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# Fibro-osseous lesions of head and neck – A Histopathological study.

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***Abstract:****Fibro -osseous lesions represent a varied group of entities in which the normal bone is replaced by cellular fibrous tissue containing mineralized foci that may vary in amount and appearance. These lesions predominantly affects the jaw and craniofacial bone. This is a retrospective study of 15 cases from June 2015 to May 2017 over a period of 24 months. Variables examined include clinical details, radiographic findings and histological examination by H & E stain.Most of the lesions were ossifying fibroma followed by fibrous dysplasia. The mean age of presentation is 30 years with slight female predominance. Osseous lesions show considerable overlapping in the clinical, radiological and histological features. So athorough knowledge of these lesions is mandatory for interpretation and appropriate diagnosis.*
***Key words :****fibro - osseous lesions, ossifying fibroma, fibrous dysplasia.*

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## I. Introduction

Fibro-osseous lesions (FOL) are a generic group of lesions which are known to affect the jaws and craniofacial bones.These disorders range from inflammatory to neoplastic lesions, that microscopically exhibit a connective tissue matrix with islands or trabeculae of bone.FOLs are characterized by the replacement of bone by a benign connective tissue matrix (1).The matrix displays foci of mineralization that vary in amount and appearance in the form of woven bone or of cementum like round acellular intensely basophilic structures.The concept of fibro-osseous lesions has evolved over the last several decades.There is still ongoing controversies on whether they are malformations, hamartomatous lesions or neoplasms.The most up to date classification was published by the WHO in 2005 (2)(table 1). A much more comprehensive classification has been suggested by Eversole et al in 2008(6)(table2) and this suggests that the classification of these diseases is likely to evolve still further(16) .The present study mainly targets the clinical, radiological, histological features of fibro-osseous lesions of craniofacial complex and to review with the current literature.

**Table1.WHO Classification of fibro osseous lesions2005 (2).**

| |
|---|
| Ossifying fibroma |
| Fibrous dysplasia |
| Osseous dysplasia |
| Central giant cell lesion (granuloma) |
| Cherubism |
| Aneurysmal Bone Cyst |
| Simple Bone Cyst |

**Table 2. Eversole 2008 classification of fibro – osseous lesions(6).**

| |
|---|
| • Bone dysplasia's<br>Fibrous dysplasia<br>-- Monostotic<br>-- Polyostotic<br>-- Polyostotic with endocrinopathy (McCune Albright)<br>Osteitis deformans<br>Pagetoid heritable bone diseases of childhood Segmental odontomaxillary dysplasia |
| • Cemento-osseous dysplasia's<br>-- Focal cemento-osseous dysplasia<br>-- Florid cemento-osseous dysplasia |
| • Inflammatory/reactive processes<br>--Focal sclerosing osteomyelitis<br>--Diffuse sclerosing osteomyelitis<br>--Proliferative periostitis |
| • Metabolic bone disease: hyperparathyroidism |

- Neoplastic lesions (ossifying fibromas)

Ossifying fibroma NOS
Juvenile ossifying fibroma
-- Trabecular type
-- Psammomatoid type
Gigantiform cementoma

## II. Methodology

A total of 38 cases of osseous lesions were recorded over a period of 2years from June 2015 to May 2017.Among these 15 cases are fibro-osseous lesions of head and neck.Histologically diagnosed cases of fibro-osseous lesions of craniofacial skeleton along with clinical, radiological data at tertiary hospital were included in the study.

## III. Results

A total of 15 cases of fibro-osseous lesions were recorded over a period of 2 years. Most of the lesions were ossifying fibroma (7 cases)(46.6%),followed by fibrous dysplasia (6 cases)(40%)with one case of central giant cell granuloma and one case of peripheral giant cell granuloma. Table 3. shows fibro – osseous lesions included in the study.The average age of presentation was 30years and most commonly seen in females(58%) as compared males(42%). Figure 1. shows the age distribution of fibro – osseous lesions.The male to female ratio was 2:3 with slight female predominance. Figure 2. shows the gender distribution of FOLs.Most of the patients complained of slow growing swelling of the jaws and facial asymmetry,one case of fibrous dysplasia with ABC formation, 2 cases of Giant cell granuloma were associated with destruction of underlying bone.

In the present study majority of the FOLs were involving the maxilla (7 cases), followed by nose ,paranasal sinus (5 cases) and mandible (3cases). Figure 3. shows the site predilection of FOLs. Radiologically 11cases (73.3%) showed mixed opaque and lucent areas and other showed radiopaque (2 cases) and radiolucent areas (2 cases). Figure 4. show radiological finding in FOLs.

**Table 3 : Fibro- osseous lesions in the present study**

| | |
|---|---|
| Ossifying fibroma | 7 cases (46.6%) |
| Fibrous dysplasia | 6 cases (40%) |
| Central giant cell granuloma | 1 case (6.7%) |
| Peripheral giant cell granuloma | 1 case (6.7%) |

**Figure 1 : Age distribution of fibro – osseous lesions.**

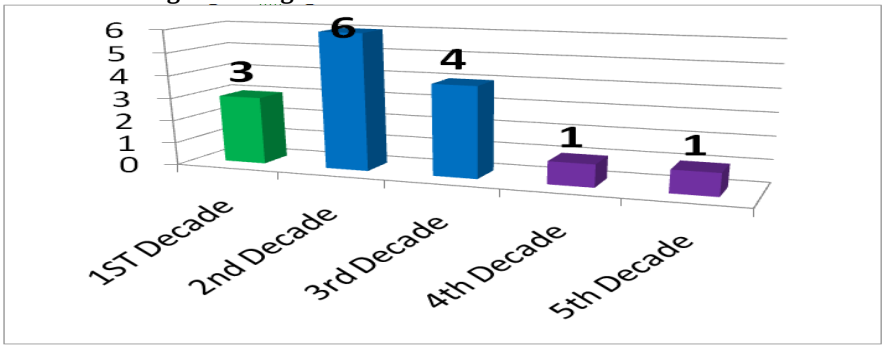



**Figure 2 : Gender distribution of fibro – osseous lesions.**

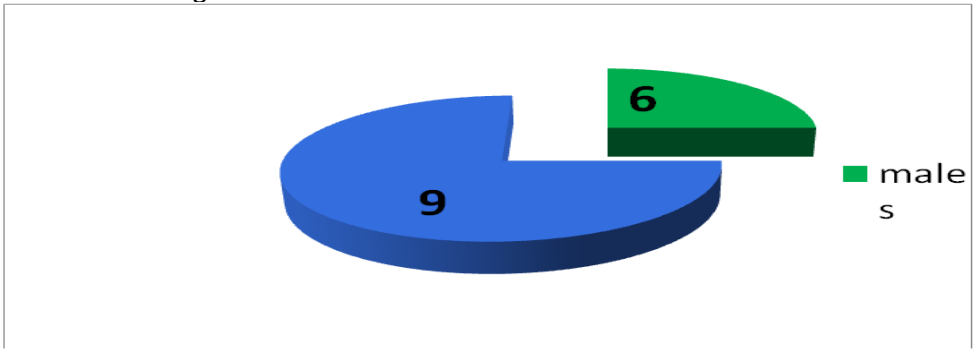


**Figure 3 : Site predilection of Fibro – osseous lesions.**

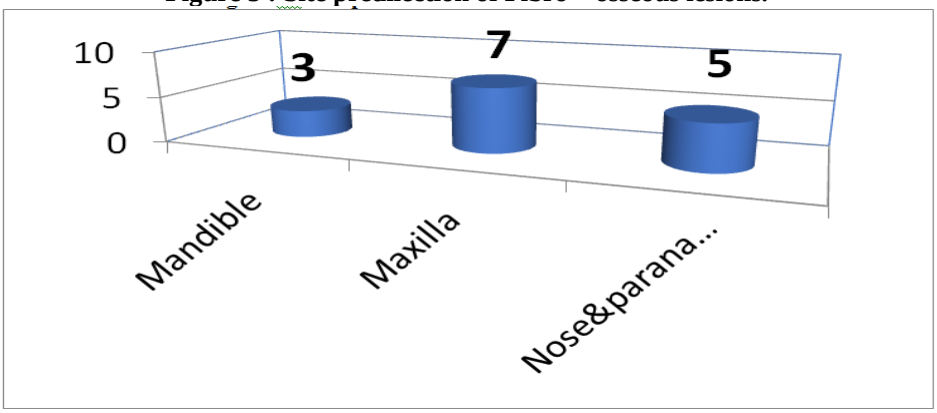
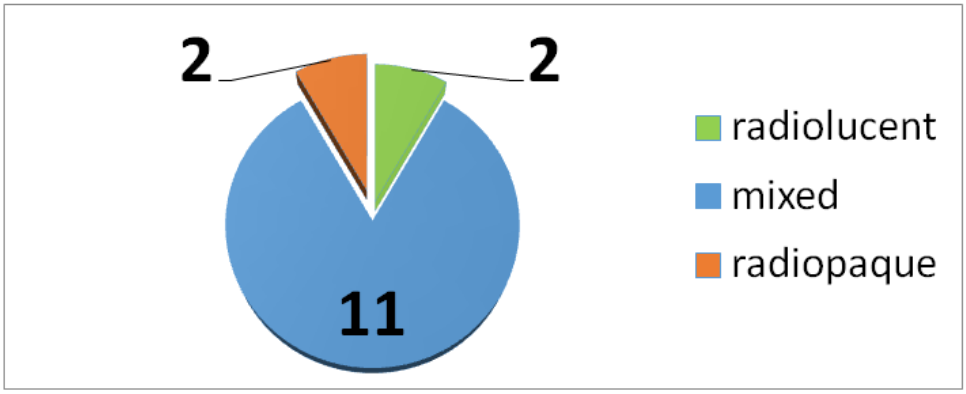
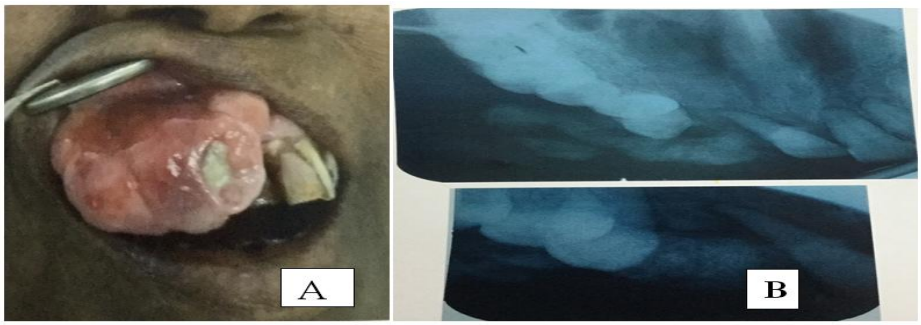
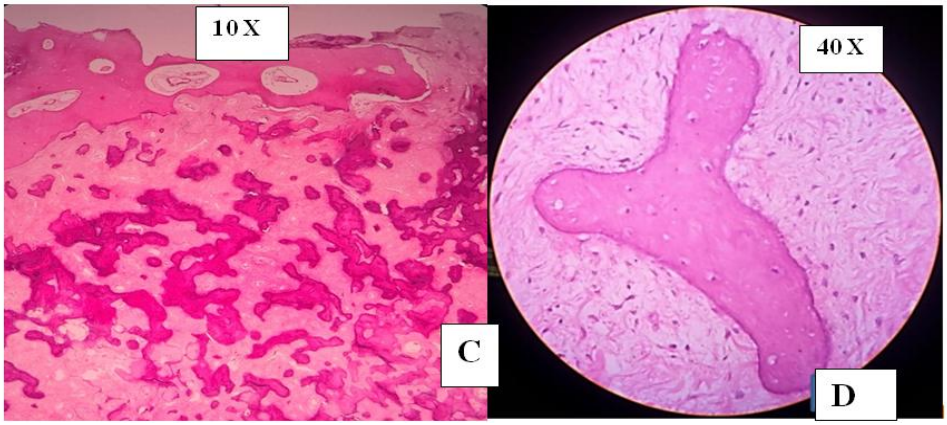



**Figure 4 : Radiological features in fibro – osseous lesions**



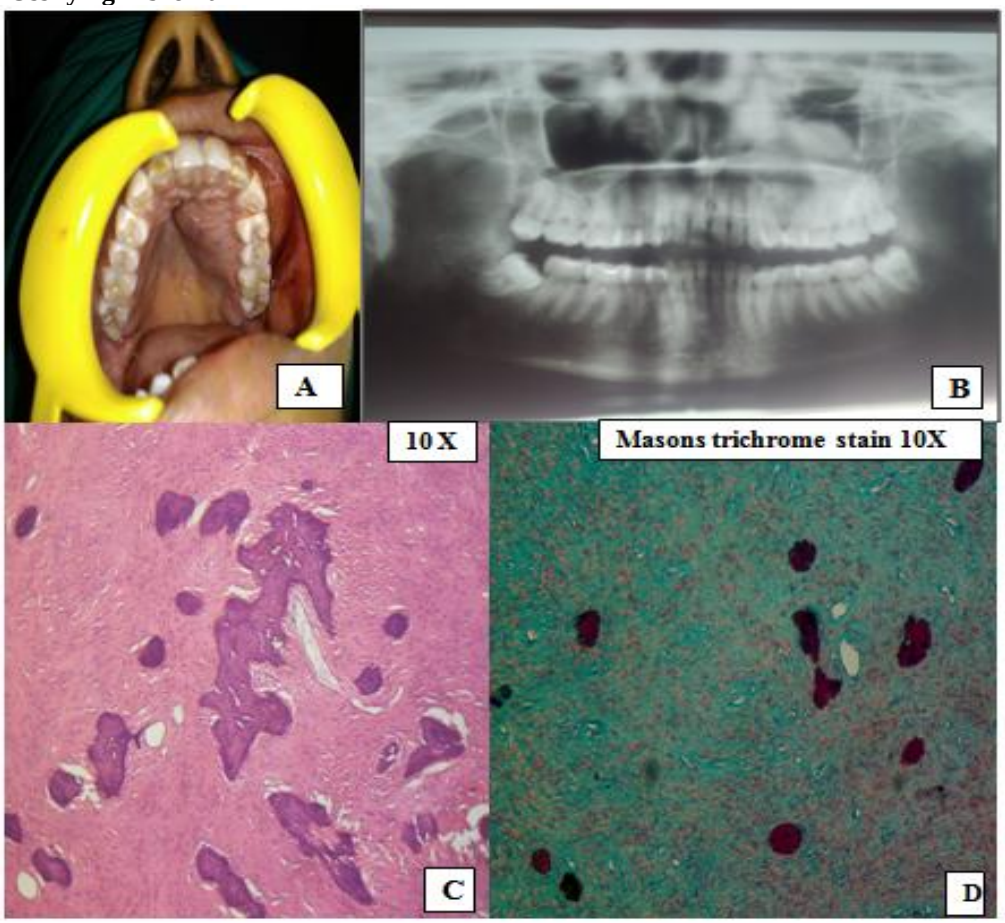

**Ossifying Fibroma**



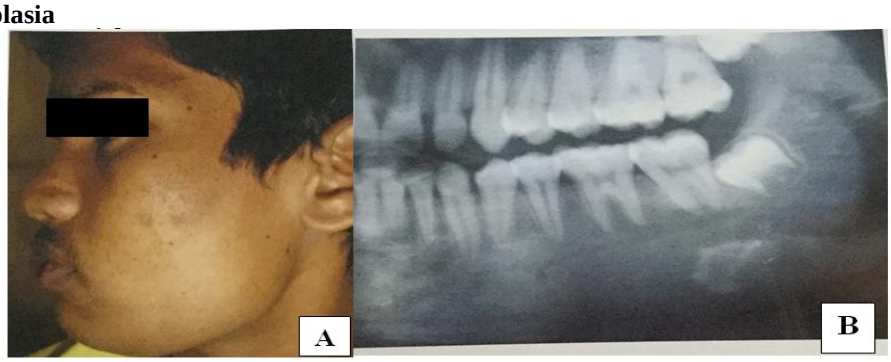
(A )55year old female patient with complaints of swelling in upper anterior gum region since 3months .swelling measuring 5x4cm extending superiorly up to labial sulcus.soft to firm in consistency and bony hard in some areas.slight bleeding on palpation,tenderness present.ulcer seen covered by pseudomembranous slough.(B ) X ray occlusal view showing ossification in the mass in the labial aspect of 13,14,15 and calculus seen.
(C,) H & E Sections shows ossified spherules, bony trabeculae & fibro-collagenous tissue. (D)High power view shows bony trabeculae with osteoblastic rimming

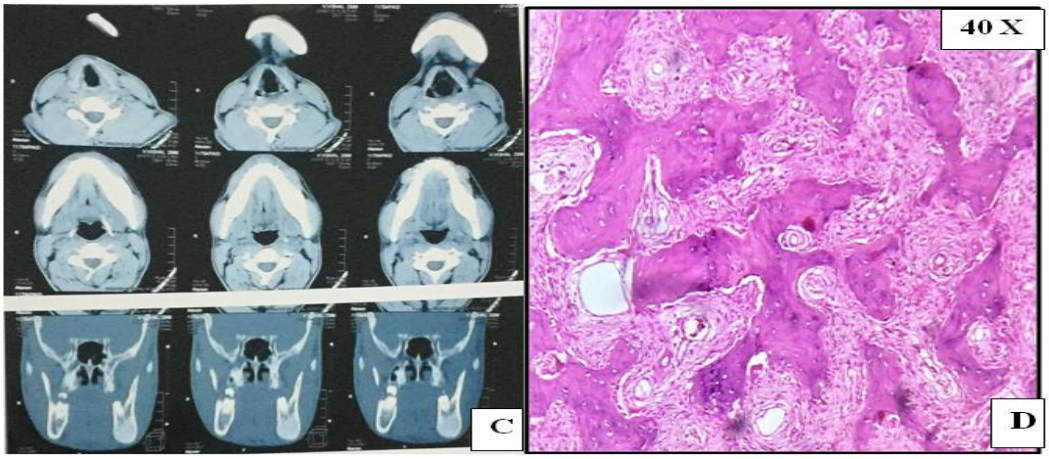
**Cemento Ossifying Fibroma**




(A)19-year patient had a chief complaint of slow growing swelling of 1-year duration on left side of the maxilla. Intraoral examination demonstrated an enlargement of the buccal and palatal maxillary left region which was oval in shape. (B) X ray showssolitary, well defined mixed radiolucent radio opaque lesion measuring approximately 4.5 x 3.5 cm. (C) H & E staining of the lesion shows lamellar bone with osteoblast rimming and calcified areas in fibrous stroma. (D)Massons trichrome stain demonstrates lamellar bone (lamellar bone trabeculae stained red with display of lamellate structure and parallel arrangement of collagen (concentric ring)(17).

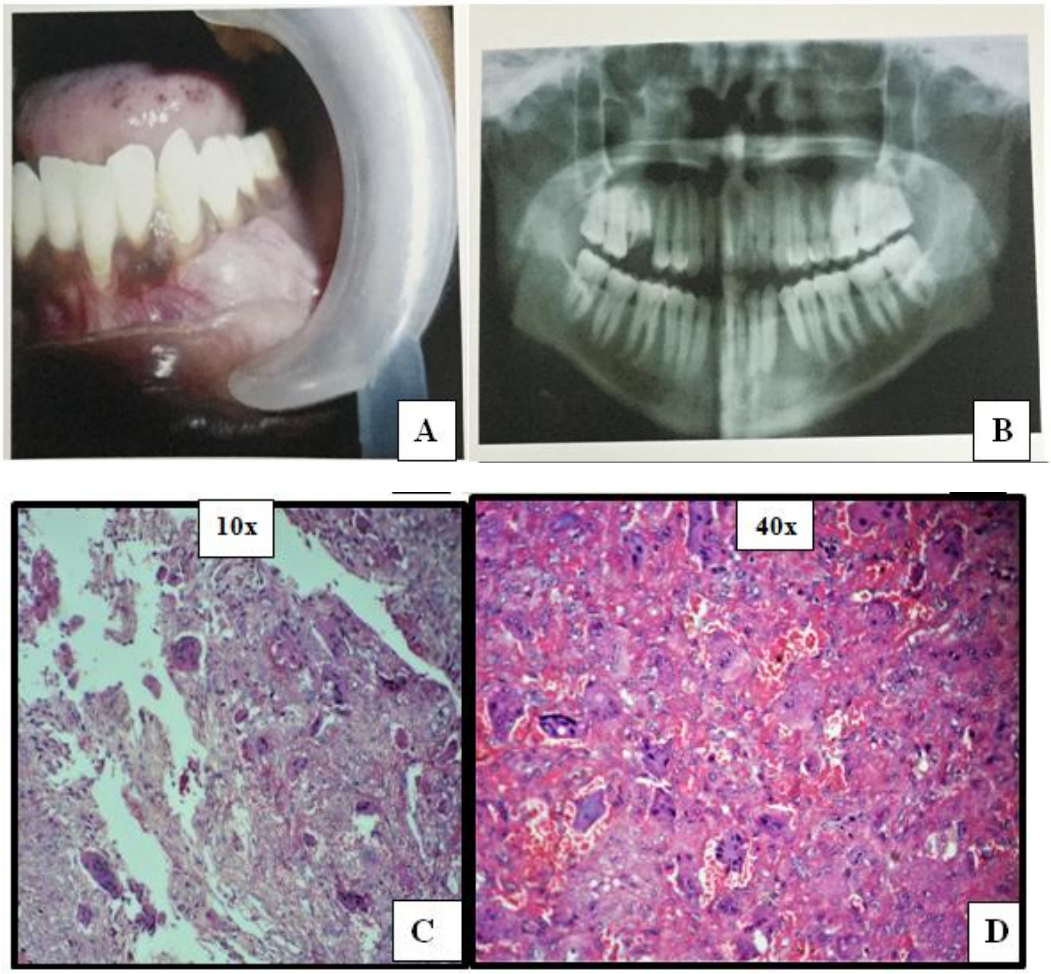
**Fibrous Dysplasia**






(A)20yr old male patient with complaints of slowly enlarging lower jaw on left side and also complaints of facial changes since 10yrs. On examination gross facial asymmetry due to swelling on body of mandible on its side. Smooth,non tender swelling bony hard in consistency.(B) X ray occlusal view show unilateral,solitary,increase BDangle of mandible. (C) C T - coronal section bone window show alteration of trabecular pattern with overall increase in density with gga. (D)H&E section shows fibrous stroma andimmature woven bone trabeculae with no osteoblastic rimming, forming irregular structures resembling Chinese letters, in a fibrous stroma.

**Central Giant Cell Granuloma**



(A)28yr old female patient with complaints of painless swelling in left lower gum since 4 months. On examination single oval swelling 4cm size on buccal slope of mandibular ridge. (B) OPG shows well defined irregular,solitary radiolucency surrounded by discontinuous thin radiopaque border. (C)& (D)H&E sections shows fibrillar stroma with mononuclear cells mixed with multinucleated giant cells. small capillaries, haemorrhage,Reactive bone with osteoblastic rimming.

## IV. Discussion

The FOL's of the craniofacial skeleton are a diverse group of lesions mostly seen in mandible and maxilla.The similarity between all the FOL is the replacement of the normal bone with fibrous connective tissue interspersed mineralized product, that includes osteoid, mature bone or presence of cementum like calcifications (1).

Langdon et al., suggested that certain FOLs of the jaw may represent different stages in the evolution of a single disease process (3).Fibro- Osseous Lesions of the jaw have been under frequent renaming and reclassification due to its varied features.

**Comparision With Other Studies**

**Ossifying fibroma**

| Clinical parameter | Present study | Alsharif et al(4) | Ogunsalu et al(5) | Langdon et al(3) |
|---|---|---|---|---|
| OSSIFYING FIBROMA no.of cases | 07 | 43 | 10 | 19 |
| FIBROUS DYSPLASIA no.of cases | 06 | 29 | 17 | 15 |
| CEMENTOID lesions | 01 | 55 | 5 | 5 |
| Age of OSSIFYING FIBROMA | 25 | 28 | 26 | 35 |
| Age of FIBROUS DYSPLASIA | 14 | 33 | 25 | 24 |
| Overall Male : Female ratio | 2:3 | 1: 1.04 | 2:3 | 1:1.23 |

One of the most common FOL,exhibit progressive proliferative capabilities with bony expansion. It can occur in any facial bone more common in mandible . In contrast to fibrous dysplasia it is well demarcated(6).
Ossifying fibroma of the craniofacial skeleton are separated into two main clinicopathologic entities:
1. Ossifying fibroma of odontogenic origin (cemento- ossifying fibroma), and Juvenile ossifying fibroma, which is further divided into two distinct types:

1. Trabecular juvenile ossifying fibroma (TrJOF)
2. Psammomatoid juvenile ossifying fibroma (PsJOF)

This benign odontogenic tumor has been variously called ossifying fibroma, cementifying fibroma, and cemento- ossifying fibroma. The latter is preferred because of its descriptive value and is used in the World Health Organization classification of head and neck tumors(2). COF affect the tooth bearing areas of the mandible and maxilla.

OF more common in 3$^{rd}$ and 4$^{th}$ decade , juvenile ossifying fibroma is seen at younger age.Ossifying fibroma are radiographically well-defined and round or oval in shape with sharp distinction from adjacent structures. Ossifying fibroma requires radical surgery because of the tendency for recurrence and possibility of malignant transformation(7). Sawyer JR et al found a balanced translocation with recurring breakpoints at Xq26 and 2q33 in patients affected with OF (14). Dal Cin et al. also reported a mandibular OF with an interstitial deletion on chromosome 2 between q31-32 and q35-36 (15).

**Fibrous dysplasia**

The term Fibrous dysplasia was given by Lichenstein in 1938,which was earlier described as "osteitis fibrosa disseminate". Fibrous dysplasia (FD) is a benign dysplastic disease with a well-known genetic basis (12, 13). FD is a condition that results from a mutation in (Guanine nucleotide binding protein alpha stimulating activity polypeptide 1 (GNAS 1) gene. The clinical severity of the condition depends upon the time of GNAS 1 mutation occurrence during fetal or postnatal life. These are mono-stotic or poly-stotic. May be associated with McCune-Albright syndrome(MAS) and with soft tissue myxomas - Mazabraud syndrome.
Most cranio-facial FOLs are monostotic and more common in maxilla(8,9).
Criteria for the diagnosisof fibrous dysplasia (1):
1) a fibroosseous histology with trabecular rather than central bone.

2) onset in childhood or teenage.
3) unilateral distribution with polyostotic form uncommon.
4) Early lesions may be radiolucent, but they become increasingly radiopaque a ground glass radiographic pattern with poorly defined lesional boundaries.

**Giant cell granuloma**

Giant cell granuloma (GCG) is not a true neoplasm but rather a reactive process , its origin can be triggered by trauma or inflammation.They were found in first two decades of life, and involves the maxilla more than mandible (10).

## V. Conclusion

A total of 15 cases of fibro-osseous lesions were diagnosed.Ossifying fibroma(46%) was most commonly encountered case.The average age of presentation was 30years and most commonly seen in females(58%) as compared males(42%). One case of fibrous dysplasia with ABC formation, 2 cases of Giant cell granuloma were associated with destruction of underlying bone. A number of other non–fibro-osseous disease processes that develop within the craniofacial region exhibit similar radiological and clinical findings. FOLs of jaw and face must be differentiated from other bone lesions which may mimic them histologically and radiographically. Thus, a definitive diagnosis requires correlation of the histologic features with the clinical, radiographic and intraoperative findings.Immunohistochemical expression by using "Osteocalcin and Osteonectin" assists in further differentiating among similar histologically resembling lesions (11).Although sub classification of FOLs occasionally can be challenging, a proper diagnosis is essential to ensure adequate and appropriate treatment.

## References


[1]. Speight PM, Carlos R. Maxillofacial fibro‐osseous lesions. Current DiagPathol2006; 12:1‐10.
[2]. Barnes L, Eveson JW, Reichart P, Sidransky D. World Health Organization Classification of Tumors Pathology and Genetics of Head and Neck Tumors. Lyon, France: IARC press; 2005. p. 284-327.
[3]. Langdon JD, Rapidis AD, Patel MF. Ossifying Fibroma‐one disease or six? An analysis of 39 fibro‐osseous lesions of the jaws. Br J Oral Surg1976; 14:1‐11.
[4]. Alsharif MJ, Sun ZJ, Chen XM, Wang SP, Zhao YF. Benign fibro-osseous lesions of the jaws: A study of 127 Chinese patients and review of the literature. Int J SurgPathol2009; 17:122-34. 7.
[5]. Ogunsalu CO, Lewis A, Doonquah L. Benign fibro-osseous lesions of the jaw bones in Jamaica: Analysis of 32 cases. Oral Dis 2001; 7:155-62.
[6]. R.Eversole et al head neck pathol (2008) 2:177-202.
[7]. Y Liu et al ossifying fibromas of the jaw bone :20 cases. Dentomaxillofac Radiol.2010 Jan;39(1):57 – 63.
[8]. Lichetenstein L. Polyostotic fibrous dysplasia. Arch Surg1938; 36:874.
[9]. Zimmerman DC, Dahlin DC, Stafne EC. Fibrous dysplasia of the maxilla and mandible. Oral Surg Oral Med, OralPathol 1958;11:55‐68.
[10]. Soames JV, Southam JC. Oral Pathology. 3rd ed. Oxford University Press; 1998. pp. 312–3.
[11]. Yara Y. Mouselhy, Awatef I. Draz, Marwa M. El-Shafei, Dalia H. El-Rouby. Comparative immunohistochemical study on osteocalcin expression in fibrous dysplasia and ossifying fibroma. International Journal of Academic Research Part A; 2013; 5(1), 9-13. DOI: 10.7813/2075-4124.2013/5-1/2.
[12]. MacDonald-Jankowski D. Fibro-osseous lesions of the face and jaws. Clin Radiol. 2004; 59:11-25.
[13]. Dorfman H D. New knowledge of fibro-osseous lesions of bone. Int J Surg Pathol. 2010; 18:62-5.
[14]. Sawyer J R, Tryka A F, Bell J M, et al. Nonrandom chromosome breakpoints at Xq26 and 2q33 characterize cemento-ossifying fibromas of the orbit. Cancer. 1995; 76:1853-9.
[15]. Dal Cin P, Sciot R, Fossion E, et al. Chromosome abnormalities in cementifying fibroma. Cancer Genet Cytogenet. 1993; 71:170-2.
[16]. Gillian Hall - Fibro-osseous lesions of the head and neck Diagnostic Histopathology 18(4):149–158 · April 2012.
[17]. Soyele OO, et al. Masson's trichrome and AgNOR study of fibrous dysplasia and ossifying fibroma in Lagos University Teaching Hospital. World J Pathol. 2013;2:94-101.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