ORIGINAL ARTICLE

The frequency of various histopathological types of odontogenic tumor at a tertiary care dental hospital

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ABSTRACT

Odontogenic tumors are group of heterogeneous lesions derived from epithelial or ectomesenchymal tissues or both, which are a part of tooth forming apparatus. They range from hamartomatous or non-neoplastic tissue proliferations to malignant neoplasms with metastatic capacity. The main aim of this study was to determine the frequency of various histopathological types of odontogenic tumor at a tertiary care dental hospital.A sample of 90 patients was taken who were diagnosed with odontogenic tumors. The most frequent type was ameloblastoma and the rare form was calcifying cystic. These tumors showed marked predilection for mandible (80%) than maxilla (20%) with a mandible to maxilla ratio of 4.0:1.

Keywords: Odontogenic tumor, epithelial tissue, non-neoplastic tissue

INTRODUCTION

Odontogenic tumors occur as a result of disturbances in the development of teeth and associated structures[1]. They share two common characteristics namely; arise from the tissue with potential for differentiation into tooth or periodontal structures and that is why they are found in mandible or maxilla and occasionally in gingiva. The other feature includes formation of tooth related extracellular substances which may calcify and become visible on radiograph. They range from hamartomatous or non-neoplastic tissue proliferation to malignant neoplasms with metastatic ability[2,3]. These tumors have specific histological structures that reflect various stages of odontogenesis[4].

As a group they are derived from the epithelial ectomesenchyme and mesenchymal tissues that are part of the tooth forming apparatus, thus odontogenic tumors are divided into lesions derived from odontogenic epithelium only, tumors derived from odontogenic mesenchyme only and those derived from both.

The aggressive behavior and high recurrence rate of the OKC suggests a true neoplastic potential and prompted the WHO to classify OKC as a benign tumor with odontogenic epithelium and mature, fibrous stroma without odontogenic ectomesenchyme[5]. Both odontogenic epithelium as well as odontogenic mesenchyme may show Neoplastic degeneration, causing either carcinomas or sarcomasof odontogenic origin[6]peripheral odontogenic tumors occur in gingival tissues[7]and present as exophytic masses, which can be mistaken for other more common exophytic gingival lesions[8]. They demonstrate the histological characteristics of their intraosseous counterparts but occur in the soft tissues covering the tooth bearing portion of the jaws. They are also known as extraosseous or soft tissue odontogenictumors[7,9,10].

Most odontogenic tumors remain painless throughout their course. This is the main reason why either patient doesn't present to the hospital at all or only presents when tumor has reached enormous size [11].

Factors such as age of the patient, location and extent of the lesion and histopathological features all play a role in determining surgical management. Radiographic appearance also influence the treatment[12]. Several retrospective studies have been carried out in Africa, asia, europ and US[13-22], there's still controversy in relation to the relative frequency and incidence of odontogenic tumors.

Despite several studies that have been carried out, there are few available reviews on odontogenic tumors in Pakistan. Given the paucity of data available on odontogenic tumors in Pakistani population, the present study aims to determine the pattern of presentation of odontogenic tumors at one of a tertiary care center in our country. Microscopic pictures of different odontogenic tumors are presented below.

The objective of this study is to find out the frequency of various histopathological types of odontogenic tumors at a tertiary care dental hospital**.**

Fig. 1: Microphotographs of Ameloblastoma

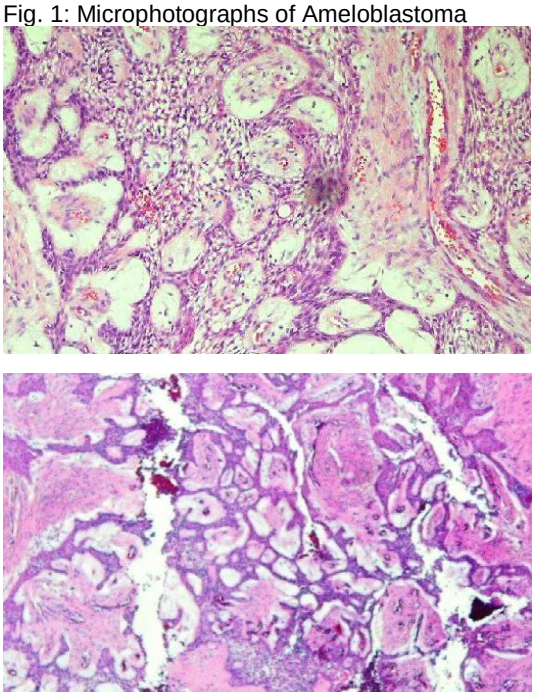

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Fig.2: Microphotographs of keratocysticodontogenic tumor

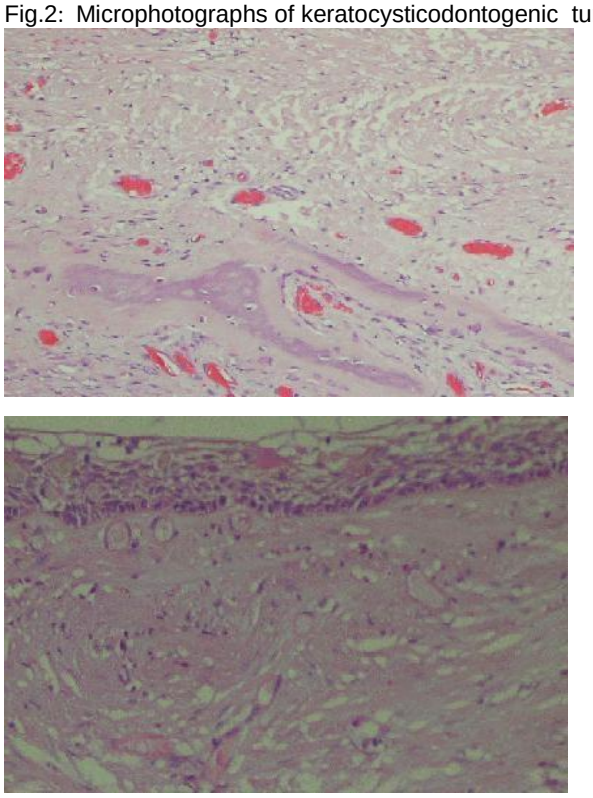


Fig. 3: Microphotographs of Calcifying epithelial odontogenic tumor

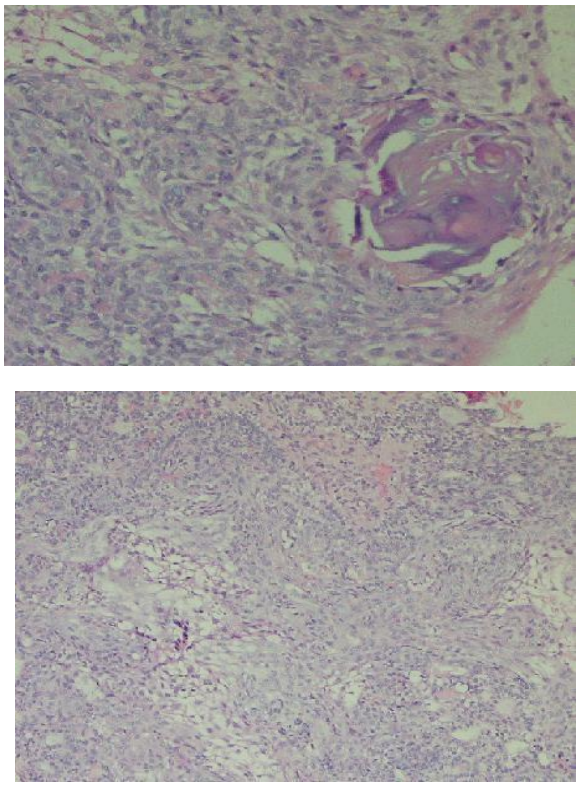


Fig.4 : Microphotographs of Calcifying cystic odontogenic tumor

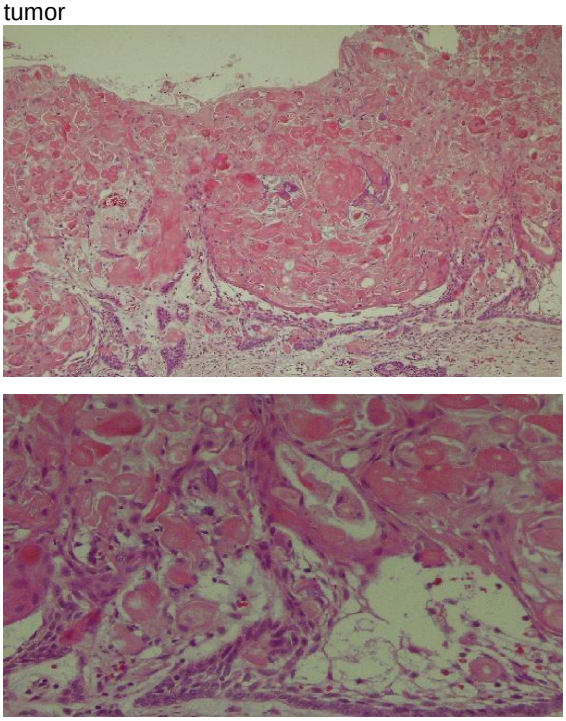


Fig. 5: Microphotograph of compound odontome

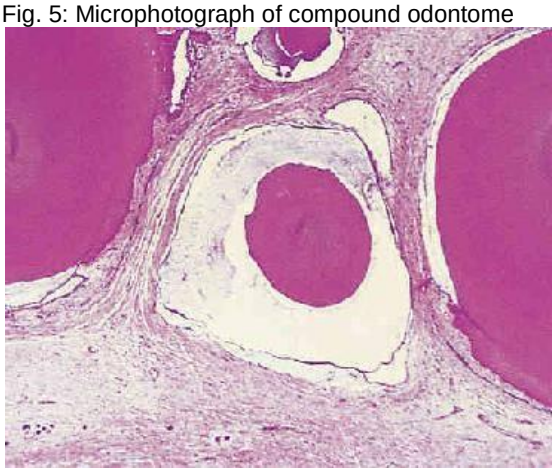
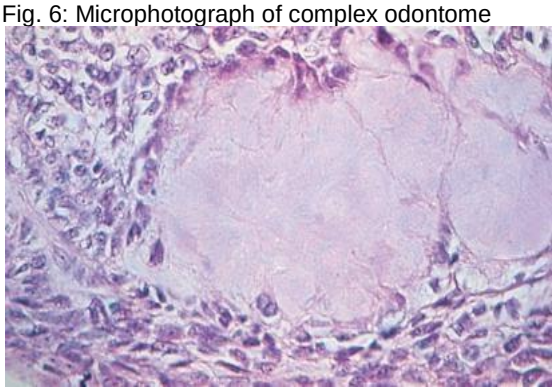


Fig. 6: Microphotograph of complex odontome



MATERIAL AND METHOD

This descriptive cross-sectional survey conducted in the Oral and Maxillofacial Surgery Department, Punjab Dental Hospital, de'Montmorency College of Dentistry. 90 patients diagnosed with odontogenic tumors were included in this study, irrespective of age and gender. A sample of 90 patients was taken who were diagnosed with odontogenic tumors. Patients presenting with swellings were assessed by history, clinical and radiographic examination. After performing the preoperative workup, an incisional biopsy was carried out for each case. Patients having odontogenic tumor as confirmed by the histopathological report were included in the study.

RESULTS

Table 1: Frequency of different odontogenic tumors.

Tumor types	n	%age
Ameloblastoma	59	65.6
OKC	22	24.4
Odontoma	05	5.6
Calcifying epithelial odontogenic tumor	03	3.3
calcifying cystic odontogenic tumor	01	1.1 %

Table 2: Site of occurrence of odontogenic tumors in maxilla

Tumor	Total
Ameloblastoma	8
KCOT	4
Odontoma	2

Table 3: Site of occurrence of odontogenic tumors in mandible

Tumor	Total
Ameloblastoma	51
KCOT	18
Odontoma	3
CEOT	-
CCOT	-
Total	72

Ninety patients diagnosed with odontogenic tumors were included in the study. There were 50 (55.6%) were males and 40(44.4%) were females. Odontogenic tumors occurred over a wide age range (11-65 years). The mean age was 33.8 years in this study. Odontogenic tumors showed marked predilection for mandible (80%) than maxilla (20%) with a mandible to maxilla ratio of 4.0:1

Fig. 1. Frequency of different types of tumors

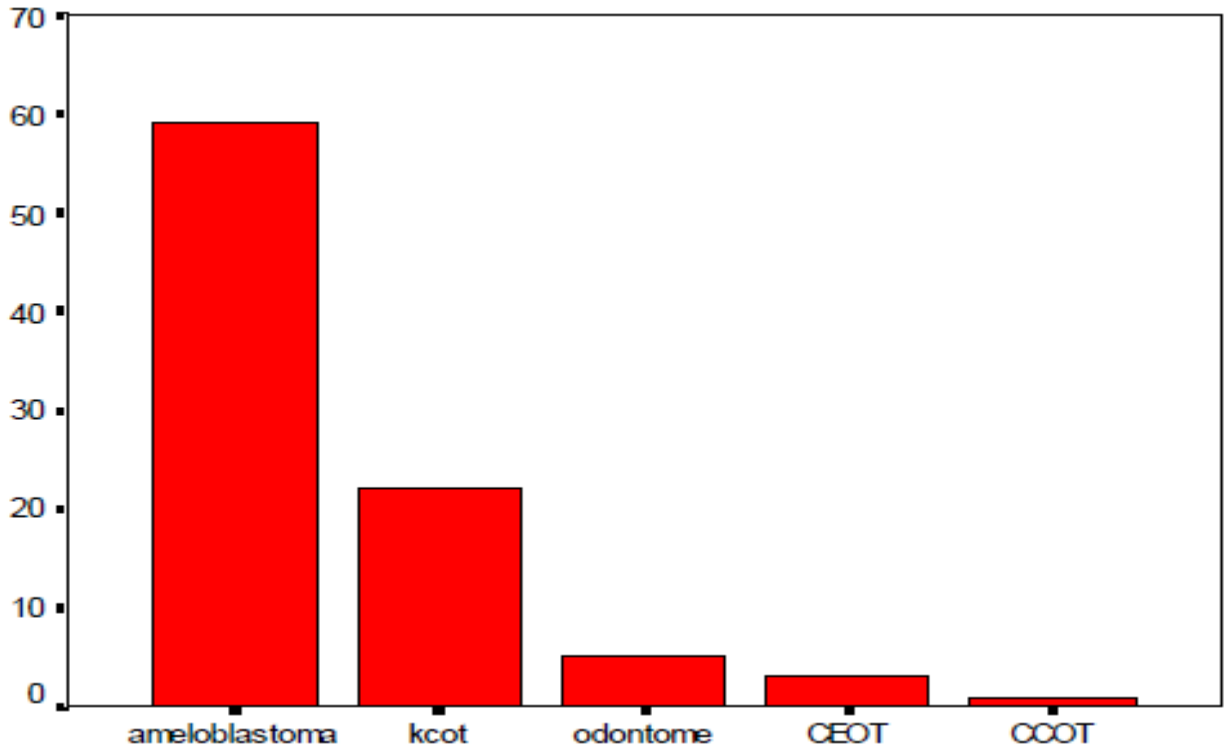
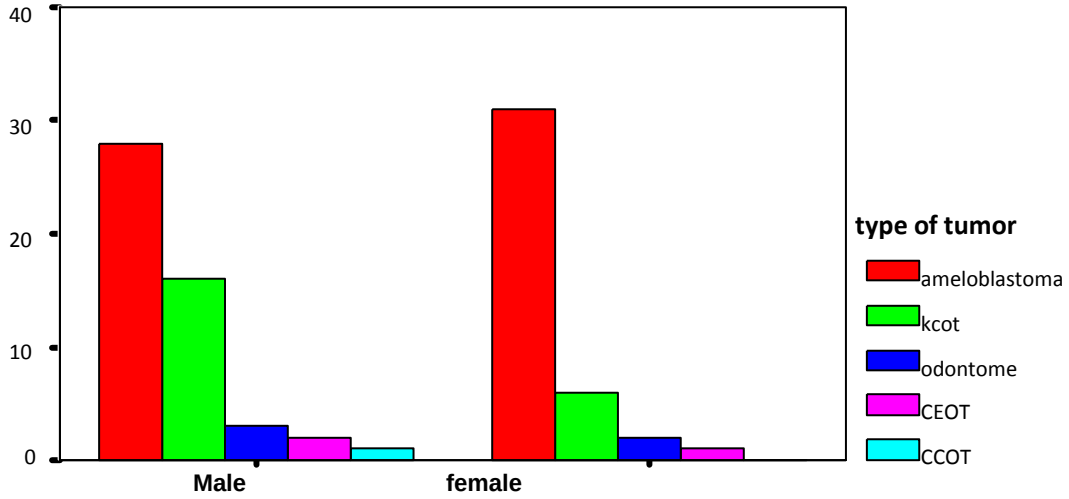


Fig. 2: Age distribution of odontogenic tumors



DISCUSSION

A sample of 90 patients was taken in Punjab dental hospital who were diagnosed with odontogenic tumors. All cases were diagnosed with benign tumor and no case of malignancy was found. This might be because of rarity of these tumors as mentioned in previous studies (Tawfik MA[23] Daley et al[13], Mosqueda-Taylor et al[20] and Ochsenius G et al[24]). This is in contrast to Chinese population where the frequency of these tumors was as high as 6.1%[17]. Frequency of different odontogenic tumors is illustrated in table. 1.

Ameloblastoma is considered to be the most common type of odontogenic tumors. followed by KCOT, Odontoma, CEOT and CCOT. These results are consistent with results of Tawfik MA[23], Jing W et al[25]. The high frequency of ameloblastoma and low frequency of odontoma are consistent with the studies conducted in Nigeria[3,26,27]. However, these results are different from the results of studies from America[24,28] where odontoma occurred with highest frequency. These discrepancies clearly show the geographic variations in the presentation of these tumors. Another reason for this variation is that many cases are treated in dental surgeries and they are not registered or sent for histopathological evaluation[23].

Ameloblastoma was seen in all age groups with a peak incidence in the age range 20-29 years. These results are similar to the study done by Jing W et al[25] in China. Ameloblastoma was observed in 54.5% of the females. High female predilection was also reported in studies from South America[20,24,28] and Turkey[4]. These studies are in contrast to those in China[25] and Nigeria[3,15,25,26].

Keratocystic was the second most common tumor in this study with 24.4% of the cases of odontogenic tumors. Kcot was observed in all age groups with a peak incidence in 30-39 years. These results are comparable to the earlier reports by Philipsen[29] and Tawfik et al[23]KCOT tended to occur in males more than female. Higher male predilection for KCOT was also reported by Jing W et al[25].

Odontoma was the third most common tumor in this study with five reported cases (5.6%). This is in contrast to studies done in Estonia[14] and America[24,28] where odontomas occurred with the highest frequency. Odontoma tended to occur in young individuals with 80% of the cases were under 30 years of age(Jing W et al[25] Tawfik et al,[23]while female preponderance was reported by Tawfik et al[152], and Tamme T et al[14]. However,Ladeinde et al[3] in Nigeria reported no sex predilection for odontomas.

Calcifying epithelial tumor was the fourth most common type in this study with three reported cases (3.3%). CEOT is a rare tumor which is confirmed by the frequency reported in other studies. Tawfik et al[23],Sriram and Shetty[30],Mosqueda-Taylor et al[20] and Jing W et al[25]reported lower frequency of CEOT.

CEOT occurred in the age range of 20-42 years. These results are comparable to the study done by Sriram and Shetty[30]. A male predilection of CEOT was observed in this study. Sriram and Shetty[30] reported a female predilection of the tumor while Jing W et al[25] found no sex predilection in their study.

There was one case of Calcifying cystic odontogenic tumor (CCOT) (1.1%) reported in this study which suggest the rarity of this tumor in our population. The only affected patient was a male 24 years of age. Jing W et al[25] reported 2.2% cases in his study in China. However, Tawfik et al[23] did not report any case of CCOT in their study. These discrepancies in results may be due to the rarity, and geographic distribution of this tumor.

Ameloblastoma showed marked predilection for mandible. The mandible to maxilla ratio was 6.4:1. Sriram and Shetty[30] reported almost 95% of ameloblastoma occurring in mandible with a striking mandible to maxilla ratio of 18.1:1.In this study 13.6% of ameloblastomas presented in the maxilla which is higher than those reported in other studies from Asian and African studies (2% to 8%)[17]. However, this is comparable to figures reported in some studies in American(16 to 22%) andTurkish population (18.8%).[19,31,32]

KCOT also showed marked predilection for the mandible (81.8%). Mandible to maxilla ratio was 4.5:1. These results are consistent with study done by Tawfik et al[23], Jing W et al[25], Sriram and Shetty[30], Ladeinde et al[3].And other earlier reports[29,31,32].

However, these results are in contrast to the studies done by Mosqueda-Taylor et al[20] who reported maxillary predilection of odontomas and Tamme T et al[14]. Predilection of odontomes for posterior parts of the jaws found in this study is comparable to other reports from Mexico, Estonia, Chile and Brazil[20,14,27, 31,32]

The next most common tumor was CEOT (3.3%). All cases of CEOT were seen in the maxilla making it the site of predilection.However, these results are in contrast to many other studies. Tawfik et al[23] reported a maxilla to mandible ratio of 0:3 in their study. Similarly, Sriram and Shetty[30], Lu et al[17], Jing W et al[25] and Ladeinde et al[3], all reported marked predilectionfor mandible.

There was one (1.1%) case of CCOT diagnosed in maxilla and found to involve both the anterior and the posterior segments. Jing W et al[25] reported maxilla to be the site of predilection for CCOT

CONCLUSION

Odontogenic tumors affect maxillofacial region with varying frequency. An early diagnosis can significantly reduce surgical morbidity as early surgical intervention is possible. Because of the changes that have occurred over the years in the definition and classification of odontogenic tumors and differences in the classification systems, it is impossible to make any comparison of the frequencies. The variations may be attributed to geographic, ethnic, and socioeconomic factors.

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