Odontogenic tumors in Port Harcourt: South–South geopolitical zone of Nigeria

CA Iyogun, OG Omitola, GE Ukegheson

Departments of Oral Pathology and 1Child Dental Health, University of Port Harcourt Teaching Hospital, Port Harcourt, Nigeria

Abstract

Aim: A retrospective study of odontogenic tumors (OTs) in Port Harcourt was undertaken to establish its prevalence and compare with known data in the literature from Nigeria and elsewhere.

Materials and Methods: All pathologically diagnosed OTs between 2008 and 2013 at the archives of the Department of Oral Pathology and Oral Biology of the University of Port Harcourt/University of Port Harcourt Teaching Hospital were retrospectively studied and classified according to the 2005 WHO classification of OTs and allied diseases. These were recorded into a computer and analyzed using Statistical Package for Social Sciences (SPSS 21.0, Inc., Chicago, IL, USA).

Results: A total of sixty-three cases of OTs were recorded for the period under review. Fifty-two of these were cases of ameloblastoma (82.54%). This was followed by adenomatoid odontogenic tumour (AOT) 4 (6.35%) and odontogenic myxoma 3 (4.76%). Most lesions were seen within the second to fourth decades of life and mandible was most frequently affected.

Conclusion: It is concluded that the pattern of occurrence of OTs in Port Harcourt followed a general pattern in Nigeria and other African countries but slightly differs from findings from other parts of the world.

Key Words: Ameloblastoma, odontogenic tumors, South–South Nigeria

INTRODUCTION

Odontogenic tumors (OTs) are a large group of jaw tumors arising from odontogenic apparatus during or after odontogenesis.1 Histopathologically, they vary in behavior from hamartomatous-like lesions to benign lesions and to frank malignant lesions. They may arise from epithelium or ectomesenchyme or both which are a part of the tooth forming apparatus.2 They may occur centrally within the jaw bones or the gingival mucosa (peripheral).3 There is worldwide variation in the distribution of OTs. In Europe and America, odontoma is the most prevalent while ameloblastoma is most prevalent in Africa and some Asian countries.4-11

It is noteworthy that ameloblastoma is more common in blacks than whites while odontoma is more common in whites than in blacks.12-14 The demographic differences between ameloblastoma and odontoma as found in the scientific literature particularly as it relates to few reported cases of odontoma in Africa and Asian countries may be explainable thus; that odontomas are often asymptomatic and discovered on routine radiographs which are not done in most developing
countries and hence are not often detected. In addition, patients in developing countries are often more concerned with pain relief or alleviation than sophisticated surgeries which are not easily available and expensive. \[15\]

There are several reports on these lesions in Nigeria and Africa, \[7,11,14-16\] so we, therefore, undertook this study because Port Harcourt is the largest city in the Niger-Delta and indeed the South-South geopolitical zone of Nigeria does not have any such data. There is a need for baseline data with regards to OTs in this region of Nigeria. This study will enable us to evaluate the pattern of OTs in this environment and compare it with similar studies in Nigeria and other parts of the world.

**MATERIALS AND METHODS**

This was a 5-year (2008–2013) retrospective study of all OTs diagnosed in the Department of Oral Pathology and Oral Biology. All biopsies were formalin fixed and paraffin embedded archival materials. All slides were reviewed and reclassified where necessary. New sections were taken where necessary and processed for further review. The tumors were classified according to the 2005 WHO classification of OTs and allied diseases of the jaws.

Patient’s biodata was retrieved from the record book of the Oral Pathology Laboratory of the University of Port Harcourt/Teaching Hospital. The information collected were patient’s age, sex, site of lesion and histological diagnosis. These were recorded into a computer and analyzed using a statistical package for social sciences (SPSS version 21.0, Inc., Chicago, IL, USA). Summary and descriptive statistics were generated. Cross tabulation was done to find differences between groups. The \( P \) value was set at <0.05.

**RESULTS**

Sixty-three OTs were diagnosed in the period under review, and all were benign lesions. The patient’s age range was 6–60 years with a mean ± standard deviation of 38.84 ± 16.52. The peak incidence was in the second and third decades of life. There were 35 female and 28 males giving a male:female ratio of 1:1.26 [Table 1].

Ameloblastoma was the commonest OT with a frequency of 82.54% followed by adenomatoid odontogenic tumor (AOT) with 6.35% and odontogenic myxoma with 4.76%. Fibromyxoma had a frequency of 3.17% while cementoblastoma and ameloblastic fibroma had a frequency of 1.59% each [Table 2].

Table 3, shows the distribution of the lesions by gender. Ameloblastoma and AOT had equal male to female ratio while all the other lesions were seen only in females. Most cases of ameloblastoma and all OT were seen within the second and third decade of life [Table 4]. The mandible was the most favored site for all OTs. Ameloblastoma was overwhelmingly found in the mandible. Seventy-five percent of AOT were reported in the mandible [Table 5].

**DISCUSSION**

OTs in this study were all benign in nature as there were no cases of malignant OT recorded. This followed a general trend which shows no malignant OTs or very few recorded cases in Nigeria. \[7,11\]

Ameloblastoma was the single most common OT in this study with a frequency of 82.54%. There was no case of odontoma. This is in conformity with most reports from Africa: Zaria 73%, Tanzania 79%, Ibadan 65.4% and Lagos 63%. \[5,7,11,16-19\] This is however in contradiction with findings from Europe and America where odontoma is the most occurring OT. \[14,20\] The reason for this finding may be related to the fact that odontomas are often asymptomatic and painless and discovered on routine radiographs. Routine radiographs are not often done in many developing countries including this country. One of the major reasons for patients seeking dental attention in this environment is pain and in most cases, they are not bothered about lesions discovered on routine radiographs. In addition, access to modern dental practice is limited in this
Seventy-five percent of AOT in this study of 315 cases in Kaduna, Nigeria. J Craniofac Surg 1993;21:951-5.

Table 4: Distribution of lesions by histological diagnosis and age group

| Histological diagnosis                  | 0-9 (%) | 10-19 (%) | 20-29 (%) | 30-39 (%) | 40-49 (%) | 50-59 (%) | 60-69 (%) | 60-90 (%) |
|----------------------------------------|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Ameloblastoma                           | 1 (1.6) | 17 (27.0) | 15 (23.8) | 7 (11.1)  | 6 (9.5)   | 4 (6.3)   | 2 (3.2)   | 0 (0.0)   |
| Adenomatoid odontogenic tumor          | 0 (0.0) | 3 (4.8)   | 0 (0.0)   | 0 (0.0)   | 1 (1.6)   | 0 (0.0)   | 0 (0.0)   | 0 (0.0)   |
| Cementoblastoma                        | 0 (0.0) | 0 (0.0)   | 0 (0.0)   | 1 (1.6)   | 0 (0.0)   | 0 (0.0)   | 0 (0.0)   | 0 (0.0)   |
| Fibromyxoma                            | 0 (0.0) | 1 (1.6)   | 1 (1.6)   | 0 (0.0)   | 0 (0.0)   | 0 (0.0)   | 0 (0.0)   | 0 (0.0)   |
| Ameloblastic fibroma                    | 1 (1.6) | 1 (1.6)   | 0 (0.0)   | 2 (3.2)   | 0 (0.0)   | 0 (0.0)   | 0 (0.0)   | 0 (0.0)   |
| Odontogenic myxoma                      | 0 (0.0) | 0 (0.0)   | 0 (0.0)   | 2 (3.2)   | 0 (0.0)   | 0 (0.0)   | 0 (0.0)   | 0 (0.0)   |
| Total                                  | 2 (3.2) | 21 (33.3) | 16 (25.4) | 10 (15.9) | 7 (11.1)  | 4 (6.3)   | 2 (3.2)   | 1 (1.6)   |

P<0.000

Table 5: Distribution of lesions by histological diagnosis and sites

| Histological type                  | Mandible (%) | Maxilla (%) | Right (%) | Left (%) | Both right/left |
|------------------------------------|--------------|-------------|-----------|----------|----------------|
| Ameloblastoma                      | 44 (71.0)    | 7 (11.4)    | 19 (35.8) | 15 (28.3) | 11 (20.7)      |
| Adenomatoid odontogenic tumor      | 3 (4.8)      | 1 (1.6)     | 0 (0.0)   | 2 (3.8)  | 0 (0.0)        |
| Cementoblastoma                    | 0 (0.0)      | 1 (1.6)     | 1 (1.9)   | 0 (0.0)  | 0 (0.0)        |
| Fibromyxoma                        | 1 (1.6)      | 1 (1.6)     | 1 (1.9)   | 1 (1.9)  | 0 (0.0)        |
| Ameloblastic fibroma                | 0 (0.0)      | 1 (1.6)     | 1 (1.9)   | 0 (0.0)  | 0 (0.0)        |
| Odontogenic myxoma                  | 2 (3.2)      | 1 (1.6)     | 2 (3.8)   | 0 (0.0)  | 0 (0.0)        |
| Total                              | 50 (80.0)    | 12 (19.4)   | 24 (45.3) | 18 (34.0) | 11 (20.7)      |

environment. Most nonhospital-based dental practice do not take routine radiographs and may also not submit a specimen for histopathological analysis. Environmental factors may also be implicated because a report of OTs from Australia conform more with African studies where odontoma is displaced to the third most frequent OT even though their lifestyle is similar to Western countries.[21]

AOT is the second most common lesion while odontogenic myxoma is the third most common lesion in this study. This finding is in conformity with other Nigerian studies where AOT or odontogenic myxoma alternate in second and third positions,[7,9,11] but is in contradiction to the study of Avelar et al., 2011 where AOT occupies the fifth position.

Most cases of OTs were recorded within the second and third decades of life in this study. This lower age incidence of OTs in Africa and sub-tropical Australia has been well documented.[11,15,18,21-24] The reason for this finding is not clear, but environmental factors may play a role.

Mandible is the most common site for all OTs and ameloblastoma in this study. This is in conformity with previous reports from Nigeria.[7,9,11] Seventy-five percent of the AOT in this study is found in the mandible; this is in contradiction to previous reports in the literature where AOT is usually found in the maxillary canine/lateral incisor region.[4,7,11,16] However, some authors in Nigeria have reported mandibular predilection for AOT.[25,26] The reason for this finding is not clear, but it may be related to an environmental factor or the type of AOTs seen in this region. It was noted by Arotiba et al.[27] that extrafollicular type of AOT tends to occur more in the mandible and Nigeria. There is a need for further studies to investigate this finding.

CONCLUSION

The pattern of OTs reported in this study is similar to that reported from other parts of Nigeria and Africa but differs from reports from other parts of the world.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Regezi JA, Scuibba AJ, Jordan RC. Oral Pathology, Clinical – Correlations. 5th ed. Philadelphia: WB Saunders; 2003. p. 261-81.
2. Barnes L, Eveson JW, Reichart P, Sidransky D. Pathology and Genetics of Head and Neck Tumours. Lyon: IARC Press; 2005. p. 284-327.
3. Neville BW, Damm DD, Allen CM, Bouquot JE. A Textbook of Oral and Maxillofacial Pathology. 3rd ed. St. Louis: WM Saunders Co.; 2009. p. 701-31.
4. Avelar RL, Primo BT, Pinheiro-Nogueira CB, Studart-Soares EC, de Oliveira RB, Romulo de Medeiros J, et al. Worldwide incidence of odontogenic tumors. J Craniomaxillofac Surg 2011;22:2118-23.
5. Simon EN, Merx MA, Vuhahula E, Ngassapa D, Stoelinga PJ. 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;99:598-602.
6. Owens BM, Schuman NJ, Mincer HH, Turner JE, Oliver FM. Dental odontomas: A retrospective study of 104 cases. J Clin Pediatr Dent 1997:21:261-4.
7. Adebayo ET, Ajike SO, Adekeye EO. A review of 318 cases of odontogenic tumours in Kaduna, Nigeria. J Oral Maxillofac Surg 2005;62:811-9.
8. Ahmed O, Lawal AO, Adisa AO, Olusanya AA. Odontogenic tumours: A review of 266 cases. J Exp Dent 2013;5:e13-7.
9. Arotiba JT, Ogumbiyi JO, Obiechina AE. Odontogenic tumours: A 15-year review from Ibadan, Nigeria. Br J Oral Maxillofac Surg 1997:35:363-7.
10. Olaitan AA, Adekeye EO. Ameloblastoma clinical features and management of 315 cases in Kaduna, Nigeria. J Craniofac Surg 1993;21:951-5.
11. Ladeinde AL, Ajayi OF, Ogunlewe MO, Adeyemo WL, Arotiba GT, Bargwose BO,
et al. Odontogenic tumors: A review of 319 cases in a Nigerian teaching hospital. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2005;99:191-5.

12. Reichart PA, Philipsen HP, Sonner S. Ameloblastoma: Biological profile of 3677 cases. Eur J Cancer B Oncol 1995;31B: 86-99.

13. Tamme T, Soots M, Kulla A, Karu K, Hanstein SM, Sokk A, et al. Odontogenic tumours, a collaborative retrospective study of 75 cases covering more than 25 years from Estonia. J Craniomaxillofac Surg 2004;32:161-5.

14. Adeeye EO. Ameloblastoma of the jaws; a survey of 100 Nigeria patients. J Oral Surg 1980;38:36-41.

15. Ochicha O, Iyogun CA, Omitola OG, Raphael S, Adebola RA. Odontogenic tumours in Kano, Northern Nigeria. Afr J Oral Health 2014;4:9-13.

16. Chidzonga MM, Lopez VM, Alvarez AP. Odontogenic tumours: Analysis of 148 cases in Zimbabwe. Cent Afr J Med 1996;42:158-61.

17. Jing W, Xuan M, Lin Y, Wu L, Liu L, Zheng X, et al. Odontogenic tumours: A retrospective study of 1642 cases in a Chinese population. Int J Oral Maxillofac Surg 2007;36:20-5.

18. Gill S, Chawda J, Jani D. Odontogenic tumours in Western India (Gujarat): Analysis of 209 cases. J Clin Exp Dent 2011;3:e78-83.

19. Mosqueda-Taylor A, Ledesma-Montes C, Caballero-Sandoval S, Portilla-Robertson J, Ruiz-Godoy Rivera LM, Meneses-Garcia A. Odontogenic tumors in Mexico: A collaborative retrospective study of 349 cases. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1997;84:672-5.

20. Daley TM, Wysocki GP, Prigle GA. Relative incidence of odontogenic tumours and jaw cysts in a Canadian population. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1994;77:276-80.

21. Johnson NR, Savage NW, Kazoulis S, Bastone MD. A prospective epidemiological study of odontogenic and nonodontogenic tumours in Queensland. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2013;115:515-22.

22. Naz I, Mahmood MK, Akhtar F, Nagi AH. Clinicopathological evaluation of odontogenic tumours in Pakistan – A seven years retrospective study. Asian Pac J Cancer Prev 2014;15:3327-30.

23. Santos JN, Pinto LP, de Figueredo CR, de Souza LB. Odontogenic tumors: Analysis of 127 cases. Pesqui Odontol Bras 2001;15:308-13.

24. Ochsenius G, Ortega A, Godoy L, Peñafiel C, Escobar E. Odontogenic tumors in Chile: A study of 362 cases. J Oral Pathol Med 2002;31:415-20.

25. Ajagbe HA, Daramola JO, Junaid TA, Ajagbe AO. Adenomatoid odontogenic tumor in a black African population: Report of thirteen cases. J Oral Maxillofac Surg 1985;43:683-7.

26. Sawyer DR, Mosadomi A, Nwoku AL. Adenomatoid odontogenic tumour in Lagos, Nigeria. Niger Dent J 1980;1:40-5.

27. Arotiba GT, Arotiba JT, Olaitan AA, Ajayi OF. The adenomatoid odontogenic tumor: An analysis of 57 cases in a black African population. J Oral Maxillofac Surg 1997;55:146-8.