



# Prevalence of Bone Pathologies Reported in a Private Dental Hospital - A Retrospective Study

G.Nivedhita<sup>1</sup>, Reshma P Krishnan<sup>1</sup>

Department of Oral Pathology and Microbiology, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India

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## KEYWORDS

Bone lesions, Oral Pathology, Fibro osseous lesions, Cemento ossifying dysplasia, Osteomyelitis, innovative technique, novel method

## ABSTRACT:

**Introduction:** Bone lesions of the jaw are either related to the dentition or the alveolar bone proper. Most commonly seen bone lesions are cemento osseous dysplasia, fibrous dysplasia, chondroma, osteosarcoma etc.

**Objectives:** The aim of this study was to determine the prevalence of bone pathologies reported in the Department of oral pathology of a private dental hospital.

**Methods:** This is a retrospective study done within an institution in a hospital setting. All the case details were collected from the hospital management system and histologically proven bone pathologies were included in the study. A total of 15 patient data were collected and Statistical analysis was done using the latest version of SPSS software (version 24).

**Results:** From the data collected, incidence of bone pathologies was seen more in the age group of 20-29. Number of female patients reported with bone pathologies was more than the number of male patients reported with bone pathologies. Pain was the common clinical feature that was presented by most of the patients. The p value is 0.360(>0.05) which is statistically insignificant. Radio opaque finding was predominantly. The p value is 0.285(>0.05) which is statistically insignificant. It was also found that surgical excision was the commonly followed treatment for the bone pathologies. The p value is 0.325(>0.05) which is statistically insignificant.

**Conclusions:** Within the limitations of the retrospective study done in a hospital setting it is found that females have more predilection to occurrence of bone pathologies than males and that most bone lesions affected individuals within the age of 20-29.

## 1. Introduction

Numerous bone pathologies can occur in the craniofacial region. Several of these lesions pose a diagnostic challenge to the pathologist. To ensure that a correct diagnosis is rendered, it is of utmost importance that accurate and detailed clinical and radiographic information is available. Primary bone tumors are rare and as such they represent a difficult category of tumors for appropriate recognition, classification and treatment.

Cemento ossifying fibroma is a benign form of tumor that predominantly affects the craniofacial region. It contains fibrous tissue that contains a mixture that includes structures like the bony trabeculae, cementum like spherules or both [1, 2, 3]. Microscopically a fibrous capsule surrounding the tumor is elicited [4,5]. It has a very good prognosis and recurrence is very rare [6].

Osteosarcoma is the most common malignancy of the bone. It is also known as odontogenic sarcoma [7]. Radiographically the lesion usually has an ill defined peripheral border making it difficult to determine the extent of the lesion. The classic sunburst or sun ray appearance caused by osteophytic bone production is also seen in the surface of lesions of jaw osteosarcomas [8].

Chondrosarcoma is a malignant tumor arising most commonly in the maxilla when occurring in the head and neck region. A painless mass or swelling in the most frequently elicited sign in chondrosarcoma [9,10]. Radiographically the tumor shows radiolucent processes with ill defined borders and often contains scattered and variable amounts of radiopaque foci which are caused as a result of calcification or ossification [11,12]. Histopathologically, a tumor often shows a lobular



pattern with thin fibrous connective septa separating the lobes [13]. Chondrosarcomas may be divided into three grades of malignancy depending on the rate of growth of tumor and prognosis [14, 15]. Osteomyelitis is an inflammatory process in the medullary spaces or cortical spaces of the bone that is either acute or chronic and the bone extends away from the initial site of involvement. It is mainly caused due to bacterial infections and expands by lytic destruction of the involved bone, with sequestra formation of suppuration [16]. Fibrous dysplasia is a tumor-like condition where normal bone is replaced with an excessive proliferation of cellular fibrous connective tissue mixed with irregular bony trabeculae. It is a sporadic condition resulting from the post zygote century mutation of the GNAS1 gene [17]. Teeth involved mostly remain firm unless disturbed by some bony mass. Ground glass appearance in radiographs is a characteristic feature [18]. Histopathologically classical microscopic finding consists of irregularly shaped trabeculae of immature bone in a cellular, loosely arranged fibrous stroma [19]. They often look like Chinese script.

These are the few common pathologies occurring most commonly involving bone of the oral and Maxillofacial region. The prevalence data of these bone lesions in head and neck regions is limited, mainly in south India population.

## 2. Objectives

The aim of this study was to determine the prevalence of bone pathologies reported in the Department of oral pathology of a private dental hospital

## 3. Methods

This retrospective study was conducted in the Department of Oral and maxillofacial pathology at Saveetha dental college and hospital, Chennai to evaluate the prevalence of bone lesions. All the case details were collected from the hospital management system of the patients who came in a specified time period and underwent biopsy. Only the histologically proven cases of bone lesions were included in the study. Other pathologies and the lesions that were not histologically reported as bone lesions were excluded. A total of 15 data were collected that were verified in the oral pathology lab. Demographic details, clinical features, radiographic features and treatment modality were collected and

tabulated. Statistical analysis was done using SPSS software(version 24). Age of patients and gender of patients were compared to clinical features, radiographic findings, and treatment modality. Categorical variables were expressed in frequency and percentage. Chi-square test was used to test associations between categorical variables. P value < 0.05 was considered statistically significant.

## 4. Results

A total of 15 data were collected out of which 5 patients were with osteomyelitis, 4 patients were with cemento ossifying fibroma, 2 patients were with fibro osseous lesions, and 1 patient with solitary bone exostosis, chondrosarcoma, osteosarcoma, and osteitis deformans each. From the data collected, incidence of bone pathologies was seen more in the age group of 20-29 years. Number of female patients reported with bone pathologies was more than the number of male patients reported with bone pathologies. Pain was the common clinical feature that was presented by most of the patients (  $p = 0.360$ ). Radio opaque finding was predominantly seen radiographically (  $p = 0.285$ ). It was also found that surgical excision was the commonly followed treatment for the bone pathologies. When clinical features and age of the patients were compared, people between the age of 20-29 followed by 10-19 year olds and more than 70 years olds reported more bone pathologies than people of other age groups. Pain was the most common clinical feature presented by most of the age groups followed by swelling and nasal regurgitation(Fig.1). Radio opaque findings were the most common finding in most of the cases, followed by mixed radio opaque and lucent findings and radiolucency(Fig. 2). Biopsy was the most common treatment modality for most of the age groups followed by surgical excision, maxillectomy and pharmacotherapy (  $p = 0.311$ )(Fig. 3). When compared between genders, female patients reported pain followed by swelling while males patients reported pain followed by nasal regurgitation and growth (  $p = 0.98$ )(Fig. 4). Number of radiographic findings of female patients that were radiopaque and radiolucent were equal followed by mixed radiopaque and radiolucent findings(Fig. 5). Most male radiographic findings were radiopaque. Treatment modality for female patients was biopsy followed by surgical excision and pharmacotherapy(Fig. 6). Male patients were treated with biopsy and maxillectomy followed by surgical excision.

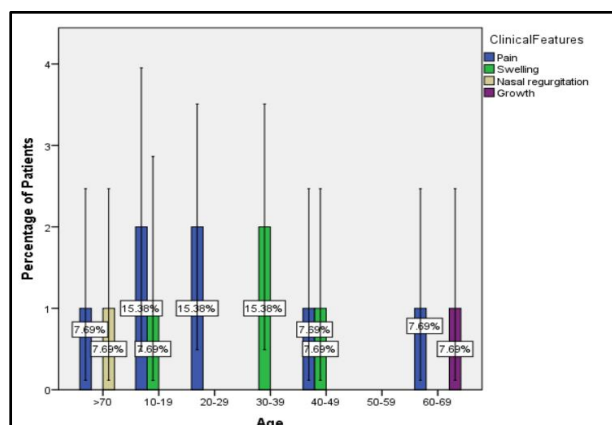


Fig 1: The bar graph represents the association between the age and the clinical features of bone pathologies. X axis represents age and Y axis represents the percentage of patients. Blue denotes pain, green denotes swelling, magenta denotes nasal regurgitation and orange denotes growth. Pain was the most common complaint reported by patients with bone pathologies. Patients of 20-29 years of age complains of pain (15.38%), patients with 10-19 years of age complain of pain and swelling (7.69%). Pearson correlation showed p value of 0.360(>0.05) which is statistically insignificant.

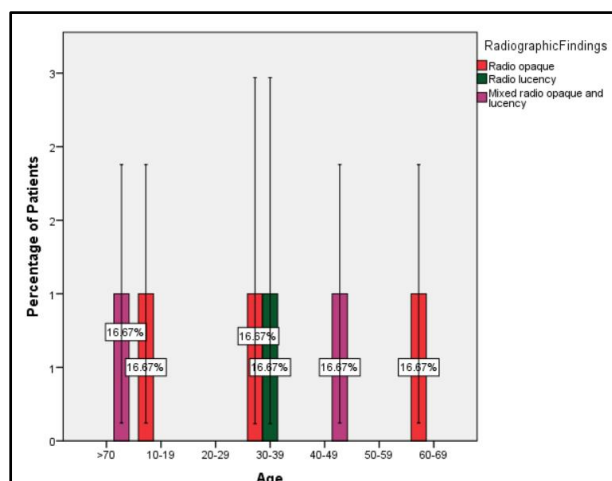


Fig. 2: The bar graph represents the association between the radiographic findings and the age of the patients reported with bone pathologies. The X axis represents age and the Y axis represents the percentage of patients. Orange colour denotes radio opaque, dark green denotes radiolucency and pink denotes mixed radiopaque and radiolucency. Patients of 10-19 years of age showed radiopacity in the radiograph (16.67%). Patients of 40-49

years of age showed mixed radio opacity and radiolucency (16.67%). Pearson correlation showed p value of 0.285(>0.05) which is statistically insignificant.

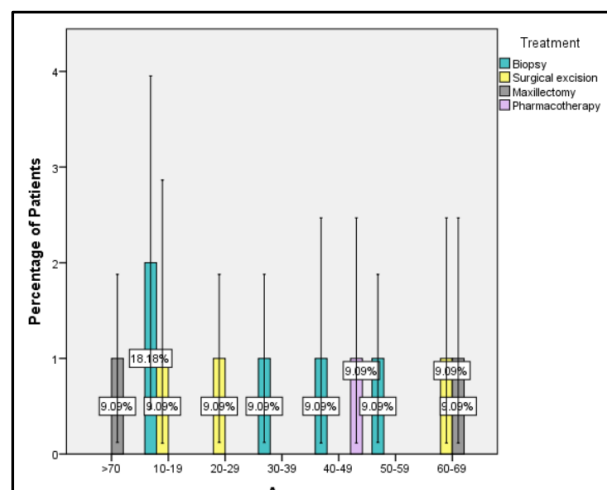


Fig. 3: The bar graph depicts age wise distribution of treatment modalities followed for patients with different bone pathologies. The X axis represents age and the Y axis represents the percentage of patients. Teal color denotes biopsy, yellow denotes surgical excision, gray denotes maxillectomy and lavender denotes pharmacotherapy. Biopsy was done in most of the patients. Patients of 10-19 years of age underwent biopsy and surgical excision (9.09%). Pearson correlation showed p value of 0.311(>0.05) which is statistically insignificant.

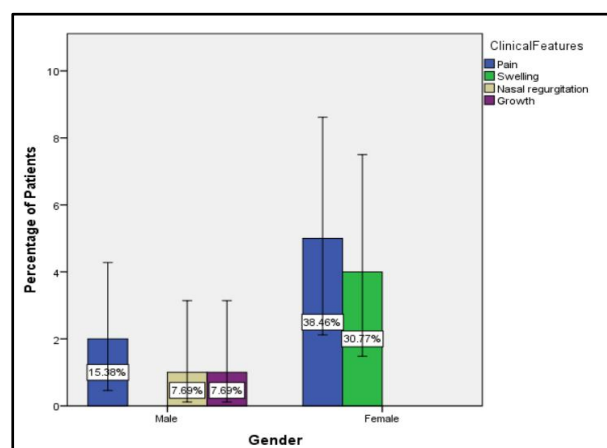


Fig. 4: The bar graph depicts gender wise distribution of clinical features presented by different patients with different bone pathologies. X axis represents gender and Y axis represents the percentage of patients reported with bone pathologies. Blue denotes pain, green denotes



swelling, magenta denotes nasal regurgitation and orange denotes growth. Pain was the most common clinical symptom reported by both males and females. Pearson correlation showed p value of 0.98(>0.05) which is statistically insignificant.

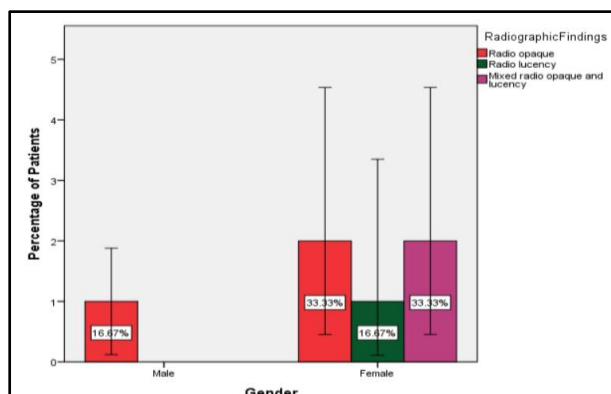


Fig. 5: The bar graph depicts gender wise distribution of radiographic findings of various patients with different bone pathologies. X axis represents the gender and Y axis represents the percentage of cases reported. Orange denotes radio opaque, dark green denotes radiolucency and pink denotes mixed radiopaque and lucency. Radiopacity was the most common radiographic feature reported by both males and females. Pearson correlation showed p value of 0.549(>0.05) which is statistically insignificant.

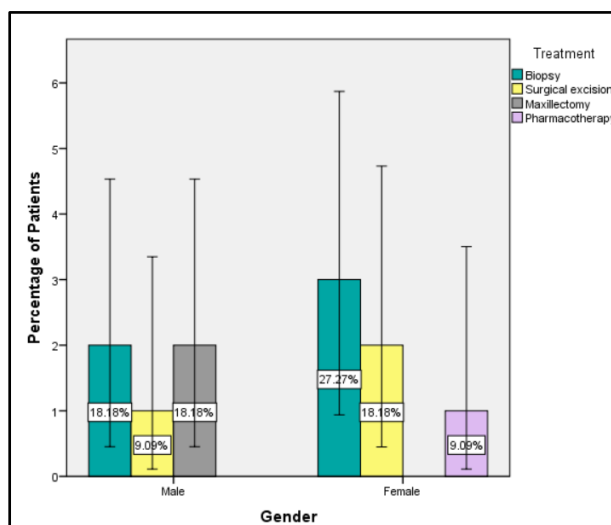


Fig. 6: The bar graph depicts gender wise distribution of various treatment modalities followed for various patients with different bone pathologies. X axis represents gender and Y axis represents Percentage of

patients. Teal colour denotes biopsy, yellow denotes surgical excision, grey denotes maxillectomy and lavender denotes pharmacotherapy. Biopsy was the most common treatment modality in males and females. Pearson correlation showed p value of 0.325(>0.05) which is statistically insignificant.

## 5. Discussion

Bone lesions of the jaw are either related to the dentition or the alveolar bone proper. Most commonly seen bone lesions are cemento osseous dysplasia, fibrous dysplasia, chondroma, osteosarcoma etc [20,21]. Among the pathologies reported fungal osteomyelitis, fibro osseous lesion, osteomyelitis and peripheral cemento ossifying fibroma were reported more compared to other lesions. These bone lesions have distinct clinical and radiographic features.

Osteomyelitis is an inflammatory process in the medullary spaces or cortical spaces of the bone that is either acute or chronic and the bone extends away from the initial site of involvement. It is mainly caused due to bacterial infections and expands by lyric destruction of the involved bone, with sequestra formation of suppuration [22]. Chronic systemic diseases, immunocompromised status, and conditions associated with the reduction of vascularity of the bone have been few predisposing causes for osteomyelitis [23,24]. Fungal osteomyelitis is an unusual condition that is mostly inactive in nature. Urs AB, et al., stated that the radiographic findings of fungal osteomyelitis had radiopaque interdental septum in relation to the associated teeth which correlated to the radiographic findings of the data collected from the patient details [25]. Anehosur, Venkatesh, et al, stated that the number of male affected with fungal osteomyelitis were more than females affected with the pathology [26]. This differed from the results of this study as the number of males and females who were affected by fungal osteomyelitis were the same. Total of 5 patients were reported with osteomyelitis.

2 cases of fibro osseous lesions were reported in our hospital. Fibro osseous lesions is a diverse group of processes that are characterized by replacement of normal bone by fibrous tissue containing a newly formed mineralized product. Fibrous dysplasia is a tumor-like condition where normal bone is replaced with an excessive proliferation of cellular fibrous connective



tissue mixed with irregular bony trabeculae. It is a sporadic condition resulting from the post zygote century mutation of the GNAS1 gene. Cemento osseous dysplasia occurs in tooth bearing areas of the jaw and is probably the most common fibro osseous lesion. Cemento ossifying fibroma is a true neoplasm that predominantly affects the craniofacial region. It is a neoplasm with significant growth potential [27]. It contains fibrous tissue that contains a mixture that includes structures like the bony trabeculae, cementum like spherules or both. The tumor has been found to have an odontogenic origin, or periodontal ligament, but microscopically resembles neoplasm with cementum-like differentiation in the orbital, frontal, ethmoid, sphenoid, and temporal bones. As also found by Muwazi, L. M., and A. Kamulegeya, fibrous dysplasia was the most common lesion which was followed by cemento ossifying fibroma [28]. Many researches state that fibro osseous lesions have a female predilection which is not yet clear. It also stated that most patients presented with pus discharge swelling and pain in the associated area, which contradicted the clinical findings presented by patients in this study. In an article Lasisi, Taye Jemilat, et al, it was found that fibro osseous lesions affected mostly in the 30-39 years, while the patients listed in this study were between 10-19 of age. In a case review conducted by Ajabe, H. A., and J. O Daramila, it was recorded that cemento ossifying fibroma was common among the age of 11-20 which is similar to results of our study. It also stated that the majority of the patients had painless, gradually enlarging swelling in the affected regions which contradicted with painless features presented by the patients of this study. Osteosarcoma of the jaw is challenging both to diagnose and manage. This is due to the high incidence of mistakes in biopsy results, rare specific radiological features and difficulties in proper resection due to proximity to vital structures. 1 case of osteosarcoma and 1 case of chondrosarcoma were reported to our department. The basic treatment followed in all of the above mentioned articles was surgical excision of the swelling in the affected region. The potential limitation of the present study was that it was a single centered study and the sample size was small.

Within the limitations of the retrospective study done in a hospital setting it is found that females have more predilection to occurrence of bone pathologies than

males and that most bone lesions affected individuals within the age of 20-29.

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