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Odontogenic Tumors: Anatomopathological Characteristics in the Region of Fez, Morocco

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Abstract: Odontogenic tumors represent a heterogeneous group of rare lesions accounting for about 1% of all jaw tumors. This work was carried out in order to evaluate the demographic and the histopathological characteristics of these tumors in Hassan II University Hospital, Fez, Morocco. This is a retrospective study including all cases of odontogenic tumors histologically diagnosed during a period of 10 years (2007-2016), in the department of pathology, Hassan II University Hospital, Fez, Morocco. Different demographic and histopathological characteristics have been analysed. A total of 31 odontogenic tumors were recorded. We noted a male predominance with a sex -ratio of 1.81. Mean age was 39.7 years (range, 7–87 years). The mandibular location was predominant with a maxillary/ mandibular ratio of 1: 1.21. Except one case of malignant odontogenic tumor, all other cases were benign. Ameloblastoma was the most common type (64.5%), followed by odontogenic myxoma/fibromyxoma and cementoma. In this series, odontogenic tumors have similarities and differences with those of previous series. We noted a male predominance, a more advanced age at diagnosis, and predominance of mandibular location and of ameloblastoma.

Keywords: Odontogenic tumors; mandible; maxillary; ameloblastoma; histopathology; frequency

INTRODUCTION

Odontogenic tumors (OTs) represent a heterogeneous group of lesions with variable clinical and pathological characteristics, located exclusively at the maxillofacial region [1]. They are rare and account for about 1% of all jaw tumors with an incidence of less than 0.5 cases per 100,000 per year [2-5].

They are derived from the epithelial, ectomesenchymal and/or mesenchymal elements of the teeth forming tissue [6]. OTs are classified according to the WHO classifications 2005 and2017 into two groups: benign and malignant [7, 8]. Benign tumors are largely predominant, whereas malignant tumors account for only 0% to 6.06% of all OTs [9]. The benign OTs were represented, in the WHO classification 2005, by odontogenic epithelial tumors with mature fibrous stroma without odontogenic ectomesenchyma, odontogenic epithelial tumors with odontogenic ectomesenchyma, with or without dental tissue, mesenchymal and / or ectomesenchymatous OTs with or without odontogenic epithelium, bone-related lesions and other tumors. Malignant OT swere represented by carcinomas and sarcomas [7]. The 2017 version recognizes only epithelial, mesenchymal (ectomesenchymal) and mixed OTs [8].

Several studies in different continents have been published and have shown a geographical variation of the frequency of different OTs. In our knowledge, there is no published Moroccan study including all types of OTs. For this reason, this survey was carried out in order to evaluate the frequency and the demographic and histopathological characteristics of OTs in Hassan II University Hospital, Fez, Morocco. Its results would reflect regional characteristics as most of patients in this region are treated in this hospital.

MATERIALS AND METHODS

This is a retrospective study including all OTs histologically diagnosed, during a period of 10 years (2007-2016), in the department of pathology, Hassan II University Hospital, Fez, Morocco. It includes all benign or malignant OTs according to the 2005 WHO classification [7]. The 2017 classification was not used because all cases were diagnosed before 2017 and to permit comparison with previous series using 2005 classification. Bone-related lesions were excluded from this study to allow comparison with other series which also excluded them. The different characteristics of the patients including age, sex, localization and histological type were analysed. Age was expressed as mean and range and was stratified into two groups: children and teenagers (age ≤18 years) and adults (age> 18 years), and into several groups by decades. Sex was expressed by percentage and sex-ratio. Location was divided into maxillary and mandibular and was expressed by frequency and Maxilla-mandible ratio. Distribution of histological types was analyzed according to sex and topography.

Statistical analysis was performed using Epi-Info7 version 7.1.0.6.

RESULTS

Age and gender

31 cases of OTs were diagnosed. We noted a male predominance: 20 cases occurred in male (64.5%) and 11 in female (35.5%), with a sex-ratio of 1.81. Age varied between 7 years and 87 years with an average of 39.7 years and a median of 40 years. Adults were more affected than children and adolescents. In fact, only 3 cases (9.6%) occurred in children and adolescents versus 28 cases (90.4%) in adults.

Location

Concerning topographic repartition, mandibular location was the most frequent (17 cases, 54.8% of cases) whereas maxilla was less frequently affected (14 cases, 45.2% of cases). Maxilla-mandible ratio was 1: 1.21.

Histological types

Except one case of malignant OT (ameloblastic carcinoma), all other cases were benign (30 cases, 96.77%). Histological type repartition is provided in table 1.

Distribution of histological types according to sex

Analysis of gender distribution according to histological type showed male predominance for ameloblastoma and female predominance for myxofibroma/odontogenic myxoma and cementoma. Details concerning histological type distribution according to gender are presented in Table 1.

Table 1: histological repartition according to age, gender and location

Histological types	Total n (%)	Adults n	Children and teenagers n	Males n	Females n	Sex ratio M/F	Max n	Mand n	Ratio max /mand
Odontogenic epithelium with mature, fibrous stroma without odontogenic ectomesenchyme	21(67.6)	19	2	16	5	3.2	6	15	1 :2.5
Ameloblastoma	20(64.5)	18	2	16	4	4	6	14	1:2.33
Squamous OT	1 (3.2)	1	0	0	1	NA	0	1	NA
Odontogenic epithelium with odontogenic ectomesenchyme, with or without hard tissue formation	3(9.6)	2	1	2	1	NA	1	1	NA
Ameloblastic fibroma	1 (3.2)	1	0	1	0	NA	1	0	NA
Ameloblastic fibrodentinoma	1 (3.2)	1	0	1	0	NA	0	1	NA
Calcifying cystic odontogenic tumour	1 (3.2)	0	1	0	1	NA	1	0	NA
Mesenchyme and/ or odontogenic ectomesenchyme with or without odontogenic epithelium	6(19.3)	6	0	2	4	NA	5	0	NA
Myxofibroma	1 (3.2)	1	0	1	0	NA	1	0	NA
Odontogenic myxoma	2 (6.4)	2	0	0	2	NA	2	0	NA
Odontogenic fibroma	1 (3.2)	1	0	1	0	NA	1	0	NA
Cementoma	2 (6.4)	2	0	0	2	NA	1	1	NA
Carcinomas	1(3.2)	1	0	0	1	NA	1	0	NA
Ameloblastic carcinoma	1(3.2)	1	0	0	1	NA	1	0	NA
Total	31(100)	28	3	20	11	1.81	14	17	1 :1.21

Abbreviations: Mand : mandible ; Max: maxillar; NA : not applicable

Distribution of histological types according to location

Histological type distribution according to location is provided in Table 1.

DISCUSSION

OTs are rare tumors of the jaws, accounting for 0.7% to 2.7% of all oral cavity lesions in the departments of pathology [1]. In our knowledge, this is the first Moroccan study including all types of OTs.

Sex distribution in the present series showed a male predominance. In the literature, results were variable with a male predominance in some Chinese [6, 11], Indians [3, 4], Nigerian [12], Iranian [13], Saudi [14] and Greek series [15], and a female predominance in others like a Brazilian [1, 16] and Iranian series [17]. In Other studies (an Egyptian [2] and a Turkish [18]), OTs were seen equally in male and female.

When age analysis was performed, it showed that age was older in comparison with mostly reported age [2, 4, 6, 11, 14, 17-20]. It was close to the age reported by Chrysomali [15] who found a mean age of 38 years. Table 2 presents age and gender distribution of OTs in previous and in present series.

Regarding location, this study, as well as all reviewed studies [1-4, 6, 11-21], share the same topographic repartition with a large predominance of mandibular location. However, this predominance was less important in this survey (table 2).

Table 2: Comparison of epidemiological characteristics in the present study with other series

	SR M/F	Mean age (age range) years	Ratio max-mand
Avelar (Brazil) [16]	0.75	-	1 :2.05*
Osterne (Brazil) [1]	0.62	-	1 :2.1
Luo (China) [6]	1.35:1	34.48	1:3.50
Lu (China) [11]	1.3	29.3	1 :3.2
Tawfik (Egypt) [2]	1.1:1	29.57(4-80)	0.2:1
Gupta (India) [19]	-	32.64 (5-75)	1:4.02
Varkhede (India) [3]	1.4:1	-(5-75)	1 :2.75
Sriram (India) [4]	1.2:1	29.81 (2.5-75)	1 :3.8
Saghravanian (Iran) [17]	0.85*	26.3	1 :2.43*
Adebayo (Nigeria) [21]	1.35*	-	1 :4.41*
Odukoya (Nigeria) [12]	1.2	- ($2^{7}/_{2}$-82)	1 :5.67*
Okada (Sri Lanka) [20]	1:1.1	31.4 (1-84)	1:3.9
Taghavi (Iran) [13]	1.23	-	1 :2.7
AlSheddi (Saudi Arabia) [14]	1.4:1	29 (7-82)	1 :2.25*
Sekerci (Turkey) [18]	1.01	34.52 (10-84)	1 :3.52*
Chrysomali (Greece) [15]	1.2:1	38.0 (2.5-92)	1 :2
Presentseries	1.81	39.7 (7-87)	1 :1.21

* Value that we calculated from the data presented in the article

Abbreviations : F: female; M : male; Mand : mandible ; Max: maxilla; SR : sex ratio

Analysis of different histological types of OTs in published series showed that the very hight frequency of benign OTs in comparison with malignant OTs is a constant finding [1-4, 6, 11-21].

As in most studies [1-4, 11-13, 17-21], ameloblastoma was the most common OT in our series. Other studies reported a predominance of keratocystic OT [6, 14-16].

The distribution of gender varied according to the histological type. Concerning ameloblastoma, the vast majority of studies, like the present data, reported a higher proportion of male patients [2-4, 6, 11, 12, 15-17, 19, 21]. Only rare publications reported a female predominance [18, 22] or no gender difference [13, 20]. For myxofibroma / odontogenic myxoma, we shared the same results with other series which frequently showed a female predominance [2, 4, 6, 12, 13, 15, 19-21]. Male predominance [16] or lack of gender predominance was rare [11; 17; 18; 22]. In cementomas, the proportion of females was reported to be higher [6, 16-18]. concerning other OTs, male predominance was more frequently reported in odontogenic keratocystic tumor [2, 3, 6, 15, 22] and calcifying epithelial OT [6, 13, 16, 18-21] whereas female predominance was more common in ameloblastic fibroma [6, 11, 15, 17, 19], odontoma [2, 11, 12, 15-18, 20]. For other tumors, results were variable.

Analysis of location for each histological type in the literature has always shown a predominance of mandibular location for ameloblastoma [1-4, 6, 11-16,

19-21]. For myxoma / fibromyxoma, results were variable with equal frequency of the two locations [4; 10; 14; 20], mandibular predominance [1, 2, 12, 14, 20] or maxillary predominance [6; 13]. For cementoma, most of the studies reported a common mandibular involvement [1, 2, 6, 13, 14, 16, 19]. For other OTs, mandibular predominance was common for keratocysticOT [1-3, 6, 14-16], calcifying epithelial OT [2, 4, 10, 13, 15, 16], ameloblastic fibroma [4, 6, 13, 15, 16], odontoma [2, 4, 11, 19], squamous OT [12, 16, 19], calcified cystic OT [1, 4, 16, 19, 21]. On the other hand, for adenomatoidOT, most studies reported a predominance of maxillary location [3, 4, 12, 13, 16, 19-21]. In this analysis, ameloblastoma was more frequently located in the mandible. The three cases of myxoma / fibromyxoma were located in maxillar, and the two cementomas were located in mandible and maxillar.

In summary, odontogenic tumors are rare heterogeneous tumors. Inthe present study, they share some characteristics with previous publications. They have also some differences. We observed a male predominance, a more advanced age in comparison with other studies, a predominance of mandibular location and a frequency of ameloblastoma.Other larger and national studies are necessary to analyze national characteristics of these tumors.

ABBREVIATIONS

F: female; M: male; Mand: mandible; Max: maxillar; NA: not applicable; SR: sex ratio; WHO: World Health Organization

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REFERENCES

1. Osterne, R. L. V., de Matos Brito, R. G., Alves, A. P. N. N., Cavalcante, R. B., & Sousa, F. B. (2011). Odontogenic tumors: a 5-year retrospective study in a Brazilian population and analysis of 3406 cases reported in the literature. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology*, *111*(4), 474-481.
2. Tawfik, M. A., & Zyada, M. M. (2010). Odontogenic tumors in Dakahlia, Egypt: analysis of 82 cases. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology*, *109*(2), e67-e73.
3. Varkhede, A., Tupkari, J. V., & Sardar, M. (2011). Odontogenic tumors: a study of 120 cases in an Indian teaching hospital. *Med Oral Patol Oral Cir Bucal*, *16*(7), e895-9.
4. Sriram, G., & Shetty, R. P. (2008). Odontogenic tumors: a study of 250 cases in an Indian teaching hospital. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology*, *105*(6), e14-e21.
5. Jordan, R. C., & Speight, P. M. (2009). Current concepts of odontogenic tumours. *Diagnostic Histopathology*, *15*(6), 303-310.
6. Luo, H. Y., & Li, T. J. (2009). Odontogenic tumors: a study of 1309 cases in a Chinese population. *Oral Oncology*, *45*(8), 706-711.
7. Barnes, L., Eveson, J. W., Reichart, P., & Sidransky, D. (2005). World Health Organization classification of tumours: pathology and genetics of head and neck tumours. *Word Health Organization Classification of Tumours: Pathology and genetics of head and neck tumors*, *11*(1), 68-77.
8. Lee, R. J., Tong, E. L., Patel, R., Go, L. A., & Christensen, R. E. (2015). Epidemiology, prognostic factors, and management of malignant odontogenic tumors: an analysis of 295 cases. *Oral surgery, oral medicine, oral pathology and oral radiology*, *120*(5), 616-621.
9. Philipsen, H. P., & Reichart, P. A. (2006). Classification of odontogenic tumours. A historical review. *Journal of oral pathology & medicine*, *35*(9), 525-529.
10. Lu, Y., Xuan, M., Takata, T., Wang, C., He, Z., Zhou, Z., ... & Nikai, H. (1998). Odontogenic tumors: a demographic study of 759 cases in a Chinese population. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology*, *86*(6), 707-714.
11. Odukoya, O. (1995). Odontogenic tumors: analysis of 289 Nigerian cases. *Journal of oral pathology & medicine*, *24*(10), 454-457.
12. Taghavi, N., Rajabi, M., Mehrdad, L., & Sajjadi, S. (2013). A 10-year retrospective study on odontogenic tumors in Iran. *Indian Journal of Dental Research*, *24*(2), 220.
13. AlSheddi, M. A., AlSenani, M. A., & AlDosarib, A. W. (2015). Odontogenic tumors: analysis of 188 cases from Saudi Arabia. *Annals of Saudi medicine*, *35*(2), 146.
14. Chrysomali, E., Leventis, M., Titsinides, S., Kyriakopoulos, V., & Sklavounou, A. (2013). Odontogenic tumors. *Journal of Craniofacial Surgery*, *24*(5), 1521-1525.
15. Avelar, R. L., Antunes, A. A., de Santana Santos, T., de Souza Andrade, E. S., & Dourado, E. (2008). Odontogenic tumors: clinical and pathology study of 238 cases. *Brazilian journal of otorhinolaryngology*, *74*(5), 668-673.
16. Saghravanian, N., Jafarzadeh, H., Bashardoost, N., Pahlavan, N., & Shirinbak, I. (2010). Odontogenic tumors in an Iranian population: a 30-year evaluation. *Journal of oral science*, *52*(3), 391-396.
17. Sekerci, A. E., Nazlım, S., Etoz, M., Denız, K., & Yasa, Y. (2015). Odontogenic tumors: a collaborative study of 218 cases diagnosed over 12 years and comprehensive review of the literature.

Medicina oral, patologia oral y cirugia bucal, *20*(1), e34.
18. Gupta, B., & Ponniah, I. (2010). The pattern of odontogenic tumors in a government teaching hospital in the southern Indian state of Tamil Nadu. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology*, *110*(1), e32-e39.
19. Okada, H., Yamamoto, H., & Tilakaratne, W. M. (2007). Odontogenic tumors in Sri Lanka: analysis of 226 cases. *Journal of oral and maxillofacial surgery*, *65*(5), 875-882.
20. Adebayo, E. T., Ajike, S. O., & Adekeye, E. O. (2005). A review of 318 odontogenic tumors in Kaduna, Nigeria. *Journal of oral and maxillofacial surgery*, *63*(6), 811-819.
21. Abdennour, S., & Benhalima, H. (2013). Les tumeurs odontogènes bénignes: analyse épidémiologique de 97 cas dans la population algérienne. *Revue de Stomatologie, de Chirurgie Maxillo-faciale et de Chirurgie Orale*, *114*(2), 67-71.