



ORIGINAL ARTICLE

Imaging and Histological Characteristics of Non-Hybrid and Hybrid Fibro-Osseous Lesion at Maxillofacial Area

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Abstract

Background: The integration of clinical, radiographic and pathology findings-based information has long been intrinsic to diagnosis and proper management. **Objective:** The purpose of study was to observe the imaging features of hybrid and non-hybrid Fibro-Osseous Lesion at Maxillofacial Area among the participants. **Methodology:** This cross-sectional study was conducted in the Department of Oral & Maxillofacial Surgery at Dhaka Dental College & Hospital, Dhaka, Shaheed Suhrawardy Hospital, Dhaka and Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh from January 2004 to December 2005. Participants were selected for the study who attended into outpatient and inpatient departments with fibro-osseous lesions during study period. A standardized structured data collection sheet was used to collect necessary information of the study history of the patients and clinical examination; radiology, histopathology and macroscopic findings of surgical specimen were recorded. **Results:** Most of the patients' age was between 11 to 30 for both hybrid and non-hybrid form. Among them average age of the patients was 24.98 years (\pm SD 13.4). The mean age of the Non-hybrid group is 26.35 (\pm SD 13.92) years and mean age of Hybrid group is 17.17 (\pm SD 6.18) years. In hybrid form most of the radiological pattern was mixed type (83.3%) but in non-hybrid form all other mentioned radiological character were found. In cross-section of surgical specimens of hybrid form cavitation were found in all cases (100.0%). **Conclusion:** The Imaging and histomorphology of fibro-osseous lesion is very important tools to proper diagnosis and management. [Journal of Current and Advance Medical Research, July 2022;9(2):79-82]

Keywords: Non-hybrid; hybrid; fibro-osseous lesion; aneurysmal bone cyst; ossifying fibroma; cementifying fibroma; cemento-ossifying fibroma

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Introduction

Fibrous dysplasia and ossifying fibroma lie at the opposite ends of microscopic spectrum of fibro-osseous proliferation. At one end are the lesions with trabeculae of woven bone devoid of osteoblasts along their periphery (metaplastic bone). The trabeculae are discontinuous and are often curvilinear with irregular branches. This is fibrous dysplasia. At the other end of the spectrum are the lesions of lamellar bone with osteoblasts are confined to the periphery of the bone. The trabeculae tend to connect extensively with one another. This is ossifying fibroma. These definitions would be useful if a given lesion displayed only the features of fibrous dysplasia or ossifying fibroma. The problem is that the trabecular architecture of many fibro-osseous lesions varies. These lesions may have both woven and lamellar bone formation in the same trabecula. Moreover, many lesions have at least a few spherules that are often interpreted as cementum. This microscopic mélange decreases the value of microscopy as the sole criterion for classification¹.

According to Boysen et al² the differential diagnosis of fibrous dysplasia versus ossifying fibroma rests on a radiologic criterion after the histopathologist has verified the fibro-osseous nature of a lesion. Waldron stated² diagnosis based on histologic appearance alone considerable limitations, and, often, the pathologist can be no more specific than a diagnosis of benign fibro-osseous lesion, in the absence of adequate clinical and radiologic data. Therefore, the final diagnosis of a fibro-osseous lesion must be a combined radiopathologic interpretation.

Methodology

Study Settings and Population: This was cross-sectional observational type of study at the Department of Oral & Maxillofacial Surger of Dhaka Dental College & Hospital, Dhaka, Shaheed Suhrawardy Hospital, Dhaka and Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh from January 2004 to December 2005. Participants were selected for the study who attended into outpatient and inpatient departments with fibro-osseous lesions during study period, irrespective of age & sex. patients were included who gave informed consent, patients attended with jaw swellings, and radiologically suspecting as fibro-osseous lesions, Biopsy proven fibro-osseous lesions. Patients were excluded who had not be clinically or radiologically susceptible for fibro-osseous lesions, psychotic patients and pregnant women.

Study Procedure: A standardized structured data collection sheet was used to collect necessary information of the study history of the patients and clinical examination; radiology, histopathology and macroscopic findings of surgical specimen were recorded. All patients were advised initially for radiological examination which includes orthopantomogram (OPG), postero-anterior (P/A) view of skull with mandible, lateral view of skull with mandible. After taking informed consent, biopsy was done. The diagnosis was established initially in all cases preoperatively on the basis of an incision biopsy.

The tissue was processed for preparation of slide and stain with haematoxylin and eosin to study under a light microscope. After incision and reflection of mucoperiosteum, bony window was made by rongeurs, drill bur or chisel according to need. As soon as tissue was removed, it was then immersed into a preservative considering 10% neutral buffer formalin as ideal for 24 to 48 hours. Before immersing in a preservative solution, the specimen was rinsed in normal saline to remove excess blood. Postoperatively every surgical specimen was examined carefully and sectioned to examine the nature of tissue within the tumour and examination of the expansion and perforation of the bone was performed. Then histologic examination was done for re-evaluation.

Statistical Analysis: All the data were analyzed after thorough checking, cleaning, editing and compiling by the software SPSS windows V-11.6. Descriptive statistics were followed first and then appropriate statistical tests were performed to find out the association between different variables when and where necessary. I consulted with an expert in the field of bio-statistics to bring up the correct and unbiased result for the study.

Ethical Consideration

All procedures of the present study were carried out in accordance with the principles for human investigations (i.e., Helsinki Declaration) and also with the ethical guidelines of the Institutional research ethics. Formal ethics approval was granted from IRB of the respective hospital. Participants in the study were informed about the procedure and purpose of the study and confidentiality of information provided. All participants consented willingly to be a part of the study during the data collection periods. All data were collected anonymously and analyzed using the coding system.

Results

A total number of 40 consecutive patients were studied. Among the studied population 34 were non-hybrid and rest 6 (15%) were hybrid form. Among them average age of the patients was 24.98 years (\pm SD 13.4). It shows that the age distribution is positively skewed in the chart (Figure I).

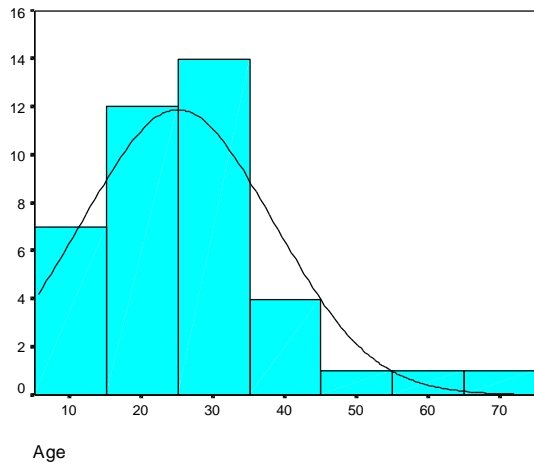


Figure I: Age Distribution of Patients with Normality Curve

Most of the patients’ age was between 11 to 30 for both hybrid and non-hybrid form. Mean age of the Non-hybrid group is 26.35 (\pm SD 13.92) years and mean age of Hybrid group is 17.17 (\pm SD 6.18) years. Though the t-test shows no significant difference ($p=.123$) between two mean age and Hybrid patients has lower mean age (Figure II).

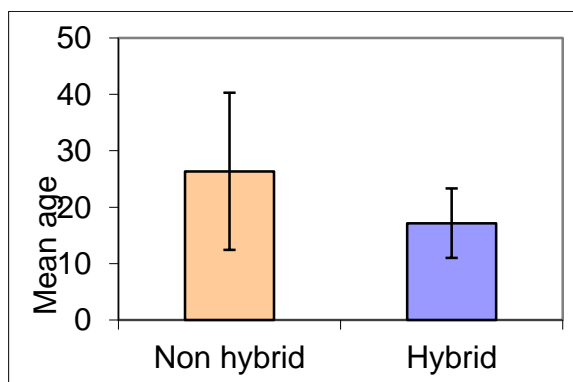


Figure II: Mean age of the Studied Population by Diagnosis Type

In hybrid form most of the radiological pattern was mixed type represents 5 (83.3), ground glass appearance 1(16.7%) but in non-hybrid form mixed nature 19(55.9%), Radiopaque 8(23.5%), ground glass appearance 6(17.6%), radiolucent 1(2.9. %) mentioned radiological character were found (Table 1).

Table 1: Radiological Characteristics of Fibro-ocessuous Lesion

Character	Non-Hybrid	Hybrid
Radiolucent	1(2.9%)	0(0%)
Radiopaque	8(23.5%)	0(0%)
Mixed	19(55.9%)	5(83.3%)
Ground glass appearance	6(17.6%)	1(16.7%)
Total	34(100%)	6(100%)

In cross-section of surgical specimens of hybrid form cavitations were found in all cases6 (100%) but it was not detected in a single case in non-hybrid form (0%). Multicystic haemorrhagic spaces were seen in6 100% cases of hybrid form whereas none (0%) was detected in non-hybrid form (Table 3).

Table 3: Distribution of cases according to Macroscopic and microscopic features

Variables	Non hybrid	Hybrid	P value
Macroscopic Cavitation on cross-section			
• Présent	0(0.0%)	6(100.0%)	0.001
• Absent	34(100.0%)	0(0.0%)	
Multicystic Haemorrhagic Spaces			
• Présent	0(0.0%)	6(100.0%)	0.001
• Absent	34(100.0%)	0(0.0%)	

p value is reached from unpaired student’s t test (P <.001)

Discussion

During the period of January 2004 to December 2005 a total number of 40 consecutive patients were studied, those were attending in outpatient and inpatient department of DDCH, SSH and BSMMU based on inclusion and exclusion criteria. Among the studied population 34 were non-hybrid and rest 6 (15%) were hybrid form. Among them in hybrid form most of the radiological pattern was mixed type (83.3%) but in non-hybrid form all other mentioned radiological character were found.

There may be different combination within this form i.e. ABC may be associated with the early active phase of fibrous dysplasia as a secondary vascular change within the pre-existing primary lesion, fibrous dysplasia⁴ or it may be associated with other fibro-osseous lesions like ossifying fibroma, cementifying fibroma and cemento-ossifying fibroma⁵⁻⁸. It cannot be ascertained properly how frequently an ABC develops concomitantly with a fibro-osseous lesions of the jaw, since complete information and prolonged follow-up studies are often missing. Nevertheless, 21.0% of the reported cases of ABC in the jaws have been reported in

association with a fibro-osseous lesion⁶. Sudden rapidly enlargement of the previous silent lesion due to ABC transformation may clinically simulate malignant transformation which must be differentiated clinically and histopathological. Fibro-osseous lesions associated with ABC were reported by different authors Cornyn and Morris⁷ reported 1 cases of OF. Oliver⁹ reported 1 cases of OF.

Oliver⁹ reported 1 case of OF. El-Deeb et al¹⁰ reported 1 cases of OF. Citardi et al¹¹ described a 12-year-old patient with a cystic erisive orbitoetymoid mass that showed features of ABC and FD. Lucarelli et al¹² ABC of superotemporal orbit in a patient with previously diagnosed FD. Som et al¹³ reported 1 cases of involving sphenoid and ethmoid sinuses as well as upper nasal fossae. Lin et al¹⁴ reported 1 cases of involving frontal bone.

Itshayek et al¹⁵ reported 1 cases of involving occipital bone. Haddad et al¹⁶ cases of involving skull base. Itshayek et al¹⁵ reported 57 cases of ABC that were associated with a variety of other lesions of bone including solitary bone cyst, osteoclastoma, osteosarcoma, non-osteogenic fibroma, osteoblastoma, haemangi endothelioma and hemangioma of bone.

Biesuker et al¹⁷ in a series of 66 cases of ABC of skeleton found primary lesions present in 21 cases (32%). These were non-ossifying fibroma, chondroblastoma, giant cell reparative granuloma, FD, fibromyxoma and solitary bone cyst. Numerous small to moderate sized cavitation were seen on necked eye examination in the cross-section of surgical specimens in all cases of hybrid form (100.0%) lesions, however, it was detected none of a single case of non-hybrid form (0.0%) which was highly significant ($p < 0.001$).

Histopathological examination in this study revealed that multicystic haemorrhagic spaces attenuated with endothelium indicating ABC were identified in all cases of hybrid form (100%) whereas none was detected in non-hybrid form (0.0%) which was highly significant ($p < 0.001$) and it was the confirmatory diagnosis of hybrid form of fibro-osseous lesions. Slootweg and Müller¹⁸ gave special emphasis upon the histomorphology of the lesion-jawbone interface, blending of lesional bone with adjacent jawbone being employed as the decisive factor in distinguishing between fibrous dysplasia and other fibro-osseous jaw lesions. A case of ABC arising in an area where a cementifying fibroma was excised earlier was reported by Robinson.

Conclusion

In conclusion, radiologically cortical plate perforation and destruction of alveolar bone surrounding the involved tooth of hybrid lesion and ABC transformation as cystic like radiolucency and cavitations were detected macroscopically on cross-section of surgical specimen and confirmed histologically. So, it should be confirmed by image and histologically before surgery and proper management.

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