

REVIEW ARTICLE

Odontogenic Tumor in India: A Review

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ABSTRACT

Odontogenic tumors (OT) are a group of heterogeneous lesions derived from epithelial or ectomesenchymal tissues or both, which are part of the tooth-forming apparatus. They range from hamartomatous or non-neoplastic tissue proliferations to malignant neoplasms with metastatic capacity. A marked geographic variation in the relative incidences of various OTs is seen worldwide. This review focuses on the condition of OTs in India.

Keywords: Ameloblastoma, Epidemiology, Geographic distribution, Odontogenic tumors, Prevalence.

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INTRODUCTION

A tumor can be defined as a swelling of tissues that does not imply a neoplastic process.¹ Neoplasia is a biologic phenomenon, i.e., poorly understood and cannot be exactly differentiated from other processes or tissue reactions.¹ The lesions originating from the odontogenic epithelium and remaining entrapped either in adjacent soft tissues or within the jaws are considered OTs.² Odontogenic tumors are relatively destructive and rare lesions of the jaw bones, which are formed from the remnants of tooth-forming apparatus. The biological behavior of these lesions varies from non-neoplastic/hamartomatous tissue proliferation to malignancies with metastasizing abilities with accurate clinicopathological diagnosis.^{1,2} The third edition of the World Health Organization (WHO)

histological typing published in the year 2005 gives the most accurate classification of OT. The relative incidence of OTs diverges in different countries. This discrepancy in incidence is because of geographic and ethnical diversity.^{3,4} In India, the population is ethnically diverse based on caste and language, which require more epidemiological studies to be conducted.⁵ Most of the epidemiological studies relating to OT are conducted in countries other than India, and majority of the Indian studies are carried in Southern states of India. The studies on OT are relatively few despite large number of studies on odontogenic cysts. Hence, the aim of the present review was to assess OT in the India scenario.

CLINICOPATHOLOGICAL FEATURES OF OT

Odontogenic tumors share essentially similar clinicopathological features that mandate a careful diagnosis for proper treatment and prognosis. Epidemiological studies conducted in India and Africa showed higher incidence of OT. The mean age in India is recorded as second to fourth decade of life, and these observations were similar to the studies conducted in other countries.⁶ The incidence of age was found to be extending from second to fifth decade of life. This wide distribution of age was similar to the studies conducted in countries like America,⁷ Europe,⁸ and Asia.⁹ Low incidence of OT in children has indicated the probable development of OT from the tooth-forming structures after crown formation, before the age of 5 years. There were significant involvement of children and adolescents in studies conducted in Argentina¹⁰ and Libya.¹¹ Male predominance of 59% was found, which was similar to the studies conducted by Odukoya.¹² The prevalence of maxilla was less involved as compared with mandible (72%). It was similar to many other studies.¹³

AMELOBLASTOMA

The most common epithelial OT is found to be ameloblastoma, comprising 1% of tumors and cysts of the jaws.¹⁴ The average age of patients having ameloblastoma is 36 years. In developing countries ameloblastomas are found at young age. Men and women are equally affected. The size of the tumors is larger in females and it appears in women at 4 years younger age. Noncharacteristic major clinical symptoms are painless swelling and slow growth. Ameloblastomas occur most frequently in the molar region of the mandible. In Blacks, anterior region of the jaws is more frequently affected. Radiologically, 50% of

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the ameloblastomas appear as multilocular radiolucent lesions with sharp delineation. Histologically, one-third are plexiform, one-third follicular; other variants mandible, and there appears to be no gender difference. Lesions frequently become large, destructive, large, and multilocular.¹⁵ Fine-needle aspiration biopsy is a technique in which a fine needle is introduced into a mass, cellular material is aspirated, and a cytological diagnosis is rendered. It separates reactive and inflammatory processes that do not require surgical intervention from neoplasia and benign from malignant tumors. Fine-needle aspiration biopsy lends itself to the diagnosis of palpable head and neck masses, in particular, those that persist following antibiotic treatment.¹⁶ The prudent use of these techniques can be cost-effective and negate the need for more invasive diagnostic procedures. Fine-needle aspiration biopsy represents a rapid and cost-effective technique for the assessment of nodules and masses within the head and neck.¹⁷ Fine-needle aspiration biopsy contributes to conservative management in many patients with non-neoplastic conditions and provides accurate diagnosis of most salivary gland lesions.¹⁸

KERATOCYSTIC ODONTOGENIC TUMOR

Keratocystic odontogenic tumor (KCOT) is an OT, which has been reclassified by the WHO as a cystic benign tumor. With relative incidence of 28 to 36%, KCOT is the second frequent OT. The third decade of life and posterior mandible had maximum (54.7%) incidence of KCOT. These features were similar to the previously published literature.¹⁹ Females are commonly affected than males, with the male to female ratio of 1:1.2, and these findings were not in accordance to the epidemiological reports of Ramos Gde O et al,²⁰ which have reported male predominance. Association of KCOT with nevoid basal cell carcinoma syndrome was recorded to be 6% in the previous literature, and interestingly, studies conducted in Brazil showed frequency as high as 40%.²⁰

ODONTOMES

Odontome was recorded as the third common OT. Odontomes are symptomless and diagnosed accidentally in the routine radiograph. This could be the reason of low incidence of odontomes in Indian population where the patients do not seek medical consultation until the obvious symptoms exist. Low incidence of odontomes can also be correlated to geographic variation, genetic and environmental influences.² It has been found that patients in their second decade of life showed more frequency of odontomes, which is similar to the previous literature.^{11,15} Maxillary anterior region was the common site of involvement. These findings are similar to some of the Indian institutional studies.¹⁵

ADENOMATOID ODONTOGENIC TUMOR

Adenomatoid odontogenic tumor (AOT) is the fourth common OT in the present series with a relative incidence of 5.5%, which is similar to Indian institutional studies.¹ Study showed male predominance (66.6%) with maxillary anterior region (55.5%) as the chief anatomical location. These findings are similar to the many previous literature.² Present series showed occurrence of AOT in young individuals (55%) below the age of 20 years. These findings support the hypothesis^{8,14} that AOTs are encapsulated and expand centrifugally, leading to the expansion of cortical plate earlier than ameloblastomas.

LESS RARE OT

Studies have shown that rare OTs such as odontogenic myxoma (2.4%), calcifying epithelial OT (1.8%), squamous OT (1.2%), and ameloblastic fibroma (0.6%) are also present. Because of lack of these tumors, the epidemiological data cannot be concluded. However, lower incidence of these OTs exhibits the rarity of the tumors. Age, gender, anatomical location, and incidence of these OTs were in accordance with previous Indian studies.^{21,22}

CONCLUSION

Although there are many larger epidemiological studies reported from other parts of the world on OTs, the studies and reports from India are scarce. Dental teaching institutions, hospitals/nursing homes, and government should maintain the patient records reported in these hospitals with OTs. Dentists should study and include OTs as case reports and get it published. More data should be collected regarding OTs in India.

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