POSTER #

Well-Defined Lytic Lesion With Opacities in Angle of Mandible: A Case Report

Sekna Dabaja, Felipe Nor, Giovana Anovazzi Medeiros, Rodney Vergotine

University of Michigan School of Dentistry, Ann Arbor, MI

ABSTRACT

There are a variety of radiolucent and radiopaque lesions that can present and be diagnosed from panoramic radiographs. Radiolucent/radiopaque lesions of the mandible are known to originate from both odontogenic and non-odontogenic structures and may have a variable potential for malignancy. This case report details management of an asymptomatic, well-defined mixed radiolucent/radiopaque lesion involving the posterior body and ascending ramus of the right mandible, associated with fully impacted #32, in a 14 year, 10 month male. Clinical and radiographic assessment resulted in a list of differential diagnoses, which are discussed in this case report.

INTRODUCTION

Examples of mixed radiolucent-radiopaque lesions include odontoma, ameloblastic fibro-odontoma, calcifying epithelial odontogenic tumor, and calcifying odontogenic cyst.

An odontoma is a benign odontogenic lesion which produces dental tissues, occurring more frequently in males than females. As the most common odontogenic tumor, it is classified as a hamartoma, which is a benign growth composed of an abnormal mixture of cells and tissues normally found in the area of the body where the growth occurs. An odontoma is usually asymptomatic and discovered either on routine radiographs, or in assessment of delayed tooth eruption. Clinical signs included delayed or disturbed tooth eruption, persistence of deciduous teeth, and, in severe cases, infection or regional lymphadenopathy.

Odontomas can be further classified as compound or complex. While both commonly occur in the 1st and 2nd decades of life, are pericoronal, and involve enlargement of the alveolar processes, there are some distinct differences that set them apart. Compound odontomas appear as discrete tooth forms, as they produce enamel, dentin, and pulp arranged as in a normal tooth, and occur most often in the anterior maxilla. On the other hand, complex odontomas appear as a jumbled, amorphous mass, and occur most frequently in the posterior mandible or maxilla. Radiographically, they both have a radiolucent periphery. While a compound odontoma appears as multiple tooth-like forms with enamel, dentin, pulp, and cementum arranged in an orderly pattern, a complex odontoma appears as an amorphous radiopaque mass of dental hard and soft tissues, with no distinct tooth forms. Treatment involves excisional biopsy, with excellent prognosis and rare recurrence, which may be followed by orthodontic treatment.

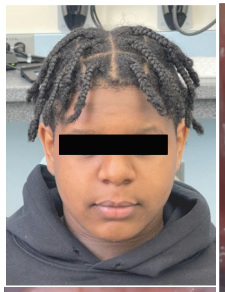
An ameloblastic fibro-odontoma is a benign mixed odontogenic tumor classified as an epithelial odontogenic tumor with odontogenic mesenchyme. It occurs in the 1st and 2nd decades, usually in patients less than 20 years old. Clinically, it is slow-growing and expansile with the potential to inhibit tooth eruption and displace involved teeth. It occurs with equal frequency in the maxilla and the mandible, and in males and females, and is usually found in the molar area. Patients commonly present with complaints of swelling, which may cause facial disfigurement, and failure of tooth eruption. Radiographically, it presents as a well-defined radiolucent lesion with various amounts of radiopaque material of irregular size and form. Treatment is excisional biopsy, including any involved unerupted teeth, with very little potential for recurrence or malignant transformation.

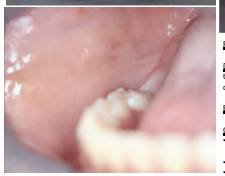
A calcifying epithelial odontogenic tumor (CEOT), also known as Pindborg tumor, is an epithelial odontogenic neoplasm that is predominantly intraosseous (central) but can rarely occur as a less aggressive extraosseous (peripheral) tumor. It usually presents as an asymptomatic and benign tumor, but may cause swelling and nonspecific pain with slow, painless enlargement of the jaw and buccal-lingual expansion. Although it has a wide age distribution, the mean age of occurrence is 43.5 years with an equal predilection for both sexes. The intraosseous form occurs most commonly in the mandibular premolar/molar region and is larger and more aggressive, with a potential growth potential of 4 cm. On the other hand, the extraosseous form is smaller (less than 2 cm in diameter) and less aggressive, with a low recurrence rate. In addition, it is localized to the anterior gingiva and is usually diagnosed earlier. CEOTs are often discovered as incidental radiographic findings with widely varying radiographic features, which can create confusion in diagnosis. They can either present as solitary lesions in the alveolar process, or as pericoronal lesions, may be well or poorly defined, and may be unilocular or multilocular. CEOTs commonly present as corticated mixed radiolucent and radiopaque lesions with a "driven snow" pattern. They have mild to moderate invasiveness and grow by infiltration, causing cortical expansion and root displacement and resorption. Small lesions can be treated with conservative excision such as enucleation or curettage, while large lesions are treated with segmental resection or radical and extensive resection (hemimandibulectomy/ hemimaxillectomy), which often require facial reconstruction. CEOTs have a 15% recurrence rate.

Calcifying odontogenic cysts (COC), also known as Gorlin cysts, are benign odontogenic lesions, classified as cysts, with aggressive growth potential. For this reason, COC is often classified as a tumor (calcifying cystic odontogenic tumor) with its aggressive form called dentinogenic ghost cell tumor. While they occur in the 2nd and 3rd decades with a wide age range, they are more common in females. They have equal incidence in the maxilla and the mandible, mostly in the anterior regions. Because they cause slow, painless expansion in the jaw, swelling in the affected area is the most common presenting clinical sign. Root resorption and tooth displacement are common. Radiographically, COCs appear as well-defined unilocular or multilocular radiolucencies with small radiopaque foci of calcifications. They can occur either pericoronal or apart from teeth. Treatment options include excision and enucleation with curettage. Decompression and marsupialization are conservative options for large lesions. Although they have low recurrence rates, long-term follow-up is recommended. More aggressive treatment may be necessary in the case of dentinogenic ghost cell tumors.

Diagnosis of these lesions occurs by histological examination of biopsy specimens, as they may be differentiated by their distinct histological features.

CASE REPORT





Patient Presentation
14 y 10 m male presents with mother for oral medicine consultation.

History of Present Illness Lesion is asymptomatic with unknown duration and was discovered as an incidental finding on routine radiographic examination by patient's private dental practitioner. Patient was then referred to Michigan Oral Surgeons, from where he was referred to the University of Michigan SOD for a "circumscribed, well-defined radiolucent lesion present on lower right mandible angle, measuring 3x5 mm" with a differential diagnosis of dentigerous cyst. Patient denies history of pain, swelling, discharge, changes in sensation, or bleeding.

Medical History: ADHD

Medications: None

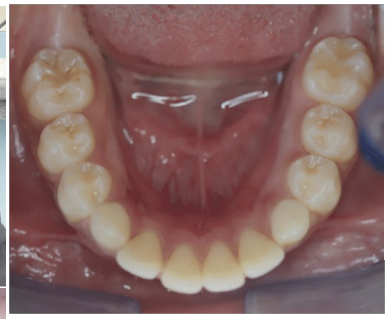
Allergies: None known

Surgical History: None

ASA Physical Status: II

Family History: Mother has history of asthma.

Social History: Lives with parents, younger brother, and one dog; no tobacco use in home
- Smoking status: never
- Smokeless tobacco status: never
- Vaping status: never
- Alcohol status: never



ROS: WNL

Dental history: Patient has a private practice dental home, to which he will be returning for treatment of dental needs. Mother states they are only interested in oral medicine consultation and expressed concern with over-retained primary teeth.

Behavior assessment: Cooperative; patient is shy but friendly.

Clinical Examination:
- Extraoral Findings: no pathosis detected; no signs of asymmetry or facial swelling and lesion is not palpable; mouth opening within normal limits
- Intraoral Findings: no pathosis detected; no buccal or lingual expansion
- Teeth present: #3, #A, #5, #C, #7, #8, #9, #10, #H, #12; #J, #14, #19, #20, #21, #M, #23, #24, #25, #26, #R, #28, #29, #30
- Clinical caries: None
- Existing restorations: None

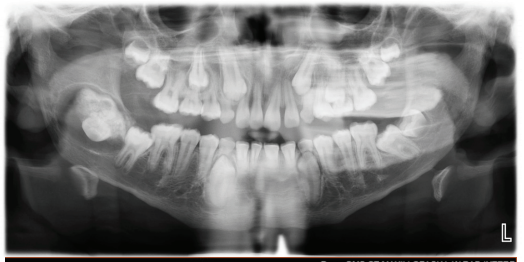
Radiographic Examination:

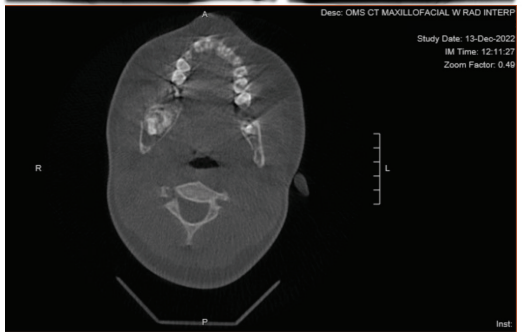
Panoramic Findings:
- TMJ and sinuses are within normal limits.
- All permanent teeth are present.
- Over-retained primary teeth: #A, #C, #H, #J, #M, and #R
- Ectopic eruption of #13, #18, and #31
- Unfavorable angulation of impacted #6 over the root of #7
- Mixed radiolucent/radiopaque lesion involving the right angle and ramus of the mandible, associated with fully impacted #32; adjacent tooth not directly involved; lesion is well-defined with corticated borders, measuring approximately 4.5 cm x 3.5 cm in the greatest dimension

CBCT Findings:
- There is a well-defined lytic area with sclerotic margins measuring 3.0 x 1.9 x 2.9 cm involving the vertical ramus and angle of the mandible on the right side. Coarse calcific/ossific densities are seen within the lesion. Along the anterior margin, it abuts the third molar.
- The temporomandibular joints are grossly unremarkable.
- No air fluid levels or mucosal thickening. Patent ostiomeatal complex.
- No osseous destruction. Unremarkable visualized portions of the orbital and intracranial compartment.

Differential Diagnoses:

1. Odontoma (Complex)
2. Ameloblastic Fibro-odontoma
3. Calcifying Epithelial Odontogenic Tumor- less likely due to patient's age
4. Calcifying Odontogenic Cyst (Calcifying Cystic Odontogenic Tumor)- less likely due to patient's age





Treatment Approach: Patient was referred to Oral Surgery Clinic for "evaluation for possible excisional biopsy of mixed radiolucent/radiopaque lesion on right posterior mandible (#32)" and extraction of over-retained deciduous teeth (#A, #C, #H, #J, #M, and #R). A referral to the Orthodontics Clinic would also be pertinent to address the ectopically erupting permanent teeth, in addition to concerns with impacted #6 and its consequences to the root of #7.

Oral Surgery Assessment and Plan:

Patient was diagnosed with a radiographically visible but asymptomatic large cystic mixed radio-opaque radiolucent lesion in the posterior body and ascending ramus of the right mandible, associated with the third molar. Oral Surgery recommended excision and biopsy of the lesion. A case request was submitted for excisional biopsy of right mandible lesion, possible allograft bone grafting to the right mandible, and possible extraction of remaining primary teeth, all under general anesthesia. A CBCT was obtained to help assess size and location of the lesion and proximity to IAN.

Definitive Diagnosis:

The excisional biopsy has yet to be completed and there is no definitive diagnosis at the time of creating this poster.

DISCUSSION

In the case of mixed radiolucent-radiopaque lesions of the mandible, extensive radiographic exposure, such as in CT and CBCT, are not usually indicated in pediatric patients due to higher sensitivity to radiation than adults. However, in cases of large lesions with proximity to the inferior alveolar nerve and extensive jaw involvement, these radiographs are necessary for appropriate surgical planning and assessment of the size and location of the lesion.

Surgical management includes removal of the lesion followed by the necessary reconstruction of the remaining jaw defect. Surgical treatment options include enucleation and curettage, or resection for larger lesions. Depending on the size of the lesion, treatment may have many potential long-term ramifications for the patient and his or her quality of life. Surgery in children is particularly difficult due to the importance of restoring the patient's facial features in addition to proper function and continued growth without restrictions. In children, reestablishment of normal occlusion is essential for the face to continue growth as normal. In addition, preservation of the condyle maximizes mandibular growth potential, while preservation of the periosteum can allow bone regeneration to continue.

Surgical complications include:
- Postoperative bleeding, which poses a potential risk for airway patency
- Infection
- Neurosensory disturbances due to iatrogenic injury of the inferior alveolar nerve
- Jaw fracture
- Jaw and face deformity
- Future problems with growth and function
- Malocclusion or occlusal cants

In addition, if a bone graft is necessary in a pediatric patient, the clinician must consider the effects on future growth and development of the donor site when choosing donor tissue. Rib grafts are common, with complications including resorption and ankylosis of the temporomandibular joint.

If reconstruction involving hardware is necessary, removal of the hardware 6-18 months following surgery or after confirmation of bony union radiographically is important to avoid constricting bony growth. In severe cases, maxillomandibular fixation may be necessary to stabilize the mandible while it heals. This can have important implications for the patient's recovery and quality of life immediately following the surgery.

REFERENCES

1. Antonia Kolokythas, State-of-the-Art Surgery to Treat Jaw Tumors in Children: How is it Performed?, Journal of Oral and Maxillofacial Surgery, Volume 79, Issue 2, 2021, Pages 501-503.
2. Cezairli, B., Taskesen, F., Coskun, Ü., Cezairli, N. S., & Tosun, E. (2017). Surgical Treatment of a Large Complex Odontoma/Dev Kompleks Odontomonin Cerrahi Tedavisi. Meandros Medical and Dental Journal, 18(2), 148+.
3. Chang, H., Shimizu, M. S., & Precious, D. S. (2002). Ameloblastic fibro-odontoma: a case report. *Journal-Canadian Dental Association*, *68*(4), 243-246.
4. Chrcanovic, B. R., & Gomez, R. S. (2017). Calcifying epithelial odontogenic tumor: an updated analysis of 339 cases reported in the literature. *Journal of Cranio-Maxillofacial Surgery*, *45*(8), 1117-1123.
5. de Oliveira, B. H., Campos, V., & Marçal, S. (2001). Compound odontoma-diagnosis and treatment: three case reports. *Pediatric dentistry*, *23*(2), 151-157.
6. Dubey, D., Rishi, S., Chawla, P., Anupriya, C. H., & Badyal, V. Pindborg tumour: A case report.
7. Giacomo De Riu, Silvio Mario Meloni, Marcella Contini, Antonio Tullio, Ameloblastic fibro-odontoma. Case report and review of the literature, Journal of Cranio-Maxillofacial Surgery, Volume 38, Issue 2, 2010, Pages 141-144.
8. L.K. Surej Kumar, Suvy Manuel, Sherin A. Khalam, Kannan Venugopal, T.T. Sivakumar, Jyothi Issac, Ameloblastic fibro-odontoma, International Journal of Surgery Case Reports, Volume 5, Issue 12, 2014, Pages 1142-1144.
9. Lucía Thistle Barba, Daniela Muela Campos, Martina M Nevárez Rascón, Víctor A Ríos Barrera, Alfredo Nevárez Rascón, Descriptive aspects of odontoma: literature review, Revista Odontológica Mexicana, Volume 20, Issue 4, 2016, Pages e265-e269.
10. Mainassara Chekaraou Samir, Gamra Lamiae, Chami Bassima, Calcifying odontogenic cyst of anterior maxillary: Case report and review, International Journal of Surgery Case Reports, Volume 85, 2021, 106267.
11. Mazur, Marta, Gianni Di Giorgio, Artnora Ndokaj, Maciej Jedliński, Denise Corridore, Beatrice Marasca, Alessandro Salucci, Antonella Polimeni, Livia Ottolenghi, Maurizio Bossù, and Fabrizio Guerra. 2022. "Characteristics, Diagnosis and Treatment of Compound Odontoma Associated with Impacted Teeth" *Children* 9, no. 10: 1509.
12. Park, J. C., Yang, J. H., Jo, S. Y., Kim, B. C., Lee, J., & Lee, W. (2018). Giant complex odontoma in the posterior mandible: A case report and literature review. *Imaging science in dentistry*, *48*(4), 289-293.
13. Shahzad F. Pediatric Mandible Reconstruction: Controversies and Considerations. Plast Reconstr Surg Glob Open. 2020 Dec 17;8(12):e3285.