Clinicopathologic Analysis of Ameloblastoma in Children and Adolescents - A 17 year Retrospective Study from a South Indian Government Teaching Institute

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ABSTRACT

Introduction: Ameloblastoma is an aggressive, benign, epithelial odontogenic tumor that comprises of 10 % of the odontogenic tumors. Its occurrence is considered a rarity in the younger age group and accounts for approximately 10–15 % of all reported cases of ameloblastoma The aim of this study is to determine the relative frequency ,distribution and histologic type of Ameloblastoma in children and adolescents ≤ 19 years in a south indian teaching institute. **Material and methods:** The past 17 year records of the Department of Oral Pathology and Microbiology and dept of pedodontics, Government Dental College Kozhikode, Kerala were retrieved from the archival files between January 2001 and December 2017. Only those cases belonging to pediatric population in the age group 0-19 years were included.

Results: Of the total 8967 biopsies received, 991 cases were from pediatric population. Ameloblastoma constituted 23.65% of odontogenic tumors. Mandible was affected more than maxilla. Male predilection was observed in the present study. Conventional ameloblastomama was the major subtype followed by unicystic ameloblastoma. The most common histologic variant of ameloblastoma was found to be Follicular(27.27%) followed by plexiform (13.63%) and acanthomatous ameloblastoma (9.09%). Most of the Ameloblastoma presented as unilocular radiolucency.

Conclusion: Ameloblastomas are not uncommon in the south Indian pediatric population. Variations with previous literature seem to be due to ethnic or racial differences, and criteria applied in each study and the lack of infrastructure and facilities to detect asymptomatic lesions.

Keywords: Ameloblastoma, Adolescents, Children

INTRODUCTION

Odontogenic tumors comprise a complex group of lesions of diverse histopathologic types and clinical behavior[1]. Frequency of odontogenic tumors in pediatric population differ greatly ranging from 1% to 28%[2,3] . Ameloblastoma is an aggressive, benign, epithelial odontogenic tumor that comprises of 10 % of the odontogenic tumors. Its occurrence is considered a rarity in the younger age group and accounts for approximately 10–15 % of all reported cases of ameloblastoma [4,5]. Till date only very few studies have analysed the clinicopathologic parameters of Ameloblastoma in children and adolescents especially from south india. The aim of this study is to determine the relative frequency ,distribution and histologic type of Ameloblastoma in children and adolescents ≤ 19 years in a south indian teaching institute.

Aims and objectives

1. To determine the frequency and distribution of Ameloblastoma in pediatric population from a major tertiary dental care institution in Kerala, south india.
2. To compare the findings with epidemiological data from different geographic locations.

MATERIAL AND METHODS

The past 17 year records of the Department of Oral Pathology and Microbiology and Dept of pedodontics, Government Dental College Kozhikode, Kerala were retrieved from the archival files between January 2001 and December 2017. Only those cases belonging to pediatric population in the age group 0-19 years were included. The collected data was subjected to analysis of age, gender, anatomic site and histopathologic type. Records with incomplete clinical data, reports with doubtful or controversial diagnosis and recurrent cases were excluded from the study. Recurrent cases with similar histopathology were considered as a single case to avoid duplication. The age of the patients were categorized into 3 groups; Group1 (0-6 years), Group 2 (7-12 years) and Group 3 (13-19 years). Site distribution for maxilla and mandible were divided into 2 regions – anterior and posterior. Anterior region was defined from distal aspect of right canine to distal aspect of left canine. Posterior region was defined from mesial aspect of first Premolar to distal aspect of third molar including ramus for mandibular posterior region.

STATISTICAL ANALYSIS

Data was recorded and analyzed by descriptive statistics

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using computer software SPSS (Statistical Package for Social Science).

RESULTS

Of the total 8967 biopsies received, 991 cases (11.05%) were from pediatric population. 217 tumors were seen ,of which 93 (42.85%) were odontogenic. Ameloblastoma constituted 23.65% of odontogenic tumors. Mandible was affected more than maxilla (mandible:maxilla 21:1) (Table2). Male predilection was observed in the present study (Male:female ratio 3.4:1) (Table1).Conventional ameloblastoma (50%) was the major subtype followed by unicystic ameloblastoma (40.99%) (Fig3). One each case of

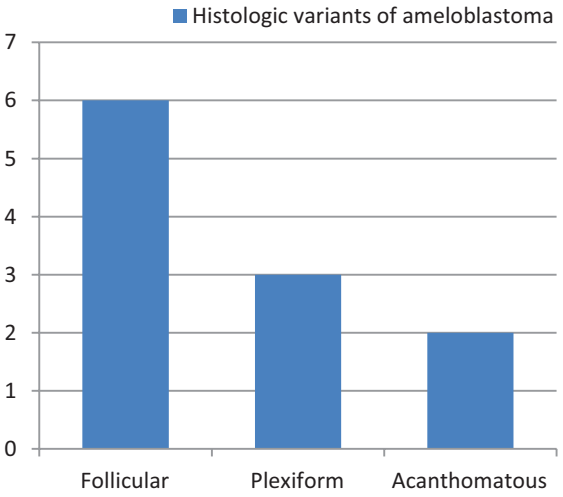

Figure-1: Frequency distribution of histologic variants of Ameloblastoma

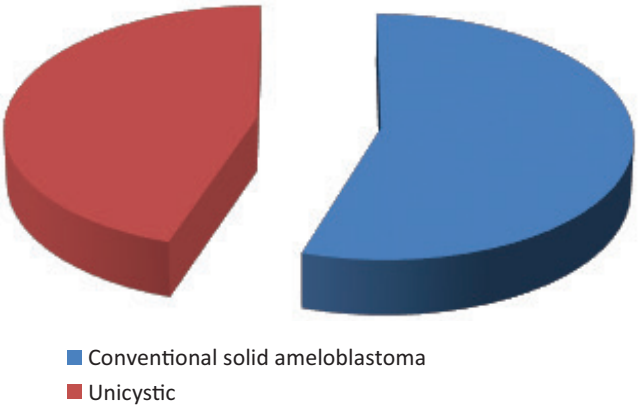

Figure-2: Distribution of Ameloblastoma subtypes

Ameloblastoma type	Incidence		Age group			Gender	
	N	%	0-6	7-12	13-19	Males	Females
Follicular	6		1	1	4	6	0
Plexiform	3		0	1	2	2	1
Acanthomatous	2		0	1	1	2	0
Unicystic	9		0	2	7	6	3
Proliferative Ameloblastoma	1		0	1	0	1	0
Ameloblastoma ex COC	1				1	0	1
Ameloblastic fibroma	5		0	2	3	3	2
Total	27		1	8	18	20	7

Table-1: Frequency and distribution of Ameloblastoma in relation to age and gender

Ameloblastoma type	N	Maxilla Anterior	Maxilla posterior	Mandible Anterior	Mandible Posterior	Maxilla	Mandible
Follicular	6	0	0	0	6	0	6
plexiform	3	0	0	0	3	0	3
Acanthomatous	2	0	0	0	2	0	2
Unicystic	9	1	0	1	7	1	8
Proliferative ameloblastoma	1	0	0	0	1	0	1
Ameloblastoma arising from COC	1	0	0	1	0	0	1
Total	22	1	0	2	19	1	21

Table-2 :Anatomic Site Distribution of Ameloblastoma

Ameloblastoma type	N	Radiographic presentation
Follicular	6	5 Multilocular ,1 Unilocular
plexiform	3	Unilocular
Acanthomatous	2	Unilocular
Unicystic	9	Unilocular
Proliferative ameloblastoma	1	Unilocular
Ameloblastoma arising from COC	1	Unilocular
Total	22	

Table-3: Radiographic presentation of pediatric Ameloblastoma cases

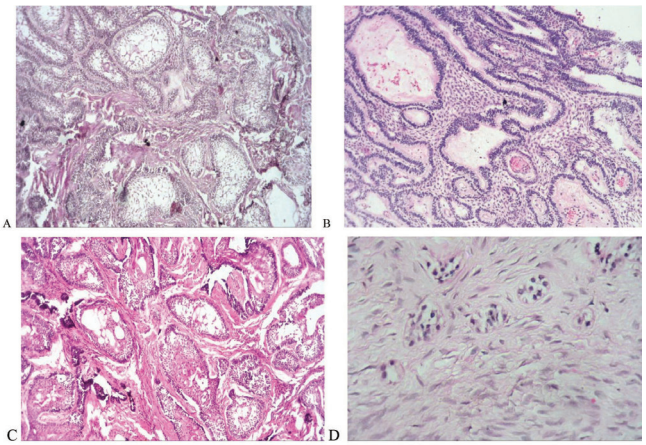

Figure-3: Histopathology. (A) Follicular Ameloblastoma (H&E10x) (B) Plexiform (H&E10x) (C) Acanthomatous (H&E10x) (D)Ameloblastic Fibroma (H&E10x)

proliferative ameloblastoma (4.54%) and Ameloblastoma arising from calcifying odontogenic cyst (4.54%) were also recorded. Ameloblastic fibroma accounted 5.37% of odontogenic tumors in pediatric population. where as Ameloblastic fibroodontoma constituted 4.3% (Fig2). The most common histologic variant of ameloblastoma was found to be Follicular (27.27%) followed by plexiform (13.63%) and acanthomatous ameloblastoma (9.09%) (Fig1). All histologic variants were more common in the age group 13-19.Most of the Ameloblastoma presented as unilocular radiolucency (77.2%) where as 22.7% presented as multilocular radiolucency. All unicystic ameloblastoma presented as ulilocular radiolucent lesions (Table 3).

DISCUSSION

Ameloblastoma is uncommon in the pediatric population, with only 8.5–15 % of all ameloblastomas in the Western countries[4,6,7].In the present study Ameloblastoma accounted for 23.65% of odontogenic tumors. This finding is in accordance with previous published reports from Asia and Africa which showed a frequency ranging from 14.6 to 25%. Neelam etal[8] found a frequency of 17.5% from central india. However studies from Taiwan and jordan showed a very high frequency of 24 to 53.8%[9,10] . Some authors like Jones[11], Tanrikulu R[12] observed lower percentages.

Among the 93 odontogenic tumors in the pediatric group, Ameloblastoma was the second most common tumor comprising of 22 cases (23.65%), first being odontome. This finding is supported by other studies by sato etal[13] and chuong R etal[14] . The study done by Krishnan eta*l*[15] . from Tamil Nadu (South india) and Neelam etal[8] (central india) showed ameloblastoma as the most common odontogenic tumor in pediatric population. In our study, the incidence of ameloblastoma was highest in the age group of 13–19years (68.18 %) with the mean age of occurrence being 14 years[13]which is consistent with a study by Arotiba et al[16] and Neelam etal[8].

The male to female ratio of 3.4:1, indicates a marked male preponderance which is in unison with reports by Olaitan etal[17], Huang IY etal[18] , Daramola JO etal[19]. However, some authors have reported equal gender distribution[7,20,21] .

The current study observed a marked predilection for mandible. Only one case occurred in maxilla. The molar-ramus region was the most common site of occurrence as was noted by Zhang et al[22] and Neelam etal[8].

We found the solid variant to be the most common type (50%) as reported by Zhang etal[22] . However, most of the studies have found the unicystic variant to be the predominant one[23,24,25].

The most common histologic variant of ameloblastoma was found to be Follicular (27.27%)followed by plexiform (13.63%) and acanthomatous ameloblastoma (9.09%) (Fig 3).

Takahashi et al[21]reported 66% of the cases with plexiform type, Al-Khateeb[9] and Ababneh[26] and Ord et al[6] reported a high percentage of their tumors to be unicystic in nature (81 and 60%); contrastingly Zhang et al[16] reported a low percentage (24.3%) of their cases with unicystic type, where the predominant histopathological pattern was of follicular type (48.7%).

CONCLUSION

Ameloblastomas are not uncommon in the south Indian pediatric population. This tumor occurs commonly in the age group of 12–18 years with a marked male predilection. The most common site of occurrence is the posterior mandible. Variations with previous literature seem to be due to ethnic or racial differences, and criteria applied in each study and the lack of infrastructure and facilities to detect asymptomatic lesions.

Clinical significance

Studies from India could contribute additional knowledge to the literature and serve as a potential source of information to understand the role of regional or geographic variations.

REFERENCES

1. Neville BW, Damm DD, Allen CM, et al. Oral and maxillofacial pathology. 3rd ed. Philadelphia: WB Saunders CO; 2009. P.701
2. Guerrisi M, Piloni MJ, Keszler A. Odontogenic tumors in children and adolescents. A 15-year retrospective study in Argentina. Med Oral Patol Oral Cir Bucal 2007; 12:E180-185.
3. Lawal AO, Adisa AO, Popoola BO. Odontogenic tumours in children and adolescents: A review of forty-eight cases. Ann Ibadan Postgrad. 2013; 11:7–11.
4. Keszler A, Dominguez FV (1986) Ameloblastoma in childhood. J Oral Maxillofac Surg 44:609–613
5. Ueno S, Nakamura S, Mushimoto K, Shirasu R (1986) A clinicopathologic study of ameloblastoma. J Oral Maxillofac Surg 44:361–365
6. Ord RA, Blanchaert RH Jr, Nikitakis NG, Sauk JJ (2002) Ameloblastoma in children. J Oral Maxillofac Surg 60:762–770
7. Kahn MA (1989) Ameloblastoma in young persons: a clinicopathologic analysis and etiologic investigation. Oral Surg Oral Med Oral Pathol 67:706–715 66 J. Maxillofac. Oral Surg. (Jan-Mar 2013) 12 (1):60–67
8. Neelam N. Andrade Shweta P. Shetye Tejas S. Mhatre Trends in Pediatric Ameloblastoma and its Management:

A 15 year Indian Experience J. Maxillofac. Oral Surg. (Jan-Mar 2013) 12 (1):60–67.
9. Al-Khateeb T, AL Hadi Hamasha AA, Almasri NM. Oral and maxillofacial tumors in North Jordanian children and adolescents: a retrospective analysis over 10 years, Int. J. Oral Maxillofac. Surg. 2003; 32: 78–83
10. Chen Y-K, Lin L-M, Huang H-C, Lin C-C, Yan Y-H. A retrospective study of oral and maxillofacial biopsy lesions in a pediatric population from southern Taiwan. Pediatr Dent 1998; 20:404-10.
11. Jones AV, Franklin CD. An analysis of oral and maxillofacial patho¬logy found in children over a 30-year period. Int J Paediatr Dent 2006; 16:19-30.
12. Tanrikulu R, Erol B, Haspolat K. Tumors of the maxillofacial region in children: retrospective analysis and long-term follow-up outcomes of 90 patients. Turk J Pediatr 2004; 46:60-6.
13. Sato M, Tanaka N, Sato T, Amagasa T (1997) Oral and maxillofacial tumors in children: a review. Br J Oral Maxillofac Surg 1:26–31
14. Chuong R, Kaban LB (1985) Diagnosis and treatment of jaw tumors in children. J Oral Maxillofac Surg 43:323–332
15. Krishnan R, Ramesh M, Paul G. Retrospective evaluation of pediatric oral biopsies from a dental and maxillofacial surgery centre in Salem, Tamil Nadu, India. J Clin Diagn Res 2014;8:221-3.
16. Arotiba GT, Ladeinde AL, Arotiba JT, Ajike SO, Ugboko VI, Ajayi O (2005) Ameloblastoma in Nigerian children and adolescents: a review of 79 cases. J Oral Maxillofac Surg 63:747–751
17. Olaitan AA, Adekeye EO (1996) Clinical features and management of ameloblastoma of the mandible in children and adolescents.Br J Oral Maxillofac Surg 34:248–251
18. Huang IY, Lai ST, Chen CH, Chen CM, Wu CW, Shen YH (2007) Surgical management of ameloblastoma in children. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 104:478–485
19. Daramola JO, Ajagbe HA, Oluwasanmi JO (1975) Ameloblastoma of the jaws in Nigerian children: a review of sixteen cases. Oral Surg Oral Med Oral Pathol 40:458–463
20. Chidzonga MM (1996) Ameloblastoma in children. The Zimbabwean experience. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 81:168–170
21. Takahashi IK, Miyauchi K, Sato K (1998) Treatment of ameloblastoma in children. Br J Oral Maxillofac Surg 36:453–456
22. Jones AV, Franklin CD. An analysis of oral and maxillofacial patho¬logy found in children over a 30-year period. Int J Paediatr Dent 2006; 16:19-30.
23. DeLair D, Bejarano PA, Peleg M, El-Mofty SK (2007) Ameloblastic carcinosarcoma of the mandible arising in ameloblastic fibroma: a case report and review of the literature. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 103 (4):516–520
24. Leider AS, Eversole LR, Barkin ME (1985) Cystic ameloblastoma: a clinicopathologic analysis. Oral Surg Oral Med Oral Pathol 60:624–630
25. Pogrel MA, Montes DM (2009) Is there a role for enucleation in the management of ameloblastoma? Int J Oral Maxillofac Surg 38:807–812.
26. Al-Khateeb T, Ababneh KT. Ameloblastoma in young Jordanians: a review of the clinicopathologic features and treatment of 10 cases. J Oral Maxillofac Surg. 2003;61 (1):13–18

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