Ameloblastic Fibro-Odontoma in the Posterior Maxilla: A Rare Presentation and Management

Case Report

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ABSTRACT

Ameloblastic fibro-odontoma (AFO) is a rare mixed odontogenic tumor characterized by both epithelial and mesenchymal components, along with dental hard tissue formation. It commonly occurs in the posterior mandible of children and young adults. It typically manifests as a slow-growing, painless swelling in the posterior jaw, frequently associated with an unerupted tooth. Radiographic examination reveals a well-defined radiolucent lesion with radiopaque foci, mimicking other odontogenic tumors such as ameloblastic fibroma and odontoma, making diagnosis challenging. Histopathological analysis confirms the presence of odontogenic epithelium within a cellular ectomesenchymal stroma, alongside dental hard tissue formation. Surgical enucleation remains the primary treatment, with an excellent prognosis and low recurrence rates. However, misdiagnosis or delayed intervention may lead to significant jaw deformities and potential malignant transformation. This case report details an unusual presentation of AFO in the posterior maxilla of a 12-year-old male, discussing the clinical presentation, differential diagnosis, and management of AFO, emphasizing the need for early detection and precise histological evaluation to optimize patient outcomes.

Key Words: ameloblastic fibro-odontoma, mixed odontogenic tumor, maxillary lesion, ameloblastic fibroma, odontoma.

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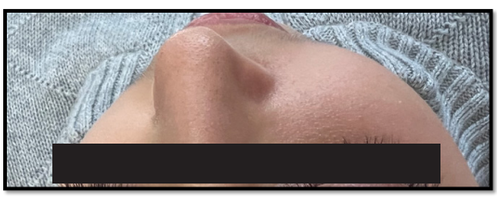
INTRODUCTION

AFO is a benign tumor, predominantly seen in the first two decades of life, and typically associated with impacted or unerupted teeth. Maxillary involvement is rare, particularly in the posterior region. Early detection and management are crucial to prevent complications, including facial deformity and tooth displacement [1]. This case report will exhibit (AFO) in posterior maxilla.

CASE REPORT:

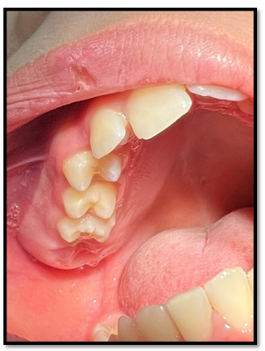
A 12-year-old boy was referred to the OMFS unit from the school oral health program as he had right-side facial & palatal painless swelling for 10 days. The swelling gradually increased in size and caused slight discomfort during mastication. The patient's medical history was unremarkable. Extra-oral examination: The lesion was causing facial asymmetry. [Figure 1].

Figure 1: Preoperative extraoral photograph.



Intraoral examination revealed a firm, non-tender swelling extending from the first molar to the maxillary tuberosity. The overlying mucosa was intact. [Figure 2].

Figure 2: Intraoral photograph.



Radiographic findings:

OPG interpretation:

revealed a mixed (radiolucent and radio-opaque) with well-defined, corticated lesion arising from the alveolar process of the right maxilla, expanding anteriorly to the midline and posteriorly into the infratemporal fossa by enlarging the right maxillary tuberosity. The lesion measurements (3.5 cm x 2.8 cm). [figure 3].

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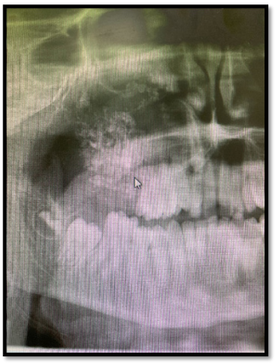
Figure 3: Preoperative OPG showing the lesion extension.



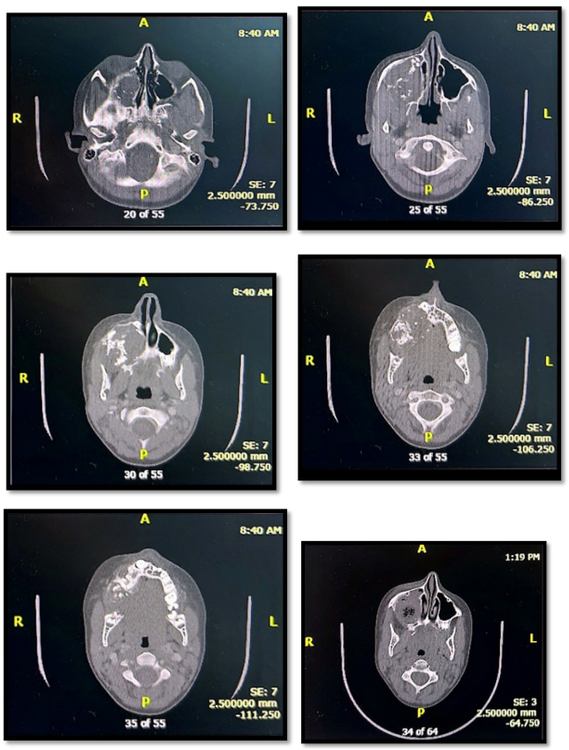
CT scan interpretation:

•Borders: There is a well-defined, corticated lesion originating in the alveolar process of the right maxilla, extending anteriorly to the midline (tooth #12), and posteriorly, it expands the right maxillary tuberosity into the infratemporal fossa. Superiorly, the lesion expands into the sinus, causing displacement of the roof of the maxillary sinus and encroaching on the right orbit.

Inferiorly, it involves the entire alveolar process and the right palatal bone. Medially, the lesion expands to displace the lateral wall of the right nasal cavity and the right ethmoid air cells.

The lesion is well-defined and partially corticated. The cortical boundaries have been disrupted in multiple regions, mainly the distal and inferior borders of the lesion. The posterior-lateral edge of the lesion has a hydraulic shape with an area of "dimpling." Internally, the lesion is mixed radiolucent-radiopaque. The radiolucent portion of the lesion has the same attenuation as soft tissue. The radiopaque component is distributed throughout the lesion and has a similar attenuation as amorphous bone. Round "pebble-like" calcifications that resemble dental tissues throughout the lesion, particularly around the lesion's periphery. The lesion has a concentric, space-occupying growth pattern. It has caused mesial tipping of the right premolars and root resorption. It has also caused displacement of the walls of the right maxillary sinus and encroached on the right nasal cavity, ethmoid air cells, infraorbital wall, and infratemporal fossa. [Figure 4].

Considering the clinical picture and the radiographic investigations, fibro-osseous lesion such as ossifying fibroma and vascular malformation was suspected as a differential diagnosis.



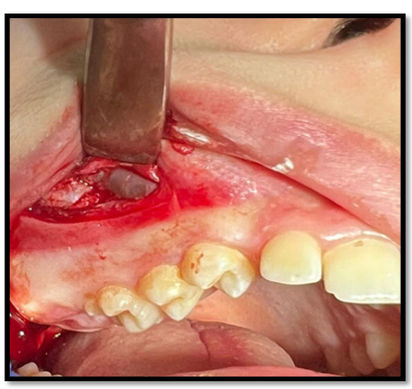
Treatment and Management:

Under general anesthesia with endotracheal intubation, a vestibular incision was made from the premolar region to the end of the maxillary tuberosity. [Figure 5A]. A flap was elevated, and a thin bone covering the lesion's surface was removed by performing the Caldwell-Luc approach to ensure complete removal of the lesion. The mass is well-capsulated and enucleated with ease. [Figure 5B]. The tooth with the related bud was removed. Then, the cavity was irrigated carefully, and the debris was removed. [Figure C].

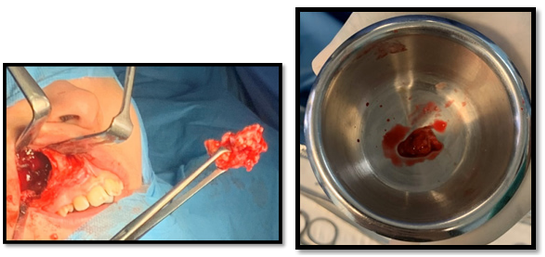
Lastly, the flap was repositioned, and suturing was done with vicryl 3.0.

The excised specimen was sent for histopathological confirmation.

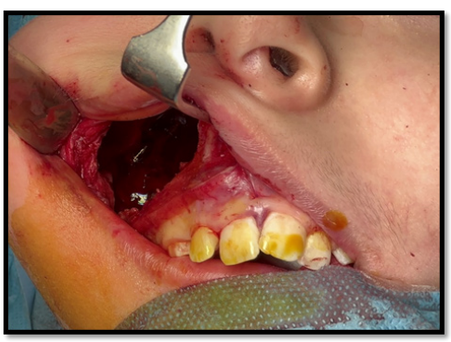
Figure 5: Surgical intervention.
A- Vestibular incision showing the thin bone covering.



B- The excised mass.



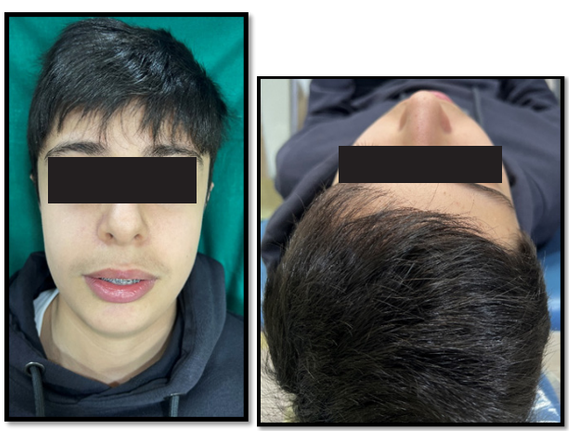
C- The surgical field after mass excision.



Outcome and Follow-up
The patient's postoperative course was uneventful. A follow-up appointment at six months revealed no evidence of recurrence, with good healing of the surgical site and no functional impairment. The patient was referred to the orthodontist to further plan the impacted canines and align the teeth in a proper position. [Figure 6].

Bone formation was noticed in the follow-up OPG. [Figure 7].

Figure 6: Postoperative pictures:
A) Follow up extraoral photographs.



B) Follow up intraoral photograph:

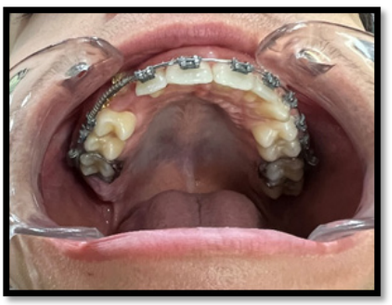
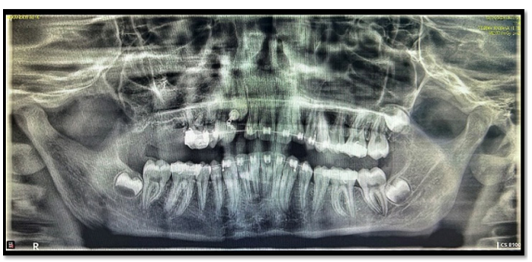


Figure 7: Postoperative OPG (6 months)

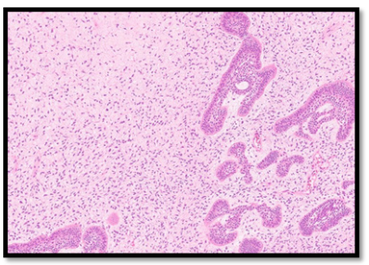


Histopathology:

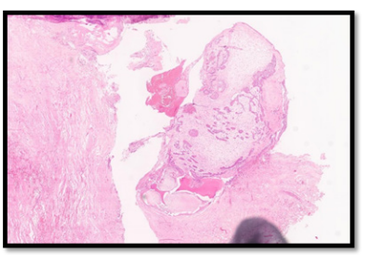
Histopathology: Incisional biopsy revealed strands and islands of ameloblastic epithelium embedded in a mesenchymal stroma [Figure 8A] , resembling dental papilla, along with enamel, dentin, and cementum-like structures [Figure 8b], confirming the diagnosis of AFO.
Gross Examination: Multiple tan irregular pieces of soft and hard tissue measuring 4x4x1.5cm in aggregates

Number of pieces: Multiple. Hard tissue was submitted for decalcification.
Microscopic Examination: Examination reveals a neoplastic proliferation composed of an epithelial component, cellular myxoid stroma, and dental hard tissue. The epithelial component consists of thin strands and small islands of odontogenic epithelium. The epithelial islands consist of central stellate reticulum-like cells and peripheral columnar cells with reverse nuclear polarization. The mesenchymal stroma is composed of plump, stellate-shaped cells, and a loose matrix. Mitotic activities are noted, but none are atypical. The mineralized tissue consists of dentin-like tissue, a disorganized enamel matrix, lamellar calcifications, and conglomerate masses of dentin and enamel. Hyperplastic lymph nodes and regional adipose and salivary gland tissues are also noted.
Differential Diagnosis: Ameloblastic Fibroma (AF), Complex Odontoma , Calcifying Odontogenic Cyst (COC)
Definitive Diagnosis: AMELOBLASTIC FIBRO-ODONTOMA.

Figure 8 : Histopathology.
A) Ameloblastic epithelium embedded in a mesenchymal stroma:



B) Dental papilla, along with enamel, dentin, and cementum-like structures



DISCUSSION

Ameloblastic fibro-odontoma (AFO) is classified as a benign, mixed odontogenic tumor composed of both epithelial and mesenchymal components, along with varying amounts of dental hard tissues such as enamel and dentin[2]. It is a slow-growing lesion, primarily found in children and adolescents, and considered part of a spectrum of odontogenic tumors that includes ameloblastic fibroma (AF), ameloblastic fibro-dentinoma (AFD), and odontoma. The presence of well-developed dental structures distinguishes AFO from ameloblastic fibroma, suggesting that it may represent a more mature form of odontogenic neoplasm rather than a separate entity [3,4].

AFO is included in the World Health Organization (WHO) classification of odontogenic tumors, which recognizes its benign nature but also suggests a potential progression toward odontoma if left untreated [2]. Some studies propose that ameloblastic fibroma and AFO are developmental stages of odontoma, rather than distinct pathologies[5]. The lesion is usually well-demarcated and non-invasive, allowing for conservative surgical excision. However, misdiagnosis or delayed treatment can lead to complications, such as cystic degeneration, secondary infection, or even malignant transformation in rare cases [6]. Radiologically, AFO appears as a mixed radiolucent-radiopaque lesion with variable degrees of mineralization, depending on the amount of dental hard tissue present. Cone-beam computed tomography (CBCT) is highly useful for assessing the lesion's size, extent, and effects on adjacent structures [4].

The characteristic displacement of unerupted teeth (as seen in this case) is a hallmark of the lesion, distinguishing it from other odontogenic tumors [3]. Differentiating AFO from complex odontoma, ameloblastic fibroma, or calcifying odontogenic cysts (COC) is critical, as the treatment approach varies. The presence of enamel and dentin matrix strongly supports AFO over ameloblastic fibroma[5]
Histologically, The distinguishing feature of AFO is the simultaneous presence of epithelial and mesenchymal components alongside mineralized structures. This composition supports the theory that AFO may represent an intermediate stage between ameloblastic fibroma and odontoma [5].
The treatment of choice for AFO is complete surgical enucleation, with or without curettage. Due to its benign nature and well-defined borders, conservative excision is usually sufficient, as seen in this case where a Caldwell-Luc approach was used to remove the lesion without significant disruption of surrounding structures [6].

The prognosis of AFO is excellent, with minimal risk of recurrence following complete excision. Unlike ameloblastic fibroma, which has a higher recurrence rate, AFO rarely recurs because of its odontogenic differentiation and slower growth pattern [3,5]. Long-term follow-up is still recommended, particularly for cases with incomplete removal or proximity to vital structures such as the maxillary sinus and orbit [1] AFOs are often confused with ameloblastic fibroma and odontoma due to overlapping clinical and radiographic features. However, the presence of dental hard tissues distinguishes AFO. The posterior maxilla is a rare site for this tumor, making this case unique. Complete surgical excision is the treatment of choice, with a low risk of recurrence. [7]

CONCLUSION:

This case highlights the rare presentation of AFO in the posterior maxilla, emphasizing the importance of early detection, accurate diagnosis, and appropriate surgical intervention. Early intervention and meticulous surgical management can achieve excellent outcomes and prevent recurrence. Given its benign nature and excellent prognosis, conservative excision is the treatment of choice. However, long-term follow-up is advised to monitor for any potential recurrence or impact on adjacent dentition.

CONFLICT OF INTEREST

the authors declare that there are no conflict of interest.

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