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ODONTOGENIC TUMORS; A RETROSPECTIVE STUDY OF 102 CASES

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ABSTRACT

Background: Oral & Maxillofacial pathology has paramount importance in connecting basic science & Clinical features; progress in this field will improve diagnosis & treatment. Although the prevalence odontogenic tumor varies in geographic sites, however, there is little information available in the English-language literature on the relative frequency of odontogenic tumors in India. **Methods:** A Retrospective study was designed to determine epidemiology and clinicopathologic presentation of cases with odontogenic tumors reported at the Sharad Pawar Dental College and Hospital, DMIMS Sawangi (M) Waradha, India, over the period of 2001 to 2012. The histopathology records were retrospectively reviewed for all the odontogenic tumors of orofacial region. H & E stained sections were re-evaluated and the diagnosis in each case was confirmed or modified according to World Health Organization (WHO) classification, 2005; and were subjected to analysis of age, sex, site of tumour and histopathological type. A total of 102 lesions were classified as intraosseous odontogenic tumors during this period. **Results:** Odontogenic tumors in the present study constituted 5.78% of all registered biopsies. The most frequent histological type was Keratocystic odontogenic tumour followed by ameloblastoma, odontoma and Adenomatoid odontogenic tumour. Ameloblastomas occurred with a marked predilection for the mandible, while adenomatoid odontogenic tumour showed predilection for the maxilla, anterior regions of the jaws, and young females. **Conclusion**: The Odontogenic tumors are not common among orofacial lesions and malignant types are very rare. These tumors mostly occurred in posterior site of mandible. Also, most cases were found in second to third decade of life.

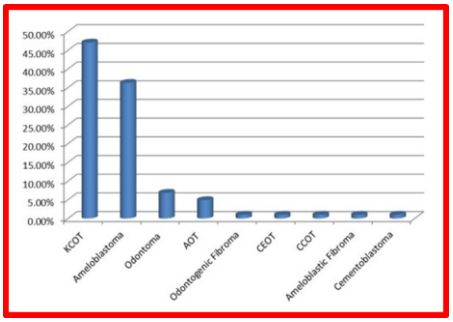
KEYWORDS: Odontogenic tumor; Ameloblastoma; Keratocystic odontogenic; Tumor; Jaws

INTRODUCTION

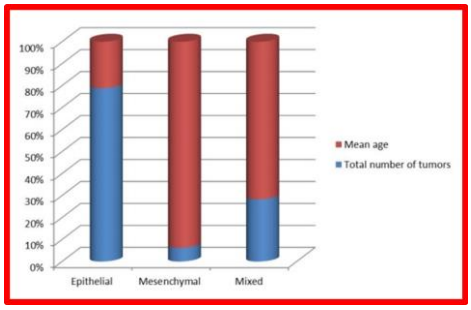
Odontogenic tumors (OT) are heterogeneous lesions derived from epithelial or ectomesenchymal tissues or both, which are part of the tooth-forming apparatus. They range from hamartomatous or nonneoplastic tissue proliferations to malignant neoplasm with metastatic capacity. In humans, tumors of the odontogenic tissues are comparatively rare, comprising about 1% of all oral and maxillofacial biopsy specimens diagnosed.[1-3] Several retrospective studies carried out in Africa, Asia, Europe, and America, show that differences exist in the relative frequency of the various histologic types. In 2005 the third edition of WHO histological typing was published in which definitions of some pathological entities have been changed and some new ones have been introduced.[4-7] Available literature on the relative frequency of odontogenic tumors are mostly among Americans and Africans. Very few studies are reported among Asians, especially from the Indian subcontinent.[3,5] The aim of the present study was to determine the epidemiology and clinicopathologic presentation of this heterogeneous group of lesions reported at the Sharad Pawar Dental College and Hospital, Wardha, India, over the period of January 2001 to December 2012 and to compare these data with previous reports.

MATERIALS & METHODS

The histopathology records were retrospectively reviewed for all the odontogenic tumors and tumor like lesions of the oral cavity and the jaws reported between January 2001 to December 2012. Hematoxylin and eosin-stained sections were re-evaluated and the diagnosis in each case was confirmed or modified according to World



Graph 1: Distribution of Odontogenic tumors



Graph 2: Frequency of Odontogenic Tumour Based on Histologic Origin & Mean Age

Table 1: Distribution of Odontogenic Tumors

Type of Odontogenic tumour	Total	
	Number	Percentage
KCOT	48	47.05%
Ameloblastoma	37	36.27%
Odontoma	7	06.86%
AOT	5	04.90%
Odontogenic Fibroma	1	00.98%
CEOT	1	00.98%
CCOT	1	00.98%
Ameloblastic Fibroma	1	00.98%
Cementoblastoma	1	00.98%
Total number	**102**	**100%**

Table 2: Frequency of Odontogenic Tumour Based on Histologic Origin & Mean Age

Type of tumour	Total number of tumors	Mean age
Epithelial	91	24.4
Mesenchymal	2	30.1
Mixed	9	22.8

Health Organization (WHO) classification, 2005 and were subjected to analysis of age, sex, site of tumour and histopathological type. A total of 102 lesions were classified as intraosseous odontogenic tumors during this period.

RESULTS

The relative frequency was 5.78% (102 odontogenic tumors) of all oral biopsied samples encountered between 2001 to 2012. Out of the 102 reported odontogenic tumors, all were benign. Among these 80% were in males and 20% were in female. Among all odontogenic tumours 84 tumors were encountered in the mandible and 18 in the maxilla, Table 1 shows the frequency for different pathologic types of tumors listed according to the WHO International Classification of Odontogenic Tumors,[4,5] keratocystic odontogenic tumor (KCOT) was the most frequent benign tumor (47.05%, 48 cases). The second most common tumor was Ameloblastoma (36.27%, 37 cases), followed by odontoma (6.86%, 7 cases), and adenomatoid odontogenic tumor (AOT) (4.90%, 5 cases), which is followed by other odontogenic tumors like Calcifying epithelial odontogenic tumor (CEOT) (0.98%, 1 case), Calcifying cystic odontogenic tumor (CCOT) (0.98%, 1 case), Ameloblastic fibroma (0.98%, 1 case)

Odontogenic Firoma (0.98%, 1 case) and Cementoblastoma (0.98%, 1 case). odontogenic tumor in this study population affected patients over a wide age range of 5-75 years. Age distribution showed a peak occurrence in the third decade, 85% of the cases occurring between the second and fifth decades. KCOT & Ameloblastoma are the most common tumour in this study.

DISCUSSION

There are a few numbers of published studies that reveal about odontogenic tumors, besides based on our information there is just one comprehensive related survey in our Vidarbha region of Maharashtra , which was done in Wardha. The relative frequency of odontogenic tumors in the present study was 3%to 6% of all specimens recorded between 2001 and 2012 the present study shows, OTs found as an infrequent lesions (3% to 5%) among jaw and oral biopsies, which is similar to many published series.[1,3] The relative frequency of odontogenic tumors on the other hand was less than 3% of all specimens in Brazil, North American , South American and Europen series. But some other countries like Africa and Asia the frequency of odontogenic tumors comprise from 3.9% to 9.6% of all oral lesions. This study confirms that benign OT tumors (94.5%) are the most frequently seen, however, the malignant OT represented 5.5% in the present series The frequency of malignant tumors is similar to the Brazilian population.[6,8] Many odontogenic tumors are thought to arise from the tooth germ. In most permanent teeth, crown formation completes by the age of 4 or 5 years, which indicates that odontogenic tumors probably develop after crown formation. This strengthens the impression that the majority of odontogenic tumors arise from quiescent remnants of the tooth germ.[3,9-11]In the present study, odontogenic tumors were most frequent in the second to fifth decades of life. Most of the previous studies reported an equal gender distribution of odontogenic tumors but a female preponderance was reported by Isfahan *et al*.[1,3,6] In the present series, we found almost equal distribution of occurrence between the genders (slightly more common in males). In general, the odontogenic tumors in this series occurred 2 to 3 times more commonly in the mandible than in the maxilla, posterior mandible more common than anterior area is which is in agreement with most of the previous studies.[1,2,6] As expected, we found KCOT to be the most common OT (47.05%) followed by ameloblastoma (36.27%). There were no statistically significant differences between the ameloblastoma and KCOT. These results are comparable with the corresponding data reported by other authors that followed the 2005 WHO Histological Classification of Tumors.[4,5,7] In contrast, Narollah Saghravarian *et al*.,[2] Ajinkya Varkhede *et al*.,[3], Isfaha *et al*.,[1] Johnson NR *et al*.,[9] and Vijay Ebenezer *et al*.,[9] and Okada H *et al*.,[11] reported ameloblastoma to be most frequent tumour, followed by KCOT and odontoma, some of the studies are not compared with KCOT because of lack of uniform nomenclature among surgeons and pathologists, the WHO classification has not entirely been adapted completely. According to most studies, the main difference reported in the literature is related to the relative frequency of ameloblastoma and odontoma. In Egypt, Sri Lanka, Brazil and in certain countries of Africa, the frequency of ameloblastoma was higher than odontoma, in contrast to what has been observed in some countries of the American Continent. Jing *et al*., and Tawfik and Zyada considered that the low number of odontoma cases recorded in their study was due to the fact that these lesions have a limited growth, are often asymptomatic and diagnosed only radiographically (left untreated or without pathologic examination). Also, they may go undiagnosed in patients who do not receive regular dental check-up. These results show that studies in teaching institutions and private hospitals equipped with orthopantomograms do not underestimate cases of odontomas.[6,8,9,12)] Ameloblastoma was found in all the age groups considered in this study, unlike other histologic types of OT. Few cases of unicystic variant of ameloblastoma were seen in the present series. Unicystic ameloblastoma has been reported to be more common in Western children than African children.. Unicystic tumors have a different prognosis to the multi cystic type and are said to be more common in children.(6,13,14) In the present study, ameloblastoma were frequently encountered in the molar ramus region in the mandible and the molar region in the maxilla. The age and sex distribution of KCOT were in accordance with earlier series that is the most of

the cases are diagnosed in second to fourth decades, male patients are frequently affected. Similar to ameloblastoma, solitary KCOT demonstrated a site predilection for posterior mandible.[11-13] Odontomas occurred in the present series with a relative frequency of 6.86%. They showed equal distribution in males and females and occurred mostly in younger individuals. Most odontomas are symptomless and discovered on routine radiographs. This may also be responsible for the low incidence in Indian population, because most patients in our environment do not seek medical consultation unless there are symptoms suggesting an obvious pathology.[15] This geographic variation may also be due to genetic and/or environmental influences. Adenomaoid odontogenic tumor (AOT) occurred in the present series with frequency of 4.90%. It is the fourth most common tumor where it was the second most common tumor. The female predilection of AOT is supported by earlier reports.[1, 3, 5, 7] The second & third decade involvement noted in the present study, is similar to other series.[3,7] AOT also showed predilection for the maxilla and anterior regions of the jaws, unlike other odontogenic tumors. The lower numbers of other benign odontogenic tumors like SOT, CEOT, CCOT, Ameloblastic fibroma and Cementoblastoma were too negligible to draw any meaningful observation. They represent 0.98% of the odontogenic tumors. The frequency of this neoplasm in other series was also lower, confirming the rarity of these tumors.[11] In relation to sociodemographic data, a higher proportion of males was affected with OT and the average age at diagnosis was 35 years. However, there are some other studies that have reported differences associated with this gender and age distribution of OT. The majority of articles confirm the mandible as the anatomic site most frequently affected by OT, especially by KCOT and ameloblastoma , which agrees with our findings.[3,7-9,12,13]

CONCLUSION

In Conclusion this study shows that the Odontogenic tumors are not common among oromaxillofacial lesions and malignant types are very rare. These tumors mostly occurred in posterior site of mandible. Also, most cases were found in second to third decade of life. These data are in correlation with those mentioned in Saghravanian study in the other parts of Iran. So, Since most data on the frequency of OTs are derived from hospital based records which may be biased by some socioeconomic factors, the role genetic and/or environmental factors in modulating in geographic variations in the incidence of OTs requires further investigations. Maybe we can extent these findings to other site of our country, but for better understanding and perfect conclusion it seems more studies in other areas are necessary.

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