



## OSSIFYING FIBROMA OF MANDIBLE WITH IMAGING FINDINGS: A CASE REPORT

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### ABSTRACT

Ossifying fibroma is a benign fibro-osseous lesions of the jaws that are characterized by replacement of normal bone by fibrous tissue containing a newly formed mineralized product. It generally manifests in third to fourth decade of life with female predilection and mandibular premolar-molar region being the most common site of occurrence. It usually presents as a single, painless, slow growing, spherical or ovoid swelling, causing significant facial asymmetry. Radio graphically; the features of ossifying fibroma may vary markedly from an initial radiolucent lesion to mixed and sclerotic type, depending on the amount of mineralized tissue within the tumor. The wide spectrum of radiographic presentations makes clinical diagnosis difficult on initial presentation. Here, we report an unusual radiographic presentation of an ossifying fibroma of mandible in a 14-year-old boy.

## INTRODUCTION

### Case Report

A fourteen year-old boy reported to our department with a swelling in the lower left side of his face since one year. The swelling was initially smaller in size and had gradually increased to attain the present size, without any associated symptoms. There was no history of trauma or any other surgical intervention in the past. The patient's medical and family histories were non-contributory. General physical examination revealed that the patient was undernourished and poorly built. Examination revealed gross facial asymmetry caused due to the presence of a well defined, smooth-surfaced swelling, measuring approximately 3 × 2 cm in dimension, extending from left mandibular body to angle region (Figure 1a, b). Palpatory findings revealed that swelling was uniformly hard in consistency, non-tender, not adherent to the overlying skin.



Figure 1 Extra oral swelling in left lower border of mandible Extending to submandibular region.

Intraoral examination revealed no evidence of lesion with no mobility or displacement of the teeth in the associated region. However there was dental caries irt 26,36 and dental caries with pulpal involvement irt 46, erupting 48 and crowding in relation to lower anterior with retained 63 (Figure 2). With these clinical findings patient was further evaluated with an initial Intra-Oral Periapical Radiograph in relation to 36, 37 region which revealed intact lamina dura with no periapical changes.



Figure 2 Intraoral view

Panoramic view showed a well-defined, mixed radiopaque-radiolucent lesion in the left body of mandible sparing the angle, measuring approximately 1.5cm in greatest dimension, roughly circular in shape. The lower border of mandible appears indented, with "double -cortex", the lower layer of which is continuous with lower border of mandible. However, the thickness of each of these is reduced (Figure 3).

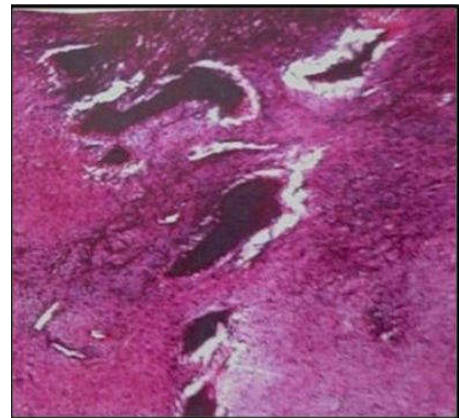


**Figure 3** Orthopantomograph showing mixed radiolucent-radiopaque lesion in left mandibular body region with multiple Flecks of calcification

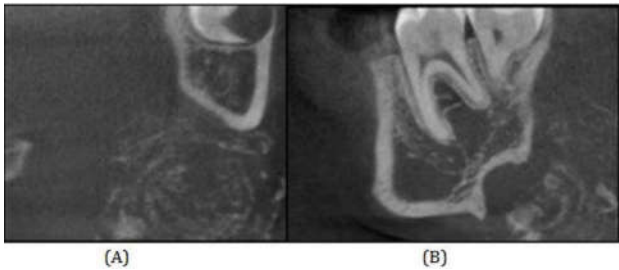


**Figure 6** Excised surgical specimen measuring approximately 4x 2 cms in dimension.

A Cone Beam Computed Tomography (CBCT) and 3D reconstruction of the same region was done. Axial section showed multiple radiopaque foci of calcification of varying dimensions, with radiodensity similar to that of bone arranged in concentric ring like pattern with outermost ring of approximately 1.5 cm in greatest dimension suggesting centrifugal growth pattern. There was no evidence of buccal or lingual cortical plate expansion (Figure 4a). Sagittal section showed concentric ring of multiple radiopaque flecks corresponding to the scooped out lower border of mandible. The lamina dura of the teeth in the associated region appears to be intact without any periapical changes. (Figure 4b).



**Figure 7** Photomicrograph showing fragments of thick bony trabeculae surrounded by proliferating fibroblasts. These cells show bland appearing nucleus with moderate amount of eosinophilic cytoplasm suggestive of ossifying fibroma.

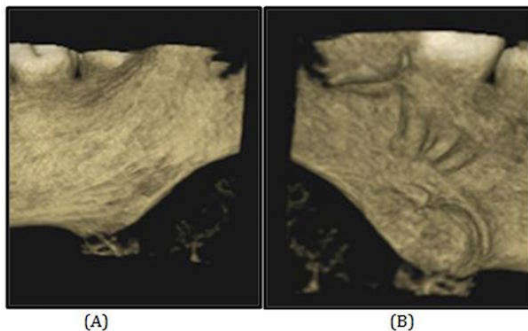


**Figure 4** (A) Axial view (B) Saggital view of CBCT showing Radiopaque flecks arranged in concentric ring like pattern.

3D Reconstruction of CBCT images showed lesion involving lingual aspect of body of mandible, below the inferior alveolar canal and is surrounded in its periphery by multiple radiopacities. The lower border of the mandible appears smooth and indented (Figure 5).



**Figure 8** Postoperative Orthopantomograph of patient after 1 month.



**Figure 5** 3D Reconstructed images showing buccal (A) and lingual (B) aspect of body of mandible with multiple foci of calcifications

Radiographic diagnosis of ossifying fibroma and radiographic differential diagnosis of cemento-ossifying fibroma, osteoblastoma, and cement oblastoma was established. With these characteristic findings, patient was subjected to incisional biopsy after routine blood investigations that gave an impression of ossifying fibroma. The patient was managed surgically by resection of the lesion. The patient is reviewed regularly and is on a follow-up of one year.



**Figure 9** Postoperative picture of patient after 1 month.

## DISCUSSION

Ossifying fibroma (OF) is a slow growing benign fibro-osseous tumor that manifests as a painless swelling of the involved bone along with functional alterations and cosmetic deformities. According to World Health Organization (WHO) classification 1992, ossifying fibroma is well demarcated or rarely encapsulated neoplasm consisting of fibrous tissue containing varying amount of mineralized material resembling bone or cementum [1]. In literature it is known by a variety of other terms such as fibro osteomas, osteofibroma [2].

### Etiology & Demographics

OF generally manifests in the third or fourth decades of life with female predilection and the male to female ratio are around 1:5 [3,4,5,6]. It is found predominantly in the mandible (75%) but can also arise in the skull base and paranasal sinuses [7]. It is proposed to be derived from multipotential mesenchymal cells of the periodontal ligament, which are able to form cementum, bone and fibrous tissue [8]. Although the precise pathogenesis is still unknown, Wenig *et al.* has suggested that trauma-induced stimulation may play a role [5].

### Imaging Findings

Imaging characteristics of ossifying fibroma are highly variable and depend on stage of development and amount of calcification. It is characterized by three stages. Stage I (initial stage) appears as a well-defined radiolucency, with no evidence of internal calcification. Stage II (mixed stage) is characterized by flecks of radiopacities in the radiolucent area. Stage III (mature stage) is a completely radiopaque mass [9]. Three-dimensional radiographic characteristics of ossifying fibromas have been described majorly based on Computed Tomographic (CT) scans: Ponniah *et al.* reported osteolytic, soft-tissue density lesion with thinning and erosion of the buccal cortex in the anterior region of the mandible, whereas presentation similar to stage II of OF was described by Popli *et al.* as a mixed-density, expansile lesions at the alveolar process of both the maxillae, walled by irregularly thick sclerotic border [10,11]. Kiran Desai *et al.* highlighted the appearance of OF as diffuse radiolucency with internal punctate calcifications [12]. Stage III presentations were reported in CT by Agarwal *et al.* who reported hyper attenuated masses in left maxillary and right mandibular alveolar ridges in coronal and axial sections of CT [13]. Although CBCT is an emerging technology and is increasingly being used to evaluate the interior and margins of bone tumors, still there is scarcity in literature on CBCT imaging in OF [14,15]. However case reported by Brugger *et al.* shows well-defined, unilocular, round, radiolucent structure, comparable to frosted glass, with a sclerotic border, while a mixed, bilocular, well-defined lesion with dense, amorphous and odontome-like calcifications with radiolucent rim around the lesion was reported by Imanimoghaddam *et al.* [16,17]. Findings in CBCT also correlate with CT findings mentioned by various authors in different stages of ossifying fibroma. Hence, CBCT can be effectively used as a dose-sparing technique compared CT scans for imaging of oral and maxillofacial lesions.

The radiographic presentation, which was observed in this case corresponds to stage II with centrifugal pattern of growth having multiple radiopaque foci adjacent to the indented lower border of mandible. This kind of presentation of OF on CBCT has not been reported in the literature so far. Also there was no expansion at the buccal and/or lingual cortical plates that is the

most frequent clinical sign of ossifying fibroma as reported by Eversole *et al.*, Mintz S, Sciubba JJ *et al.* [18,19,20]. Also, there was no displacement of teeth or root resorption in the associated region.

### Differential Diagnosis

The differential diagnosis of ossifying fibroma includes fibro-osseous lesions namely fibrous dysplasia, focal osseous dysplasia (FOD), cementoblastoma, osteoblastoma and cemento-ossifying fibroma. Radiographically, fibrous dysplasia usually appears as a diffuse, homogeneous ground-glass, radiodense region, whereas FOD presents with ill-defined radiographic borders in contrast to a well-demarcated mixed radiolucent and radiopaque image of OF [21]. Cementoblastoma is fused to the roots of involved tooth [21]. Osteoblastoma often have a radiolucent rim at periphery indicating that tumor is more mature in central region where there is evidence of abnormal bone. It is important to distinguish OF from the cemento-ossifying fibroma, which is a benign jaw lesion of odontogenic origin with a thin radiolucent line representing fibrous capsule separating it from the surrounding bone [22]. Microscopically, the cemento-ossifying fibroma consists of fibroma with dense cellularity and small spherical calcifications - 'cementicles' [21].

### Treatment & Prognosis

The treatment depends on the size of the lesion and can range from curettage or enucleation for small lesions to radical surgical resection for the larger ones [24]. In lesions with a fibrous capsule around, the surgical excision may be performed more easily. Radiotherapy is contraindicated primarily because these lesions are benign and radioresistant and because of the possibility of subsequent malignant bone formation [25]. Recurrences are rarely observed.

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