BULLETIN OF STOMATOLOGY AND MAXILLOFACIAL SURGERY
Volume 21, Issue 8

DOI: 10.58240/1829006X-2025.21.8-5

ORIGINAL ARTICALE

CLINICOPATHOLOGICAL STUDY OF ODONTOGENIC CYSTS AND TUMORS IN A TERTIARY CARE HOSPITAL

Preethi Srinivasan[1] Karthik Sigamani[2], Dharmishtha Natvarlal Kapadiya[3] ,Varadharajaperumal Radhakrishna[4] , T. PUHAZHENDHI[5]

[1]Assistant Professor, Department of Pathology, Karpaga Vinayaga Institute of Medical Sciences and Research Centre. om.lovely93@gmail.com
[2]Professor and Head, Department of Pathology, Karpaga Vinayaga Institute of Medical Sciences and Research Centre. eversmile_kar@yahoo.com

[3]Associate Professor, Department of Pathology, Karpaga Vinayaga Institute of Medical Sciences and Research Centre. dharmishthakapadiya@gmail.com
[4.]Professor, Department of Pathology, Karpaga Vinayaga Institute of Medical Sciences and Research Centre. varadharajaperumal87@gmail.com
[5]Tutor, Department of Public Health Dentistry, Sree Balaji Dental College and Hospital (BIHER University), Chennai, India. drpugalbds@gmail.com
Corresponding author: **Dr Varadharajaperumal Radhakrishnan**, Karpaga Vinayaga Institute of Medical Sciences and Research Centre, Maduranthagam, India,varadharajaperumal87@gmail.com
Received: *Jul 7. 2025;* ***Accepted:*** *Aug 24, 2025;* ***Published:*** *Aug, 27. 2025*

ABSTRACT

Background: Odontogenic lesions that include cysts and tumors constitute less than 2-3% of all the oral and maxillofacial lesions. Odontogenic cysts and tumors originate from tooth apparatus or its remnants.

Objectives: To determine the frequency and clinicopathological characteristics of odontogenic tumours**:** This study aimed to evaluate the role of CTA in diagnosing CHD and to compare the diagnostic accuracy of TTE and CTA.

Materials and Methods*:* Cross-sectional study, Department of Pathology. The clinicopathological details were retrieved over the period of nine years from January 2013 to December 2021. Data were tabulated and analysed for any significant association among the clinicopathological variables.

Results*:* In the present study, among the total 149 cases, 113 cases (75.8%) were odontogenic cysts and 36 cases (24.2%) were odontogenic tumors. The most common age group involved was 20-40 years (64.4%) and the male:female (M:F) ratio was 1.4:1. Right mandible (32.2%) was the predominant site involved followed by left maxilla (24.2%). The average size of odontogenic cysts was 1.5cm whereas the mean size of odontogenic tumors was 2.8cm. Periapical cyst (70.8%) was the commonest odontogenic cyst while ameloblastoma (36.1%) was the frequent odontogenic tumor. There was statistically significant association of lesion size with age of patients (p-value 0.002), gender (p-value 0.023), histopathological nature of odontogenic lesions (p-value- 0.010) and histopathological subtypes of odontogenic tumors (p-value 0.042).

Conclusion: The present study provides insights into the clinicopathological characteristics and association of various clinicopathological parameters with size of the odontogenic lesions, thereby facilitating early diagnosis and management of this diverse group of odontogenic lesions.

Keywords: Odontogenic lesions, Periapical cyst, Ameloblastoma, mandible, maxilla

\INTRODUCTION

Odontogenic lesions that include cysts and tumors account for less than 2-3% of all the oral and maxillofacial lesions.[1] The World Health Organisation (WHO) Collaborating Centre for the histological classification of odontogenic tumors and allied lesions was established in 1966 by the department of oral pathology that was universally adopted by 1969. Two years later, in 1971, WHO had published the first authoritative and useful guide to the classification of odontogenic tumors, cysts and allied lesions authored by Pindborg and Kramer.[2] A second edition entitled:

Histological Typing of Odontogenic Tumours appeared in 1992, twenty years later.[3]

The embryogenesis of teeth involves a complex interaction between connective tissue elements (odontogenic ectomesenchyme) and specialized epithelial cells. For each tooth, a group of epithelial cells (dental lamina) proliferates downward from the surface mucosa into the developing alveolar bone to form the enamel organ. This epithelium induces the differentiation of ectomesenchymal cells which form the central dental papilla and surrounding connective tissue follicle. Enamel formation is mainly dependent on specialized epithelial cells (ameloblasts) from the enamel organ. The dental papilla is destined to become the tooth pulp and gives rise to the odontoblasts which form the dentin of the tooth. Later in tooth formation, cells from the surrounding dental follicle differentiate into cementoblasts to form a thin layer of bone-like cementum on the outer root surface. [4]

Odontogenic lesions include a complex and broad spectrum of non-neoplastic cystic lesions to neoplastic odontogenic tumors developing from the various complex structures of the tooth. Odontogenic cysts may arise de novo or from stimulation of epithelial remnants by odontogenic infections. Tumors of odontogenic origin may develop from the epithelial cells, ectomesenchymal component, or combination of both.[4] The latest WHO Classification 2023 had classified the odontogenic lesions into cysts of jaw and odontogenic tumors.[5] The present study was designed to determine the frequency and clinicopathological characteristics of the various odontogenic lesions encountered among the patients in a tertiary care hospital.

MATERIALS AND METHODS

After obtaining Institutional Ethical Committee approval (KIMS/F/2022/17), the following cross-sectional study was conducted in department of pathology based on laboratory records. The clinicopathological data of all the odontogenic cysts and tumors reported from January 2013 to December 2021 were collected including variables like patients' age, gender, lesion site, gross size and histopathological diagnosis. All the odontogenic lesions were categorised into two groups based on the gross size cutoff value of 3cm according to the study based on WHO Head and Neck tumors classification by Monteiro L et al.[6] The mean size of odontogenic lesions (cysts and tumors) was 3.3cm in the study by Monteiro L et al.[6] The data was plotted in Microsoft excel and analyzed using chi-square test with SPSS software version 25.

RESULTS

In the present study, total 149 cases have been included as per inclusion and exclusion criteria with predominant age group of 20-40 years (64.4%) and mean age of 32 years. Among the 149 cases, 58.4% were males and 41.6% were females with M:F ratio of 1.4:1 [Table 1].

The site distribution of odontogenic cysts and tumors showed 32.2% of cases in right mandible, 24.2% of cases in left maxilla, 22.1% of cases in left mandible and 21.5% of cases in right maxilla. Based on histopathological examination, among the total 149 odontogenic lesions encountered in this study, 75.8% cases were classified as odontogenic cysts and 24.2% cases as odontogenic tumors. The size of odontogenic cysts ranged from 0.1cm to 2.5cm with the average size of 1.5cm while the size of odontogenic tumors ranged from 0.1cm to 7cm with the mean size of 2.8cm. Around 69.8% of odontogenic lesions were less than 3cm in size grossly in the present study [Table 1].

Table 1. Descriptive statistics of the study variables

Study Variables	Frequency (n = 149)	%
Gender		
Males	87	58.4
Females	62	41.6
Age		
< 20 years	18	12.1
20 – 40 years	96	64.4
>40 years	35	23.5
Site distribution		
Right Mandible	48	32.2
Left Mandible	33	22.1
Right Maxilla	32	21.5
Left Maxilla	36	24.2
Histopathological Diagnosis		
Odontogenic cysts	113	75.8
Odontogenic tumors	36	24.2
Gross Size of the lesion		
≥3cm	45	30.2
< 3cm	104	69.8

The histopathological distribution of odontogenic cysts and tumors revealed a spectrum of lesions in the present study with periapical cyst (70.8%) being the most common odontogenic cyst while ameloblastoma (36.1%) being the most common odontogenic tumor. The other odontogenic cysts were dentigerous cyst (17.7%), odontogenic keratocyst (5.3%), residual cyst (5.3%) and glandular odontogenic cyst (0.9%). The other odontogenic tumors encountered in this study were cemento-ossifying fibroma (19.4%), calcifying epithelial odontogenic tumor (13.8%), odontogenic fibroma (11.1%), calcifying cystic odontogenic tumor (5.6%), odontoma (5.6%), ameloblastic fibroma (2.8%), adenomatoid odontogenic tumor (2.8%) and ameloblastic carcinoma (2.8%) [Table 2, Figure 1- 7].

Table 2. Histopathological distribution of Odontogenic cysts and tumor

Odontogenic lesions				
S.No	**Odontogenic Cysts (n=113)**		**Odontogenic Tumors (n=36)**	
	Histopathological type	**n (%)**	**Histopathological type**	**n (%)**
1.	Periapical cyst	80 (70.8%)	Ameloblastoma	13 (36.1%)
2.	Dentigerous cyst	20 (17.7%)	Cemento-ossifying fibroma	7 (19.4%)
3.	Odontogenic keratocyst	6 (5.3%)	Calcifying epithelial odontogenic tumor	5 (13.8%)
4.	Residual cyst	6 (5.3%)	Odontogenic fibroma	4 (11.1%)
5.	Glandular Odontogenic cyst	1 (0.9%)	Calcifying cystic odontogenic tumor	2 (5.6%)
6.	-	-	Odontoma	2 (5.6%)
7.	-	-	Ameloblastic fibroma	1 (2.8%)
8.	-	-	Adenomatoid odontogenic tumor	1 (2.8%)
9.	-	-	Ameloblastic carcinoma	1 (2.8%)

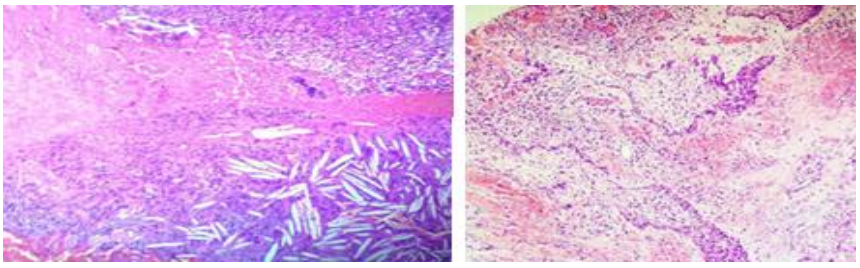

Figure 1. Periapical cyst: Cyst wall with underlying stroma shows lymphocytes, plasma cells and cholesterol clefts (H&E stain 10x).

Figure 2. Dentigerous cyst: Cyst wall lined by odontogenic epithelium containing lymphocytes and congested blood vessels (H&E stain 10x).

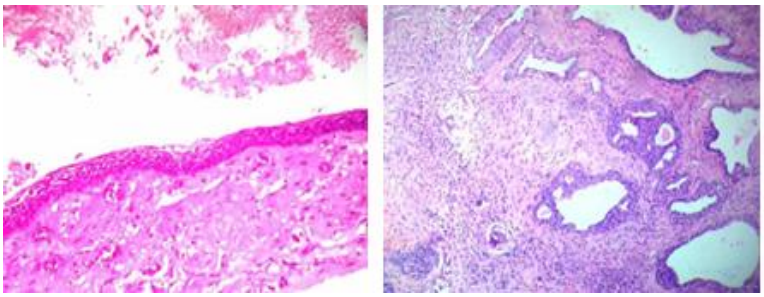

Figure 3. Odontogenic Keratocyst: Cyst wall lined by stratified squamous epithelium enclosing lamellar keratinous debris (H&E stain 10x).

Figure 4. Glandular odontogenic cyst: Multilocular cyst wall lined by flattened to stratified squamous epithelium with intraepithelial microcysts surrounded by lymphocytes (H&E stain 10x).

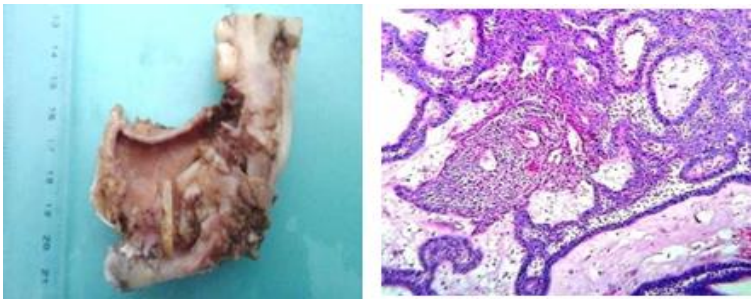

Figure 5: 5a) Hemimandibulectomy specimen showing unicystic ameloblastoma (Gross)
Figure 5:5b) Follicular type ameloblastoma: Tumor arranged in follicles with stellate reticulum (H&E stain 10x)

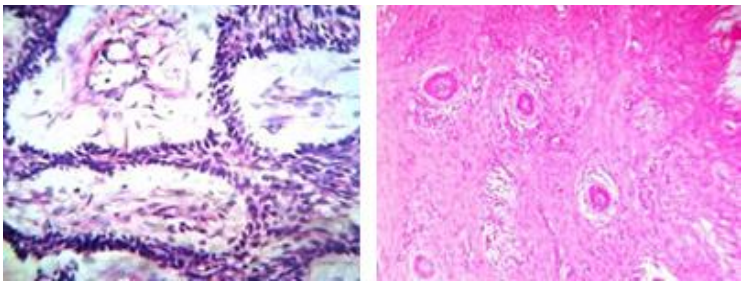

Figure 5:5c) Follicular type ameloblastoma: Follicles with peripheral nuclear palisading. (H&E stain 40x)
Figure5: 5d) Desmoplastic type ameloblastoma: Islands of tumor cells in a collagenous stroma (H&E stain 10x)

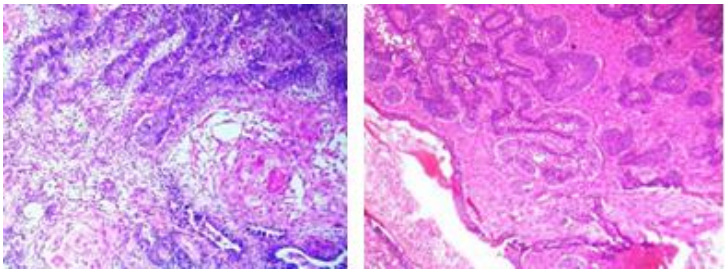

Figure 5: 5e) Acanthomatous type ameloblastoma: Showing squamous metaplasia and keratinisation of stellate reticulum (H&E stain 10x).

Figure5: 5f) Plexiform type ameloblastoma: Showing anastomosing cords of odontogenic epithelium (H&E stain 10x).

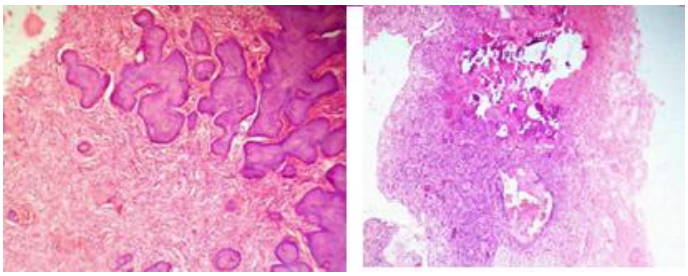

Figure 6 Cemento-ossifying fibroma: Cementum and bony trabeculae with osteoblastic rimming in a fibrous stroma (H&E stain 10x).

Figure 7 Calcifying cystic odontogenic tumor: Cyst wall lined by odontogenic epithelium with small foci showing calcification (H&E stain 10x).

In this study, the association between size of the odontogenic lesions and various clinicopathological variables including patients' age, gender, site distribution and histopathological subtypes was statistically analyzed. Among all patients more than 20 years of age in this study, the gross size of odontogenic cysts and tumors were predominantly less than 3cm with 73.1% of them occurring in the 20-40 years age group. Thus there was a statistically significant association observed between gross size of the lesion and patients' age group in the present study (p-value 0.002). In the present study, the gross size of the odontogenic lesions were predominantly less than 3cm in both gender with 64.4% of them occurring in males and 35.6% in females. Thus there was a statistically significant correlation between gender and gross size of odontogenic lesions (p-value 0.023) [Table 3].

Analysing the gross size of odontogenic lesions in relation to their site distribution revealed that majority of the lesions were less than 3cm in size in all the four sites with 34.6% of the lesions involving the right mandible followed by 25% of the lesions in right maxilla. However, there was no significant association between site distribution and gross size of the odontogenic lesions in the current study (p-value 0.156) [Table 3].

Table 3. Association between size of odontogenic lesions and clinical variables

Clinical Variables	**Size of the Odontogenic lesions**		**Chi-square test**
	≥ 3cm (n = 45)	**< 3cm (n = 104)**	
Age			
< 20 years	10 (22.2%)	8 (7.7%)	p-value 0.002
20 – 40 years	20 (44.5%)	76 (73.1%)	
> 40 years	15 (33.3%)	20 (19.2%)	
Gender			
Males	20 (44.4%)	67 (64.4%)	p-value 0.023
Females	25 (55.6%)	37 (35.6%)	
Site distribution			
Right Mandible	12 (26.7%)	36 (34.6%)	p-value 0.156
Left Mandible	13 (28.9%)	20 (19.2%)	
Right Maxilla	6 (13.3%)	26 (25%)	
Left Maxilla	14 (31.1%)	22 (21.2%)	

On comparing the gross size with that of histopathological types of odontogenic lesions, the gross size was predominantly less than 3cm in both odontogenic cysts and tumors with 81.7% of them being odontogenic cysts while 18.3% of them being odontogenic tumors. There was a statistically significant correlation between gross size and histopathological nature of odontogenic lesions (p-value 0.010) [Table 4].

Table 4. Association between odontogenic lesions and gross size

Histopathological Diagnosis	Size of odontogenic lesions		Chi-square test
	≥3cm	< 3cm	
Odontogenic cysts (n=113)	28 (62.2%)	85 (81.7%)	p-value 0.010
Odontogenic tumors (n=36)	17 (37.8%)	19 (18.3%)	

The association between gross size with that of histological subtypes of odontogenic cysts revealed that all the subtypes of odontogenic cysts being predominantly less than 3cm grossly except residual cyst which showed equal incidence in both the gross size categories. Among the odontogenic cysts that were less than 3cm in size, periapical cyst was the most common subtype (71.8%) while glandular odontogenic cyst was the least common subtype (1.2%). However, the association between gross size and subtypes of odontogenic cysts was not statistically significant in the present study (p value - 0.574) [Table 5].

Table 5. The association between gross size and histopathological subtypes of odontogenic cysts

Histopathological subtypes of odontogenic cysts	Gross size of odontogenic cysts		Chi-square test
	≥3cm (n = 28)	< 3cm (n = 85)	
Periapical cyst	19 (67.9%)	61 (71.8%)	p – value 0.574
Dentigerous cyst	4 (14.3%)	16 (18.8%)	
Odontogenic keratocyst	2 (7.1%)	4 (4.7%)	
Residual cyst	3 (10.7%)	3 (3.5%)	
Glandular Odontogenic cyst	0 (0.0%)	1 (1.2%)	

The association between gross size with that of histological subtypes of odontogenic tumors revealed statistically significant (p-value 0.042) results in the current study with majority (52.8%) of them being less than 3cm grossly. However, ameloblastomas showed larger sized lesions (≥3cm) grossly in around 69.2% of cases [Table 6].

Table 6.The association between gross size and histopathological subtypes of odontogenic tumors

Histopathological subtypes of odontogenic tumors	Gross size of odontogenic tumors		Chi-square test
	≥3cm (n = 17)	< 3cm (n = 19)	
Ameloblastoma	9 (52.9%)	4 (21.1%)	p-value 0.042
Cemento-ossifying fibroma	2 (11.8%)	5 (26.3%)	
Calcifying Epithelial odontogenic tumor	0 (0.0%)	5 (26.3%)	
Others	6 (35.3%)	5 (26.3%)	

DISCUSSION

Odontogenic cysts may arise de novo or through stimulation of epithelial remnants by odontogenic infections whereas odontogenic tumors can arise from the epithelial cells, ectomesenchymal component, or a combination of both.[3] This study determined the demographic, clinical and histopathological characteristics of odontogenic lesions among patients in a tertiary care hospital.

The age distribution of odontogenic lesions in the present study revealed that both odontogenic cysts and tumors were commonly encountered in the 20-40-years age group (64.4%) in concordance with the study by Ramachandra S et al [7] where the age of occurrence was between 21-50 years. However in the study done by Channappa et al, [8] odontogenic cysts were commonly encountered in 20-29 years of age group while odontogenic tumors were seen between 21-50 years of age. These findings emphasize the occurrence of odontogenic lesions among patients of wider age group in clinical practice.

The current study demonstrated a slightly higher male predominance (58.4%) among patients with odontogenic lesions similar to the study conducted by Singh CK et al. [9] However in the studies conducted by Ramachandra S et al [7] and Nayak et al, [10] odontogenic cysts showed male predilection while odontogenic tumors showed female predilection.

Mandible was the most frequent site for odontogenic lesions in the present study (54.3%) followed by maxillary lesions (45.7%) which was in correlation with the studies done by Nayak et al [10] and Ramachandra S et al.[7]

In the present study, odontogenic cysts (75.8%) were the predominant odontogenic lesions compared to odontogenic tumors (24.2%) which was similar to the study done by Singh CK et al [9] where odontogenic cysts accounted for 76.8% of cases while odontogenic tumors accounted for 23.2%. of the cases. Among the odontogenic cysts, periapical cyst (70.8%) was the most common cystic lesion while ameloblastoma (36.1%) was the most common odontogenic tumor which was in concordance with the study by Channappa et al [8] where periapical cysts accounted for 50.8% and ameloblastoma accounted for 54.8% of the total cases. Odontogenic cysts are characterized by bone resorption and develop from the odontogenic epithelial components or its residuals which gets trapped within the gingival tissue or bone. [11] Based on their origin, odontogenic cysts are classified into developmental and inflammatory. [12] Periapical cysts belong to the group of inflammatory lesions which are caused by infection of the tooth pulp chamber. The inflammatory response leads to proliferation of epithelial rests of Malassez and the cystic lesion is formed. [13] The cyst is lined by non-keratinized stratified squamous epithelium with a characteristic arcading pattern. The fibrous stroma of cyst wall is infiltrated by foamy histiocytes, lymphocytes and plasma cells along with cholesterol crystals and foreign body giant cells.[3] Ameloblastoma being the most common subtype, is a locally infiltrative odontogenic tumor of epithelial origin that arises from jaw bones.[5] Any odontogenic epithelium including dental lamina during pre-odontogenesis, epithelial rests of Malassez and Serres during post-eruption, reduced enamel epithelium during post-odontogenesis and basal layer of the overlying epithelium during embryogenesis and pre-odontogenesis can give rise to the development of ameloblastoma.[14] Based on WHO, ameloblastoma is classified into unicystic, extraosseous/peripheral, conventional, adenoid and metastasizing ameloblastoma. The subtypes of conventional ameloblastoma are follicular, plexiform, acanthomatous, granular cell, basal cell and desmoplastic ameloblastoma.[5] On microscopy, ameloblastoma is characterized by two types of cells - columnar cells resembling normal ameloblasts that palisades around epithelial islands and the more centrally located cells resembling stellate reticulum.[3]

In the present study, the statistical association between gross size of the odontogenic lesions and various clinicopathological variables revealed significant association with age of the patients (p value - 0.002), gender (p value - 0.023), histopathological nature of odontogenic lesions (p value - 0.010) and histopathological subtypes of odontogenic tumors (p value – 0.042). Al-Rawi et al [15] from UAE reported statistically significant association between lesion size with gender (p value < 0.05) and histopathological nature of odontogenic lesions (p value-0.01). In their study, around 53% of lesions were less than 1cm among males while 76% of lesions were less than 1cm among females which was in concordance to the current study.

In the study by Al-Rawi et al, [15] around 75% of radicular cyst were less than 1cm in size while all the four cases of ameloblastoma were larger than 1cm in size which was in concordance to the current study where 76.3% of radicular cysts were less than 3cm in size and 69.2% of ameloblastomas were more than 3cm in size grossly. Thus there was a statistically significant correlation between gross size and histopathological subtypes of odontogenic tumors in the current study (p value – 0.042). However, there was no significant association of gross size with the histopathological subtypes of odontogenic cysts (p value – 0.574) in the current study.

In the present study, the gross size of odontogenic lesions was also correlated with the patients' age and site distribution with no similar studies reported in literature. It was found that there was a significant association between the lesion size and patients' age (p value – 0.002) with majority of the lesions being significantly smaller in size among patients more than 20 years of age. However, the association between lesion size and site distribution of odontogenic lesions was statistically insignificant (p value – 0.156) in the present study.

doi:10.58240/1829006X-2025.21.8-5

LIMITATIONS: The present study has not included radiological features of the odontogenic lesions such as radiolucency, margin characteristics and pattern of bone expansion which can influence the prognosis and treatment planning. The study also did not include the long-term follow-up data such as local recurrences of odontogenic lesions.

CONCLUSION

The current study evaluated the clinicopathological characteristics of odontogenic cysts and tumors which revealed the preponderance of odontogenic cysts in comparison to odontogenic tumors. The novelty in the present study is determining the association of the lesion size with various clinicopathological variables that will influence the long-term prognosis of the patients with odontogenic lesions. It is found out that majority of the odontogenic lesions including cysts and tumors were smaller in size at diagnosis with significant correlation with patients age, gender and histopathological subtypes of odontogenic tumors.

KEY MESSAGES: Odontogenic cysts and tumors occurred frequently between 20-40 years of age with male to female ratio of 1.4:1 and right mandible being the most predominant involved site. Histopathological subtypes of odontogenic tumors showed significant correlation with that of lesion size and majority of them were smaller in size at initial clinical presentation.

DECLARATIONS

Ethics approval and consent to participate
Not applicable.

Consent for publication
Not applicable.

Competing interests
The authors declare no conflict of interest.

Funding
This research received no external funding

REFERENCES

1. Imran A, Jayanthi P, Tanveer S, Gobu SC. Classification of odontogenic cysts and tumors – Antecedents. 2016;20(2):269-71.
2. Pindborg J, Kramer IRH, Torloni H. World Health Organization international histological classification of tumours: histological typing of odontogenic tumours, jaw cysts and allied lesions. Geneva: World Health Organization, 1971: 18-19.
3. Kramer IRH, Pindborg JJ, Shear M. International histological classification of tumours: histological typing of odontogenic tumors. 2nd ed. Heidelberg: Springer-Verlag, 1992.
4. Chi AC, Neville BW. Odontogenic Cysts and Tumors. Surg Pathol Clin. 2011 Dec;4(4):1027-91. doi: 10.1016/j.path.2011.07.003.
5. Tilakaratne.W.M, Odel.E.W, Muller.S et al. Odontogenic and Maxillofacial bone tumors:WHO Classification of Head and neck tumours. 5th ed.; vol. 9, Lyon (France): International Agency for Research on Cancer; 2023.
6. Monteiro L, Santiago C, Amaral BD, Al-Mossallami A, Albuquerque R, Lopes C. An observational retrospective study of odontogenic cysts and tumours over an 18-year period in a Portuguese population according to the new WHO Head and Neck Tumour classification. Med Oral Patol Oral Cir Bucal. 2021 Jul 1;26(4):e482-e493. doi: 10.4317/medoral.24337.
7. Ramachandra S, Shekar PC, Prasad S, Kumar KK, Reddy GS, Prakash KL, et al. Prevalence of odontogenic cysts and tumors: A retrospective clinico-pathological study of 204 cases. SRM J Res Dent Sci 2014;5:170-3.
8. Channappa, Niranjan & Shaikh, Zulfin. Clinicopathological correlation of odontogenic cysts and tumors in a south Indian population over a 20-year period. International journal of dental research. 2014. 32-36. 10.14419/ijdr.v2i2.15900.
9. Singh CK, Chandra A, Kumar P, Rakhee, Singh AK, Kumar A. To determine the prevalence of odontogenic cysts and tumors in a rural area. J Adv Med Dent Scie Res 2020;8(10):210-213.
10. Nayak, Sushruth & Karadwal, Asha & Nayak, Prachi & Pathak, Kush. Prevalence of Odontogenic Cysts and Tumors – A Clinicopathological Study. Medico Legal Update. 2020 Jul 24;20(3):207- 10.
11. Avelar RL, Antunes AA, Carvalho RWF, Bezerra PGC, Neto PJO, Andrade ESS. Odontogenic cysts: a clinicopathological study of 507 cases. J Oral Sci 2009;51:581–586.
12. Jones AV, Craig GT, Franklin CD. Range and demographics of odontogenic cysts diagnosed in a UK population over a 30- year period. J Oral Pathol Med. 2006;35:500-7.
13. Shear M. Cysts of the oral regions, 3rd ed. Oxford: Wright. 1992: 56-75.
14. Scholl RJ, Kellett HM, Neumann DP, Lurie AG. Cysts and cystic lesions of the mandible: Clinical and radiologic-histopathologic review. Radiographics 1999;19:1107–24.
15. Al-Rawi NH, Awad M, Al-Zuebi IE, Hariri RA, Salah EW. Prevalence of odontogenic cysts and tumors among UAE population. J Orofac Sci 2013;5:95-100.