

# Fibro-Osseous Lesions of the Craniofacial Region: An Account of Fifty Cases Seen in a Resource-Challenged Setting

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## ABSTRACT

**Background:** Craniofacial Fibro-osseous lesions (CFOLs) are a diverse group of relatively rare entities which aetiology range from reactive to dysplastic with a potential for malignant transformation. Their clinical presentations range from asymptomatic, causal radiographic findings to huge lesions which may present with endocrinopathies. The differential characterization of members of the CFOLs presents a diagnostic dilemma due to their overlapping clinico-radiologic features, while the various treatment modalities described in the literature attest to the controversy surrounding their management. Aim: to determine the pattern of presentation of CFOLs in the study location and compare same to reported patterns from other geographic locations. **Methods:** Consecutive patients diagnosed with CFOLs who presented at the Ahmadu Bello University Teaching Hospital (A.B.U.T.H), Shika-Zaria, Kaduna State from May 2016 to December 2017, were recruited for the study. The clinical and radiological presenting features were recorded and tumour classification was done using the Speight and Carlos' classification of CFOLs. Observation, shaving/paring down, excision and jaw resections were the management modalities employed in this study. Treatment outcomes were assessed 6 months post-operatively or after 6 months of observation. **Results:** CFOLs were commoner in males than females (ratio 1: 1.38). Fibrous dysplasia (64%) was the most prevalent lesion most of which are of the craniofacial variant (68.7%), while the maxilla was the most affected site (62%). The mixed radiological pattern (56%) was the most prevalent radiologic pattern, while most of the subjects had excision or jaw resection. Six months after surgery or observation, most (66%) of the subjects had no evidence of recurrence, while 6% either recurred or developed morbidity. **Conclusion:** the pattern of presentation of CFOLs in our environment largely agrees with reported pattern in most of the African studies.

**Key words:** Craniofacial, Fibro-osseous lesions, Patterns, Treatment outcomes

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## INTRODUCTION

Fibro-osseous lesions comprise a relatively rare group of pathology which share the same evolutive mechanism characterised by replacement of normal bone by fibrous connective tissue with subsequent deposition of mineralized tissues.<sup>1</sup> This diverse group of lesions affect both craniofacial and long bones, however, some are found exclusively in the jaws where they may involve single or multiple sites. 2 These developmental, neoplastic, reactive and dysplastic pathological processes are subsumed under the rubric of craniofacial fibro-osseous lesions (CFOL) which include; fibrous dysplasia, ossifying fibromas and the cemento-osseous (osseous) dysplasias 1. Lesions with overlapping clinico-radiographic/pathological features such as aneurysmal bone cyst, central giant cell granuloma, Cherubism, Brown's tumour of hyperparathyroidism, chronic sclerosing osteomyelitis and solitary bone cyst have also been considered as members of fibro osseous lesions in some classifications<sup>2-5</sup>. Although the aetiology of CFOL is largely unknown, mutation in the gene coding for the  $\alpha$ -subunit of the *GNAS* protein located on chromosome 20q13.2-13.3 has been identified in fibrous dysplasia<sup>6</sup>. Furthermore, other genetic disturbances such as mutations in the *HRPT2* gene in ossifying fibroma have been reported by Pimenta et al 7. These lesions range from asymptomatic/casual radiographic findings, , , to large lesions with significant aesthetic and functional disturbances. Some syndromic cases may also exhibit biochemical, dermatological and endocrine manifestations.,

The aim of this study is to describe the patterns of presentation and treatment outcomes of 50 cases of craniofacial fibro-osseous lesions seen in a resource-challenged setting.

## METHODOLOGY

A prospective descriptive study conducted on consecutive patients who presented at the Oral and Maxillofacial Surgery Clinic and Accident/Emergency sections of the Ahmadu

Bello University Teaching Hospital, Zaria, Kaduna State, Nigeria. The study was conducted from May, 2016 to December, 2017, while ethical clearance for this study was obtained from the Health Research and Ethics Committee of the Ahmadu Bello University Teaching Hospital, Zaria, Kaduna State (ABUTHZ/HREC/ S17/ 2015). Biodata, clinical and radiological information were obtained. Both cases of primary and recurrent lesions were included in this study and tissue samples were obtained for histopathological examination. Plain radiographs were used for the radiologic assessment of all patients except for cases of polyostotic fibrous dysplasia (CT scan) and osseous dysplasia (periapical radiograph). Radiographic investigations were performed at presentation/pre-operatively and repeated after six months of observation/surgery.

The definitive diagnosis of each lesion was obtained by juxtaposing the histopathological features with the clinical and radiological presentation. The Speight and Carlos' classification<sup>11</sup> of fibro-osseous lesions was adopted for this study owing to its simplicity. Observation, shaving/paring down, excision and jaw resection were the treatment modalities employed and treatment outcomes were determined six months post-operatively/after six months of observation. Data obtained was analysed using SPSS version 16 and a *p* value <0.05 is considered statistically significant at a 95% confidence level.

## RESULTS

### Age and gender

A total of fifty (50) cases of craniofacial fibro-osseous lesions were recorded during the duration of the study, and this figure consists of 21(42%) males and 29 (58%) females, with a male to female ratio of 1:3.8. While more males were affected in the first two decades, there was a feminine preponderance from the third to the fifth decade, however, this was not statistically significant (*p* = 0.592). The overall age range of the cases seen was between 6 and 65 years with a mean of  $27.0 \pm 13.1$

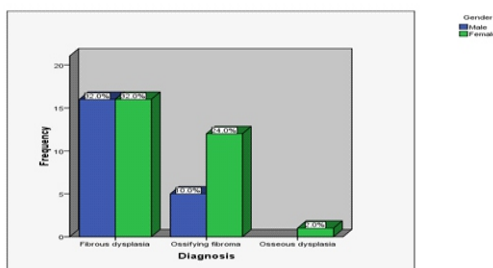
years.

Although cases of fibrous dysplasia had an equal gender distribution, ossifying fibroma presented more in females (n=12) than in males (n=5) with a male to female ratio of 1:2.4, while the only case of osseous dysplasia presented in a female (Fig. 1). The minimum and maximum ages of individuals with fibrous dysplasia were 6 and 65 years respectively (mean 24.3 ± 12.2, median 20.5 years), while that of those with ossifying fibroma was 13 years and 65 years respectively (mean 30.8 ± 13.1, median 27.0 years).

The overall peak age of presentation was in the 3<sup>rd</sup> decade while cases with ossifying fibroma had a peak age of presentation in the 3<sup>rd</sup> decade, however, cases with fibrous dysplasia had peaks at the 2<sup>nd</sup> and 3<sup>rd</sup> decades.

**Histopathological variants and site distribution**

Of the fifty cases of craniofacial fibro-osseous lesions that were studied, 32 cases of fibrous dysplasia, 17 cases of ossifying fibroma and a case of osseous dysplasia were recorded. With respect to the variant of craniofacial fibro-osseous lesion, craniofacial fibrous dysplasia (n=22, 68.8%) was the commonest variant of fibrous dysplasia, followed by the monostotic (n=7, 21.8%) and the polyostotic (n=3, 9.4%) variants of fibrous dysplasia (Table 1). On the other hand, the convectional ossifying fibroma (n=10, 58.8%) and the juvenile trabecular ossifying fibroma (n=7, 41.2%) were the variants of ossifying fibroma reported. Finally, the only case of osseous dysplasia reported was of the focal osseous



**Fig 1: gender distribution of craniofacial fibro-osseous lesions**

**Table 1: Frequency of variants of craniofacial fibro-osseous lesions**

Lesion type	n	Group %	Overall % (n=50)
<b>Fibrous dysplasia</b>	<b>32</b>		<b>64</b>
Polyostotic fibrous dysplasia	3	9.4	6
Monostotic fibrous dysplasia	7	21.9	14
Craniofacial fibrous dysplasia	22	68.7	44
<b>Ossifying fibroma</b>	<b>17</b>		<b>34</b>
Conventional ossifying fibroma	10	58.8	20
Juvenile trabecularossifying fibroma	7	41.2	14
<b>Osseous dysplasia</b>	<b>1</b>		<b>2</b>
Focal osseous dysplasia	1	100	2
<b>Total</b>	<b>50</b>		<b>100</b>

dysplasia variant (Table 1).

On the overall, the maxilla was the most affected bone in the craniofacial region either alone (n=26) or in combination with other bones of the craniofacial skeleton (n=5), whereas the mandible was affected in 17 cases alone, and in 3 cases in combination with other bones. A total of 4 cases had involvement of both gnathic and extra-gnathic sites while 45 cases had involvement of jaw sites alone.

There two were cases with combined involvement of the mandible and maxilla, while a single case with only extra-gnathic involvement was reported (Table 2). Of the 32 cases of fibrous dysplasia, there was involvement of the maxilla in 24 cases while the mandible was involved in 8 cases giving a mandible to maxilla ratio of 1:3. On the other hand, there was a predilection for mandibular sites (11) as against the maxilla (7) for cases of ossifying fibroma (Table 2), giving a mandible to maxilla ratio of 1:0.64.

**Clinical presentation**

Generally, swelling was the commonest presenting feature of the cases of CFOL seen, and was present in 49 (98%) of the 50 cases of CFOL. Other presenting features in descending order were: pain (n=12, 24%), missing tooth (n=11, 22%), mobile tooth (n=9, 18%), spontaneous bleeding (n=7, 14%), weight loss (n=4, 8%), chronic pus discharge (n=2, 4%), and neurological deficit (n=1,

**Table 2: Diagnosis and site distribution of craniofacial fibro-osseous lesions**

Diagnosis	Tumour site							Total
	Mandible alone	Maxilla alone	Mandible + maxilla	Mandible + temporal bone	Maxilla + ethmoids	Maxilla + orbital bones	Frontal bone + ethmoid	
Fibrous dysplasia	6	21	1	1	1	1	1	32
Ossifying fibroma	10	5	1	-	1	-	-	17
Osseous dysplasia	1	-	-	-	-	-	-	1
<b>Total</b>	<b>17</b>	<b>26</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>50</b>

**Table 3: Treatment modalities of CFOLs/diagnoses and outcomes**

Treatment/diagnoses	Outcomes				Total
	Apparently stabilized	Tumour Elimination	Recurred	Developed morbidity	
<b>Observation</b>					
Fibrous dysplasia	2	-	-	-	2
<b>Shaving</b>					
Fibrous dysplasia	7	-	3	-	10
<b>Excision</b>					
Fibrous dysplasia	2	10	-	-	12
Ossifying fibroma	-	10	-	-	10
Osseous dysplasia	-	1	-	-	1
<b>Excision + resection</b>					
Ossifying fibroma	-	-	-	1	1
<b>Resection alone</b>					
Fibrous dysplasia	-	6	-	1	7
Ossifying fibroma	-	5	-	1	6
<b>Resection + immediate reconstruction</b>					
Fibrous dysplasia	-	1	-	-	1
<b>Total</b>	<b>11</b>	<b>33</b>	<b>3</b>	<b>3</b>	<b>50</b>

lesions, 2 had no clinical/radiological evidence of lesions (cases that had resection), while 2 cases that had shaving were among the cases that recurred and one case that had resection developed morbidity (Table 3). On the overall, three (30%) of the ten cases of fibrous dysplasia (2 recurrent and 1 primary) who had shaving recurred, whereas no case of tumour involution or mortality was observed in this study.

**DISCUSSION**

**Age and gender**

The mean age of subjects at presentation reported in this study is in agreement with the reported mean ages from studies in Ibadan, South-Western

Nigeria, by Lasisi et al.,<sup>12</sup> and Uganda by Muwazi and Kamulegeya.<sup>13</sup> However, it differs slightly from the report of de Noronha Santos Netto and co-workers<sup>14</sup> which found a higher mean age among cases of craniofacial fibro-osseous lesions in a Brazilian population. This disparity could be as a result of a lower life expectancy in a predominantly African setting compared to the Brazilian population.<sup>15</sup> Furthermore, majority of the lesions reported de Noronha Santos Netto et al.,<sup>14</sup> were osseous dysplasias which are predominantly found in middle-aged to elderly individuals.

On the overall, craniofacial fibro-osseous lesions occurred more in females than males in this study which is in keeping with earlier African studies by Moshy et al.,<sup>16</sup> and Muwazi and Kamulegeya.<sup>13</sup> Although a male preponderance has been reported by Suarez-Soto et al.,<sup>17</sup> the small number of cases in the above report<sup>17</sup> may have contributed to this discrepancy.

Cases of fibrous dysplasia had an equal gender distribution in this study, and although it is in consonance with the reports of Lasisi et al.,<sup>12</sup> as well as that of Ogunsalu et al.,<sup>18</sup> it differs from that of Ziadi et al.<sup>19</sup> which found a female preponderance among fibrous dysplasia cases studied. However, the reason for this difference is not clear.

On the other hand, more females presented with ossifying fibroma than males which is in support of an earlier report by Lasisi et al.<sup>12</sup> However, both Alsharif et al.,<sup>20</sup> and Liu et al.,<sup>21</sup> did not find any gender difference. The reason for the disparity could be due to racial differences since both studies

2%). On the overall, 23 cases (46%) presented with more than one symptom. With respect to variants of the craniofacial fibro-osseous lesion group, all 32 cases of fibrous dysplasia presented mainly with swelling. Other presenting features of fibrous dysplasia were: pain (7 cases, 21.9%), missing tooth (6 cases, 18.8%), mobile tooth (5 cases, 15.6%), spontaneous bleeding (5 cases, 15.6%) and weight loss (4 cases, 12.5%). Similarly, all 17 cases of ossifying fibroma presented with swelling, while other presenting features were: missing tooth (5 cases, 29.4%), pain (4 cases, 23.5%), mobile tooth (4 cases, 23.5%), spontaneous bleeding (2 cases, 11.8%), pus discharge (1 case, 5.9%) and neurological deficit (1 case, 5.9%). Pain and pus discharge were the presenting features of the only case of osseous dysplasia recorded in this study.

### **Radiological patterns of presentation**

The mixed radiographic pattern was the commonest radiographic pattern of presentation accounting for 28 cases (56%) of all studied CFOLs, while the radio-opaque and radiolucent patterns were present in 18 (36%) and 4 (8%) cases respectively.

Most (22 cases, 68.75%) cases of the fibrous dysplasia cases presented with a mixed radiolucent-radiopaque radiographic pattern, while radiopaque and radiolucent radiological patterns of presentation were seen in 6 (18.75%) and 4 (12.5%) cases respectively. Similarly, most (n=11, 64.7%) cases of ossifying fibroma presented with radio-opaque radiographic pattern, while 6 cases (35.3%) had mixed radiolucent-radiopaque pattern.

The only observed case of osseous dysplasia presented with a radio-opaque radiographic pattern, and the association between diagnosis and radiographic pattern of presentation is statistically significant ( $p=0.004$ ).

### **Treatment modalities and outcomes**

A total of 48 cases (96%) out of the 50 cases of CFOL had various surgical treatment modalities, while 2 cases (4%) were placed under observation.

These 2 cases were male patients with histologically diagnosed fibrous dysplasia (mean age of  $23.5 \pm 17.7$  years) who were unwilling to undergo any surgical intervention.

The remaining 30 cases of fibrous dysplasia had surgery and this includes: 5 subjects with recurrent lesions and 25 subjects with primary lesions. Two of the subjects with recurrent lesions had shaving while the remaining three had resection. Of the 25 subjects with primary tumour, 12 (48%) had excision, 7 cases (28%) had shaving/paring down, while 4 cases had resection alone (16%). Furthermore, 1 case (4%) had resection with immediate reconstruction using autogenous (iliac) bone graft, while 1 case (4%) with involvement of both mandibular and temporal bones had a combination of shaving for temporal lesion, and resection for mandibular lesion.

Excision alone was performed on 10 (58.8%) out of the 17 cases of ossifying fibroma, while 6 (35.3%) had jaw resection alone. A single case (5.9%) with involvement of maxillary and mandibular sites had a combination of excision for maxillary lesion and resection for the mandibular lesion, while the single case of focal osseous dysplasia had excision of lesion.

On outcomes of treatment, 11 (22%) of the 50 cases of CFOL (all fibrous dysplasias) had apparent stabilization of lesion. This consists of 7 subjects who had shaving, 2 who had excision, and 2 subjects who were under observation (Table 3). While 33 (66%) of the 50 reported cases of CFOL had elimination of lesions and this comprises 17 fibrous dysplasia cases, 15 ossifying fibroma cases and a case of osseous dysplasia (Table 3). Three (6%) cases of recurrence were observed (all fibrous dysplasia treated by shaving/paring down), while three (6%) cases developed morbidity (Table 3).

Although there was a statistically significant association between treatment modality and outcome (Chi-square = 65.74, degree of freedom = 18,  $p<0.001$ ), the association between diagnosis and outcome was not statistically significant ( $p=0.072$ ).

Of the 5 subjects that presented with recurrent

<sup>20, 21</sup> involved individuals that are mainly of Asian descent. Furthermore, data from published studies <sup>2, 3</sup> show that while the trabecular and psammomatoid juvenile ossifying fibromas are relatively rare and tend to have no definite gender predilection, the conventional variant is commoner and tends to have a female preponderance.

### **Histopathological diagnoses and site distribution**

Fibrous dysplasia was the predominant of the craniofacial fibro-osseous lesions in this study. Although this is similar to reports from Jamaica by Ogunsalu et al., <sup>18</sup> and from Uganda by Muwazi and Kamulegeya, <sup>13</sup> it disagrees with reports from Asia, <sup>20, 22</sup> and some other African studies <sup>12, 16</sup> where ossifying fibroma was the more commonly diagnosed of the fibro-osseous lesions. On the other hand, studies by de Noronha Santos Netto et al. <sup>14</sup> in Brazil, and other authors <sup>5, 23</sup> identify the osseous dysplasias as the more frequently diagnosed of the fibro-osseous lesions. The reason for the disagreement in the above reports is not exactly clear, however, reports from centres with facilities for routine radiographic assessment tend to diagnose osseous dysplasias more readily since most are asymptomatic and are mostly seen on routine radiographic investigation. <sup>24</sup> Moreover, since fibrous dysplasia and ossifying fibroma have overlapping histopathologic features they misdiagnosed in the absence of detailed clinical and radiographic information, or with the aid of molecular studies. <sup>12, 25, 26</sup> Furthermore, some variants of ossifying fibroma share overlapping clinicopathologic features with the osseous dysplasias. <sup>25</sup> Finally, since routine radiographic evaluation was not a common practise in the study centre this may have contributed to the paucity of osseous dysplasia lesions observed in this study.

There was an obvious preponderance of the craniofacial variant of fibrous dysplasia in this study accounting for 68.7% of the total fibrous dysplasia cases seen, while the monostotic variant contributed only 21.9%. This is at variance with studies by MacDonald-Jankowski <sup>27</sup> and Ziadi et al.

<sup>19</sup> where monostotic fibrous dysplasia contributed 74% and 94% of the total fibrous dysplasia samples respectively.

The exact reason for this disparity is not clear, however, majority of the fibrous dysplasia found in this study presented in the maxilla (Table 3). Furthermore, some literature reports are devoid of the term “craniofacial fibrous dysplasia” thus cases of craniofacial fibrous dysplasia were either subsumed under monostotic or polyostotic fibrous dysplasia. <sup>12, 28</sup> Moreover, there is yet no consensus on the exact classification of maxillary fibrous dysplasia: whether they should be grouped as monostotic, craniofacial or even polyostotic fibrous dysplasia. <sup>29</sup>

The maxilla was the most affected jaw site in cases of CFOL which is in contrast with other African reports where the mandible was predominantly affected. <sup>12, 13, 16</sup> The exact reason for the discrepancy in site distribution is not clear. Although fibrous dysplasia occurred mainly in the maxilla, ossifying fibroma occurred more in the mandible, while the only recorded case of osseous dysplasia was located in the mandible. These findings are in support of previous reports from Africa <sup>12, 13</sup> and South America. <sup>14</sup>

### **Clinical presentations of Craniofacial Fibro-osseous Lesions**

Swelling was the commonest presenting feature of fibro-osseous lesions being reported in all cases of fibrous dysplasia and ossifying fibroma which is in keeping with most reports from the literature. <sup>14, 16, 29</sup>

The above finding was buttressed by Eversole et al. <sup>2</sup> who has stated that lesions of fibrous dysplasia and ossifying fibroma present mostly as swellings which sizes range from a few centimetres to massive swellings often with resultant aesthetic and functional defects.

On the contrary, there was no swelling in the only case of focal osseous dysplasia reported in this study which agrees with earlier reports. <sup>2, 14, 29</sup> With the exception of massive lesions, osseous dysplasias are usually asymptomatic, and are only

identified on routine radiographic investigation.<sup>29</sup> Occasionally they present with pain and pus discharge when infected as reported in this study. In their report, de Noronha Santos Netto and colleagues<sup>14</sup> identified swelling as the presenting feature in less than 40% of osseous dysplasias, while the remainder were diagnosed incidentally on routine radiographic investigation.

The other presenting features identified in the study such as pain, mobile tooth/teeth, missing tooth/teeth in relation to the disease, spontaneous bleeding, neurological deficit and weight loss have also been documented by some earlier studies.<sup>17,29,30</sup> This study attributes the above symptoms to poor oral hygiene, trauma from opposing tooth, pressure effect and impaired feeding due to massive jaw lesions, in line with suggestions from previous studies.<sup>29,30</sup>

A history of trauma prior to onset of fibrous dysplasia lesions was reported in 12% of cases, although this was not statistically significant ( $p=0.692$ ), it is in keeping with previous reports by Aubert et al.,<sup>31</sup> and Yetiser et al.<sup>32</sup> The pathogenesis of the development of fibrous dysplasia following trauma has not been fully elucidated. However, Goulesbrough<sup>33</sup> suggests that following trauma, the ensuing bleeding into bone sinuses initiates an abnormal osseous healing process with subsequent arrest of maturation, thus resulting in the development of fibrous dysplasia. Similar lesions have also been reported in the ribs as a component of sports-related injury.<sup>31,33</sup>

### **Radiographic patterns of Craniofacial Fibro-osseous lesions**

This study identified the mixed radiolucent, radio-opaque pattern as the commonest radiographic pattern of presentation of CFOLs. While this finding agrees with that of de Noronha Santos Netto et al.,<sup>14</sup> it is at variance with the findings of Vegas-Bustamante et al.<sup>34</sup> which reported the radio-opaque radiographic pattern as the commonest pattern of CFOL. The reason for this discrepancy is not clear, however, most of the samples reported by Vegas-Bustamante et al.<sup>34</sup> were ossifying fibroma

which presented with a radio-opaque radiographic appearance. Moreover, the few samples seen by Vegas-Bustamante et al.<sup>34</sup> may have contributed to this discrepancy.

Similarly, cases of fibrous dysplasia found in this study presented mostly with the mixed radiographic pattern, which is in support of findings by Obisesan et al.,<sup>35</sup> and a previous study from the study centre by Adekeye et al.<sup>36</sup> However, it contrasts with that of de Noronha Santos Netto et al.<sup>14</sup> which found the radio-opaque radiographic pattern as the commonest radiographic presentation pattern for fibrous dysplasia. The reason for this disparity could be that fibrous dysplasia cases reported by de Noronha Santos Netto et al.<sup>14</sup> presented at a later stage of the disease when calcification was well established.

On the contrary, the radio-opaque radiographic pattern was the most predominant radiographic presentation pattern of ossifying fibroma which is in keeping with the report of Vegas-Bustamante et al.<sup>34</sup> However, it disagrees with reports from Brazil<sup>14, 37</sup> and Kenya<sup>16</sup> which found the mixed radiographic pattern as the most prevalent radiographic pattern, and the reason for this difference is not clear.

The only case of focal osseous dysplasia encountered in this study presented with a radiopaque radiological pattern thus supporting previous reports by Eversole et al.,<sup>2</sup> and de Noronha Santos Netto et al.<sup>14</sup> Meanwhile, Eversole and colleagues<sup>2</sup> have stressed that the focal and periapical cemental dysplasias present three radiographic patterns depending on the stage of the disease: an early radiolucent stage at the apices of involved teeth (mimicking endodontic infection), an intermediate mixed radiolucent-radio-opaque stage and a late stage of diffuse radiopacity with ill-defined borders. This assertion is supported by the radio-opaque radiographic appearance of the case of focal osseous dysplasia found in this study which presented relatively late.

### **Treatment outcomes**

In this study, subjects with fibrous dysplasia whose

lesions became apparently stabilized were those that were under observation, and some cases that had shaving/paring down which is partly in agreement with the report of Menon et al.<sup>30</sup> This could be due to the benign nature of this lesion, as well as the short duration of follow-up. On the other hand, subjects with fibrous dysplasia who had resections either had elimination of lesions or developed morbidity (Table 3) which is partly in keeping with the reports of Valentini et al.,<sup>38</sup> Park et al.,<sup>39</sup> and Cheng et al.<sup>40</sup> The reason for this concordance could be due to complete elimination of lesions,<sup>29</sup> which was achieved in this study by placing the resection margins on apparently normal bone with a safety margin of 0.5cm. Conversely, subjects whose lesion recurred in this study were fibrous dysplasia cases who had conservative surgery (Table 3). Although this finding is in support of the reports of Park et al.,<sup>39</sup> and Cheng et al.,<sup>40</sup> it is at variance with the study of Menon et al.<sup>30</sup> which found stabilization of fibrous dysplasia lesions among individuals who had shaving after a 2-year follow-up period. However, the reason for the above discrepancy is unknown. The 30% recurrence rate recorded in this study is also in keeping with the reported rate of 25-50 % in the literature.<sup>2,4,17,29</sup>

Although there were two subjects with ossifying fibroma who developed morbidity (Table 3), there was no case of recurrence among the ossifying fibromas in this study which is consistent with the report of Alawi,<sup>29</sup> however, this is at variance with the report of Sloomweg et al.<sup>41</sup> This could be due to the fact that cases of ossifying fibroma in this study had excisions or resections, unlike that of Sloomweg and colleagues,<sup>41</sup> where some of the subjects had conservative surgery. As a true neoplasm, ossifying fibroma undergoes continuous growth except if lesions were completely eliminated.<sup>24</sup>

There is paucity of data on treatment outcomes of the osseous dysplasias probably due to the rare nature of these lesions and in most of the available reports, observation was cited as the main stay of management in the literature.<sup>8, 29</sup> Recurrence appears to be very rare as some authors<sup>8,24</sup> did not

observe any recurrence after a 2-year follow-up period, a finding which is supported by the report of this study. Surgical interventions for osseous dysplasias are often complicated by infection or indeed osteomyelitis.<sup>29</sup> Although no infection occurred following the treatment of the osseous dysplasia case observed in this study, its clinical presentation (chronic pus discharge) was sequel to an earlier attempted extraction, which is in agreement with the position of Alawi.<sup>29</sup>

## CONCLUSION

The findings of this study show that the presenting pattern of craniofacial fibro-osseous lesions in the study centre largely similar to the reported pattern from most African studies in the literature.

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