Ameloblastoma: Analysis of 207 cases in a Nigerian teaching hospital

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Objective: The aim of the study was to review all the cases of ameloblastoma seen at the Oral and Maxillofacial Surgery Clinic of the Lagos University Teaching Hospital, Nigeria, between 1980 and 2003. **Methods and materials:** In this retrospective study, case files and biopsy reports of new cases of ameloblastoma covering a 24-year period were retrieved and analyzed for sex, age on presentation, histologic type, and site distribution. **Results:** A total of 207 cases of ameloblastoma were seen in the given period. One hundred and ninety-eight (95.7%) were benign, and 9 (4.3%) were malignant. A male-to-female ratio of 1.1:1 was found. The average ages on presentation for ameloblastoma and ameloblastic carcinoma were 31.67 and 46.44 years, respectively. The lesion was found to be more common in the premolar-molar region of the mandible. The most common histologic type was follicular ameloblastoma (25.1%). Nine (4.3%) cases of ameloblastic carcinoma were also reported. **Conclusions:** Ameloblastoma with a predilection for the posterior mandibular region is relatively common in our environment. Sex and site distributions are similar to previous reports in the literature. *(Quintessence Int 2006;37:69–74)*

Key words: ameloblastoma, analysis, Nigerians

Ameloblastoma is a benign, but locally aggressive and infiltrative odontogenic tumor with a high tendency to recur but a rare capacity to metastasize.[1,2] Ameloblastoma of the jaws is the most commonly encountered odontogenic tumor in Africa.[3–7] Its incidence appears to equal or exceed the combined incidence of all other odontogenic tumors.[1,8] It is reported to constitute about 1% to 3% of tumors and cysts of the jaws.[9–11] The tumor is by far more common in the mandible than in the maxilla and shows predilection for various parts of the mandible in different racial groups.[12] The relative frequency of occurrence in the mandible to that in the maxilla is reported to vary from 80% to 20% to 99% to 1%.[9,10] The high recurrence rate has justified its management by radical resection with inclusion of a margin of apparently normal bone.[3,13–16]

Maxillary ameloblastomas, while histologically indistinguishable from their mandibular counterparts, may behave aggressively, have a reputation for a high recurrence rate and significant mortality, have the ability to metastasize, and are considered more difficult to manage.[9,17] The proximity of the maxilla to the

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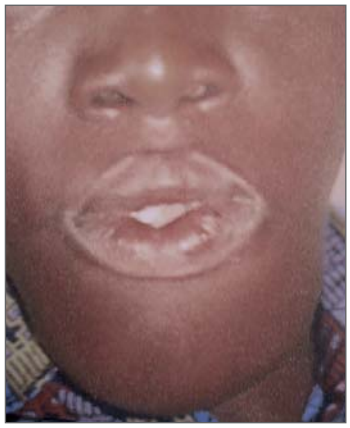

Fig 1 Ameloblastoma of the anterior mandible in a 14-year-old Nigerian. The patient complained of progressive swelling of the mandible within 4 years' duration.

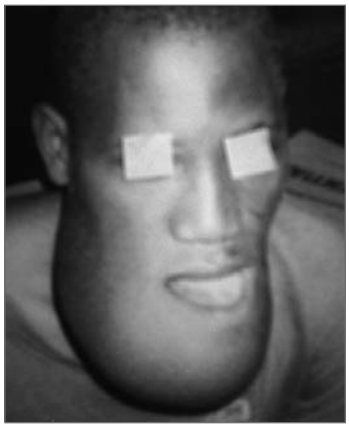

Fig 2 A 27-year-old man with a massive mandibular swelling of 8 years' duration extending from the mandibular left body to the right mandibular angle. Histology confirmed a multicystic (follicular) ameloblastoma.

ocular orbit, skull base, and intracranial contents accounts for most of the deaths attributed to ameloblastomas in this site.[18,19]

Ameloblastoma is usually described as a locally invasive, benign neoplasm. However, there has been evidence that the tumor can give rise to distant metastasis.[20] According to the World Health Organization (WHO), malignant ameloblastoma is "a neoplasm in which the pattern of an ameloblastoma and cytological features of malignancy are shown by the primary growth in the jaws and by any metastatic growth."[21] The definition is similar to that of Eversole,[22] who described ameloblastic carcinoma as retaining the features of ameloblastic differentiation, yet also exhibiting cytologic features of malignancy.[22]

The aim of this study was to review all the cases of ameloblastoma—with emphasis on gender, age, site, and histologic type—seen at the Oral and Maxillofacial Surgery Clinic of the Lagos University Teaching Hospital, Lagos, Nigeria, between 1980 and 2003.

METHODS AND MATERIALS

For this retrospective study, the case files and biopsy reports of patients who presented with ameloblastoma during the period from 1980 to 2003, inclusive, were retrieved from the medical records and histopathological services of both the Department of Oral and Maxillofacial Surgery, and Oral and Pathology and Biology at the Lagos University Teaching Hospital. Information sought on each case included sex, age on presentation, clinical diagnosis, site distribution, and histologic diagnosis. All cases of recurrent ameloblastoma were excluded from the study.

Two hundred and seven cases that were histologically diagnosed as ameloblastoma or ameloblastic carcinoma were selected for detailed analysis. Data was analyzed using the statistical software package SPSS version 11.5 (SPSS). Descriptive statistics and graphs were used as appropriate.

RESULTS

A total of 207 cases of ameloblastoma of the jaws were diagnosed within the period under study. Two hundred and five (99.03%) of the cases diagnosed were central (intrabony) ameloblastoma, while 2 (0.97%) were peripheral. The most common clinical presentation was mandibular swelling (Figs 1 and 2). One hundred ninety-eight (95.65%) of the cases were benign, and 9 (4.35%) were ameloblas-

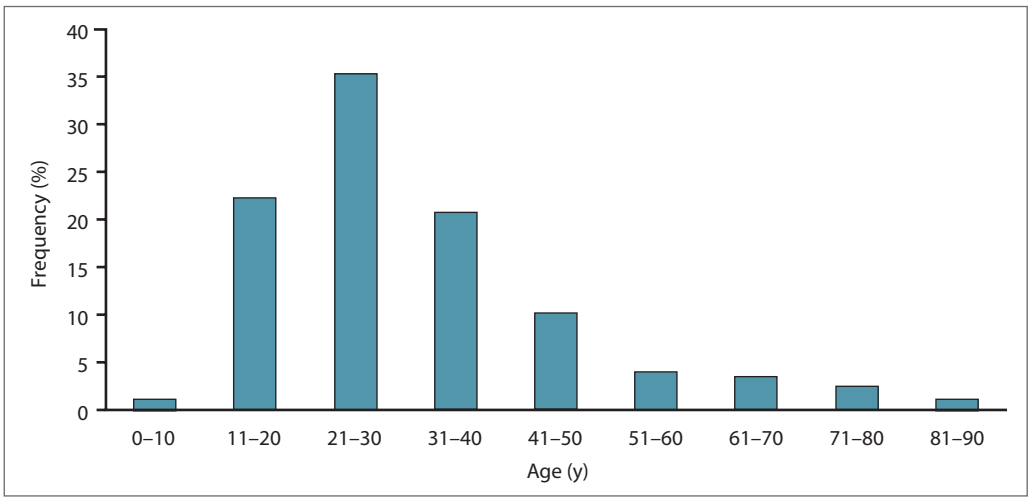

Fig 3 Age distribution of the patients at the time of presentation.

toma with cytologic features of malignancy. There were 109 males and 98 females with a male-to-female ratio of 1.1:1.

Age

Figure 3 shows the age distribution of the patients at the time of presentation. In this study, the youngest patient presenting with ameloblastoma was 9 years old, and the oldest was 85 years; the mean age at presentation was 31.7 years (± 15.6 SD). One hundred and ten patients (53.14%) between the ages of 21 and 40 years were seen. A striking majority of the patients, 164 (79.23%), had the disease at or before the age of 40 years. The mean age of patients with ameloblastic carcinoma was 46.4 years (± 25.2 SD; range 12 to 85 years).

Site distribution

In this study, ameloblastoma was more common in the mandible (92.8%) than in the maxilla (7.2%). Table 1 shows that 119 (57.5%) of the cases were in the posterior (molar-premolar) region of the mandible, 38 (18.4%) were in the anterior (canine-canine) region, and 13 (6.3%) were in the anterior-posterior region. In the maxilla, 10 (4.8%) cases were found in the posterior (molar-premolar) region, while 3 (1.4%) cases occurred in the anterior (canine-canine) segment.

Table 1 Site distribution of the tumors

Region/jaw	No.	%
Anterior		
Mandible	38	18.4
Maxilla	3	1.4
Posterior		
Mandible	119	57.5
Maxilla	10	4.8
Anterior/Posterior		
Mandible	13	6.3
Maxilla	—	—
Ramus	2	1.0
Not specified		
Mandible	20	9.6
Maxilla	2	1.0

Histologic type

Table 2 shows the various histologic types of ameloblastoma. Follicular type (25.12%) was the most common (Fig 4), followed by mixed type (16.91%), cystic type (13.53%), and plexiform type (13.04%). Figure 5 shows the plexiform unicystic ameloblastoma. Nine (4.35%) cases of ameloblastic carcinoma were diagnosed during the time period.

Table 2 Distribution of histologic types of ameloblastoma

Histologic type	No.	%
Acanthomatous	9	4.35
Adenoameloblastoma	1	0.48
Ameloblastic carcinoma	9	4.35
Cystic ameloblastoma	28	13.53
Desmoplastic	15	7.25
Follicular	52	25.12
Granular cell	3	1.45
Mixed	35	16.91
Plexiform	27	13.04
Unspecified	28	13.53

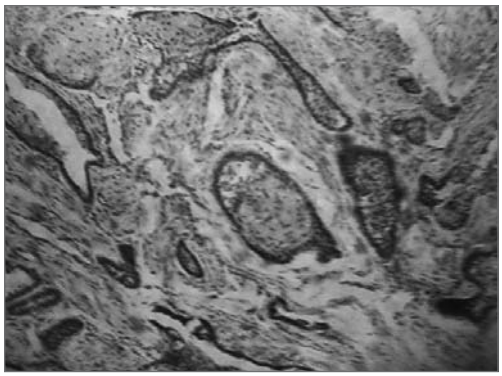

Fig 4 Follicular ameloblastoma (granular cell type). Photomicrograph showing dense fibrous connective tissue stroma, many discrete follicles of epithelium arranged in ameloblastomatous pattern (peripheral ameloblast-like cells and central stellate reticulum-like cells). The latter cells are undergoing granular changes in some areas and cystic changes in other areas (hematoxylin and eosin; original magnification ×100).

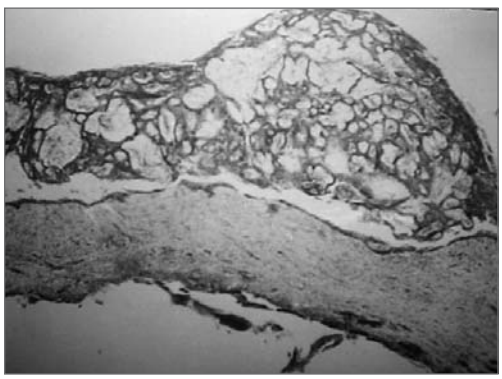

Fig 5 Plexiform unicystic ameloblastoma. Photomicrograph showing a dense connective tissue mass lined by squamous epithelium 2 to 3 layers thick, present in a plexiform ameloblastomatous pattern intraluminally (hematoxylin and eosin; ×40).

DISCUSSION

In this study, the youngest patient was 9 years old, while the oldest was 85 years of age. This age range is similar to reports in the literature.[2,3,6,12,13,23,24] The average patient age at presentation in this study was 31.67 years. Gardner[24] concluded that age at the time of presentation is usually between 30.1 years, as found by Robinson[2] in 1937, and 32.7 years as reported by Small and Waldron[10] in 1955. Ochsenius et al,[25] in a study on odontogenic tumors in Chile, reported a mean age of 37.4 years for ameloblastoma.

The male-to-female ratio of 1.1:1 found in our study is in contrast to the report by Olaitan et al,[13] who reported a ratio of 1.6:1 among 315 cases of ameloblastoma in Kaduna, Nigeria. Other reports in the literature are generally in agreement with our findings.[4,6,11]

Ameloblastoma showed a predilection for the mandible in this study. This observation is similar to reports in the literature.[2,4,6,8,11–13,23,26] Gardner[24] reported that about 80% of ameloblastoma tumors occur in the mandible; of the other 20%, most occur in the posterior part of the maxilla, with only a few occurring in the anterior maxilla. Our report further showed 57.5% of cases in the posterior (molar-premolar) region of the mandible and 18.4% in the anterior mandibular segment. About 5% of cases were located in the posterior segments of the maxilla, and only 1.4% were in the anterior segment. This distribution in the maxilla is in agreement with the report of Gardner.[24] Of the 76 cases of ameloblastoma reported by Arotiba et al,[6] 91% were in the mandible, and 9% were in the maxilla. They reported the most common site as the posterior mandible (horizontal ramus). Adekeye[12] and Olaitan et al[13] gave similar reports of a preponderance of ameloblastoma in the posterior region of the mandible. On the contrary, Akinosi and William[4] reported a predilection for the symphysis and premolar region of the mandible.

In this study, the follicular type of ameloblastoma was the most common histologic variant, followed by the mixed variant. In most of the reports from Nigeria,[1,4,6,12] the histologic variant was not emphasized. However, in a series of 289 cases of odontogenic

tumors, Odukoya[5] reported 76 cases of ameloblastoma, and the predominant histologic variant was acanthomatous type.

Our series combines the cases of primary ameloblastoma in the jaws with cases of primary ameloblastoma with cytologic features of malignancy. The average age of patients with ameloblastic carcinoma was higher than patients with ameloblastoma without cytologic features of malignancy.

There is controversy about the definition of malignant ameloblastoma.[27] The WHO defines *malignant ameloblastoma* as a lesion exhibiting patterns of an ameloblastoma and cytologic features of malignancy in the primary growth of the jaws and by any metastatic growths.[21] Eversole,[22] on the other hand, described *malignant (metastasizing) ameloblastoma* as a benign lesion lacking features of malignancy in both the primary or metastatic foci. In the Eversole classification (which was used in our study), the tumor that retains features of ameloblastic differentiation yet also exhibits cytologic features of malignancy is termed *ameloblastic carcinoma*. This definition is similar to the malignant ameloblastoma in the WHO classification. The terminology regarding the rare odontogenic carcinomas is still unsettled and rather confusing.[28]

CONCLUSION

This series of 207 cases of ameloblastoma, seen at our center over a 24-year-period (1980 to 2003), shows that males are slightly more affected than females at an average age of 31.67 years. The site predilection was predominantly the posterior mandibular region, with a few cases of maxillary ameloblastoma reported. The most common histologic type was follicular ameloblastoma. A few cases of ameloblastic carcinoma seen at our center were reported, highlighting the controversy in the definition of malignant ameloblastoma and ameloblastic carcinoma.

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