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Case Report

Cone Beam Computed Tomographic (CBCT) Features in a Case of Unicystic Ameloblastoma

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ABSTRACT

Unicystic/ Cystic ameloblastoma (UCA) is a single cystic cavity which shows ameloblastomatous differentiation in the lining. First introduced in 1977, it contends on being a separate clinicopathological entity than the solid ameloblastoma. It usually arises from the wall of a pre-existing cyst rather than from cystic degeneration of a solid tumor. It is synonymous with mural ameloblastoma which refers to specific diagnosis separable from ameloblastoma and should not be used to describe a suspected classic ameloblastoma that is unilocular. Here we present a case which demonstrates use of cone beam computed tomography in the diagnosis of large unicystic ameloblastoma in a 24-year-old female patient.

Key words: Ameloblastoma, Mandible, Odontogenic tumors, Plexiform lesions, Unicystic ameloblastoma.

INTRODUCTION

Many benign lesions cause mandibular swellings, and these can be divided into odontogenic and nonodontogenic origin. The most common tumor of odontogenic origin is ameloblastoma which develops from epithelial cellular elements and dental tissues in their various phases of development. More than 80% of all ameloblastomas are solid or multicystic variants, with unicystic ameloblastoma being an important clinicopathologic form of ameloblastoma and occupying the remaining 20% of the cases along with peripheral ameloblastoma. [1]

The unicystic ameloblastoma is a less encountered variant of the ameloblastoma, referring to those cystic lesions that show clinical and radiographic characteristics of an odontogenic cyst but in histologic examination show a typical ameloblastomatous epithelium lining part of the cyst cavity, with or without luminal and/or mural tumor proliferation. [2]

The availability of cone beam computed tomography (CBCT) allows clinicians to appreciate the 3 – dimensional architecture of the lesion to a great extent than a plain film imaging such as panoramic, lateral cephalometric, and anterior posterior projections. CBCT can provide detailed examination of hard tissue findings. To

identify soft tissue spread of the lesion beyond bony structures magnetic resonance imaging (MRI) and Computed tomography (CT) with contrast is indicated. CBCT may be useful in distinguishing of desmoplastic subtype of ameloblastoma because it contains coarse internal calcification as well as destruction of surrounding cortices. [3]

CASE REPORT

A 24 year old female patient reported to the department of Oral Medicine and Radiology with a chief complaint of pain in the lower left back teeth region since 1 month. Patient had noticed a swelling in the same region 3 years back which was a pea nut size and gradually enlarged to present size. Pain was of dull aching type, which was intermittent, and aggravated on mastication and relieved on rest. Pain was not associated with fever and no medication was taken. All vital signs were within normal limits. On extraoral examination a diffuse swelling was seen on the left lower third of the face which was measuring about appximately 4 × 3 cm in size. Overlying skin was normal; no visible pulsations and no discharge were seen. On palpation, the swelling was firm in consistency and tender; no local rise of temperature, non pulsatile, non compressible and no discharge was present. A single left submandibular lymph node of size measuring about 1x2 centimeters in size was palpable, which was roughly round, firm in consistency, mobile, and non tender. (Figure 1).

Fig : 1 Extra-oral view of the patient showing fullness of left lower 1/3 rd the face

Fig : 2 Intra oral view of the lesion

On intraoral examination, solitary diffuse swelling was seen in the mandibular left buccal and lingual vestibule in relation to 36, 37 and in retromolar regions measuring approximately 3x4 centimeters. It was extending anterioposteriorly—from the buccal vestibule in relation to 36 to pterygomandibular raphae and superior-inferiorly from the attached gingiva of 36 to the buccal and lingual vestibule bilaterally. Expansion of the buccal and lingual alveolar ridges were seen with 36, 37.There was deep dental caries in relation to 36.Tenderness was present with 36 and 37. 38 was absent. On palpation, all inspectory findings are confirmed. The swelling was firm in consistency, surface was smooth, non fluctuant, non reducible, no discharge, no pulsations or crepitus were present. No

discontinuity in the cortical plates was felt. (Figure 2).
Based on clinical features the provisional diagnosis was given as Dentigerous cyst.

Differential Diagnosis

Ameloblastoma, Calcifying epithelial odontogenic tumor (CEOT), Keratocystic odontogenic tumor (KCOT), Central giant cell granuloma (CGCG), Odontogenic myxoma were considered in the differential diagnosis for our case but features like old age, multilocularity of ameloblastoma were less favourable in this case. In CEOT focal areas of calcifications are seen, but in our case we see unilocular radiolucency without any radio opaque flecks. Linear expansion of KCOT through medullary spaces without any buccolingual expansion ruled out its diagnosis.Lesions like CGCG and odontogenic myxoma were also ruled out based on their clinical and radiological features. [4-6]

Investigations

Routine investigations like complete hemogram was advised which was normal. Patient was advised for routine radiographic examination including Intra-oral periapical radiograph with 36, Cross-sectional mandibular occlusal view and Panoramic view. Occlusal radiograph showed expansion of buccal and lingual cortical plates with 36, 37. Conventional panoramic image showed features of the lesion as shown in the Figure - 3. For more accurate and detailed examination of the lesion, the patient was advised for CBCT imaging.

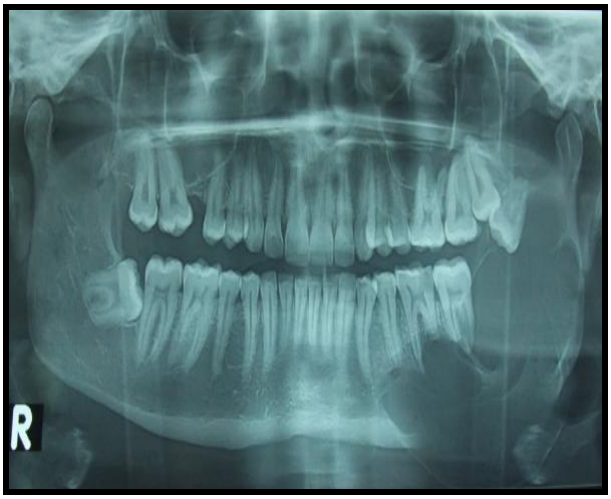

Fig : 3 Conventional panoramic image demonstrating the lesion on the left side of the mandible showing expansion , thinning and perforation of cortical plates.

CBCT Features

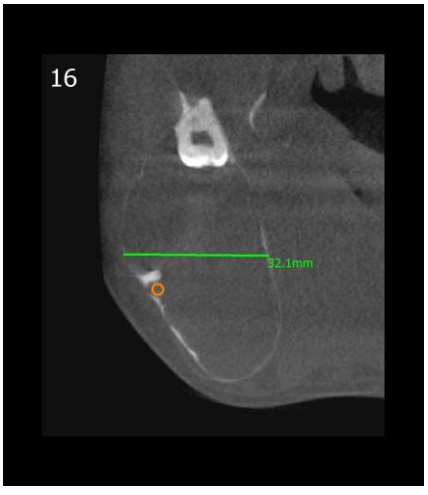

Fig : 4 Oblique coronal CBCT view

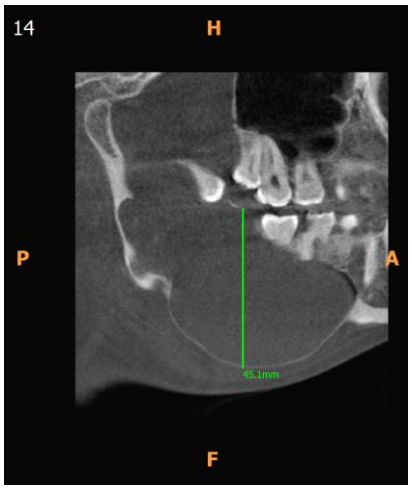

Fig : 5 Sagittal CBCT view

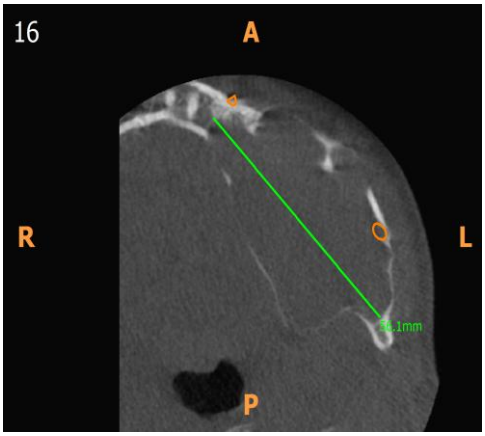

Fig : 6 Axial CBCT view.

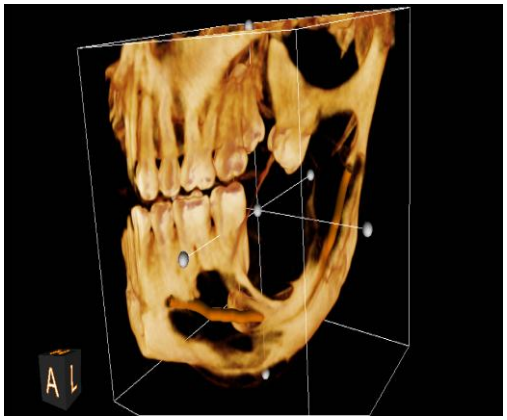

Fig : 7 3 –D Reconstruction view .

CBCT examination revealed a well-defined expansile multilocular lesion involving left mandible, approximately 5.6 x 3.0 x 4.5 centimeters (anterioposteriorly x mediolaterally x superioinferiorly) in size. Lesion extends anterio-posteriorly from peri-apical region of 35, involves body, angle and ramus (6.4 mm below the sigmoid notch), superior-inferiorly from crest of ridge to lower border of mandible. Condylar process is spared. Bucco-lingual expansion is noted with extensive thinning of cortical plates and perforation of cortical plates noted. Displacement of 38 superiorly into the coronoid process noted. Knife edge resorption of roots of 35, 36 and 37 noted. Inferior alveolar nerve canal was displaced inferiorly and buccally.

Patient was subjected to an incisional biopsy for histopathological examination for more definitive diagnosis.

H & E stained section showed cystic epithelium consisting of columnar cells with hyperchromatic nuclei with reversal of polarity. The overlying stellate reticulum like cells was loosely cohesive. The underlying odontogenic mesenchyme was highly cellular and showed dense bundles of collagen fibres, blood vessels, minimal inflammatory infiltrate and reactive bone.

Fibrous connective tissue showed reactive bone with osteoblastic rimming. Extravassated RBCs and chronic inflammatory cells were also evident. These histologic features were suggestive of unicystic ameloblastoma. (Figure -8)

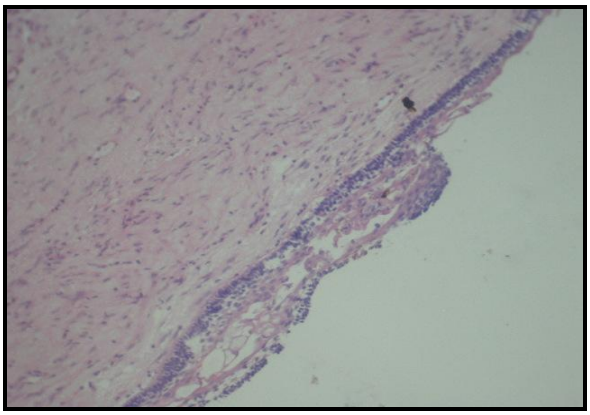

Fig : 8 Histopathology

A wide margin excision and reconstruction was planned. Follow –up clinical and radiographic examination are essential as ameloblastoma has high recurrence rate.

DISCUSSION

Unicystic ameloblastoma (UCA), a variant of ameloblastoma, was first described by Ackermann et al in 1988. [7] Unicystic ameloblastoma is the most

common term used to designate its different pathological entities. Sometimes these can present as a multilocular radiolucency which makes the use of the term "cystic ameloblastoma" more appropriate. However, some authors still believe that the notion that cystic ameloblastomas can have a "true" clinically multicystic pattern is arguable and contend with the use of the term "unicystic ameloblastoma. [8,9]

As per the WHO system of 2003, ameloblastoma is classified based on differences in biologic behavior, treatment plan and recurrence rate as follows:
(1) Classic solid/multicystic ameloblastoma,
(2) Unicystic ameloblastoma,
(3) Peripheral ameloblastoma,
(4) Desmoplastic ameloblastoma, including the so-called hybrid lesions. [8]

All unicystic ameloblastomas in the series reported earlier, by Robinson and Martinez [10] and by Eversole, Leider, and Sturb [11] showed an increased predilection for occurrence in the mandible. The ratio of the mandible: maxilla being 13:1.

Radiographically, UCAs have been divided into 2 main patterns: Unilocular and Multilocular. UCAs have clear preponderance for the unilocular pattern which shows similar features as seen in our case.

Unicystic variant of ameloblastoma with aggressive histologic behaviour can be successfully treated with marsupialisation with subsequent enucleation, and this approach can be considered as an alternative to resection.

Role of CBCT

No imaging modality has made as great an impact on dental procedures in as short a time as cone beam computed tomography. Three dimensional image capture and analysis had been absent in dentistry until its introduction in 1998 by Mozzo et al. [12] The cone-beam images acquired are excellent at displaying bony anatomy and skull spaces. Three dimensional imaging permits the clinicians to view the extent of the lesion and its effects on adjacent structures. This three-dimensional data appear superior for visualization of anatomy and many aspects of pre surgical planning.

CBCT offers a series of extra information compared to the data supplied by the conventional panoramic radiography about the extent, internal architecture of the radiolucent bony lesions, being a highly useful tool in setting of an accurate diagnosis of lesions of jaws.

Radiological analysis of jaw bone tumors needs an exact assessment of the topography, extent of the lesions as well the identification of specific diagnostic features needed for differential diagnosis of diseases. The aim of reporting this case is to present the usefulness of CBCT imaging in diagnosis of such lesions which helps in definite diagnosis and treatment planning of radiolucent jaw lesions and to correlate this with the histological findings.

CONCLUSION

Availability of CBCT imaging to clinicians made improved management of patient, reduced surgical risk and complex dental procedures will be vastly simplified. All of these developments and tools will ultimately improve patient dental care, which is major goal of all of our profession.

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