A RETROSPECTIVE STUDY ON AMELOBLASTOMA PRESENTATIONS TO KOMFO ANOKYE TEACHING HOSPITAL

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ABSTRACT

INTRODUCTION: Ameloblastoma is the second most common benign odontogenic tumor, and only odontoma outnumbers it in reported frequency of occurrence.

AIM: This study reviewed all ameloblastoma cases reported to the Oral and Maxillofacial Surgery Department of Komfo Anokye Teaching Hospital from 2016 to 2018.

METHODOLOGY: This was a retrospective descriptive study involving reviewing medical records of all Ameloblastoma cases diagnosed within the study period at the Oral and Maxillofacial Surgery Department of KATH. A data collection sheet was used for data collection that covered patients' demographics, location of the lesion, radiographic presentation, histological report, and treatment.

RESULTS: Thirty-four (34) diagnosed cases of ameloblastoma were recorded within the study period, giving an average of eleven cases (11.3) annually. The mean age of patients was 32.0 years with a male: female ratio of 1:1. All the cases reviewed were located within the mandible, with none in the maxilla. Twenty-four (70.6%) of them were found in the body of the mandible. Multilocular radiolucency is the joint radiographic presentation (24, 71%). Plexiform was the common histological variant (12, 35.3%). Thirty-two (32, 91.2%) patients were treated by resection with wide margins. There was no incidence of recurrence recorded.

CONCLUSIONS: The results of this study indicate that Ameloblastoma cases in Ghana have similar clinicopathological presentations as commonly reported in the literature.

KEY WORDS: Ameloblastoma, Tumor, Odontogenic, Maxillofacial, Surgery, Multilocular

INTRODUCTION

Odontogenic tumors represent a spectrum of jaw lesions ranging from malignant (rare) and benign neoplasms to dental hamartomas, all arising from residues of the tooth forming apparatus, i.e., odontogenic epithelial and/or ectomesenchyme with variable amounts of dental hard tissues formed generally in the same sequence as in normal tooth development.[1] Ameloblastoma is second only to odontoma as the most common benign odontogenic tumor.[2] In Africans, Ameloblastoma is estimated to account for 11% to 24% of all oral tumor-like lesions.[3] Although ameloblastoma is a benign tumor, it is known to have some aggressive features in its growth pattern. Hence it has been defined as a benign, slow-growing, locally invasive epithelial tumor (with no ectomesenchymal component) of odontogenic origin, with a strong tendency to recur after treatment.[4]

Historically, the term 'ameloblastoma' was suggested by Churchill in 1934 to replace the term 'adamantinoma,' coined by Malassez in 1885.[1] Clinically, it occurs exclusively in the jaws, with a tendency to cause gross facial deformity and tooth displacement. Although a wide age range of occurrence of the tumor (10 - 90 years) has been reported, the average age at diagnosis ranges between 33–39 years and is rare in children and older adults.[3] There is conflicting evidence on the incidence rates in different races, with increased prevalence noted among Asians and Africans.[5] Ameloblastoma occurs in all areas of the jaws. Still, the mandible is the most commonly affected area (more than 80% of all cases). Within the mandible, the molar angle ramus area is involved three times more commonly than are the premolar and anterior regions combined.[1] It is usually asymptomatic initially but becomes painful due to either secondary infection or compression of a nerve. This asymptomatic nature, together with its high capacity to infiltrate between the trabeculae of cancellous bone, accounts for the reluctance to seek early treatment by patients as well as the large tumor sizes observed at the time of presentation to the clinic among most patients.[4]

Currently, conventional, unicystic, and peripheral are the clinical-pathological classifications of ameloblastoma. The solid/multicystic term has been discarded as well as Desmoplastic ameloblastoma is now reclassified as a histological subtype and not as a clinical-pathological entity. The conventional ameloblastoma is the most common, representing 85% of all ameloblastomas, and occurs mainly in the 3rd and 4th decades of life with a higher incidence of recurrence.[5,6] Histologically, ameloblastoma can be divided into follicular, plexiform, acanthomatous, and granular cell morphological patterns; other less common histological variants are clear cell and desmoplastic cells. In general, one-third of the conventional
type has a plexiform pattern, one-third a follicular pattern, and the remaining third corresponds to the other variants. There is currently no relationship between histological pattern and tumor behavior or prognosis.[6] There is currently no relationship between histological pattern and tumor behavior or prognosis.[6]

Ameloblastoma is unresponsive to radiotherapy, and hence the current predominant mode of treatment for ameloblastoma is surgery, which can be conservative or radical. Studies have shown that conservative treatment of ameloblastoma, such as curettage and enucleation, may lead to recurrence rates as high as 90% for mandibular tumors and 100% for maxillary tumors.[7]

Radical treatment entails surgical resection of the affected part of the jaw with the associated neurovascular bundle, followed by reconstruction; this mode of treatment is usually associated with better results and a low recurrence rate. Surgical management of ameloblastoma has a profound functional and psychological effect on patients' quality of life, and jaw resection is usually accompanied by complications, such as facial deformity, nerve damage, malocclusion, and impairment of mastication.[8]

Parkins et al., 2007,[9] found ameloblastoma to be the commonest benign odontogenic tumor presentation among patients in Ghana, and so did Abdulai and Gyasi in 2001.[10] Much of what is known about ameloblastoma in terms of its clinical presentation, natural history, clinicopathological and histological variations are attributed to the numerous studies that have been conducted on this particular tumor. Notwithstanding the numerous existing literature on ameloblastoma, the knowledge and understanding of ameloblastoma continue to evolve. This is essential for effective diagnosis, management, and better prognosis of such a tumor. Studies conducted on ameloblastoma in some jurisdictions have made some distinct observations that hitherto did not appear in the general description of ameloblastoma in the existing literature. For example, ameloblastoma is generally described as a tumor for young adults with an average age of 32 years and is common in males.[1]

However, studies conducted in Nigeria and Ghana have shown a higher prevalence of ameloblastoma among patients below 19 years.[10,11] These emphasize the importance of continuous review of cases in any geographical context, especially in this era where a global change in the trends of most diseases has been observed. This study sought to review all cases of ameloblastoma seen at the Oral and Maxillofacial Surgery Department of KATH from 2016 to 2018.

METHODS AND MATERIALS

This study was a retrospective study involving a review of patients' records at the Oral and Maxillofacial Surgery Department (OMFS) of the Komfo Anokye Teaching Hospital (KATH) from January 2016 to December 2018. The department remains the primary referral center for all tumors and tumor-like lesions of the head and neck region from the Northern part of Ghana and neighboring countries like Burkina Faso. The department comprises maxillofacial surgeons and nurses who work consultatively with the Plastic surgeons. The Komfo Anokye Teaching Hospital is located in Bantama, a suburb of Kumasi, the capital city of the Ashanti Region. It is the second-largest hospital in Ghana.

The study procedure was limited to reviewing already existing medical records of patients eligible to be included in this study. Subjects' folder numbers were identified from the record data book of the clinic for the period of study and were retrieved from the record department of the oral health directorate. Study variables included socio-demographic of patients, location, clinical signs and symptoms, radiographic appearance, histological subtypes, treatment, and outcome of therapy (recurrence).

All records of patients with a preoperative diagnosis of Ameloblastoma from January 2016 to December 2018 were included. Incomplete records were not included.

Ethical approval was obtained from the Committee on Human Research, Publications, and Ethics of the Kwame Nkrumah University of Science and Technology, School of Medical Sciences. (Reg no. RD/CR19/042) Permission was obtained from the Oral Health Directorate of KATH and the Oral and Maxillofacial Surgery department. The confidentiality of data collected was ensured to secure the privacy of the study subjects. Data collected were only used for the intended study purpose, and information remained anonymous to protect the identity of the patients. The data were summarized in descriptive statistics (frequency distribution, mean of age, and prevalence) using the Statistical Package for Social Sciences (SPSS version 25.0.0.0). Descriptive tables and charts were used to display study results where necessary.

RESULTS

All thirty-four (34) patients were clinically diagnosed within the period of study. The age of the patients ranged from 10years to 66 years, with a mean age of 32.03 years (SD ± 14). There was equal gender distribution as male and female patients were seventeen (17, 50%).
All the cases reviewed were located within the mandible, with none in the maxilla. The majority of the tumors, 24 (70.6%), were located within the body of the mandible, with the multilocular radiographic presentation being the commonest (24, 71%), as shown in Table 1.0 and Figured 1.0 below;

Table 1.0 Distribution of Ameloblastoma in the mandible

Location in the mandible	Frequency	Percent
Anterior	5	14.7
Body of mandible	24	70.6
Body and angle of mandible	5	14.7
Total	34	100.0

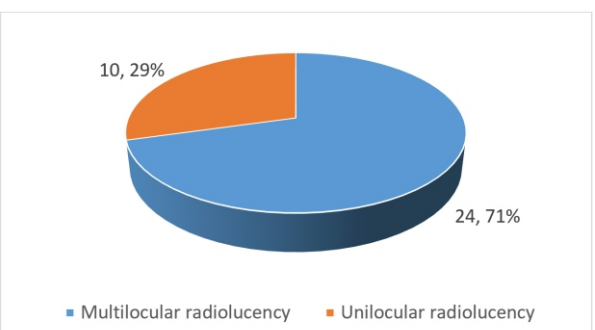

Figure 1.0 Radiographic presentations

Table 2. Histological variants

Histological variants	Frequency	Percent
Plexiform	12	35.3
Follicular	9	26.5
Total	21	61.8
Not recorded	13	38.2
Total	34	100.0

Plexiform was the common histological variant (12, 35.3%) among the twenty-one (21, 61.7%) histologically confirmed reports, as shown in table 2.0. Thirty -two (32, 91.2%) patients were treated surgically by resection with wide margins with no incidence of recurrence, as shown in table 3.0;

Table 3. Treatment offered

How it was treated	Frequenc	Percent
Conservative resection	2	8.8
Resection with wide margi	32	91.2
Total	34	100.0

Resection with wide margins was the primary treatment carried out for the patients.

DISCUSSION

This study sought to review all cases of ameloblastoma reported to the Oral and maxillofacial Surgery Department of KATH from 2016 to 2018. Ameloblastoma has been noted as the most commonly encountered odontogenic tumor among Africans and Asians[3], while it is the second most common odontogenic tumor in the Western world.[12] Retrospective studies on the prevalence of ameloblastoma have shown varied results. In Brazil, Ameloblastoma was found to have nine (9) cases annually [13], while an average of ten (10) cases annually have been reported among Indians.[14] On the contrary, a relatively low prevalence of ameloblastoma has been recorded in Ghana, with seven (7) cases and five (5) cases.[9,10] The results of this study show a total of twenty-one (21) histologically confirmed cases of ameloblastoma within the three (3) year period (2016-2018). This gives an average of seven (7) cases of ameloblastoma annually. This result suggests a relative increase in the number of cases recorded annually compared with the duration of similar studies conducted in Korle Bu Teaching Hospital.[9,10]The increase in the number of cases may be attributed partially to the increase in hospital attendance in recent years due to improving public health education and good surgical outcome.

Ameloblastoma has no gender predilection and is commonly found in the 20 – 40 years age group. While an average age of twenty-eight (28) years was reported among Saudi Arabians[15], the average age of 29.6 years was recorded in a study by Abdulai and Gyasi, 2001.[10] Additionally, the average age of 31 years has been reported among Nigerians and Brazilians.[11,13] In this study, the age of the patients ranged between 10 – 66 years with a mean age of 32.03 years (SD ± 14). The age of patients in this study was consistent with existing literature on the age group (30 – 40) commonly associated with Ameloblastoma occurrence. Although a male/female ratio of 1:1 has been reported among Nigerians and Brazilians,[11,13] it was found to be predominant among females in Saudi Arabia with a ratio of 1:2.[15] On the contrary, males, were found to be predominant in the studies by Tatapudi et al., 2014,[14] and Abdulai and Gyasi, 2001.[9] Similarly to existing literature and the findings among Nigerians and Brazilians, there was equal sex distribution as male and female patients were each 17 (50%).[11,13]

Radiographically, ameloblastoma presents as multilocular and unilocular radiolucent lesions surrounded by a radiopaque border, located primarily in the posterior mandibular segment.[16,17] In Africans, the multilocular type is predominant. [18] In this present study, twenty-four (24, 71%) of cases reviewed were found to have multilocular radiolucency radiographically, while ten (10, 29%) presented as unilocular radiolucency. This finding aligns with other studies conducted in some sub-Saharan countries.[11,18,19] Olasoji et al., 2015 [11] found multilocular type (73.3%) as the most common radiographic appearance among the [19] cases reviewed. Likewise, Vilembwa Adeline19 found 127(69.4%) multilocular radiolucency in radiographic appearance.

The main histological variants of ameloblastoma are two types, namely, the follicular and the plexiform.[1] Among the two types, the commonest presentation has been the follicular types.[20] Contrary to this finding, plexiform was the commonest histological finding in this study, with twelve (12, 57%) out of the twenty-one cases with histological reports being of the plexiform type. Meanwhile, nine (9, 43%) cases were follicular types. Plexiform being the majority of the histology types, may be an incidental finding. However, another study may be required into the common histological variants.

The treatment for amelobalstoma is mainly surgically because it is considered radioresistant.[2] The surgical resection can be conservative or resection within marginal extensions. A high rate of recurrences has been associated with Conservative surgical approaches. In this study, two (2, 8.8%) were treated by conservative surgical resection while thirty-two (32, 91.2%) were treated by resection with wide margins. Contrary to Abdulai and Gyasi in Korle Bu Teaching Hospital, where one recurrence case was recorded,
there was no case of recurrence recorded in this study.[10] In contrast, recurrence was noticed in 4 patients (21%) out of the 19 patients within five years after primary surgery in the study by Olasoji et al., 2005.[11] There is no agreed period within which recurrence can occur post-surgically. However, a long follow-up is required to conclude that no recurrence has occurred.

The availability limits the design of this study and proper documentation of patient records, and the duration reviewed. Appropriate documentation should be encouraged. Routine diagnostic investigation with an orthopantomogram(OPG) will aid early detection radiographically. More histopathological studies should be encouraged and documented to keep adequate

records for future studies. Long-term post-surgical follow-up should be encouraged. Also, a long-span study is recommended to provide further evidence on the histological variants and recurrence.

Conclusion

More cases of ameloblastoma have been seen at KATH compared with studies conducted in Korle Bu Teaching Hospital. The findings of this study indicate Ameloblastoma cases in Ghana has similar patterns as commonly reported in the literature. The majority of the cases were multilocular radiolucencies radiographically, located in the mandible preferable to the body of the mandible, and with a low recurrence rate when treated surgically by resection with wide margins. No sex predilection and prevalent within the documented aged group, although plexiform was the common histological variant in this study, contrary to the follicular type.

REFERENCES

1. Rajendran and Sivapathasundharam. Shafer's Textbook of Oral Pathology. 7th Edition. Pages 277-287New Delhi: ELSEVIER.

2. Gardner, D.G., Heikinheimo, K., Shear, M., et al. Ameloblastomas in World Health Organization Classification of Tumor. 2005. p.296-300.

3. Bassey GO, Osunde OD, and Anyanechi CE. Maxillofacial tumors and tumor-like lesions in a Nigerian teaching hospital: an eleven-year retrospective analysis. Afr Health Sci. 2014; Volume 14: pp. 56-63

4. Agbaje, J.O., Akinyele, O.A., Mariya, I.P., et al. Biologicalprofile of ameloblastoma and its location in the jaws of1246 Nigerians. Oral Surg Oral Med Oral Pathol OralRadiol. 2018. Volume 001, pp. 1-8.

5. Speight PM, and Takata T. New tumor entities in the 4th Edition of the World Health Organization classificationof head and neck tumor: odontogenic and maxillofacialbone tumor. Virchows Arch. 2018; 472:331–339.

6. Dias CD, Brandão TB, Soares FA, et al. Ameloblastomas:clinical, histopathological evaluation of 85 cases with emphasis on squamous metaplasia and keratinization aspects. Acta Odontol Scand. 2013 71:1651–1655

7. Pogrel MA, and Montes DM. Is there a role for enucleation in the management of ameloblastoma? Int J Oral Maxillofac Surg. 2009;38: 807-12

8. Black CC, Addante RR, and Mohila CA. Intraosseous Ameloblastoma. Oral Surg Oral Med Oral Pathol Oral Radiol Endod; 2010 pp 110:585-59.

9. Gandhi, D., Ayoub, A.F., Pogrel, M.A., et al.., ameloblastoma: a surgeon's dilemma. J Oral Maxillofac Surg. 2006; 64(7):1010-4

10. Parkins GE, Armah, GA, and Tettey Y. Orofacial Tumors and Tumor-like lesions in Ghana: A 6 Year prospective study. Br J Oral Maxillofac Surg; 2009 47(7), pp. 550-4.

11. Abdullai, A.E., and Gyasi, R.K. Ameloblastoma of the jaws in KBTH. Ghana Medical Journal. 2001; 35(4), pp.172-177.

12. Olasoji, H.O., Pindiga, U.H., and Tahir, AA. Ameloblastom in young persons: a retrospective study of the clinicopathologic features and treatment of 19 case from a semi-urban Nigerian teaching hospital.Pakistan Oral & Dent. Jr. 2005.; 25 (1) pp: 15-20

13. McClary AC, Robert B, Ashley C., et al.., ameloblastoma:a clinical review and trends in management. Eur ArcOtorhinolaryngol. (2016; DOI 10.1007/s00405-015-3631-8

14. Pereira, F.A.C., Melo, L.A., Gurgel, C.A.S., et al.., Clinicopathological and demographic characteristics of ameloblastomas in a population from Bahia, Brazil. Rev. odonto ciênc. 2010; 25(3), pp. 250-255.

15. Tatapudi, R., Samad, S.A., Sudhakara, R.R., et al. prevalence of ameloblastoma: A three-year retrospective study. Journal of Indian Academy of Oral Medicine & Radiology. 2018; Vol 26, Issue 2. pp: 145-151

16. Ahmed Qannam. Ameloblastoma: Analysis Of 76 Cases From A University-Based Biopsy Service In Saudi Arabia. Pakistan Oral & Dental Journal. 2016; Vol 36, No. 2 pp: 210-213

17. Kim SG, and Jang H S. Ameloblastoma: a clinical, radiographic, and histopathologic analysis of 71 cases. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2001; volume 91, pages 649-53.

18. Lagares DT, Cossió PI, Guisado JMH, et al. Ameloblastoma mandibular. Mandibular Ameloblastoma. A review of the literature and presentation of six cases. Med Oral Patol Oral Cir Bucal. 2005; volume10. Pages 231-8.

19. Simon EN, Merkx MA, Vuhahula E, et al. A 4-year prospective study on epidemiology and clinicopathological presentation of odontogenic tumors in Tanzania. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2005 ; volume 99, pages; 598-602

20. Vilembwa L. Adeline. A 10-year audit of the clinical features and histopathologic subtypes of ameloblastoma at Nairobi Centre. 2006 (Unpublished).

21. Laideinde, AK, Ogunwele, MO, Bamgbose, BO et al. Ameloblastoma: Analysis of 207 cases at a Nigerian Teaching Hospital, Lagos Quintessence International. 2004. Pages 1-4.