Case Report

Computed Tomography in Diagnosis of Admantinoma

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Abstract

Context: Admantinoma is second most common benign odontogenic tumor which clinically appears as an aggressive odontogenic tumor, often asymptomatic and slow growing, associated with symptoms such as swelling, dental malocclusion, pain, and paresthesia of the affected area. The radiographic appearance may vary from unilocular to multilocular radiolucencies, imparting a characteristic honey comb, soap bubble appearance or may resemble a caricature of spider. **Case Report:** This report highlights the importance of conventional and advanced imaging in the diagnosis of large and invasive lesions. Patient reported with complaint of swelling in jaw, which progressively increased; and was found to be bony hard, both intra- and extraorally. Radiographs revealed large multilocular radiolucency on left body and ramus of mandible with soap bubble pattern and knife edged root resorption. Computed tomographic examination evaluated the extent of the lesion, internal structure, and relation to adjacent structures; further a reconstructed image was obtained to evaluate extent of destruction in three dimensions. **Conclusion:** Computed tomography has an important role in the diagnosis and treatment planning is imperative as it is superior in revealing the cortical destruction and extension into the neighboring soft tissues than conventional radiography.

Keywords: Admantinoma, Computed tomography, Honey comb appearance, Multilocular radiolucency, Soap bubble appearance

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Introduction

Admantinoma commonly known as ameloblastoma is a benign odontogenic tumor believed to originate from sources that include residual epithelium from tooth germ; epithelium of odontogenic cysts; stratified squamous epithelium; and epithelium of the enamel organ.[1] It represents approximately 1% of oral tumors; 80% of ameloblastomas occur in the mandible, and the remaining 20% in the maxilla.[2] It is the second most common odontogenic neoplasm following odontoma.[3] The term "ameloblastoma" was suggested by Churchill in 1934, because the old term "adamantinoma", coined by Malassez in 1885 erroneously implied the formation of hard tissue.[4]

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Admantinoma is most commonly encountered in the 3rd-5th decades of life and mandible is more commonly affected than maxilla in the ratio 5:1.[5] Clinically, it appears as an aggressive odontogenic tumor, often asymptomatic and slow growing and may be associated with symptoms such as swelling, dental malocclusion, pain, and paresthesia of the affected area.[6]

The radiographic appearance of the tumor may vary from unilocular to multilocular radiolucencies, imparting a characteristic honey comb, soap bubble appearance, or may resemble a caricature of spider. The lesion may exhibit extensive thinning and expansion of the overlying cortex, and is occasionally associated with embedded teeth.[7] The role of computed tomography in the diagnosis is imperative as it is superior in revealing the cortical destruction and extension into the neighboring soft tissues than conventional radiography.

Several histopathologic types of ameloblastoma are described in the literature, including those with plexiform, follicular, unicystic, basal cell, granular cell, clear cell, acanthamatous, and desmoplastic patterns.[8] Here we describe a case of massive ameloblastoma in the right mandibular body, with an added emphasis on the role of computed tomography in the diagnosis and treatment planning.

Case Presentation

A 58-year-old female patient reported to Department of Oral Medicine and Radiology, with a chief complaint of swelling in left lower back region of jaw since 1 year. History revealed that the swelling started 1 year back, which was small to start with and progressively increased to attain the present size. There were no other symptoms of pain, discharge, or numbness associated with the same. An extraoral examination revealed gross facial asymmetry, because of a diffuse swelling on the left side of the mandible measuring about 4 cm × 4 cm in size, extending from the parasymphysis to the posterior border of the mandible anteroposteriorly and from the line joining corner of mouth and ear lobe to below the lower border of the mandible superoinferiorly. On palpation, the swelling was bony hard in consistency, nontender, and was fixed to the mandible.

Intraoral examination revealed a diffuse swelling, obliterating the left buccal vestibule, measuring about 3 cm × 3 cm in size, and extending from the distal aspect of tooth 33 to the ascending ramus anteroposteriorly. The overlying mucosa was intact, with no ulceration or sinus discharge. On palpation, the swelling was bony hard in consistency and nontender. Other dental findings revealed clinically missing 34, 35, 36, 37, 27, 16, 17; carious 18, 46, 47, 25; stains; and calculus [Figure 1].

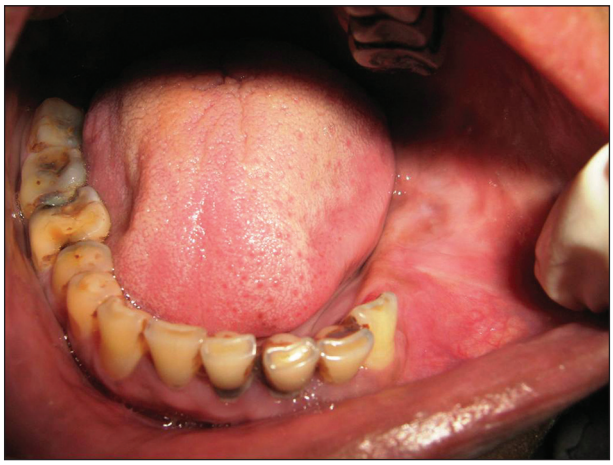

Figure 1: Intraoral photograph showing expansile swelling in left mandibular region

Following the clinical examination, patient was subjected for radiographic investigations: Orthopantomograph (OPG) and mandibular cross-sectional occlusal radiograph. OPG revealed the presence of a large multilocular radiolucency on the left body and ramus of the mandible measuring about 9 × 4 cm extending from the distal aspect of tooth 42 upto the region of condyle and coronoid process mediolaterally; from the alveolar crest to the inferior border of mandible superoinferiorly. Internal structure revealed a multilocular radiolucency with a typical soap bubble pattern. There was marked destruction of the left condyle and coronoid process and expansion of the cortex along the inferior border of the mandible with no cortical perforation. Knife edged root resorption was evident w.r.t 31, 32, and 33. Other radiographic findings revealed missing 34, 35, 36, 37, 27, 16, and 17; and carious 18, 46, 47, and 25 [Figure 2]. Mandibular occlusal radiograph revealed marked expansion of the buccal and lingual cortical plates with perforation along the lingual cortex abutting 36 and 37 region [Figure 3].

Following this, the patient was subjected for fine needle aspiration which was nonproductive.

The patient was further subjected for computed tomographic examination for enhanced evaluation of the extent of the lesion into the adjacent soft tissues. Axial slice revealed a massive expansile heterogeneous lesion in the left mandibular body, with marked expansion of the buccal and lingual cortical plates and marked destruction of cortical bone at different levels. Heterogeneous mass revealed flecks of radiopacities in its internal structure [Figure 4]. Further based on different sections, reconstructed image using spiral CT of thee patient was obtained and the destruction caused by the lesion was well-appreciated in three dimensions [Figure 5].

Based on the history, clinical and radiographic features, a provisional diagnosis of ameloblastoma w.r.t left side of the mandible was given. Various differential

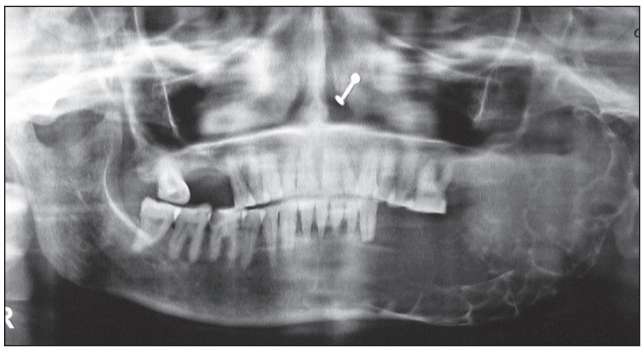

Figure 2: Orthopantomograph (OPG) with multilocular swelling on left side mandible

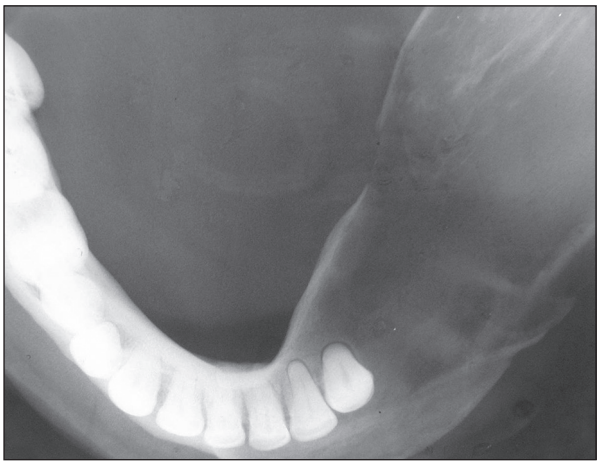

Figure 3: Occlusal radiograph revealing expansile buccal and lingual cortices and break in lingual cortex

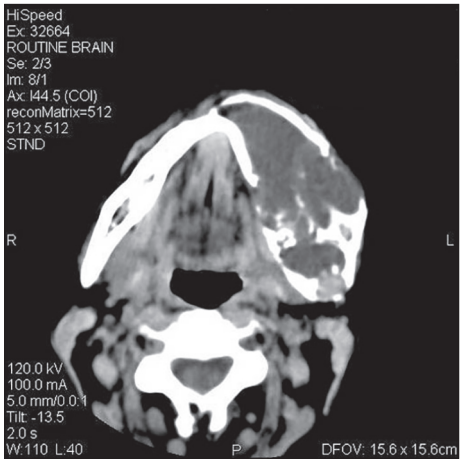

Figure 4: Axial section of computed tomography (CT) showing expansive and destructive lesion in left mandibular body

Figure 5: Reconstructed image of the patient demonstrating lesion in three dimensions

diagnoses such as keratocystic odontogenic tumor, aneurysmal bone cyst, and odontogenic myxoma were put forth.

The patient was planned for surgical resection of the left side of the mandible followed by reconstruction. Unfortunately, the patient was lost for follow-up.

Discussion

Ameloblastoma is a benign odontogenic tumor believed to originate from sources that include residual epithelium from tooth germ; epithelium of odontogenic cysts; stratified squamous epithelium; and epithelium of the enamel organ.[1] As stated by Robinson, ameloblastoma is usually unicentric, nonfunctional, intermittent in growth, anatomically benign, and clinically persistent.[9] According to Pindborg, it is a true neoplasm of enamel organ type of tissue which does not undergo differentiation to the point of enamel formation.[10]

It is most commonly encountered in the 3rd–5th decades of life, however, the lesion can be found in any age group including children.[5] Most odontogenic mandibular lesions are benign, but some may exhibit aggressive and destructive behavior locally. In addition, many of these processes are asymptomatic, particularly in their early stages, and are discovered incidentally at routine dental radiography.[11] The lesions usually progress slowly, but are locally invasive and will infiltrate through the medullary spaces and can erode cortical bone. The tumor is rarely painful, unless infected; and usually does not cause signs and symptoms of nerve involvement, even when large. If left untreated, they can resorb the cortical plate and extend into adjacent tissue.[12] Our patient was a 58-year-old female patient with an extensive swelling on the left side of the face.

Radiologically, the lesions are expansile, with thinning of the cortex in the buccal-lingual plane. According to White and Pharoah, the margin of the lesion may be classified as "well-defined" which may have a "corticated margin", "sclerotic margin", and "ill-defined". The criterion used to determine the degree of definition of the boundary of the lesion was established by Slootweg and Muller. A lesion is considered to be well-defined when its radiodensity changes markedly within a distance of 10 mm when passing from the lesion to the surrounding bone.[13]

The overall radiolucency is described as unilocular or multilocular. The lesions are classically multilocular with a "soap bubble" or "honeycomb" or resemble a caricature of spider (pattern created by the septae). Occasionally, conventional radiographs reveal unilocular radiolucency, resembling dentigerous cysts or odontogenic keratocysts.[14]

In ameloblastomas, variety of computed tomographic findings like bicortical expansion, thinning and breach in

the bony wall, and extension of the tumor into adjacent soft tissues can be seen. Axial slices are advantageous over conventional films in demonstrating the curvatures of symphysis, angle, body, ascending ramus, and visualizing changes in outer and lingual cortical plates. Coronal slices are valuable in demonstrating the extent into maxillary sinus and nasal cavity.[15] These features demonstrate the superiority of CT over conventional radiography in delineating the extent of the lesion, which may be essential to its management.

The ameloblastoma exhibits a locally aggressive behavior with a high level of recurrence. Literature describes two therapy strategies: A conservative way of treatment and radical procedures. Smaller lesions are generally treated by a less aggressive approach; whereas, larger lesions require a radical surgical tumor ablation resulting in large defects making reconstruction difficult. Recurrence rates of ameloblastoma are as high as 15-25% after radical treatment and 75-90% after conservative treatment.[15] Therefore, wide resection is usually recommended for ameloblastomas. Recent advancements in understanding the biological behaviors of ameloblastoma and the use of advanced imaging techniques like computed tomography have led to more rational surgical approaches.

Conclusion

Ameloblastoma is a benign tumor of odontogenic epithelium which is more commonly seen in the posterior region of mandible and the maxilla. About 66% of ameloblastomas occur in mandible most often in the molar ascending ramus area, while only 10% is seen in mandibular anterior area. This case highlights the importance of radiographic features in diagnosis of ameloblastoma. Computed tomography demonstrates the superiority over conventional radiography in delineating the extent of the lesion and other relations of the lesion, which may be essential to its management.

Thus, it is of utmost importance to correlate the clinical findings and radiographic features to arrive at a correct definitive diagnosis as all such lesions may have prognostically different biologic behavior and the final diagnosis may alter the therapeutic decision significantly.

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