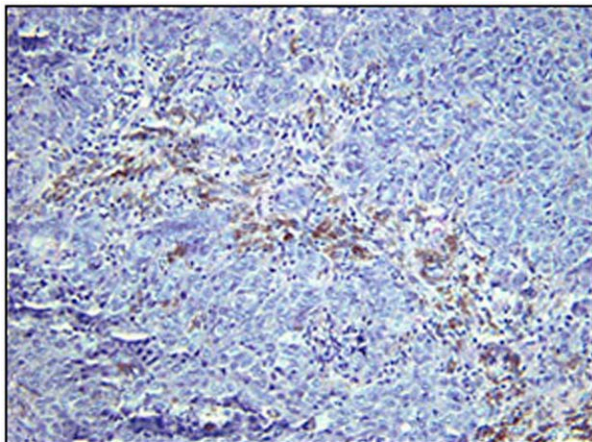


Figure 7. Medium-magnification photomicrograph of the biopsy specimen showing sheets of pleomorphic cells with prominent nucleoli and intracytoplasmic material (H&E stain).

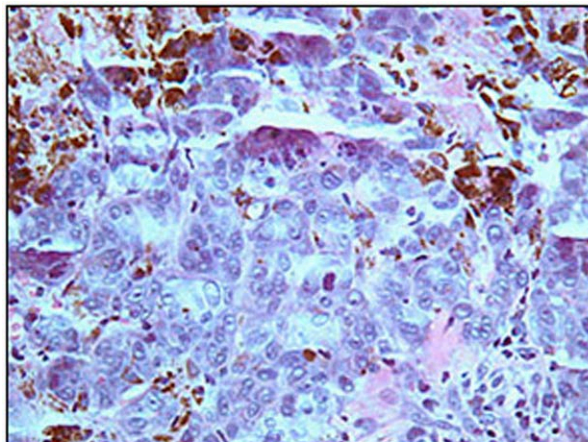


Figure 8. High-magnification photomicrograph of the biopsy specimen showing numerous mitotic figures. No intercellular bridges are present (H&E stain).

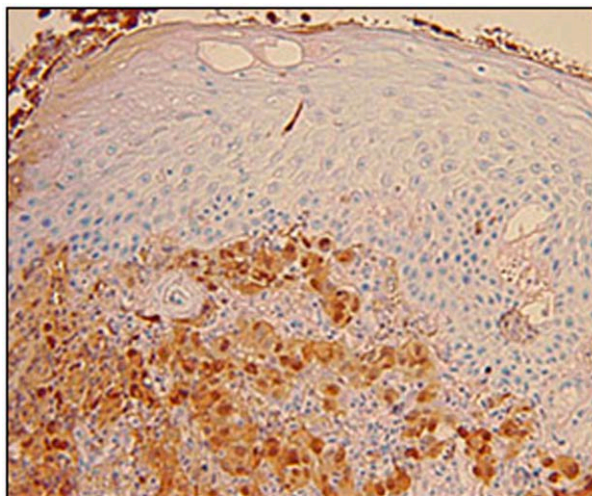


Figure 9. Low-magnification photomicrograph of the S-100 immunohistochemical stain.

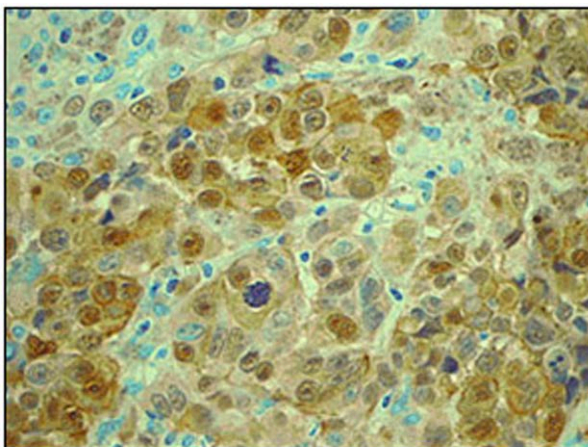


Figure 10. High-power magnification photomicrograph of the S-100 immunohistochemical stain.

Can you make the diagnosis?

A 28-year old male had undergone extraction of tooth #17 secondary to pain and swelling in the area. He continued to experience symptoms for 6 months, developing a large painful mass of the left posterior mandible with facial swelling.



Select the Correct Diagnosis

- A. Central Hemangioma
- B. Acute Osteomyelitis
- C. Malignant Melanoma
- D. Osteosarcoma
- E. Non-Hodgkin's Lymphoma

Central Hemangioma

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

Central hemangiomas are uncommon lesions within the bone which consist of a proliferation of vascular channels. Some lesions are considered true neoplasms, whereas others are referred to as malformations. The most frequent presentation is a slow-growing, expansile multilocular radiolucency in the posterior mandible. The lesion is more commonly diagnosed in females and during the second decade of life. Radiographically, it ranges in presentation from a well-defined, asymptomatic radiolucency to a large, expansile multilocular lesion that produces

gingival bleeding, a bruit or pulse, and even root resorption. Treatment may involve surgery, radiation therapy, sclerosing agents, cryotherapy, and embolization. The distal vascular supply of the involved vessels should be considered before treatment. Since the radiographic and clinical features are not entirely diagnostic, the differential diagnosis includes other entities such as odontogenic cysts and tumors. Aspiration of radiolucent lesions is recommended because the potential for uncontrollable bleeding exists, if the entity represents a hemangioma.⁵ The present lesion, however, did not yield any fluid upon aspiration prior to the biopsy procedure.

Please re-evaluate the information about this case.

Acute Osteomyelitis

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

Acute osteomyelitis is a rapidly destructive acute inflammatory response involving the trabecular bone and marrow space. It is usually associated with infections caused by bacteria. Immunosuppression and poor vascular supply are common contributing factors. This condition is usually painful, especially before drainage occurs. In the mandible, the inferior alveolar

nerve may become inflamed, causing paresthesia or anesthesia. Radiographically, this disease of the bone presents as a poorly defined radiolucent area with variably sized radiopaque foci corresponding to osseous sequestra. The management of acute osteomyelitis usually involves surgery to accomplish drainage and antibiotic therapy.⁶ In contrast to the signs and symptoms documented in the present case, acute osteomyelitis is usually associated with fever, purulent discharge, and bony sequestration.

Please re-evaluate the information about this case.

Malignant Melanoma

Choice C. Congratulations! You are correct!

Compared to its cutaneous counterpart, mucosal melanoma is a relatively rare tumor. It comprises approximately 1% of all melanoma cases. Among all mucosal melanoma cases, the head and neck region is the most frequently reported location, with 55% occurring at this site. The most common head and neck mucosal sites include the oral cavity and the nasal cavity/paranasal sinuses. Both of these sites are reported with approximately the same frequency.¹ When intraoral melanoma occurs, it is more common in the maxillary gingiva and palate.¹⁻⁴ It shows a higher frequency in adult white males during the 6th and 7th decades of life. Because it is usually diagnosed in the more advanced stages, it has a worse prognosis than its cutaneous counterpart. Approximately one-third of the cases are preceded by a pigmented lesion.² This raises the question of the existence of a mucosal counterpart for the cutaneous atypical or dysplastic nevus. This argument has not been resolved because only some of the reported mucosal melanomas have been associated with previous pigmented lesions or melanocytic nevi in the same area. Furthermore, it is unclear if these pigmented lesions were in fact benign, premalignant, or early melanomas due to the lack of previous histological confirmation in most of these lesions.

Our patient had a very large and destructive mass on the posterior mandible causing left facial asymmetry (Figures 1-4), with evidence of intraosseous involvement (Figure 5). The clinical differential diagnosis for such a lesion was broad, and based on the clinical history it could have included aggressive reactive processes, as well as benign and malignant neoplasms. When the panoramic radiograph was reviewed, the destructive nature of the process was more evident. At this point, the differential diagnosis favored a malignant neoplasm. The surface

changes and coloration of the lesion were suggestive of a vascular tumor as well as mucosal melanoma.

The incisional biopsy revealed a neoplastic population of large and pleomorphic cells intimately associated with the basal cell layer of the surface epithelium (Figure 6). The cells were arranged in nests, showing large amounts of melanin pigment within their cytoplasm. The cells also displayed very prominent nucleoli and nuclear pleomorphism. Abundant abnormal mitotic figures and extensive areas of necrosis were also present (Figures 7-8). S-100 and HMB-45 immunohistochemical stains were strongly reactive within the neoplastic population (Figures 9-10), confirming the diagnosis of melanoma.

The patient underwent a metastatic work-up, and it was discovered he had multiple pulmonary nodules, consistent with metastatic disease. His intraoral tumor was determined to be inoperable, so he underwent external beam radiation therapy for the mandibular lesion and adjuvant chemotherapy in an attempt to control the metastatic disease and reduce the size of the mandibular mass. The oncologic work-up failed to reveal additional melanoma lesions on his skin and other mucosal sites, so it was concluded the oral lesion was the primary tumor.

The prognosis for mucosal melanoma of the head and neck is significantly worse than the prognosis for cutaneous melanoma.³ The cure rate and survival time depend on the size of the lesion and the presence of local and/or distant metastasis. The patient described in this case is alive with evidence of disease 10 months after the onset of symptoms.

This case serves to illustrate that unexplained pigmented lesions, tissue associated with extracted teeth, or tissue growing from extraction sites needs to be submitted for histological examination in order to exclude serious disease.

Osteosarcoma

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

Osteosarcoma is a malignant mesenchymal neoplasm that produces bone. Approximately 5% of these tumors involve the jaws. Typically, this malignancy of bone presents as a painful swelling or masses in the third and fourth decades of life. Paresthesia and loosening of the teeth are common. Furthermore, there is a higher incidence of osteosarcoma in patients with Paget's Disease, fibrous dysplasia, retinoblastoma, chronic osteomyelitis, and a previous history of

radiation therapy to the area. Radiographically, the most common presentation is that of a poorly-defined mixed radiolucent/radiopaque lesion exhibiting expansion with or without radiating spicules of bone from the cortical surface. Another common radiographic feature of osteosarcoma is loss of the lamina dura and enlargement of the periodontal ligament space. Surgical resection with margins free of tumor is the treatment of choice. Despite treatment, the prognosis is guarded to poor for jaw lesions.⁷ The histopathologic findings of the present case did not support this primary malignancy of bone.

Please re-evaluate the information about this case.

Non-Hodgkin's Lymphoma

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

Non-Hodgkin's lymphoma is a malignant neoplasm of the lymphoreticular system. They usually arise within lymph nodes and develop into non-tender boggy masses exhibiting a slow growth rate. Progression to involve adjacent and distant lymph node groups is expected. When these lymphomas arise within the bone, they have ill-defined margins and no radiopaque component. Pain may be a

feature of intraosseous lesions, and they can be confused by the patient and clinician as being odontogenic in origin. Approximately 85% of the non-Hodgkin's lymphomas originate from the B lymphocyte series. These neoplasms are grouped according to their morphologic, immunophenotypic, and molecular characteristics via a complex classification system. The treatment and prognosis depend on the specific type and stage of the disease.⁸ The histopathologic features of the surgical specimen did not support a lymphoid origin to the presently described case.

Please re-evaluate the information about this case.

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

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