DOI:Prefix/ojms/2023.00.000, pp(36-42)

CBCT In Imaging Radiopaque and Mixed Lesions of The Jaw

Sahar SH Kadhim[1], Ali M Jaber[2]

[1,2]Department of Dentistry, Osol Aldeen University College, Baghdad, 11001, Iraq.

Corresponding Author email: dr.saharshakir@gmail.com

Abstract

Radiolucent lesion in jawbone more than radiopaque and mixed lesion, this appears in any lesion (odontogenic, non-odontogenic). However, this group include benign and malignant bone tumor. this lesion appears rarely in crown of tooth and more than in apex tooth.

Keywords *Bone jaws, CBCT (cone beam computed tomography image), Density of bone, Lesion (tumor)*

1. Introduction

Cement blastoma is relatively uncommon tumor of cement oblasts located around or involve the apex of a tooth or teeth root or roots [1]. The cement blastoma is common occur in mandible more than in maxilla with specific site in the premolar (lower 4 and 5) or first molar (lower 6) of the mandible [1, 2]. In cone beam computed tomography (CBCT) and panoramic radiographs, the observed lesion is characterized by a distinct, circular radiopaque mass that is well defined. This mass is found to be connected either to the root or roots of the tooth or teeth, or alternatively, it may be related to the apical or lateral region of the root. According to the second source, [2] Cement blastoma has the potential to merge with the root of one or more teeth, and it can also infiltrate or affect the root canal and pulp chamber of the tooth. Extraction of a tooth might potentially provide challenges [3].

Cemento-ossifying fibroma is an uncommon, non-malignant tumor mostly consisting of mineralized substances and fibrous tissue. It is often observed in individuals between the ages of 30 and 40, with a higher prevalence among females compared to males [4]. The user has provided a numerical range [5, 6]. Clinically, this condition is characterized by a painless and gradual growth that has the potential to reach significant dimensions, leading to deformity and asymmetry if not addressed. The lesion often exhibits a combination of radiopaque and radiolucent appearances on panoramic radiographs and cone beam computed tomography (CBCT) images (see Figure 1(A) and Figure 1(B)). It is less frequently observed as either purely radiolucent or radiopaque.

Cemento-ossifying fibromas often manifest as well-defined masses that cause expansion of the underlying bone. Typically, these entities have diminutive dimensions, however possess the potential to attain substantial proportions. The lesions encompass a range of odontogenic and non-odontogenic entities. This category encompasses a range of conditions, including hereditary and developmental disorders, as well as both malignant and benign primary bone tumors and metastases [7].

DOI:Prefix/ojms/2023.00.000, pp(36-42)

The majority of odontogenic radiopaque or mixed lesions primarily affect the apex of the tooth, with only occasional involvement of the crown. These lesions have the potential to induce tooth displacement and root resorption. The user's text does not provide any information or context to be rewritten in an academic manner The mandibular canal has the potential to undergo inferior displacement, whereas in cases of fibrous dysplasia, the canal may experience displacement in many directions [8, 9].

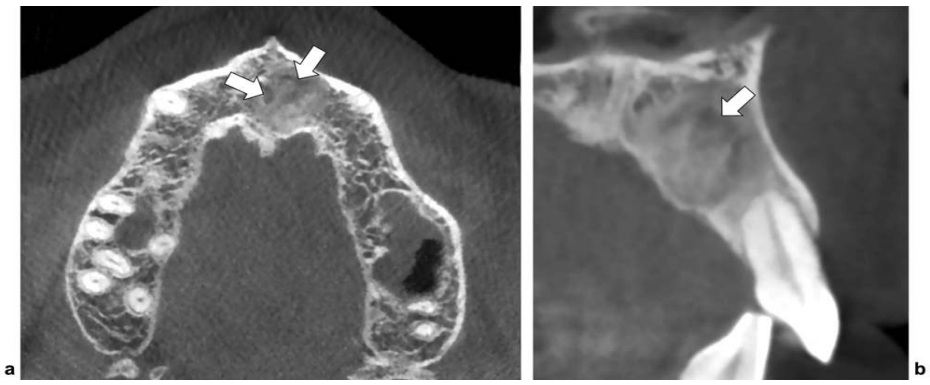

Figure 1: Cemento-ossifying fibroma of the maxilla. (A) Axial image of Cemento-ossifying fibroma and (B) sagittal image of Cemento-ossifying fibroma .... CBCT images show well details of lesion

2. Related Work

Idiopathic osteosclerosis is appear as area of increased bone production in the jaw and generally to be round, or irregular and radiopaque in shape. The accidental lesion manifests radiographically as a radiopaque zone affecting the area around the apex of the tooth or the region between the roots, often observed in the premolar or molar region. The condition primarily manifests in young individuals who do not exhibit any symptoms, and it has the potential to be present in many locations simultaneously [10].

The phenomenon under consideration can be characterized as a geographically limited condition that does not have the ability to spread, and its underlying cause remains unidentified. The lesion has acute angular edges, as shown radiographically or on cone beam computed tomography (CBCT) imaging (see Figure 2) [11]. The user's text does not contain any information to rewrite. The aforementioned lesion Similar to a compact bone mass, the studies observed that there is no discernible correlation with the dental structure [12, 13].

DOI:Prefix/ojms/2023.00.000, pp(36-42)

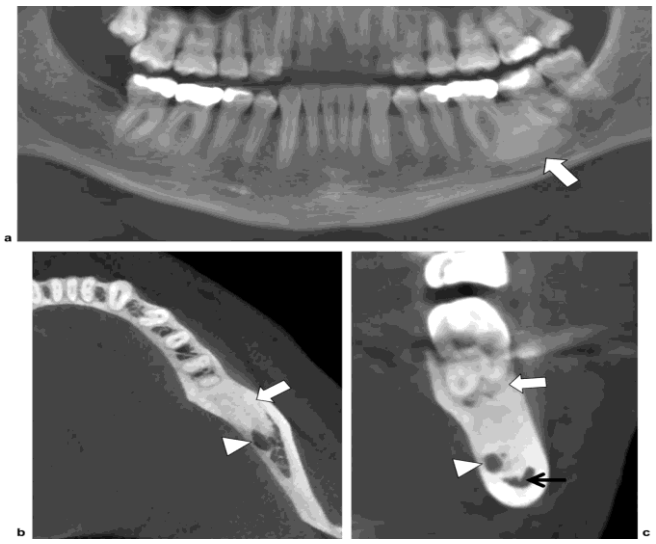

Figure. 2 Idiopathic osteosclerosis. (A) CBCT image showing a well image radiopaque lesion in the left mandible. (B) Axial image ofCBCT show the radiopaque lesion in the side left of mandible. (C) Sagittal image of CBCT Show the Idiopathic osteosclerosis lesion.

Odontomas are originat from differentiated mesenchymal cells and epithelial. The aforementioned processes lead to the development of ameloblasts and odontoblasts, which are responsible for the formation of dentin and enamel [14, 15]. The authors in [16, 17] are being referred to. Odontomas are the prevailing odontogenic neoplasm. They are most commonly observed in young adults and children. The given expression [2, 15] represents a closed interval in mathematics. There exist two distinct macroscopic classifications of odontomas. The odontoma complex exhibits a structure like that of a tooth, comprising several denticles or little teeth, akin to those found in a typical tooth.

The user provided a numerical reference without any accompanying text. The compound form, as observed by radiographic imaging, is characterized by the presence of several tiny teeth-like features that exhibit radiopacity. These structures are encompassed by a narrow radiolucent halo [18]. This is illustrated in Figure 3 (A) and Figure 3 (B). The complicated odontoma is distinguished by the presence of dental tissues arranged in a disordered pattern that deviates from the typical anatomical structure of a tooth. This anomaly manifests as a calcified mass. The complicated odontoma is characterized by an irregularly shaped and amorphous radiopaque mass, which is also encircled by a narrow radiolucent halo (see Figure 4).

The user has provided a numerical reference. The dimensions of the lesions may vary between 1 and 3 centimeters [19]. The user provided a numerical reference without any accompanying text. The posterior mandible and ramus are the most often affected areas, whereas the anterior maxilla region is the most common site for a complex odontoma [3 ,4 ,20] the Lesions may cause resorption of adjacent tooth, impaction malpositioning [1, 2, 21]. The treatment done by Surgical excision, whereas, recurrence is rare occur [1, 22].

DOI:Prefix/ojms/2023.00.000, pp(36-42)

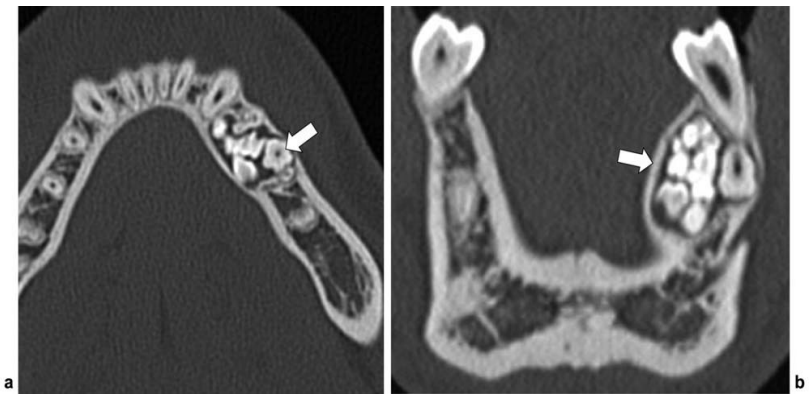

Figure3: Compound odontoma. (A) Axial image and (B) coronal CT images that show multiple small radiopaque tooth-like structures.

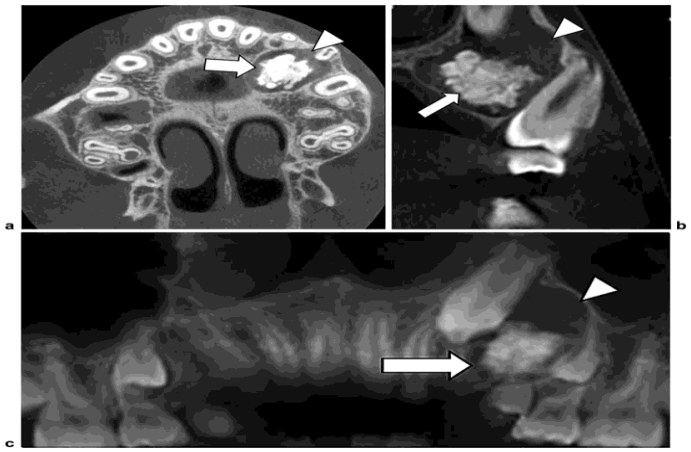

Figure 4: Complex odontoma. (A)Axial image, (B)para-sagittal CBCT images, and (C) panoramic image of the lesion show an amorphous radiopaque lesion

The odonto ameloblastoma it is now known as adenomatoid odontogenic [21, 23]. It was also noted that the location of this tumor was mostly around the tooth, especially around the crown of the tooth, in addition to that this tumor was sometimes observed that it had nothing to do with the tooth as well. It was located in the lower jaw slightly compared to the upper jaw, especially in the anterior part of the jaw. And women are more susceptible to this type of tumors compared to men and at a high rate [2, 24]. In radiography (CBCT), it appears with transparent edges containing noticeable small points similar to pieces of beads, in addition to that most teeth are exposed to this tumor, but it is primarily and common in impacted teeth.

3. Lesions That May Not Have Contact with Teeth

3.1 Osteoma

This bone tumor does not have a negative effect and does not have a prevalence rate similar to malignant tumors. This means that it is a benign tumor. It arises in the bone aggregates (spongy and compact) and in particular arises from the cranial bones in the face. We also notice noticeable distortions in the shape of the patient with this tumor, especially individuals of patients with gardner syndrome [4, 25].

3.2 Osteoblastic Metastasis

DOI:Prefix/ojms/2023.00.000, pp(36-42)

This type of tumor is not benign. Especially in people with special types of cancer, an example of which is prostate cancer. With a high rate of up to 86 percent, the back of the lower jaw(molar) is exposed to it compared to the upper jaw, [11, 26, 27] and it is not aggressive in most cases as seen in Figure 5.

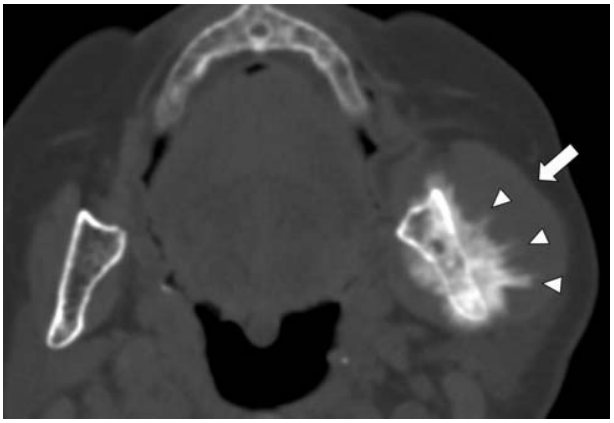

Figure5: Osteoblastic in axial CT show the lesion in the left mandible of bone

3.3 Myxofibroma

This type of dental tumor is considered an uncommon tumor, and it occurs between the ages of the twenties and thirties [15]. However, this tumor sometimes may have a strong and negative effect on the bone, causing bone erosion and tooth loss. It appears in the x-rays significantly. Its borders in the rays are often noticeable, and in a few times, it has borders that are not clear, single or bilateral as displayed in Figure 6

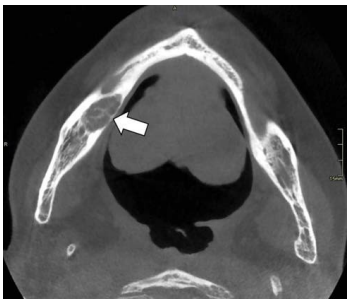

Figure 6: Odontogenic myxoma. Osteolytic lesion show in axial CBCT on the right mandible with intralesional trabeculations (honeycomb)

4. Lesions with a Specific Location

4.1 Torus Mandibularis

It arises from the opposite surface of the buccal (lingual) of the mandible. In addition, this lesion was noted to be a little unilateral (often bilateral) and differentiated in shape and size. The genial tubercles huge differentiated from torus Mandibularis, Because the first one looks like spines emerging from the lower jaw of geniohyoid [2] as shown in Figure 7.

DOI:Prefix/ojms/2023.00.000, pp(36-42)

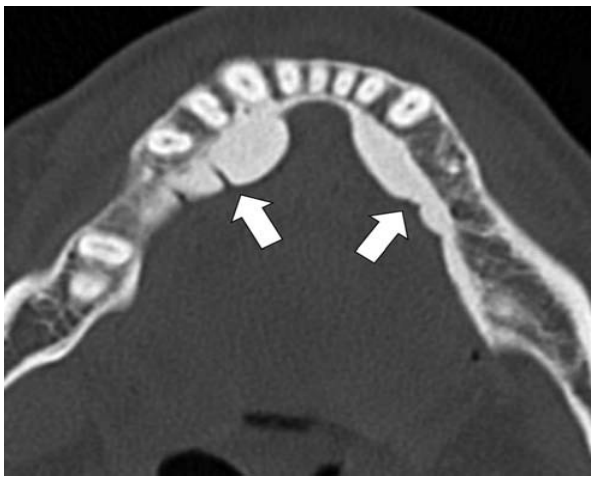

Figure. 7 Torus mandibularis. Axial reformatted dental CT image shows radiopaque

4.2 Epithelial odontogenic cyst

Keratinizing ameloblastoma (Gorlin cyst) previously known Epithelial odontogenic cyst [28]. The lesion appears in radiographs in both a transparent and opaque form, or it appears radiologically transparent, which means that this lesion does not have one specific shape [29].

5. Conclusion

It was noticed in this type of tumors and lesions that they are somewhat similar to the x-ray images, so more information was collected about the age of the injured, their gender, and all the clinical symptoms that appeared on them, in order to reach accurate results to solve the confusions in the x-ray images that are not clear.

References

[1] Dunfee BL, Sakai O, Pistey R, Gohel A. Radiologic and pathologic characteristics of benign and malignant lesions of the mandible. Radiographics 2006;26(06):1751–1768.
[2] Bernaerts A, Vanhoenacker FM, Hintjens J, et al. Tumors and tumor-like lesions of the jaw mixed and radiopaque lesions. JBR-BTR 2006;89(02):91–99.
[3] Harmon M, Arrigan M, Toner M, O'Keeffe SA. A radiological approach to benign and malignant lesions of the mandible. Clin Radiol 2015;70(04):335–350.
[4] Curé JK, Vattoth S, Shah R. Radiopaque jaw lesions: an approach to the differential diagnosis. Radiographics 2012;32(07):1909–1925.
[5] More C, Thakkar K, Asrani M. Cemento-ossifying fibroma. Indian J Dent Res 2011;22(02):352–355.
[6] Trijolet J-P, Parmentier J, Sury F, Goga D, Mejean N, Laure B. Cemento-ossifying fibroma of the mandible. Eur Ann Otorhino- laryngol Head Neck Dis 2011;128(01):30–33.
[7] Liu Y, Wang H, You M, et al. Ossifying fibromas of the jaw bone: 20 cases. Dentomaxillofac Radiol 2010;39(01):57–63.
[8] MacDonald-Jankowski DS. Ossifying fibroma: a systematic review. Dentomaxillofac Radiol 2009;38(08):495–513.
[9] Sontakke SA, Karjodkar FR, Umarji HR. Computed tomographic features of fibrous dysplasia of maxillofacial region. Imaging Sci Dent 2011;41(01):23–28.

[10] Weber AL. Imaging of cysts and odontogenic tumors of the jaw. Definition and classification. Radiol Clin North Am 1993;31(01): 101–120.

[11] Fenerty S, Shaw W, Verma R, et al. Florid cemento-osseous dysplasia: review of an uncommon fibro-osseous lesion of the jaw with impor- tant clinical implications. Skeletal Radiol 2017;46(05):581–590.

[12] Gonçalves M, Píspico R, Alves Fde A, Lugão CEB, Gonçalves A. Clinical, radiographic, biochemical and histological findings of florid cemento-osseous dysplasia and report of a case. Braz Dent J 2005;16(03):247–250.

[13] Eldaya R, Eissa O, Herrmann S, Pham J, Calle S, Ribe T. Mandibular lesions: a practical approach for diagnosis based on multimodal- ity imaging findings. Contemp Diagnost Radiol 2017;40(06):1–8.

[14] Singer SR, Mupparapu M, Rinaggio J. Clinical and radiographic features of chronic monostotic fibrous dysplasia of the mandible. J Can Dent Assoc 2004;70(08):548–552.

[15] Neyaz Z, Gadodia A, Gamanagatti S, Mukhopadhyay S. Radio- graphical approach to jaw lesions. Singapore Med J 2008;49(02): 165–176; quiz 177.

[16] de Oliveira BH, Campos V, Marçal S. Compound odontoma— diagnosis and treatment: three case reports. Pediatr Dent 2001; 23(02):151–157.

[17] Chapman MN, Nadgir RN, Akman AS, et al. Periapical lucency around the tooth: radiologic evaluation and differential diagnosis. Radiographics 2013;33(01):E15–E32.

[18] Eversole R, Su L, ElMofty S. Benign fibro-osseous lesions of the craniofacial complex. Areview. Head Neck Pathol 2008;2(03):177–202.

[19] Scholl RJ, Kellett HM, Neumann DP, Lurie AG. Cysts and cystic lesions of the mandible: clinical and radiologic-histopathologic review. Radiographics 1999;19(05):1107–1124.

[20] Gupta M, Kaste SC, Hopkins KP. Radiologic appearance of primary jaw lesions in children. Pediatr Radiol 2002;32(03):153–168.

[21] Wright JM, Soluk Tekkeşin M. Odontogenic tumors: where are we in 2017? J Istanb Univ Fac Dent 2017;51(03, Suppl 1): S10–S30.

[22] Kaneda T, Minami M, Kurabayashi T. Benign odontogenic tumors of the mandible and maxilla. Neuroimaging Clin N Am 2003;13 (03):495–507.

[23] Kaplan I, Buchner A, Calderon S, Kaffe I. Radiological and clinical features of calcifying epithelial odontogenic tumour. Dentomax- illofac Radiol 2001;30(01):22–28.

[24] More CB, Vijayvargiya R. Intraosseous calcifying epithelial odon- togenic (Pindborg) tumor: A rare entity. J Oral Maxillofac Pathol 2015;19(02):269.

[25] Garcia Garcia B, Ruiz Masera JJ, Zafra Camacho FM, Centella Gutierrez C. Intraosseous dentinogenic ghost cell tumor: Case report and treatment review. Rev Esp Cir Oral Maxilofac 2015;37 (04):243–246.

[26] Kumar G, Manjunatha B. Metastatic tumors to the jaws and oral cavity. J Oral Maxillofac Pathol 2013;17(01):71–75.

[27] Muttagi SS, Chaturvedi P, D'Cruz A, et al. Metastatic tumors to the jaw bones: retrospective analysis from an Indian tertiary referral center. Indian J Cancer 2011;48(02):234–239.

[28] 28. Uchiyama Y, Akiyama H, Murakami S, et al. Calcifying cystic odonto- genic tumour: CT imaging. Br J Radiol 2012;85(1013):548–554.

[29] Sonone A, Sabane VS, Desai R. Calcifying ghost cell odontogenic cyst: report of a case and review of literature. Case Rep Dent 2011; 2011:328743.