


Aggressive adenomatoid odontogenic tumor: an uncommon case report and discussion on the differential diagnosis

John Lennon Silva Cunha ^{1*}
Juliana Batista Melo da
Fonte ²
Maria de Fátima Batista de-
Melo ²
Rose Nely Pereira Filho ¹
Ricardo Luiz Cavalcanti de
Albuquerque Júnior ¹

Abstract:

Differential diagnosis between ameloblastomas (AMB) and adenomatoid odontogenic tumor (AOT) seldom cause difficulties due to classic histopathological presentations. Adenoid ameloblastoma with dentinoid (AAD) is a rare variant of AMB which can be misdiagnosed as AOT. We report a case of a 12-year-old female presenting a painless swelling in the anterior region of the mandible. Panoramic radiograph and cone beam CT scans demonstrated large unilocular osteolytic lesion extending from 44 to 32 and involving the impacted 43. Tumor caused teeth displacement and both vestibular and lingual cortical perforation. Histopathology revealed cuboidal and spindle-shaped cells arranged in nests and rosettes, solid, duct-like and whorled areas, and foci of calcification and dentin-like material were evident. The diagnosis was aggressive AOT. Because of the similarities of the histologic features of AOT and AAD, we intend to provide a discussion on the clinicopathologic criteria for establishing the differential diagnosis of these entities

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¹ Tiradentes University, Department of Dentistry - Aracaju - Sergipe - Brasil.

² Federal University of Sergipe, Department of Dentistry - Aracaju - Sergipe - Brasil.

Correspondence to:

John Lennon Silva Cunha.
E-mail: lennonrrr@live.com
E-mail: lennonrrr@gmail.com

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INTRODUCTION

The adenomatoid odontogenic tumor (AOT) is a rare benign odontogenic lesion, that is slow-growing and non-invasive, although few aggressive cases have been reported¹⁻³. In the past years, an unusual variant of ameloblastoma presenting histological characteristics that overlap those observed in AOT has been reported under the name of adenoid ameloblastoma with formation of dentinoid (AAD)⁴, which may cause difficulties in the differential diagnosis. Thus, the purpose of this work is to report a case of aggressive AOT and discuss the criteria for differential diagnosis of this lesion, especially with AAD.

CASE REPORT

A 15-year-old white female patient sought the service of the stomatology clinic at Tiradentes University (Aracaju/SE) complaining of swelling in the mandible. The intraoral examination revealed a painless volume increase in the anterior region of the mandible, extending from tooth 44 to 32, firm to palpation, covered by normal-colored mucosa and with the evolution time of 5 months.

No previous history of trauma was reported by the patient. Previous medical history was not contributory. Imaging exams revealed unilocular osteolytic lesion extending from tooth 44 to tooth 32 and involving the impacted 43, causing cortical bulging and perforation (Figures 1, 2 and 3). The provisional diagnosis of AOT was established and an incisional biopsy of the lesion was performed.



Figure 1. Panoramic radiograph showing unilocular radiolucent lesion with regular margins and well-defined borders, associated with the non-erupted tooth 43 and causing dental displacement of teeth 41, 42 and 44.

The surgical specimen was submitted to the Service of Oral Pathology of the School of Dentistry at Tiradentes University. Histopathological examination of the incisional biopsy revealed cubic and fusiform cells arranged as nests and rosettes, pseudoductal structures and solid vortex areas. Foci of dystrophic calcification and deposition of dentinoid material were evident (Figure 4). The diagnosis was aggressive AOT. The patient was submitted to surgical enucleation of the lesion and is under preservation without signs of recurrence 2 years after surgery.

DISCUSSION

The latest WHO classification of odontogenic tumors defines AOT as being a proliferation of odontogenic epithelium exhibiting a variety of histoarchitectural patterns embedded in mature connective tissue stroma characterized by slow and noninvasive growth⁵. Compared to ameloblastomas, AOT is a non-aggressive tumor, which exhibits limited growth and accounts for about 1% to 9% of all odontogenic tumors. However, few reports of aggressive AOTs¹⁻³, such as ours, have been reported in the literature.

The epidemiological profile shows predilection for female and young patients, with a peak prevalence in the second decade of life. Clinically, AOT usually manifests as an asymptomatic increase in volume in the anterior region of the gnathic bones, most commonly in the region of upper lateral incisors and upper canines⁶. Thus, this report is in consonance with the demographic characteristics classically described for AOT. However, the anatomical site involved and the pattern of tumor growth, causing bulging and cortical rupture are uncommon for this lesion and little reported in the literature. Some authors suggest that this possible aggressive behavior is due to the relatively higher growth rate in young patients, and the delay to seek professional assistance^{3,7}.

The AOT has three clinicopathological variants: follicular, extrafollicular and peripheral. The follicular variant is associated with an unerupted tooth, as in the present case, and accounts for about 73% of the cases. The extrafollicular variant is also a central lesion, however, it is not associated with an unerupted tooth and accounts for 24% of all AOTs. Extraosseous or peripheral lesions are very rare (about 3% of cases) and clinically appear as sessile nodules in the maxillary

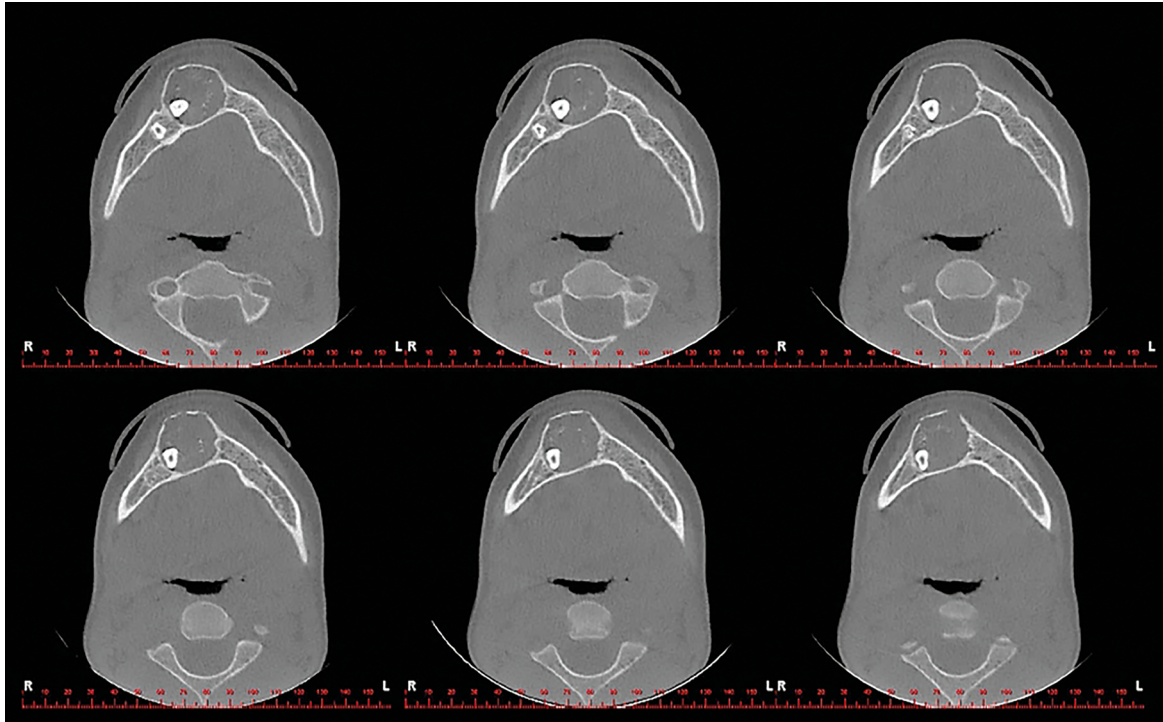


Figure 2. Cone-beam computed tomography (axial cuts) showing hypodense lesion with discrete hyperdense foci within and surrounding the tooth 43. Note discontinuity of the buccal cortex.

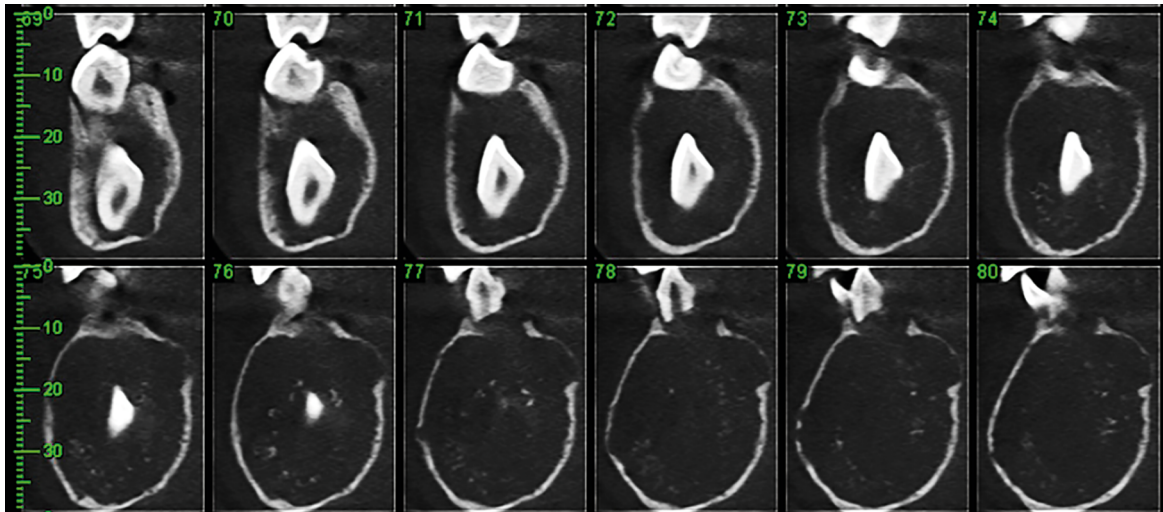


Figure 3. Cone-beam computed tomography (sagittal cuts) showing hypodense lesion with hyperdense foci involving the tooth 43. The tumor caused both vestibular and lingual cortical perforation.

gingiva, mimetizing common reactive fibrous lesions of the gingiva⁸. It is important to emphasize that all variants of the AOT share the same histopathological characteristics.

Radiographically, the follicular pattern is characterized as a well delimited radiolucent area, frequently exhibiting discrete radiopaque foci inside and associated with

an unruptured tooth, usually the upper canine. The extrafollicular pattern has no association with dental elements and, normally, the radiolucent image is located between two roots, resembling a lateral periodontal cyst⁸. Peripheral AOTs rarely exhibit radiographic imaging; however, slight erosion of the alveolar bone cortex underlying the lesion has been reported⁹.

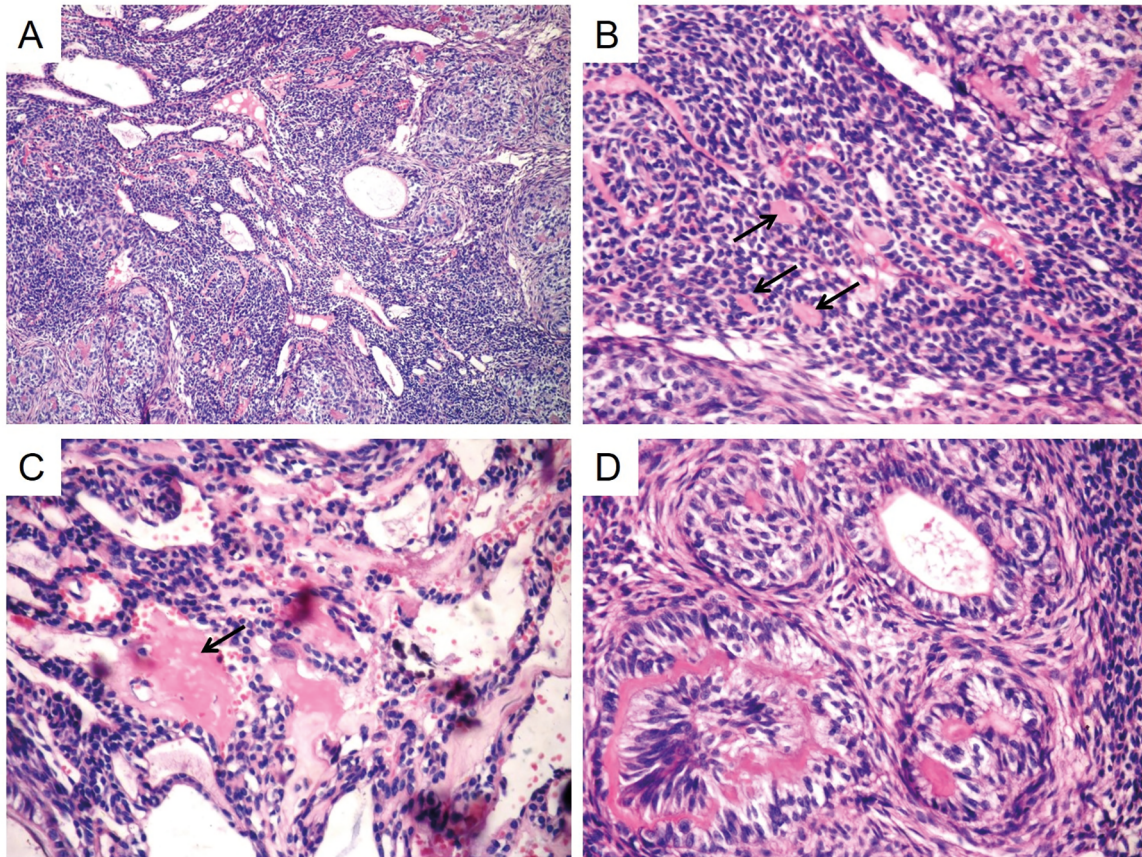


Figure 4. Histological sections stained with hematoxylin-eosin. (A) Compact proliferation of odontogenic epithelial cells forming nodules of cuboid and ovoid cells surrounded by fusiform cells arranged in a vortex pattern, and forming multiple pseudoductal structures (100 x). (B) Solid sheets and (C) strands of epithelial cells intercalated with deposition of eosinophilic material resembling dentinoid (arrows) (400 x). (D) Formation of typical nodular, pseudoductal structures and epithelial rosettes (400x).

Rarely, the lesion manifests itself without a radiopaque component; however, the follicular variant, when the radiopaque foci are incipient and the image is radiolucent, may simulate a dentigerous cyst, although in AOT the tooth inserted in the lesion is not necessarily limited to the amelocemental junction as seen in the latter^{6,10}. Radiopaque foci were not observed on the panoramic radiograph in our case, but were identified on the CT scan. Compared with conventional radiographs, computed tomography exhibits this advantage and, therefore, may guide better the diagnosis of such lesions. The presence of calcifications excludes the diagnosis of a dentigerous cyst^{6,10}.

Due to the variety of clinical/radiographic appearances, AOT has several differential diagnoses, varying according to the presence and degree of radiopacity found in lesions and whether or not it is associated with an unruptured tooth. Radiolucent images may mimetize the appearance of dentigerous

cysts, odontogenic keratocysts and ameloblastomas, as lesions exhibiting radiopaque foci can be confused with calcifying cystic odontogenic tumor and even calcifying epithelial odontogenic tumor¹⁻³.

Histologically, AOT is characterized by the compact proliferation of epithelial cells exhibiting cuboid and/or fusiform shape, permeated by scarce connective tissue stroma. Epithelial tumor cells form sheets, nests, cords, rosette-like structures and pseudoductal structures, formed by cuboidal or columnar cells exhibiting nuclei with polarization opposite to the lumen. Dystrophic calcification foci and areas of deposits of amorphous eosinophilic material with dentinoid appearance are also noted. At the periphery, thick capsule of dense fibrous connective tissue can also be seen surrounding the tumor^{1-3,9}. Similar characteristics were observed in the present case.

Although the differential diagnosis between ameloblastoma and AOT rarely causes difficulties,

Table 1. Differential clinicopathological characteristics between aggressive AOT and AAD.

	Aggressive adenomatoid odontogenic tumor ²⁵	Adenoid ameloblastoma with dentinoid ⁴	Present case
Clinical features			
Age (mean±SD)	21,1±10 years	43±16 years	15 years
Localization	Anterior mand.: 14 (20,9%)	Anterior mand.: 3 (18,75%)	
	Posterior mand.: 8 (11,9%)	Posterior mand.: 4 (25%)	
	Anterior max.: 32 (47,8%)	Anterior max.: 3 (18,75%)	Anterior mandible
	Posterior max.: 13 (19,4%)	Posterior max.: 6 (37,5%)	
Sex	Male: 24 (35,82%)	Male: 9 (56,25%)	Female
	Female: 43 (64,18%)	Female: 7 (43,75%)	
Time of evolution (mean±SD)	10,28±6,3 months	24,9±26 months	5 months
Histopathological features			
Typical ameloblastomatous pattern	Absent	Present	Absent
Dentinoid deposition	Can be present	Present	Present
Dysplastic dentin	Can be present	Can be present	Absent
Pseudoductal structures	Present	Can be present	Present
Thick fibrous capsule	Present	Usually absent	Present
Ghost cells	Can be present	Can be present	Absent
Calretenin immunoexpression ²⁶	Absent	Present	-

adenoid ameloblastoma with dentinoid (AAD) may be confused with aggressive forms of AOT. AAD is considered to be an unusual aggressive variant of ameloblastoma described in 1994 by Brannon as a parenchymal proliferation similar to AOT associated with areas with typical ameloblastic differentiation. In addition, the deposition of dentinoid material in the lesion was observed, causing the tumor to be defined as AAD¹¹.

From its initial description, other reports of similar cases were published in the literature emphasizing the potential of local aggression and recurrence of these lesion^{4,12-18}. Proliferations similar to AOT had already been found focally in ameloblastomas, however, these findings were interpreted as a possible variation of differentiation, but irrelevant to the biological behavior of the lesion¹⁹⁻²¹. Loyola et al.⁴ reported that the recurrence rate of AAD was approximately 75%, even when patients underwent radical surgery. A much higher rate than those often cited for conventional ameloblastomas and ameloblastic carcinomas²²⁻²⁴.

This high rate of recurrence can be explained in a number of ways, namely, the predilection of the AAD for the posterior maxilla, making the complete excision with adequate margin more difficult, or the inherent biological nature of the lesion, evidenced by the high proliferative

index (Ki-67)⁴. In addition, it should be noted that in some previously published reports of recurrent AAD, patients were initially treated with simple enucleation because the lesions were misdiagnosed as AOT^{15,16}.

Table 1 shows some of the main differences between aggressive AOT and AAD. Given these data, the case in question should, in fact, be framed as an uncommon aggressive presentation of AOT, since no typical ameloblastomatous areas were observed, an essential feature for suspected AAD to be considered. The evident clinical aggressiveness and the high recurrence rates of AAD compared to AOT, which exhibits limited growth and almost zero recurrence tendency, makes the precise distinction between these two entities a particularly important issue, which can greatly influence the treatment and prognosis of the lesion.

Conservative surgical excision is the treatment of choice for AOTs^{1-3,25}. Due to the low recurrence reported in the literature, conservative treatment was safely proposed. The patient underwent surgical enucleation of the lesion and after 24 months of follow-up, no relapse was observed. However, careful monitoring should be done, especially in our case, considering the unusual presentation and aggressive behavior of the tumor.

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