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Original Article

Evaluation of Histopathological Subtypes of Ameloblastoma in a Tertiary Institution in Southern Part of Nigeria

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Abstract

Background: Ameloblastoma is the most frequent odontogenic tumour reported in Nigeria. It is a slow growing locally invasive tumor which though rarely undergoes metastasis, but is clinically persistent. **Aim**: The aim of this study was to evaluate the prevalence of the various histopathological subtypes of ameloblastoma seen at the Oral Pathology department of the University of Port Harcourt Teaching Hospital and compare it with other studies in Nigeria and elsewhere. **Materials and Methods**: This is a five year (2008-2013) retrospective study of all histopathologically diagnosed ameloblastoma at the Oral Pathology department of the University of Port Harcourt Teaching Hospital, Port Harcourt. Lesions were categorized using the 2005 World Health Organization classification of odontogenic tumours. **Results:** Within the study period, there were 52 cases of ameloblastoma out of a total of 63 odontogenic tumors seen. The patients' age ranged from 7 – 65 years with a mean age of 28.5±14.6 years. There was equal sex predilection. Solid/multicystic ameloblastoma was the most prevalent 30(57.7%) and mandible was the predominant site with 43(82.7%) cases. Solid/multicystic ameloblastoma were more in females while unicystic ameloblastoma were more in males. Solid/multicystic and unicystic ameloblastoma were predominantly seen in the mandible. There was no case of malignant ameloblastoma or ameloblastic carcinoma. **Conclusion:** Solid/multicystic ameloblastoma was the most prevalent with higher incidence in females. The mandible was the commonest site of occurrence.

Keywords: Ameloblastoma; Histological; Prevalence; Unicystic; Multicystic; Odontogenic.

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Introduction

Ameloblastoma is a slow growing locally invasive tumor which rarely metastasize, but persists clinically.[1-5] It is the most common odontogenic tumour reported in Nigeria,[6-8] South Africa[9] and found to be more common among blacks than whites[10,11]. It is said to be mostly occurring in the 3rd-4thdecades of life although recent reports have found it to be commoner in children and adolescent[6,12] and affects the mandible more than maxilla.[6,8] Maxillary ameloblastoma is indistinguishable from their mandibular counterparts histologically, but may behave more aggressively. This is presumably because of the thin and fragile bone of the maxilla which unlike the thick cortical plates of the mandible, allows a relatively unimpeded spread of the tumour to the surrounding structures, such as the maxillary sinus, nasal cavity, orbit and occasionally the cranial base.[2] This account for the high recurrence rate of this tumour in the maxilla with significant mortality and often management challenges of the tumour in this location.[13]

The 2005 World Health Organization (W.H.O) histological classification of ameloblastomas (benign type) includes four types: solid/multicystic, unicystic, extraosseous/peripheral and desmoplastic.[14] The solid/multicystic is further divided into follicular and plexiform or mixed types. The follicular type can further be subdivided at cellular level into four subgroups; spindle cell type, acanthomatous type, granular cell, and basal cell ameloblastoma. The Plexiform types are anastomosing strands of basal cells often without a conspicuous stellate reticulum type cells in a delicate stroma often showing cystic degeneration.

The unicystic ameloblastoma appears as a cyst on gross examination but may appear multilocular on radiography. It has two main histologic pattern; luminal and mural but sometimes a third group named intraluminal when it appears there are detachment of ameloblastomatous tissue inside the lumen. The extra osseous type appears histologically as the solid/multicystic type. The desmoplastic type has a loose stroma immediately surrounding the odontogenic

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epithelium but further away a very dense stroma which may appear on histology with little evidence of odontogenic epithelium.[15] Previous Nigerian studies, on histological subtype of ameloblastoma are few.[15-18] These studies were mainly in the southwest geopolitical zone of Nigeria with none from the south-south zone of Nigeria particularly Port Harcourt the largest city in the zone. This study was therefore designed to evaluate the prevalence of the various histological subtypes of ameloblastoma seen at the Oral Pathology department of the University of Port Harcourt Teaching Hospital (UPTH) in Port Harcourt, south-south region of Nigeria and compare it with other studies.

Materials and Methods

This was a 5-year (2008-2013) retrospective study of all histologically diagnosed cases of ameloblastoma reported at the Oral Pathology department of UPTH, Port Harcourt. Ethical approval for this study was obtained from the Ethical Committee of the hospital. Formalin fixed tissues and paraffin embedded blocks of patients were processed and prepared for staining with haematoxylin & eosin. All slides were subsequently reviewed by two Oral Pathologists (CA Iyogun and OG Omitola) to reconfirm the diagnosis. The diagnoses were in accordance with the 2005 W.H.O classification of ameloblastoma. Biodata comprising of age, sex, and site were obtained from the patients records in the department. Data obtained were coded and analysis was performed using SPSS version 17.0 (Chicago, Illinois, USA). Chi square test was used to assess the statistical significance between different proportions. Significant level was fixed at >0.05.

Results

In the five year study period, there were 52 cases of ameloblastoma out of a total of 63 odontogenic tumors seen. The patients age range from 7–65 years with a mean age of 28.5±14.6 years. Solid/multicystic ameloblastoma was the most prevalent histological subtype accounting for 30(57.7%) cases follow by unicystic ameloblastoma with 20(38.4%) cases. Peripheral and desmoplastic ameloblastoma had 1(1.9%) case each (Table 1).

The mandible was the predominant site for ameloblastoma with 43(82.7%) cases while the maxilla had 6(11.5%). The right and left posterior sides of the mandible were predominantly affected with 19(36.5%) and 15(28.8%) cases respectively. There was one peripheral and one palatal cases accounting for 1.9% each. One case had no data with respect to site on the jaw (Table 2).

Histological subtypes		**Frequency**
Solid/Multicystic		30 (57.7%)
Unicystic	Mural	17 (32.7%)
	Luminal	2 (3.8%)
	Intramural	1 (1.9%)
Peripheral		1 (1.9%)
Desmoplastic		1 (1.9%)
Total		52 (100.0%)

Table 1: Frequencies of histopathological subtypes of Ameloblastoma

Side of Jaw	**Frequency**
Right	19 (36.5%)
Left	15 (28.8%)
Anterior mandible	5 (9.6%)
Right and left mandible	6 (11.5%)
Total	45 (86.5%)
Not recorded	7 (13.5%)
	52 (100.0%)
Site on jaw	**Frequency**
Mandible	43 (82.7%)
Maxilla	6 (11.5%)
Peripheral	1 (1.9%)
Palate	1 (1.9%)
Total	51 (98.1%)
Not recorded	1 (1.9%)
	52 (100%)

Table 2: Frequencies of side and site of jaw involved

The peak incidence of ameloblastoma was from the second to third decades of life. Also, the peak incidence of solid multicystic ameloblastoma and mural type of unicystic ameloblastoma was the second to third decades. This was not statistically significant (P-value 0.494) (Table 3).

There was equal sex predilection of 26 cases each but among the solid/multicystic type of ameloblastoma, there were 19(36.6%) females and 11(21.1%) males giving a female to male ratio of 1.7:1. There were 13 males (25.1%) and 7(13.4%) among unicystic ameloblastoma giving a male to female ratio of 1.85: 1. This value was not statistically significant (P-value 0.120) (Table 4).

As regard the relationship of the histological subtypes and site, solid/multicystic was

predominantly in the mandible with 24(47.2%) cases while the maxilla had only 4(7.8%) cases. Unicystic subtypes were also predominantly in the mandible with 19(37.3%) cases. This observation was statistically significant with P-value of 0.0000 (Table 5).

Histological subtypes		Age group						
		0-9	10-19	20-29	30-39	40-49	50-59	60-69
Solid/Multicystic		1(1.9%)	7(13.4%)	10(19.1)	5(9.5%)	3(5.8%)	4(7.6%)	0(0.0%)
Unicystic	Mural	0(0.0%)	8(15.3%)	4(7.7%)	2(3.8%)	1(1.9%)	0(0.0%)	2(3.8%)
	Luminal	0(0.0%)	1(1.9%)	0(0.0%)	0(0.0%)	1(1.9%)	0(0.0%)	0(0.0%)
	Intramural	0(0.0%)	1(1.9%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)
Peripheral		0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	1(1.9%)	0(0.0%)	0(0.0%)
Desmoplastic		0(0.0%)	0(0.0%)	1(1.9%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)
Total		1(1.9%)	17(30.6%)	15(28.7%)	7(13.3%)	6(11.5%)	4(7.6%)	2(3.8%)

Table 3: Relationship of Histopathological subtypes to age group (P-value 0.494)

Histological subtypes		Gender of patients		
		Male	Female	Total
Solid/Multicystic		11(21.1%)	19(36.6%)	30(57.7%)
Unicystic	Mural	12(23.2%)	5(9.6%)	17(32.7%)
	Luminal	0(0.0%)	2(3.8%)	2(3.8%)
	Intramural	1(1.9%)	0(0.0%)	1(1.9%)
Peripheral		1(1.9%)	0(0.0%)	1(1.9%)
Desmoplastic		1(1.9%)	0(0.0%)	1(1.9%)
Total		26(50.0%)	26(50.0%)	52(100.0%)

Table 4: Relationship of Histopathological subtype to gender (P-value 0.120)

Histological subtypes		Site on jaw			
		Mandible	Maxilla	Palate	Peripheral
Solid/Multicystic		24(47.2%)	4(7.8)	0(0.0%)	1(2.0%)
Unicystic	Mural	16(31.4%)	1(2.0)	0(0.0%)	0(0.0%)
	Luminal	2(3.9%)	0(0.0%)	0(0.0%)	0(0.0%)
	Intramural	1(2.0%)	0(0.0%)	0(0.0%)	0(0.0%)
Peripheral		0(0.0%)	0(0.0%)	1(2.0%)	0(0.0%)
Desmoplastic		0(0.0%)	1(2.0%)	0(0.0%)	0(0.0%)
Total		43(84.3%)	6(11.8%)	1(2.0%)	1(2.0%)

Table 5: Relationship of histopathological subtypes to site on the jaws (P-value 0.000)

		Frequency
Solid / Multicystic	Follicular	14 (26.9%)
	Plexiform	9 (17.3%)
	Granular	1 (1.9%)
	Basal Cell type	3 (5.8%)
	Acanthomatous	2 (3.8%)
	Hemangiomatous	1 (1.9%)
Unicystic		20 (38.4%)

Table 6: Frequencies of histopathological subtypes of Ameloblastoma

Follicular ameloblastoma was the most common cytologic type with 14 cases followed by the plexiform type with nine cases. The basal cell type had three cases while the acanthomatous type had two cases and there was only one case of granular cell type in this study (Table 6). There was no case of malignant ameloblastoma or ameloblastic carcinoma in this study.

Discussion

Ameloblastoma is the commonest odontogenic tumor in Nigeria.[4] It is also the commonest in North Africa,[19] and in people of Asian descent[20] and India.[21] In this study, 52 cases of ameloblastoma were seen accounting for 82.5% of odontogenic tumors found in the period under review. This is in agreement with various reports from sub-Saharan Africa[7,18] that ranges from 70 to above 80%. However, this is in contradiction with reports from Europe and America where odontoma is the most prevalent odontogenic tumour. This may be due to underreporting of odontoma (which is generally an asymptomatic lesion) in developing world.[22-

[25] From this study, the youngest patient was seven years while the oldest patient was 65 years with the mean age of 28.5±14.6 years. This is in agreement with the reports from Brazil[12] (31 years), Nigeria[26] (31.7+15.6) years and Jamaica[27] (29.1years). Our finding of peak incidence within the 2nd and 3rd decade of life is in agreement with that of Santos et al,[12] Adebiyi et al,[18] but differs with that of Bassey et al,[7] Waldron et al[28] who reported peak incidence within the 4th and 5th decade of life.

In this study, male/ female ratio was equal, which was comparable to studies in the western part of Nigeria[18,26] who reported 1:1 and 1.1:1 respectively. However, a ratio of 1.6:1 was reported in Kaduna.[29] The unicystic ameloblastoma affected 13(25.1%) male and 7(13.4%) females giving a male to female ratio of 1.85:1. This was in agreement with a similar study in Brazil.[12] Solid/multicystic ameloblastoma was the most prevalent histological subtype accounting for 57.7%. This was far higher than 13.9% reported in an Indian study.[21] In this study, the most prevalent subtype was unicystic ameloblastoma with a prevalent of 35.5%.

Mandible was the predominant site of ameloblastoma with 43(82.7%) of cases while the maxilla had 6(11.5%). This was in agreement with previous study by Gardner.[30] However, Arotiba et al[5] in Ibadan and Adebiyi et al[18] in Ile-Ife both in southern Nigeria reported higher prevalent of 91 and 93% respectively. Follicular ameloblastoma was the most common cellular type followed by the plexiform type and distantly by basal cell type. This is in agreement with the finding of Ladeinde et al[16] and Adebiyi et al.[18] It is important to note that there were no cases of malignant ameloblastoma or ameloblastic carcinoma. This is similar to the findings in Kano Nigeria.[8]

Conclusion

Ameloblastoma was found to have equal sex predilection in this study but the solid/multicystic ameloblastoma was the most prevalent in this region and had a higher incidence in females than their male counterpart with mandible being the commonest site. Follicular ameloblastoma was the commonest cellular subtype in this study.

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