Odontogenic tumors in an Iranian population: a 30-year evaluation

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Abstract: Oral and maxillofacial pathology has paramount importance in connecting basic science and clinical features; progress in this field will improve diagnosis and treatment. Although the prevalence of odontogenic tumors varies in different geographic sites, there are no reports in English on the relative frequency of odontogenic tumors in Iran. In the present 30-year retrospective study, the case records of all patients referred to the Mashhad Faculty of Dentistry during the period 1978-2008 were evaluated. Subsequently, all lesions diagnosed as odontogenic tumors were subjected to microscopic reevaluation. Data regarding sex, gender, location, and histopathology were gathered. Among 8,766 patients, only 165 odontogenic tumors (1.9%) were found, with a mean age of 26.3 years (range 6-81 years). One hundred and fifty-eight tumors were central with high frequency in the posterior region of both jaws especially in the mandible and seven were peripheral tumors, including five in the posterior mandible and two in anterior maxilla. Malignant transformation was seen in three cases as malignant ameloblastoma (1.8%). The most common tumor was ameloblastoma, followed by odontoma, odontogenic myxoma, and adenomatoid

odontogenic tumor. Nevertheless, odontogenic tumors occurred more in females in the third decade with affinity for the posterior mandible in this study. (J Oral Sci 52, 391-396, 2010)

Keywords: odontogenic tumor; retrospective study; prevalence.

Introduction

Odontogenic tumors are those lesions which originate from odontogenic epithelium. They remain entrapped, either within the jaws or in adjacent soft tissues (1). They can be classified by location (peripheral or central) and biologic behavior as benign or malignant. However, the most accepted World Health Organization (WHO) classification has divided them into three subclasses: epithelial, mesenchymal, and mixed (2,3).

From a biological point perspective, some of these lesions represent hamartomas with various degrees of differentiation, while the rest are benign or malignant neoplasms with variable behavior (2). Therefore, it is very important to form a set of criteria such as age, gender, and location of lesion, in the management of these tumors. In the present study, odontogenic tumors were evaluated in an Iranian population over a 30-year period.

Materials and Methods

The case records from the Department of Oral and Maxillofacial Pathology of Mashhad Faculty of Dentistry,

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Mashhad, Iran served as the source of this 30-year retrospective study (1978-2008). All patients with lesions diagnosed as odontogenic tumor, were confirmed by microscopic reevaluation. Statistical analysis was performed using SPSS software (v. 13, SPSS Inc., Chicago, IL, US).

Results

Among 8,766 patients, only 165 cases were diagnosed as odontogenic tumors (1.9%). Odontogenic tumors were more common in females and in the second or third decades of life with greater frequency in the posterior region of the mandible (Table 1). According to the WHO classification (2005), 88 cases of these diagnosed tumors were epithelial odontogenic tumors (EOT = 53.4%), 54 were mixed odontogenic tumors (MixOT = 32.7%), and 23 were mesenchymal odontogenic tumors (MOT = 13.9%) (Table 2). These data revealed that 98.2% of the tumors were benign and only three (1.8%) were malignant ameloblastoma, which were seen only in males.

Ameloblastoma consisting of all histological types (Fig. 1) was the most common odontogenic tumor (70 cases; 42.4%); followed by odontoma (44 cases; 26.7%); and odontogenic myxoma tumor and adenomatoid odontogenic tumor (15 cases each; 9.1%) (Fig. 2). The rest were other tumors (21 cases; 12.7%) (Table 3).

Centrally located tumors accounted for 158 cases

(95.7%); whereas, only 7 cases (4.3%) were peripheral. Among the peripheral odontogenic tumors, there were three cases of peripheral ameloblastoma (42.8%), two cases of odontogenic myxoma, and one case each of odontoma and odontogenic fibroma.

Discussion

In the present study, ameloblastoma was the most common odontogenic tumor. The incidence of odontogenic tumors in the oromaxillofacial region was low and peripheral and malignant tumors were relatively rare.

Nevertheless, this study showed that odontogenic tumors occurred more frequently in females, especially in the third decade and in the posterior mandible than in the anterior area.

Histologically, EOT was most commonly found in the mandible and in men in their thirties. MixOT showed a similar pattern but females were affected more than males. Moreover, MOT occurred more in females and in the mandible but in the fourth decade of life.

In the present study, the most common odontogenic tumor was ameloblastoma, followed by odontoma, odontogenic myxoma and adenomatoid odontogenic tumor each with 15 cases. Olgac et al. (15), in their 32-year study, showed the same results. Ogunsalu (7) noted that ameloblastoma was the most common odontogenic tumor

Table 1 Relative frequency of all odontogenic tumors

Location								Mean of age	Sex		Number
Peripheral				Central							
7				158							
Mandible		Maxilla		Mandible		Maxilla			F	M	
5		2		112		46					
Pos.	Ant.	Pos.	Ant.	Pos.	Ant.	Pos.	Ant.				
5	0	0	2	99	13	25	21	26.3	89	76	165

Table 2 Frequency of odontogenic tumors based on histologic origin

Type of tumor	Number	Gender		Mean of age	Location			
		Male	Female		Central		Peripheral	
					158		7	
					Man	Max	Man	Max
Epithelial	88	48	40	24.4	71	14	3	0
Mesenchymal	23	10	13	30.1	11	9	1	2
Mixed	54	20	34	22.8	30	23	1	0

(85.5%), but found that odontoma was uncommon. Lu et al. (16) and Ochsenius et al. (17) also reported that ameloblastoma was the most common odontogenic tumor, and odontoma the forth most common. According to studies in Indian, Nigerian, and Tanzanian populations,

ameloblastoma was the most common odontogenic tumor, followed by myxoma (4,18,19). On the other hand, odontoma was the most common odontogenic tumor in studies performed in Europe and the United States, followed by ameloblastoma and odontogenic fibromyxoma (13,20-

Fig. 1 Ameloblastic carcinoma.

Fig. 2 Adenomatoid odontogenic tumor.

Table 3 Frequency of the most common odontogenic tumors

Type of tumor	number	Gender		Mean of age	Location							
		male	Female		central				peripheral			
					Man		Max		Man		Max	
					Ant.	Pos.	Ant.	Pos.	Ant.	Pos.	Ant.	Pos.
Ameloblastoma	Multicystic = 49 Unicystic = 15 Peripheral = 3 Malignant = 3	40	30	38.5	3	62	0	2	0	3	0	0
Odontoma	Complex = 27 Compound = 17	18	26	21.4	2	18	9	14	0	1	0	0
Adenomatoid odontogenic tumor	15	3	12	19	3	1	9	2	0	0	0	0
Odontogenic myxoma	15	7	8	25.1	3	4	1	5	0	0	2	0
Cementoblastoma	5	0	5	31.8	2	2	0	1	0	0	0	0
Ameloblastic fibro-odontoma (Fig. 3)	5	1	4	23.4	0	5	0	0	0	0	0	0
Ameloblastic fibroma (Fig. 4)	4	1	3	unknown	0	4	0	0	0	0	0	0
Odontogenic fibroma	3	3	0	33.3	0	0	2	0	0	0	1	0
Calcifying epithelial odontogenic tumor (Fig. 5)	3	7	8	18.3	0	1	0	1	0	0	0	1
Odonto-ameloblastoma	1	0	1	unknown	0	1	0	0	0	0	0	0

Table 4 Comparison of the present study with large studies reported from different countries and regions

Author	Country/region	Cases	Top two of most common OTs %	Male/female ratio	Maxilla/mandible ratio
Simon et al. (4)	Tanzania	116	AME(78.45) OM(6.90)	1:1.09	unknown
Wu and Chan (5)	Hong Kong	68	AME (75.00) ODT (7.35)	1:1.06	1:2.40
Simon et al. (6)	Tanzania	211	AME (74.41) OM (10.43)	1:1.05	1:5.82
Ogunsalu (7)	Jamaica	80	AME (73.75) ODT (12.50)	unknown	1:7.75
Present study	Iran	165	AME (42.42) ODT (26.66)	1:1.17	1:2.43
Okada et al. (8)	Sri Lanka	226	AME (69.47) AOT (9.29)	1:1.11	1:3.91
Ladeinde et al. (9)	Nigeria	316	AME (63.01) AOT (7.52)	1.03:1	1:4.08
Luo and Li (10)	China	802	AME (59.60) ODT (9.98)	1.14:1	1:3.89
Arotiba et al. (11)	Nigeria	128	AME (59.38) OM (16.41)	1.10:1	1:2.88
Santos et al. (12)	Nigeria	127	ODT (50.40) AME (30.70)	1:1.76	1:1.36
Fernandes et al. (13)	Brazil	340	AME (45.29) ODT (25.00)	1:1.23	1:1.94
Avelar et al. (14)	Brazil	238	AME (23.70) OKC (30.00)	1:1.33	1:2.05

Fig. 3 Ameloblastic fibro-odontoma.

Fig. 4 Ameloblastic fibroma.

24) (Table 4).

In the present study, malignancy accounted for 1.8% of all the tumors, similar to other studies (7,18,19,24). Lu et al. (6) and Jing et al. (25) reported 6% malignancy in a Chinese population, whereas Fernandes (13) stated no malignancy among odontogenic tumors in a Brazilian population.

The majority of the cases in the present study were

located centrally and only 4.3% peripherally, the most common one being peripheral ameloblastoma (42.8%). Bucher et al. (23,26) showed that 99.95% of total odontogenic tumors were central and only 0.05% were peripheral, and that the most common peripheral tumor was odontogenic fibromyxoma. The posterior region of the jaws was the most common location for odontogenic tumors in the present study (mandible = 63%; maxilla =

Table 5 The most common clinical findings

Kind of tumor	Clinical findings
Ameloblastoma	Swelling without pain (in most cases) Lip paresthesia and pain (in 2 cases)
Adenomatoid odontogenic tumor	Swelling without pain
Calcifying epithelial odontogenic tumor	Swelling without pain/slow growth
Ameloblastic fibro-odontoma	Swelling without pain
Ameloblastic fibroma	Swelling without pain
Odonto-ameloblastoma	Delay in tooth eruption Pain
Odontoma	Swelling without pain (in large lesions) Delay in tooth eruption (in small lesions)
Odontogenic fibroma	Swelling without pain Tooth mobility
Odontogenic myxoma	Without pain Rapid growth (sometimes)
Cementoblastoma	Swelling with pain (in most cases)

Fig. 5 Calcifying epithelial odontogenic tumor.

15.2%) followed by anterior maxilla (13.9%), which agreed with data from Olgac et al. (15). Although various studies showed greater occurrence of odontogenic tumor in the mandible than maxilla, Jing et al. (25) showed more odontogenic tumors in the maxilla.

In the present study, more cases appeared in the third decade, the ages ranging from 6 to 81 years with a mean of approximately 26 years. Jing et al. (25) observed a median age of about 32. Occurrence was predominantly

in the second and third decade of life, as stated by Santos et al. (12) and Fernandes et al. (13), and was seen in a rather broad age group between second to fifth decades by Okada et al. (8) Furthermore, odontogenic tumors were seen more in females (53.9%), than in males which is similar to other studies (12,13,15). Jing et al. (25) showed a four-fold increase in odontogenic tumors in females over males.

The most common clinical findings in the present study are summarized in Table 5.

It should be added that according to the WHO classification in 2005, Odontogenic Keratocyst (OKC) has been renamed as Keratocystic Odontogenic Tumor (KCOT) and Calcifying Odontogenic Cyst (COC) has been renamed as Calcifying Cystic Odontogenic Tumor (CCOT). However, some of the standard references in the field of oral pathology (1,2) still use the term OKC. According to this, OKC has not been considered as a tumor in this research.

Our findings revealed a low frequency of odontogenic tumors among oromaxillofacial lesions and a small percentage of malignancy. Odontogenic tumors are more common in the mandible and in females with most cases appearing in the second and third decades of life.

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