

ORIGINAL ARTICLE

BENIGN TUMORS OF THE JAWBONES: A TEN YEAR RETROSPECTIVE ANALYSIS IN YAOUNDE-CAMEROON

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Abstract

Aim: To describe the distribution of benign tumors of the jawbones regarding diagnostic characteristics and histopathologic type in a Cameroonian population and to compare findings with other reports.

Method: Histopathologic records of patients diagnosed with benign tumors of the jawbones in three teaching hospitals of Yaounde-Cameroon from January 2010 to December 2019 were reviewed. These tumors were classified per the 4th edition of the WHO classification of head and neck tumors and were analyzed descriptively regarding age, sex, site, size, radiological presentation and histopathologic type. Chi-square test was used to assess proportional differences. *P* values < 0.05 were

statistically significant.

Results: Records of 89 patients (55 females) aged 30.74 ± 16 years (1 to 74 years) on average were examined. The ratio of mandibular to maxillary lesions was 2.3:1. The mean tumor size was 7.3 ± 5.6 cm. Radiologically, tumors were mostly unilocular (60 cases) and lucent (62 cases). Histologically, these tumors were distributed as odontogenic tumors (57 patients, 33 females, median age 21.2 years), odontogenic cysts (12 patients, 6 females, median age 20 years) and non odontogenic lesions (20 patients, 14 females, median age 24.8 years). Ameloblastoma (23/57 patients), keratocystic odontogenic tumor (12/12 patients) and fibrous dysplasia (10/20 patients) were the most frequent histopathologic type found in each of the previous groups of tumors respectively.

Conclusion: The results aforementioned revealed that the distribution and characteristics of benign tumors of the jawbones in Cameroonians have some differences as well as similarities with the findings of studies conducted in different populations over the world.

Key words: Odontogenic tumors, odontogenic cysts, bone and related lesions, jawbones

Introduction:

Benign tumors of the jawbones (BTJ) are a heterogeneous group of lesions of diverse clinical behavior and histopathologic types. They are classified into three groups according to the last edition of the World Health Organization (WHO) classification of head and neck tumors: odontogenic cysts, odontogenic tumors (odontogenic lesions) and bone and related lesions (non odontogenic lesions)[1].

The reported frequency [2] of non-odontogenic lesions dominated by central giant cell granuloma [3] seems to be less than that of odontogenic lesions dominated by keratocystic odontogenic tumor (KOT) (western series) [4] and ameloblastoma (african series) [5]. In the same vein, benign tumors of the jaws are mainly described in male patients [6] around the third decade [7] and for the mandibular bone [8].

However, it is well known that geographic distribution of diseases and the influence of ethnic, nutritional and cultural habits, and genetic patterns, have great importance in occurrence and prevalence of a particular disease [9]. Therefore, the aim of this research was to examine the distribution of BTJ regarding gender,

age, diagnostic characteristics and histopathologic type in a Cameroonian population and to compare findings of this study with other reports.

Methods:

Histopathologic records of patients diagnosed with BTJ from January 2010 to December 2019 were obtained from files of the oral and maxillofacial surgery, otolaryngology and dentistry units of Yaounde Central Hospital, Yaounde University Teaching Hospital and Yaounde Gyneco-obstetric and Pediatric Hospital.

These tumors were classified per the fourth edition of the WHO classification [1] and were analyzed descriptively regarding age, sex, site, size, radiological presentation and histopathologic type. The involved sites were subclassified into four regions with respect to the first premolar: maxillary anterior, maxillary posterior, mandibular anterior, and mandibular posterior. Incomplete clinical data reports with a doubtful or controversial diagnosis and malignant tumors were excluded from the study. Statistical analysis was undertaken using the SPSS® software, version 21.0 (SPSS Inc., IL,

USA). Data were presented in proportion for categorical variables and median, mean and standard error of mean for continuous variables. Proportional differences were analyzed using a contingency table and Chi-Square analyses. P values < 0.05 were considered statistically significant.

The study was approved by the ethics committee of the Faculty of Medicine and Biomedical Sciences of the University of Yaounde 1.

Results:

Presentation of the study population

The study population consisted of 89 patients (Figure 1).

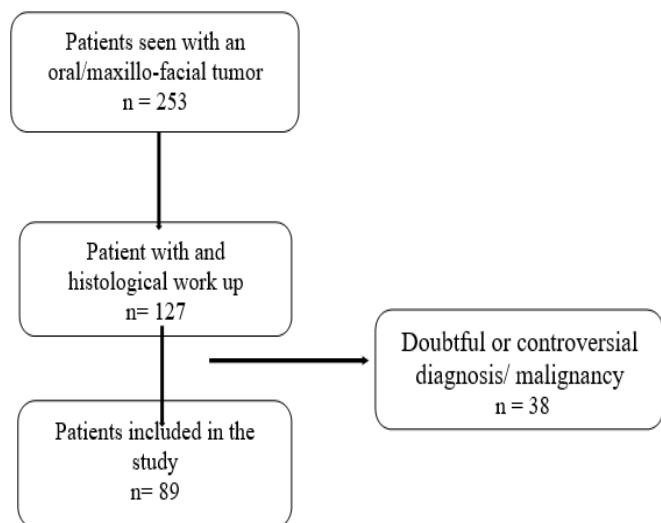


Figure 1- Flow chart of Patients inclusion.

The Male: Female sex ratio was 0.62 (34 males and 55 females). The mean age of patients was 30.74 ± 16 years (1 to 74 years). Table I illustrates the demographic data of the study population.

Table I: Demographic characteristics of the study population

	N	%
Gender		
Male	34	38.2
Female	55	61.8
Age range (years)		
[0 -10[	4	4.5
[10 -20[	28	31.5

[20 - 30[	19	21.4
[30 - 40[	14	15.7
[40 - 50[	13	14.6
[50 - 60[	7	7.8
[60 - 70[	3	3.4
70+	1	1.1

Site of tumors

Tumors had a mandibular and maxillary location in 69.6% (62 patients) and 30.4% (27 patients) of cases respectively. On the mandible, the tumors were more posterior (32 cases) whilst on the maxilla the tumors involved the entire jawbone the most (13 cases) (Figure 2).

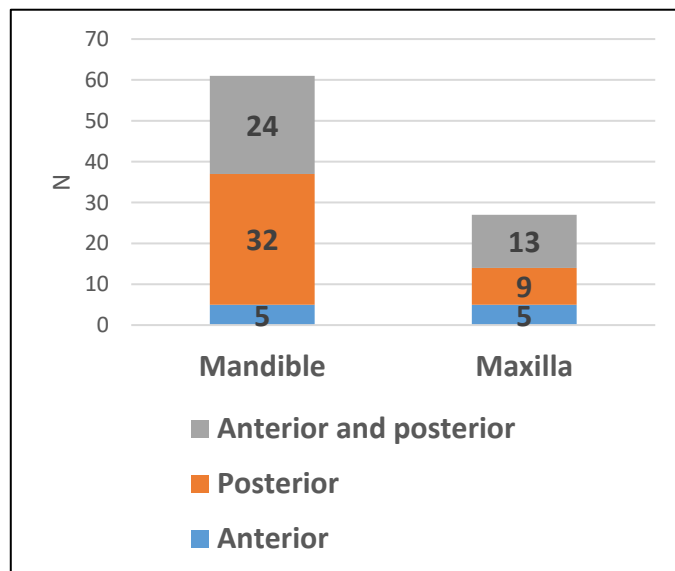


Figure 2: Location of tumors in the study population

Radiological presentation of tumors

All the patients had an imaging work-up consisting of an orthopantomogram and/or a computed tomography scan.

The mean tumor size was 7.3±5.6 cm. Tumor was < 4 cm in only 15 patients. The unilocular presentation of the tumor was more predominant (60 cases) than the multilocular one (29 cases). Concerning the matrix type, tumors were most lucent (62 cases) than opaque (11 cases) or mixed (16 cases). Teeth were affected by the tumor in 40.3% (36) of patients.

Table II resumes the radiological presentation of tumors in the study population.

Table II: Radiologic presentation of tumors in the study population

	N	%
Size		
<4 cm	15	16.8
≥4 cm	74	83.2
Margins		
Regular/irregular	64	(72)/(28)
	/25	
Condensed/not condensed	11/78	(12.4)/(87.6)
Matrix type		
Opaque	11	12.4
Lucent	62	69.6
Mixed	16	18
Tumor aspect		
Unilocular	60	67.4
Multilocular	29	32.6
Basal cortical effraction		
Yes	13	14.6
No	76	85.4
Tooth drift		
Yes	36	40.4
No	53	59.6

Histopathologic types of tumors

Odontogenic tumors were the most prevalent groups of BTJ, found in 57 (64%) patients (figure 3)

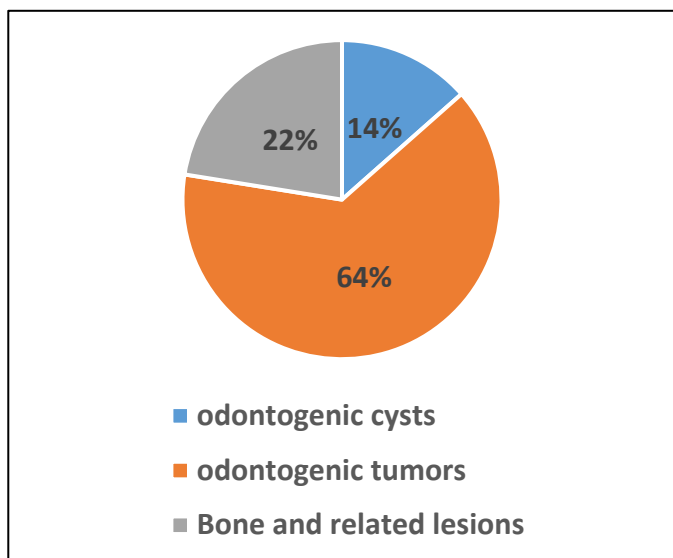


Figure 3: Classification of benign tumors of the jawbones in the study population

Odontogenic tumors were more frequent in female (M/F sex-ratio of 1/1.3, p=0.03). Analogously, bone and related lesions were also

more frequent in female (M/F sex-ratio of 1/2.3, p=0.02). However, odontogenic cysts were equally distributed as many male as female.

BTJ were mostly encountered in the second and third decade, with a median age of 20 years, 21.2 years and 24.8 years for odontogenic cysts, odontogenic tumors and bone and related lesions respectively

Ameloblastoma (23/57 patients), fibrous dysplasia (10/20) and KOT (12/12) were the most frequent histopathologic type met in odontogenic tumors, bone and related lesions and odontogenic cysts respectively.

Table III resumes the frequency and demographic characteristics of all the histopathologic type of BTJ found in the study population.

Table III: Frequency of benign tumors of the jawbones and their distribution according to gender and age

Lesion	Gender		p	Media n age (years)
	Male (%)	Femal e (%)		
Odontogenic cysts				
KOT	6 (50)	6 (50)	1	20
Odontogenic tumors				
Ameloblastoma	25 (47.8)	33 (52.2)	0.03	21.2
Ossifying fibroma	0 (0)	3 (100)	0.00	41
Cementoma	1 (33.3)	2 (66.7)	0.06	10.5
Odontogenic myxoma	1 (25)	3 (75)	0.00	14.5
Ameloblastic fibroma	2 (40)	3 (60)	0.01	3
CEOT	2 (33.3)	4 (66.7)	0.03	23.5
Odontogenic fibroma	3 (60)	2 (40)	0.06	21
SOT	2 (33.3)	4 (66.7)	0.06	18.5

odontoameloblast oma	2 (100)	0 (0)	0.00 1	24
Bone and related lesions	6 (30)	14 (70)	0.00 1	24.8
Central Giant cell granuloma	0 (0)	3 (100)	0.00 1	12.5
Osteoma	1 (100)	0 (0)	0.00 1	36
Fibrous dysplasia	2 (20)	8 (80)	0.00 1	29
Fibro-osseous lesions	3 (50)	3 (50)	1	22

KOT: keratocytic odontogenic tumor; **CEOT:** Calcified epithelial odontogenic tumor. **SOT:** Squamous odontogenic tumor

Discussion:

The epidemiological study of various diseases is important for their etiology and risk factors identification, prevention and treatment protocols institution and appropriate policies decisions concerning health planning and allocations of resources [9]. It was within this framework of idea that the present study was conducted in a Cameroonian population, as far as BTJ are concerned.

In this study, odontogenic tumors were the most frequent group of BTJ encountered (64%), followed by non odontogenic lesions (22%) and odontogenic cysts (14%). This is different from reports of studies in Turkey [10], Iran [11], Australia [12] or Brazil [13] where odontogenic cysts were the most prevalent group of BTJ. However these findings are consistent with those stated for African countries [5, 14], led us to assume that this is a particularity of those countries. This need to be confirm by a wider literature review taking into consideration the actual WHO classification of the BTJ; given that lesion names, groups, and subtypes have changed regularly since the first edition of histological classification of BTJ was published by the WHO in 1971.

Concerning odontogenic tumors, this study revealed a greater incidence in the female gender, result also found by Gaitán-Cepeda et al [15] or Olgac et al [16]. However, some studies have

found a greater incidence in male gender [4, 12, 17]. Regarding age, there was a higher incidence in the second and third decades of life. These findings are similar to the ones reported by Luo and Li [18], da-Costa et al [4] and Johnson et al [12]. The mandible was 2.3 times more commonly involved than the maxilla which is similar to previous studies [19-21]. Ameloblastoma was the main histopathologic type of odontogenic tumors as found in literature [12, 13, 22, 23].

Regarding non odontogenic lesions, the present study demonstrated increased propensity for these lesions to occur in females (M/F sex-ratio of 1/2.3), which is consistent with the findings of Ali [24] in Kuwait and Johnson et al [12] in Australia. The median age of patients was 25 years lower than that found by Johnson et al [12] (38.6 years). In the current study, the most common non-odontogenic lesion was fibrous dysplasia, result which is in agreement with that of Johnson et al [12]. Conversely, this result is inconsistent with that of many studies where central giant cell granuloma is the commonest lesion among the non-odontogenic intraosseous lesions [7, 25].

KOT is the main histologic type of odontogenic cysts as reported by various studies made in different countries [12-13] and it was the only type found in this study. KOT seems to have a male predominance, occurring in the fourth decade [26] even if these trends were not confirmed in the present study where the sex-ratio was 1 and the median age 20 years. Like odontogenic tumors, KOT were most commonly located in the mandibular posterior region [3] Nevertheless there are other type of odontogenic cysts frequently found in some series especially radicular cysts, dentigerous cysts or nasopalatine cysts [27].

Conclusion:

The present study conducted in a Cameroonian population confirmed the clinical and histopathological heterogeneity of BTJ. In this study population, odontogenic tumors were the major group of BTJ encountered followed by non odontogenic lesions and odontogenic cysts with ameloblastoma, fibrous dysplasia and KOT being the main histopathologic type in each group

respectively. The distribution and characteristics of BTJ as described in this study have several differences as well as similarities with findings of studies in different populations over the world. Therefore these results could be very helpful for clinicians and pathologists to better assess BTJ.

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