http://doi.org/10.33279/jkcd.v15i02.826

Orginal Article

FREQUENCY AND CLINICORADIOGRAPHIC PATTERN OF GIANT CELL LESIONS AFFECTING ORAL AND MAXILLOFACIAL REGION

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ABSTRACT

Objectives: *To determine the frequency, clinical and radiographic features of different types of giant cell lesions of the oral & maxillofacial region reported to Khyber College of Dentistry Peshawar.*

Materials and Methods: *This descriptive cross sectional study was conducted in the department of oral and maxillofacial surgery, Khyber College of Dentistry Peshawar from November 2019 to April 2021. Total of 239 patients with histopathologically confirmed reports of giant cell lesions were included in the study. Data about patient age, gender, clinical and radiographic features were obtained through a structured proforma and was analyzed for results.*

Results: *Out of total 239 patients, 145 (60.7%) were female. The most common age group was 11-20 years comprising (34.7%). Among different types of giant cells lesion, central giant cell (60.7%) was the most common followed by peripheral giant cell granuloma (31%). There was no pain in 72% patients. Bicortical swelling was observed in 65.7% cases. The Mandible was the most commonly involved site (65.7%), with anterior mandible affected in 46.9% cases. Tooth mobility was observed in 67.8% cases. Radiographically, 94.6% cases were radiolucent and 54.8% were multilocular.*

Conclusion: *It is concluded from this study that Giant cell lesions are frequently encountered during 2nd decade of life and more common in females, involving anterior mandible. Central giant cell granuloma is the most frequent among the other types of giant cell lesions. Clinically, the majority of patients presented without pain, exhibited tooth mobility and had biocritical swelling. Radiographically, most of the lesions appeared radiolucent and multilocular.*

Key words: *Giant cell lesion, multinucleated giant cells, radiolucent lesion, maxillofacial region*

Cite as: Bibi H, Ahmad T, Afzal S, Imran M, Izaz M. Frequency and clinicoradiographic pattern of giant cell lesions affecting oral and maxillofacial region. Journal of Khyber College of Dentistry Jun 2025, Vol. 15, No. 2. http://doi.org/10.33279/jkcd.v15i02.826

INTRODUCTION

Giant cells are multinucleated cells frequently encountered in various oral and maxillofacial lesions. These cells, which contain multiple nuclei dispersed within the cytoplasm[1], can arise in both physiological and pathological conditions[2]. Multinucleate giant cells of different types are frequently encountered in oral and maxillofacial lesion[3]. Different types of giant cells include foreign body type, langhan's type, touton type, and tumour giant cells[4], and are typically formed by fusion of macrophage[5].

Giant cell lesions of the jaw are significant subset of oral pathologies[6], and are benign in nature, although some exhibiting locally aggressive behavior involving the jaw bones[7]. Their biologic behaviour range from latent to aggressive associated with

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Date Submitted: November 2024
Date Revised: December 2024
Date Accepted: January 2025

expansion and resorbtion of bone[8]. The lesions are classified as Aggressive or nonaggressive based on lesion size, growth rate, tooth resorption, jaw bone thining and resorption and recurrence of lesion[9].

Clinically, giant cell lesion can present with swelling, pain and ulceration, though asymptomatic cases are not uncommon. Clinical presentation can vary, more common in females before 20 years of age (approximately 2:1). Mandible is commonly affected. Radiographically, they are often observed as a well-defined, multilocular radiolucency[10-12].

Histologically, these lesions are characterized by the presence of multinucleated giant cells dispersed among mononuclear stromal cells, fibroblasts, and extravasated red blood cells[2].

Several types of giant cell lesions have been identified, including Tumor like lesions (Central giant cell granuloma, Peripheral giant cell granuloma, Giant cell Tumor), Cystic lesion: (Traumatic bone cyst, Aneurysmal bone cyst), Metabolic lesions (Hyperparathyroidism) and Miscellaneous lesions including Cherubism[4]. Surgery is the main stray of treatment[12].

Despite the clinical significance of these lesions, there remains a lack of comprehensive local data comparing their frequencies, age, gender distribution, and radiographic presentation. Existing literature is limited in addressing the relative prevalence and behavior of the various subtypes, particularly in specific regional populations. Very few studies have been done locally on this topic, this study will provide important data regarding giant cell lesion.

The aim of this study is to determine the frequency, clinical and radiographic features of different types of giant cell lesion affecting mandible and maxilla reported to department of oral and maxillofacial surgery, Khyber College of Dentistry Peshawar.

The findings are intended to support clinicians in making informed diagnostic and treatment decisions, and to contribute valuable data for developing targeted management strategies.

MATERIALS AND METHODS

Ethical approval was obtained from ethical committee of Khyber college of dentistry Peshawar hospital, vide letter #817-AD/R/PG/KCD. Cross sectional descriptive study was carried out in the department of oral and maxillofacial surgery, Khyber College of Dentistry Peshawar from November 2019 to April 2021. Sampling was done through Non- probability consecutive sampling technique.

All patients upto70 years age of both genders presented with the swelling in the oral cavity, face, maxilla and mandible and were histologically diagnosed with a giant cell rich lesion following biopsy were included in the study. From each patient informed written consent was taken. Total of 239 patients were included in the study.

Previously treated cases of giant cell lesions and syndromic patients were excluded from the study. Different types of giant cell lesion were classified on the basis of histopathological and clinical correlation into Central giant cell granuloma, Peripheral giant cell granuloma, Giant cell tumor of bone and Aneurysmal bone cyst. Tooth mobility was taken as the movement of a tooth within its socket in response to applied forces. Teeth showing no movement in any direction were labeled as having no mobility, while those exhibiting movement equal and greater than 1mm in either horizontal or vertical direction were labeled as positive.

Radiographic features were standardized to ensure uniform evaluation based on radio-density and locularity. Lesion appearing dark on radiograph were classified as radiolucent, while those showing increased opacity were classified as radiopaque. Unilocular lesion were defined as having single radiolucent area, whereas multilocular lesions displayed multiple radio-lucent compartments separated by bony septa.

The types of lesions and their sites were recorded. For data entry SPSS version 20 was used and was analyzed using descriptive statistics. Frequencies and percentages were calculated for categorical variables e.g. gender, types of lesions and site. Mean and Standard deviation were calculated for numerical variables e.g. age. Stratification of giant cell lesions was done on the basis of age, gender and affected site to see effect modifiers. Post stratification analysis was done by using Chi square test. P-value equal or less than 0.05 was taken as statistically significant. The data is presented in the form of tables.

RESULT

Among 239 patients, the most prevalent age

group was 11-20 years accounting for 34.7% of cases, followed by 21-30 years age group (29.7%). Less common age group included 0-10 years (13.8%), 31 to 40 years (9.2%), 41 to 50 years (6.3%), 51 to 60 years (2.1%) and 61-70 year (4.2%) with an overall age range spanning from 0-70 years, Female were more commonly affected than male with 145 patients (60.7%) being female and 94 patients (39.3%) were male (Table 1).

Five key clinical features were assessed, among the total cases, 172 patients (72%) reported no pain, whereas 67 patients (28%) experienced pain. Bicortical expansion of the jaw was the most frequently observed feature, noted in 157 cases (65.7%). This was followed by unicortical expansion, seen in 82 cases (34.3%). Tooth mobility was noted in 162 patients (67.8%), while 77 cases (32.2%) exhibited no mobility in teeth. The Mandible was the most commonly involved site 156 cases (65.3%), followed by maxilla 83 cases (34.7%). Lesions were frequently localized to the anterior jaw (112 cases, 46.9%), while 71 cases (29.7%) showed simultaneous involvement of anterior and posterior regions, and 56 cases (23.4%) were limited to posterior jaw.(Table 2)

Majority of lesions appeared radiolucent (94.6%). Radiopacity was observed in 7 cases (2.9%) and 6 cases (2.5%) exhibited of mixed pattern.

Table 1: Age and gender Distribution of Giant cell lesion

Variables		N	%
Age {years}	0-10	33	13.8
	11-20	83	34.7
	21-30	71	29.7
	31-40	22	9.2
	41-50	15	6.3
	51-60	5	2.1
	61-70	10	4.2
Gender	Male	94	39.3
	Female	145	60.7

Table 2: Descriptive statistics of clinical and radiographic features

Variables		N	%
Pain	Yes	67	28.0
	No	172	72.0
Expansion	Unicortical	82	34.3
	Bicortical	157	65.7
Tooth mobility	Yes	162	67.8
	No	77	32.2
Lesion involving	Mandible	156	65.3
	Maxilla	83	34.7
site involved	Anterior	112	46.9
	Posterior	56	23.4
	Both	71	29.7
Locularity	Unilocular	108	45.2
	Multilocular	131	54.8
Radiodensity	Radiopaque	7	2.9
	Radiolucent	226	94.6
	Mixed	6	2.5

Table 3: Types of giant cell lesion distribution.

Type of giant cell lesion	N	%
Central giant cell granuloma	145	60.7
Peripheral giant cell granuloma	74	31.0
Giant cell tumor of bone	14	5.9
Aneurysmal bone cyst	6	2.5
Total	239	100

Table 4: Cross tabulation of different types of giant cell lesion with age and gender

Age and Gender	Types of giant cell lesions				P value
	Central giant cell granuloma	Peripheral giant cell granuloma	Giant cell tumor of bone	Aneurysmal bone cyst	
0-10yr	22(15.2%)	8(10.8%)	3(21.4%)	0	0.001*
11-20yr	49(34.5%)	25(33.8%)	8(57.1%)	0	
21-30yr	40(27.6%)	25(33.8%)	0	6(100%)	
31-40yr	16(11%)	6(8.1%)	0	0	
41-50yr	7(4.8%)	5(6.8%)	3(21.4%)	0	
51-60yr	0	5(6.8%)	0	0	
61-70yr	10(6.9%)	0	0	0	
Male	64(44.1%)	24(32.4%)	3(21.4%)	3(50%)	0.161*
Female	81(55.9%)	50(67.6%)	11(78.6%)	3(50%)	

*Fischer exact test

Regarding lesion architecture, 131 cases (54.8%) demonstrated multilocular radiolucency, whereas 108 (45.2%) were unilocular. (Table 2)

Among 239 patients, the predominant lesion was central giant cell granuloma accounting for 60.7% of cases, peripheral giant cell granuloma constituted (31%) of cases. Less frequently encountered lesions included giant cell tumor of bone (5.9%) and aneurysmal bone cyst (2.5%). (Table 3). Fisher exact test was applied, which shows stastistically significant difference between age and different types of giant cell lesions with p value 0.001. Details are given in Table 4.

DISCUSSION

The results of this study support that giant cell lesions are common and destructive pathologies of oral and maxillofacial region[13]. In present study among 239 cases of giant cell lesions, the most frequent age group was 2nd decade (34.7%) and female (60.7%) being commonly affected than male (39.3%). These results were consistent the results of several studies. Styruplkowska[14] reported mean age to be 32.5years and 55.5% were female, and Sadri et al[15] in Iran reported that 58.2% were female.

Gender wise, multiple studies found a female predominance. Salum et al[16] and Zhang et al[17] reported that lesions were common in female. We speculate that the higher incidence may be attributed to hormonal influences such as estrogen, which has been suggested as role in bone metabolism and could attribute to the lesion development in younger females.

Among 239 cases, the majority of lesions were painless and predominantly involved the anterior mandible. Hakim[10] noted lesions involving the mandible more often, and they were typically painless. In contrast, study by goaz[18] reported the posterior mandible was commonly involved. Reason for the anterior mandible being a common site may relate to the higher mechanical stress in this region.

In our study, among 239 cases, central giant cell granuloma (60.7%) being the most common types. followed by peripheral giant cell granuloma. The results were consistent with Study of Hakim et al[10] in Srinagar and by Mullapudi[7] in India, the prevalence of Central giant cell granulomas comprise of 72.6% and 7.8% cases respectively. In other studies, a study conducted by Kargahi N et al[13] in Isfahan reported that the most frequent lesion was Peripheral giant cell granuloma (68.5%). The different in prevalence in other studies may be related to geographic distribution.

Among 239 lesion, in our study the predominant radiographic pattern were multilocular (54.8%) and radiolucent (94.6%). Styruplkowska et al[14] reported the majority as multilocular (54.8%) and radiolucent (94.6%). Central giant cell granuloma was common among female (55.9%) and 2nd decade of life (34.5%), peripheral giant cell granuloma predominantly affected female (67.6%) and same age group (33.8%), giant cell tumor in female (78.6%) and 2nd decade (57.1%).These findings align with previous studies by Mohajerani et al[6], reported central giant cell among female (66.1%) in second decade and affecting anterior mandible.

Understanding the clinical relevance of jaw giant cell lesions of the jaw is vital for effective individualized surgical management. Early detection, correct classification, and personalized planning help to reduce morbidity and lower recurrence. Radiographic features guide treatment extent, with aggressive or multilocular lesion require wider excision.

Limitations of the study is, data is collected from single institution and geographic region and may not represent variation in clinical presentation or prevalence patterns across different settings . The study design may not allow assessment of progression, recurrence, or treatment outcome over time.

Future studies should include all lesions subtypes and be conducted across multiple geographic regions. Expanding research beyond a single center will improve the generalizability of finding.

CONCLUSION

The present study highlights clinicoradiographic features of giant cell lesions of the oral and maxillofacial region. It is concluded from this study that Giant cell lesions frequently encountered during 2nd decade of life and more common in females, invoving anterior mandible. Central giant cell granuloma are most frequent among the other types of giant cell lesions. Clinically, the majority of patients presented without pain, exhibited tooth mobility and had bicortical swelling. Radiographically, most lesions appeared radiolucent and multilocular.

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CONFLICT OF INTEREST
Authors declare no conflict of interest.
GRANT SUPPORT AND FINANCIAL DISCLOSURE
None declared.

AUTHORS' CONTRIBUTION

The following authors have made substantial contributions to the manuscript as under:

Conception or Design:	HB, TA, SA, MI
Acquisition, Analysis or Interpretation of Data:	HB, TA, SA, MI, MI
Manuscript Writing & Approval:	HB, TA, SA, MI, MI

All the authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.