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Extensive Ossifying fibroma of the left mandible- A case report with Clinical, Radiographical and Histopathological diagnosis.

[1]Arjit Vihan,[2]Rajendragouda Patil,[3]Ambika Murari,[4]Deeksha Gahlot,[5]Aamir Khan,[6]Aparna Mishra

[1,3,6]Post graduate student, Department of Oral Medicine and Radiology, Kothiwal dental college and Research Centre, Moradabad
[2]Professor and Head, Department of Oral Medicine and Radiology, Kothiwal dental college and Research Centre, Moradabad
[4]Senior Lecturer, Department of Oral Medicine and Radiology, Kothiwal dental college and Research Centre, Moradabad
[5]Post graduate student, Department of Oral and maxillofacial Surgery, Kothiwal dental college and Research Centre, Moradabad
E-Mail Id- Arjitvihan@gmail.com
Correspondence Author: Arjit Vihan, Department of Oral medicine and Radiology, Kothiwal dental college and Research Centre, Moradabad
Contact No: 8191974974
E-Mail Id: Arjitvihan@gmail.com
Conflicts of Interest: Nil

ABSTRACT-
OBJECTIVE: This case report of Ossifying fibroma (OF), It comprises a non-cancerous fibro-osseous lesion marked by gradual growth and the development of fibrous cellular tissue, bone, cement, or a mixture thereof. This article includes clinical findings, Radhiographical and histological investigations along with the treatment.
CASE REPORT: A 42 year old male patient reported with a swelling in the lower left back tooth region. He primarily reported worsening facial deformity, pain, and difficulty with opening her mouth. His Medical, Dental and family history was non- contributory. The patient was further sent for an occlusal radiograph, panoramic radiograph and computed tomography in order to better document the case. An incisional biopsy was performed in which the histopathological diagnosis was made as Ossifying Fibroma. Complete excision of the lesion was done and the excised specimen was further sent for biopsy which confirmed the case to be of ossifying fibroma.
CONCLUSION: OF is a non-cancerous fibro-osseous tumor typically found in the craniofacial bones, frequently affecting the jaws, particularly the mandible. The diagnosis relies on a combination of clinical assessment, radiographic findings, and histological criteria. Conservative treatment is a viable option that lowers morbidity and streamlines postoperative recovery. It is crucial to emphasize the importance of conducting a comprehensive assessment of these patients. Instead of solely addressing their primary complaints, a thorough clinical examination should be conducted, with a keen awareness of deviations from normal and particularly pathological changes. This approach ensures accurate diagnosis of the patients' conditions and the formulation of suitable treatment plans.

KEYWORDS- *Ossifying fibroma; Fibro-osseous lesions; Panoramic; Tomography*

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I. INTRODUCTION

Fibro-osseous lesions (FOL) affecting the jaw bones encompass conditions such as fibrous dysplasia, ossifying fibroma (OF), florid osseous dysplasia, cemento-ossifying fibroma (COF), and focal osseous dysplasia[1].

Ossifying fibroma (OF) is the most prevalent fibro-osseous tumor characterized by its slow growth, encapsulation, and benign nature. It consists of different proportions of bone or cementum-like tissue within a fibrous stroma that is clearly delineated from surrounding normal bone tissue[2]. This non-cancerous fibro-osseous tumor is typically located in the mandibular molar/premolar area and primarily occurs in individuals aged between the third and fourth decades of life, with a higher incidence among women than men[3]. OF is composed

of fibrous tissue within the bone, showing varying levels of cellularity and containing mineralized components. It presents as a clearly defined lesion that may or may not be encapsulated by fibrous tissue[4,5]. While the exact cell of origin remains unidentified, ossifying fibroma is thought to originate from multipotent mesenchymal cells within the periodontal ligament space[6]. OF typically manifests as solitary lesions and rarely presents as multiple lesions[1].

On radiographs, these lesions appear well-defined and typically unilocular. Most exhibit a mixed radiolucency and opacity, with some showing a sclerotic border and potential root divergence. Histologically, these lesions are often not encapsulated but are clearly delineated from surrounding bone. Therefore, radiographic, surgical, and histological findings collectively aid in distinguishing ossifying fibroma (OF) from other benign fibro-osseous lesions like fibrous dysplasia and cemento-osseous dysplasia.

OF can grow to considerable sizes, leading to both aesthetic concerns and functional impairments. Here, we discuss the clinical and radiological characteristics, histopathological findings, and surgical treatment of a rare case involving massive synchronous OF in the mandible.

II. CASE REPORT

A 42 year old male patient presented with a complaint of of swelling in left side of the face since 10 years. On further questioning the patient revealed that he underwent a trauma 11 years back when he was hit by a cricket ball in the lower 3rd of the face after which a swelling was developed over that region which was slow growing and painless initially. The swelling gradually increased over the years to attain to the present size. Patient also gave a history of experiencing dull aching pain since past 6 months. Pain was mild in intensity, gradual in onset and intermittent in nature. Pain aggravates on chewing hard food stuff and relives on taking medication. His medical history was non-contributory while his dental history revealed that he underwent extraction 4 years back in left upper and lower back tooth region which were not traumatic and was uneventful. His personal history revealed that he had a habit of smoking Bidi since last 20 years and consumes 4-6 Bidi per day. Patient also gave a habit of chewing pan masala with tobacco since last 5 years and consumes 4 packets per day. The family history of the patient was non-contributory.

On clinical examination, extra-orally, facial asymmetry was seen on the left side of the face due to a diffused swelling of size approx. 5*4 cm in diameter extending superio-inferiorly from 2cm below the zygomatic buttress till the inferior border of mandible. Mesio-laterally the swelling was seen 1 cm prior (posterior) from the left corner of mouth till the angle of mandible. The overlying and surrounding mucosa appeared normal (fig. 1 and).

On extraoral palpation the swelling was non-tender, firm to hard in consistency, non-compressible, non- fluctuant, non- reducible and fixed to the underlying structures.

Intra-orally, the swelling can be appreciated on the left lower back tooth region of size approx. 4*3 cm in diameter extending mesio-laterally from the lingual cortical plate involving the buccal cortical giving a bucco-cortical expansion (fig. 2).

On intra-oral palpation, the swelling was non-tender with irregular surface texture, non-compressible, non- fluctuant and non- reducible.

The submandibular lymph nodes were non-tender, enlarged, firm in consistency and non-mobile to underlying structure of left submandibular region.

Based on the history and clinical findings the provisional diagnosis was made as Ameloblastoma irt left mandible and the differential diagnosis considered were Ossifying Fibroma, Radicular Cyst, Odontogenic Keratocyst.

The patient was further sent for radiographical investigations, the occlusal radiograph of the patient revealed bucco cortical expansion in left body of the mandible with mixed radiolucent- radiopaque lesions. The surrounding bone shows few areas of increased density giving a cotton wool appearance (fig. 3).

The OPG of the patient revealed a mixed radiopaque lesions on the left body of the mandible surrounded by thick corticated scalloped margins. The internal structure appeared to be radiolucent with some areas of increased density i.e. radiopaque thick septaes and the surrounding structures showed change in the trabeculations pattern and there was mesio-lateral expansion of ramus with hazy trabeculations giving a cotton wool like appearance (fig. 4).

The patient was further sent for a computed tomography of the face which revealed that there was well defined expansile lytic lesion in the body and angle of mandible measuring approx. about 4*4*5 cm and shows thin irregular margins along the lateral aspect. The lesion is closely abutting the left inferior alveolar canal. Mild overlying soft tissue selling was seen (fig. 5).

Hence, the radiological findings were suggestive of a fibro-osseous lesion.

The patient was further sent for routine blood, T3, T4 and TSH hormone investigations which were under normal limits (fig 6).

An incisional biopsy was performed which revealed fibro cellular connective tissue stroma entrapped with areas of ossification. Ossified areas are in the form of irregular bony trabeculae, osteocytes in lacunae and osteoblastic rimming also present in some areas. Hence, the histological findings were suggestive of Ossifying Fibroma.

The patient underwent a planned surgical procedure with general anesthesia and nasotracheal intubation. Complete surgical removal with curettage and surgical excision was performed (fig. 7) and the specimen excised was further sent for a biopsy which revealed the similar findings as seen in the incisional biopsy and the final diagnosis was confirmed as Ossifying fibroma (fig. 8). Radiographs were taken for postoperative follow-up (fig. 9). The patient underwent postoperative monitoring for one year, with no signs of recurrence detected.

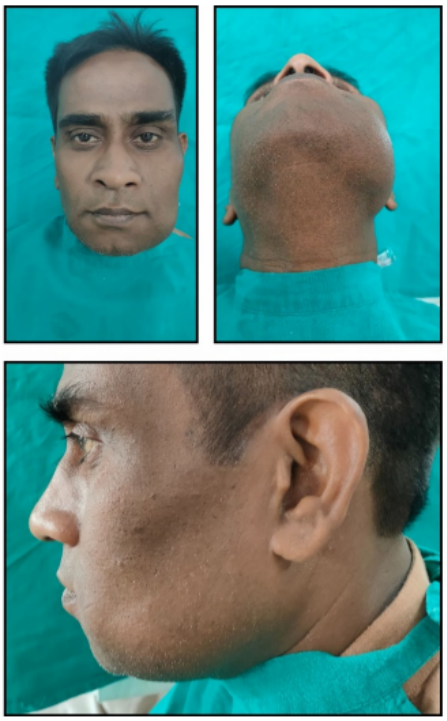

Figure 1- Extra-oral clinical pictures

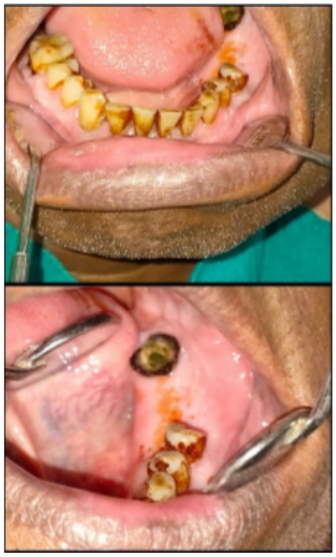

Figure 2- Intra-oral clinical pictures

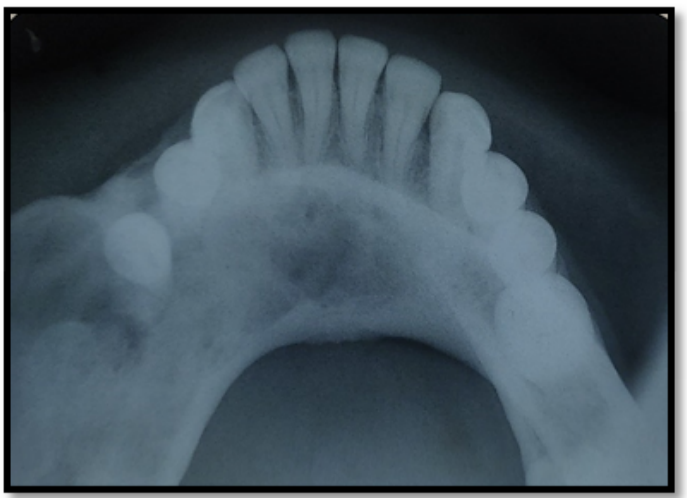

Figure 3- Occlusal Radiograph

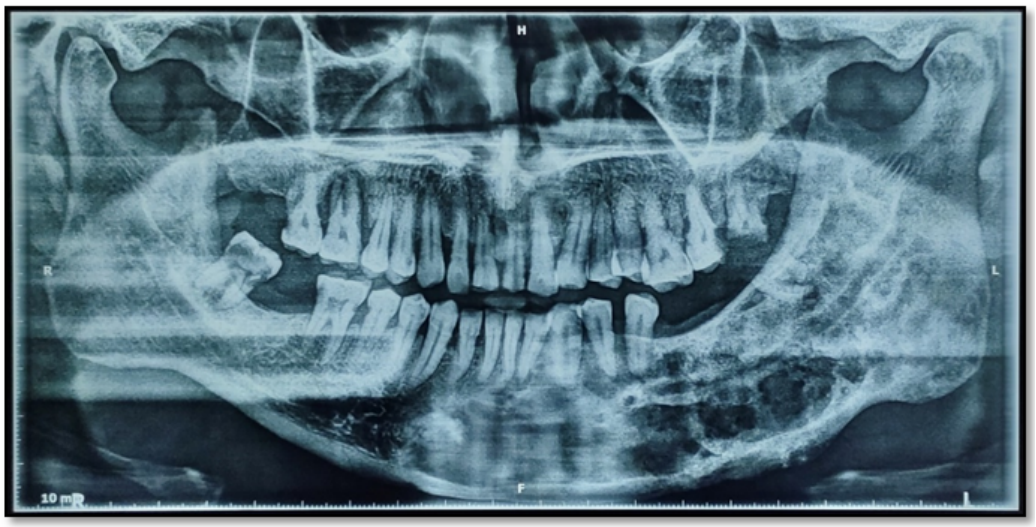

Figure 4- OPG of the patient pre-op

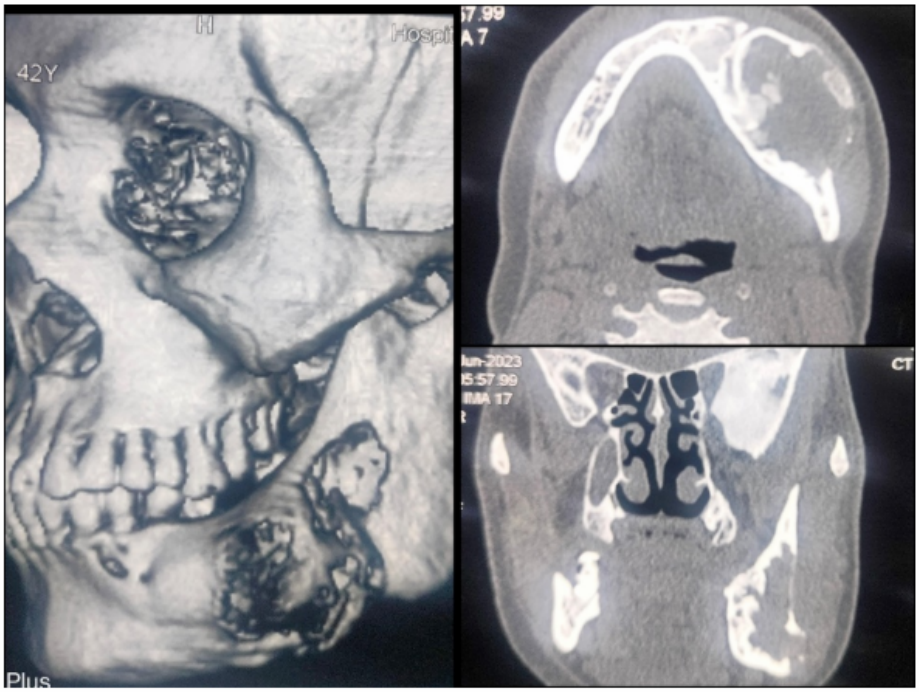

Figure 5- Pre-op CT of the patient in different views.

HAEMATOLOGY

COMPLETE BLOOD COUNT (CBC)			
HAEMOGLOBIN	15.3	12.0-18.0	gm/dl
TOTAL LEUCOCYTE COUNT	9600	4000-11000	/cumm
DIFFERENTIAL LEUCOCYTE COUNT(DLC)			
Segmented Neutrophils	60	40-75	%
Lymphocytes	31	20-45	%
Eosinophils	06	01-06	%
Monocytes	03	01-10	%
TOTAL R.B.C. COUNT	5.13	3.5-6.5	million/cumm
P.C.V./ Haematocrit value	43.9	35-54	%
M C V	85.5	76-96	fL
M C H	29.8	27.00-32.00	pg
M C H C	**34.8**	30.50-34.50	g/dl
RDW	12.5	11.0-16.0	%
PLATELET COUNT	2.19	1.50 - 4.50	lacs/mm3
MPV	8.3	6.5-12.0	fl
PDW	10.9	9.0-17.0	fl
PCT	0.180	0.130-0.280	%

HORMONE

Triiodothyronine (T3)	1.46	0.2-2.0	ng/ml
Thyroxine (T4)	8.63	5.1-14.1	ug/dl
THYROID STIMULATING HORMONE [TSH.]	1.56	0.25-5.00	uIU/mL

****End of Report****

Figure 6- Routine blood, T3, T4 and TSH hormone investigations.

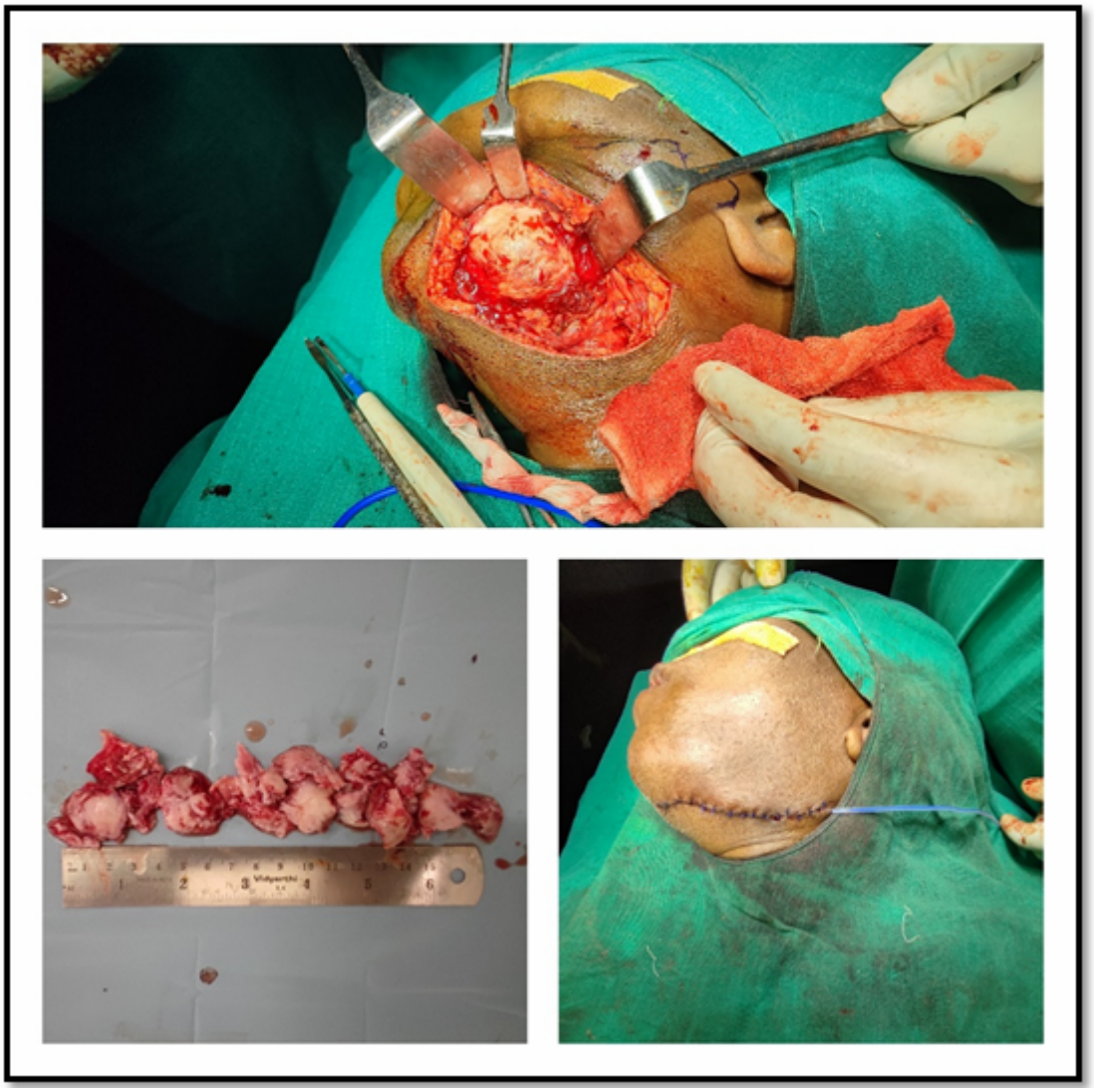

Figure 7- Surgical pictures showing complete excision of the lesion.

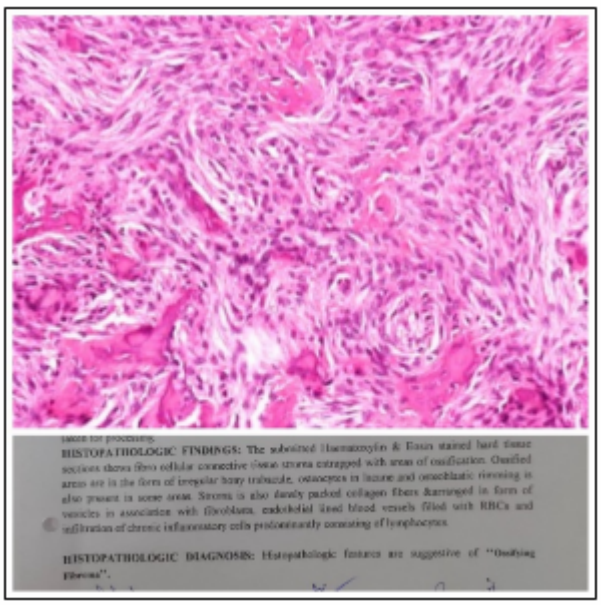

Figure 8- Histopathologic findings along with the final diagnosis report.

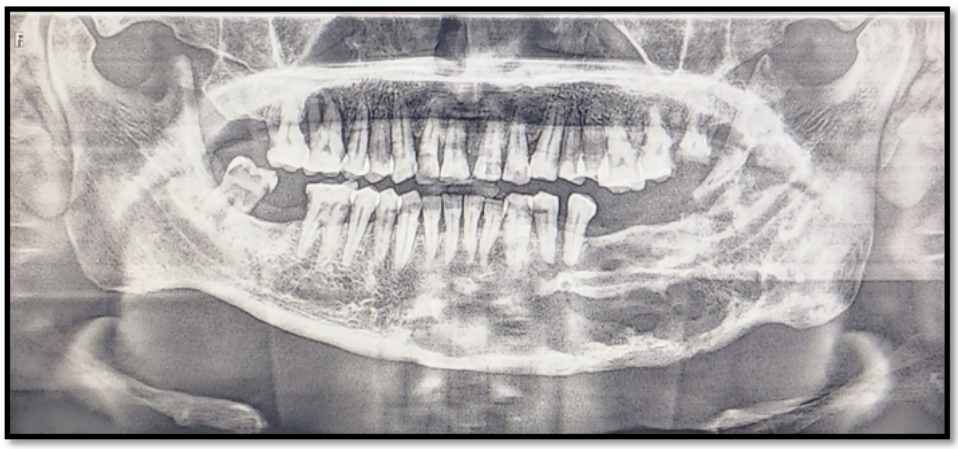

Figure 8- Post-op OPG of the patient.

III. DISCUSSION

Ossifying fibroma (OF) is a benign fibro-osseous neoplasm found in the jaws, characterized by slow growth and notable potential for enlargement. It consists of fibrous tissue along with a combination of bone trabeculae and spherules resembling cementum[7,8]. The condition involves a process where normal bone is substituted with fibroblasts and collagen fibers that contain varying quantities of mineralized material[5].

In the 4th Edition of the World Health Organization Classification of Head and Neck tumors, odontogenic and maxillofacial bone tumors categorize ossifying fibroma within the group of fibro and chondro-osseous lesions. This group includes other conditions such as familial gigantiform cementoma, fibrous dysplasia, cemento-osseous dysplasia, and osteochondroma[9]. There are three recognized variants of ossifying fibroma: cemento-ossifying fibroma (COF), juvenile trabecular ossifying fibroma (JTOF), and juvenile psammomatoid ossifying fibroma (JPOF). COF originates from odontogenic tissues, grows slowly, and predominantly affects the posterior mandible, occasionally involving the maxilla, with a higher incidence in females[10]. Juvenile psammomatoid ossifying fibroma (JPOF) is uncommon and typically occurs in individuals aged between 16 to 33 years. It primarily affects the extragnathic areas of the craniofacial bones, with a higher incidence observed in the orbit and ethmoid regions[11]. JPOF, which tends to be more aggressive, appears with a clearly defined border showing a mixture of radiopaque and radiolucent areas. Treatment for both JTOF and JPOF typically involves complete surgical removal, although the recurrence rate is higher compared to COF. Seventy percent of ossifying fibromas involve the mandible, while 22% are located in the molar region of the maxilla, ethmoid, orbital regions, and occasionally the petrous bone[1].

In the past, lesions were named based on the type of calcified tissue they contained, categorized as ossifying fibroma, cementifying fibroma, or cemento-ossifying fibroma depending on whether they contained bone tissue, cementum-like tissue, or a mixture of both. Presently, all these types are collectively referred to as OF, regardless of the specific composition of calcified material within the lesion. Some experts even regard cementum-like material as simply a variation of bone tissue[7]. Some authors acknowledge that while this lesion typically occurs in the jaws, similar lesions with microscopic features identical to those with cementum-like differentiation have also been reported in long bones. These neoplasms have been observed in various other locations such as the orbit, frontal bone, zygomatic bone, ethmoid bone, sphenoid bone, temporal bone, and tibia[4].

OF typically presents as a well-defined lesion, facilitating relatively straightforward separation from the surrounding bone. Small lesions are seldom symptomatic and are often diagnosed solely through radiographic examination. As they grow larger, OF can cause painless enlargement of the affected bone, potentially resulting in facial asymmetry. However, local pain and numbness are uncommon symptoms[4,5]. In numerous instances, OF is detected during routine dental radiography. Early clinical signs often include cosmetic concerns and complaints related to malocclusion, while facial swelling or asymmetry is the initial symptom observed in 66% of cases. OF manifests with buccolingual expansion of the mandible in 84% of cases. When the tumor affects the maxilla, the maxillary sinus is involved in 90% of cases[5,12]. Most OFs exhibit slow growth, typically maintaining intact cortical plates of the bone and overlying mucosa due to this gradual progression. However, instances of cortical plate perforation have been documented in this type of tumor. Lesion size can vary widely, ranging from 0.2 to 15 cm^3.

OF can lead to root divergence and occasionally even resorption of teeth adjacent to the lesion. In cases where it affects the mandible, it frequently causes a distinctive downward displacement of the lower border of

the mandible[12,13]. Tooth displacement and root resorption are frequently observed, with heightened tooth displacement often regarded as an early indicator. Root divergence occurs in about 17% of cases, and the occurrence of root resorption varies between 11% and 44%[3].

On radiographs, OF appears as a well-defined unilocular lesion, typically with a sclerotic border, and it usually does not perforate the buccal cortical plate[1]. A multilocular appearance can sometimes be observed, characterized by radiolucent areas with scattered radiopaque foci[13]. However, according to some studies, OF most commonly presents as completely radiolucent lesions in 53% of cases, compared to radiolucent areas with scattered radiopaque foci in 40% of cases[5,13].

While OF can appear completely radiolucent, typically there are indications of varying degrees of radiopacity, which depend on the type and quantity of calcified material formed within the tumor. Lesions that are highly radiopaque with only a thin peripheral radiolucent rim are rare; such characteristics are more commonly associated with the advanced stage of focal cemento-osseous dysplasia[3]. The differential diagnosis of OF is primarily fibrous dysplasia due to shared clinical, radiographic, and histopathological features[1]. The distinct clinical and radiographic characteristics of ossifying fibroma (OF), along with the ease of distinguishing the tumor from normal bone, are key features that differentiate it from fibrous dysplasia. Alongside fibrous dysplasia, the differential diagnosis should encompass focal cemento-osseous dysplasia, periapical cemento-osseous dysplasia, osteoblastoma, desmoplastic fibroma, cementoblastoma, and osteoid osteoma[5].

Histologically, ossifying fibroma (OF) exhibits a relatively avascular fibrous stroma containing spindle-shaped cells interspersed with bone trabeculae and spherical calcifications resembling cement-like structures. Multinucleated giant cells may also be observed. The calcified material consists of irregularly shaped trabeculae of woven bone, scattered trabeculae of lamellar bone, and deposits of basophilic-staining round or oval calcified masses. These calcifications can be cellular or acellular and have been likened to cementum, or they may exhibit a combination of these features[6].

Broadly, there are three treatment approaches available: enucleation, curettage, and surgical resection. Enucleation is suitable for small, clearly defined lesions. Curettage is recommended for relatively large lesions with well-defined borders that do not involve the mandibular basal bone or perforate the cortical plate. Surgical resection, on the other hand, is necessary for aggressive cases characterized by rapid growth, involvement of the basal bone, or perforation of the cortical plate[5,14]. Typically, enucleation and curettage are initially considered, followed by partial or en bloc resection as necessary to minimize the risk of recurrence[13].

The prognosis for OF is generally good, with rare occurrences of recurrence and no evidence of malignant transformation. Nevertheless, certain authors advocate for radical resection due to the tendency for recurrence and the potential risk of malignant transformation. Reports indicate that as many as 12% of cases have experienced recurrence or reactivation, underscoring the importance of prolonged clinical and radiographic monitoring[3].

IV. CONCLUSION

Ossifying fibroma (OF) is a benign fibro-osseous tumor commonly found in the craniofacial bones, particularly the jaws, often affecting the mandible. Diagnosis typically involves a combination of clinical examination, radiographic imaging, and histological analysis. Radiographically, OF typically presents as a well-defined mixed lesion, characterized by a radiolucent area with clearly defined margins containing scattered radiopaque foci. It is widely agreed upon that early detection and ongoing monitoring of this tumor type are crucial for achieving a favorable prognosis. Additionally, it is important to distinguish it from other conditions, particularly fibrous dysplasia, before determining the best course of action for each individual case. Conservative treatment stands out as an effective choice that minimizes complications and streamlines recovery after surgery.

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