ORIGINAL ARTICLE

Review of oral and maxillofacial biopsies in a tertiary hospital in Nigeria

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Abstract

Background: Oral cancers have remained a global burden amidst the inadequate access to healthcare in sub-Saharan Africa. This study investigated the histological pattern of oral and maxillofacial biopsies in north-central Nigeria.
Methods: A retrospective analysis was carried out on 167 oral and maxillofacial biopsies obtained over a six year period in a tertiary hospital in Makurdi, Nigeria.
Results: The 167 biopsy samples had a mean age of 34.4±18.0 years. There were 65 males (38.9%) and 102 females (61.1%). Benign conditions constituted 76.6% (n=128/167) while the malignant tumours were 23.4% (n=39/167). The benign conditions had a mean age of 32.3±16.3 years. These had 44 (34.4%) males and 84 (65.6%) females, and 1:1.9 male: female (m:f) ratio. Inflammatory and reactive lesions were the most common benign conditions and constituted 26.6% (n=34/128) followed by odontogenic tumours (21.1%, n=27/128). Ameloblastoma (18.5%, n=24/128) was the most frequent benign odontogenic tumour. The malignant tumours had a mean age of 40.9±21.6 years. Malignant cases had 21 (53.8%) males and 18 (46.2%) females (m:f ratio, 1:2). The common malignant tumours were squamous cell carcinoma (28.2%, n=11/39), adenoid cystic carcinoma (23.1%, n=9/39) and rhabdomyosarcoma (10.3%, n=4/39) in descending order of frequency. Biopsies in the paediatric age groups contributed 20.5% of the malignant lesions and most of them (7.7%, n=3/39) were rhabdomyosarcomas.
Conclusion: Most of the cases were inflammatory conditions. Ameloblastoma and squamous cell carcinoma were the most frequent benign and malignant tumours, respectively.

Keywords: Ameloblastoma, Maxillofacial biopsies, Maxillofacial tumours, Oral tumours, Squamous cell carcinoma.

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Introduction

The oral cavity and maxillofacial region is a potential site for developmental, inflammatory, benign and malignant lesions with variations in their demographic and clinico-pathological characteristics.[1,2] Cancers involving the oral cavity remain a growing worldwide problem.[3] Poor oral hygiene, tobacco chewing, alcohol and smoking have been associated with increased risk of oral cancers.[4] The burden of cancers involving the oral cavity and maxillofacial region in sub-Sahara Africa and indeed, Nigeria has not been entirely determined considering the persisting constrains of inadequate cancer registry, depleted diagnostic resources and poor access to dental or surgical care.[5] Relatively few papers exist on this subject in the north-central region of Nigeria[6] and the ones from Jos[6], Kaduna[7] and Lagos[8], and more recent ones from Zaria[9], Sokoto[10], Ile-Ife[11] and Ibadan[12] all suggest a heavy burden of oral cancers in Nigeria.

A retrospective analysis of oral and maxillofacial biopsies was conducted to determine the histological spectrum in north-central Nigeria.

Materials and Methods

The materials used for this study include archived microscope slides, duplicated reports and case files of patients with oral and maxillofacial lesions accessioned in the histopathology laboratory of the Benue State University Teaching Hospital, Makurdi, Nigeria. The cases histologically diagnosed during a six year period from January 2013 to December 2019 were retrospectively analyzed. In this laboratory, submitted biopsy specimens were registered, cut-up and processed routinely including dehydration in graded alcohol concentrations, treatment with xylene, infiltration and embedding in paraffin wax and sectioning. Thin 3-5 micron thick tissue sections were stained with hematoxylin and eosin. Immunohistochemical analysis was not performed due to unavailability. The tumours were classified using the WHO classification of head and neck tumours, 4th edition.[13] The anatomical sites of the lesions within the oral cavity and maxillofacial region were not included in this analysis.

Cases with incomplete records such as unavailable demographic data, normal morphological architecture, or those in which histological diagnosis could not be rendered were excluded from this analysis.

Ethical approval was obtained from the health research ethics committee of the Benue State University Teaching Hospital (Reference number: BSUTH/MKD/HREC/20201017; Date: 7th October, 2020).

Data analysis was performed using Microsoft Excel, version 16.0 (Microsoft Corporation, Redmond, Washington, USA) and SPSS Statistics, version 23 (IBM Corporation, Armonk, New York, USA).

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Results

Table 1: Distribution of benign oral and maxillofacial biopsies (N=128)¶

Diagnosis	Age group 0-9 M	0-9 F	10 - 19 M	10 - 19 F	20-29 M	20-29 F	30-39 M	30-39 F	40-49 M	40-49 F	50-59 M	50-59 F	60-69 M	60-69 F	80-89 M	80-89 F	Total [a] M (%)	Total [a] F (%)	Total [a] T(%)
1. Inflammatory/Reactive Lesions																			
Abscess	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1(1.2)	1(2.9)
Cholesterol granuloma	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1(2.3)	0	1(2.9)
Chronic inflammation	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	3(6.8)	0	3(8.8)
Fibroepithelial polyp	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	1(2.3)	2(2.4)	3(8.8)
Fibrous epulis	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1(1.2)	1(2.9)
Giant cell granuloma	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1(2.3)	0	1(2.9)
Gingival hyperplasia	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2(4.5)	0	2(5.9)
Granulation tissue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1(2.3)	0	1(2.9)
Pyogenic granuloma	0	1	1	2	0	3	0	4	0	4	0	1	0	1	0	0	1(2.3)	16(19)	17(50.0)
Radicular cyst	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2(2.4)	2(5.9)
Scar tissue	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1(2.3)	1(1.2)	2(5.9)
Total	0	1	2	4	3	4	3	5	1	6	0	1	1	2	1	0	11(25.0)	23(27.4)	34(26.6)
2. Odontogenic and developmental cysts																			
Dentigerous cyst	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	2(4.5)	0	2(28.6)
Odontogenic keratocyst	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2(4.5)	0	2(28.6)
Periodontal cyst	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	3(3.6)	3(42.9)
Total	0	0	1	0	1	0	1	0	1	2	0	1	0	0	0	0	4(9.1)	3(3.6)	7(5.5)
3. Odontogenic tumours																			
Adenomatoid odontogenic tumour	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1(1.2)	1(3.6)
Ameloblastoma	2	0	4	2	6	3	1	1	0	1	1	1	0	2	0	0	14(31.8)	10(11.9)	24(85.7)
Calcifying epithelial odontogenic tumour	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3(3.6)	3(10.7)
Total	2	0	4	3	6	6	1	1	0	1	1	1	0	2	0	0	14(31.8)	14(16.7)	28(21.9)
4. Salivary gland tumours																			
Adenomatoid hyperplasia	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1(2.3)	0	1(5.0)
Basal cell adenoma	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2(2.4)	2(10.0)
Mucocele	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1(1.2)	1(5.0)
Pleomorphic adenoma	0	0	0	2	1	1	1	3	0	1	0	4	0	2	0	0	2(4.5)	13(15.5)	15(75.0)
Retention cyst	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1(2.3)	0	1(5.0)
Total	0	0	0	2	1	1	2	3	0	1	1	5	0	4	0	0	4(9.1)	16(19)	20(15.6)
5. Maxillofacial bone tumours and lesions																			
Osteoma	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1(2.3)	0	1(50.0)
Osteomyelitis	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1(2.3)	0	1(50.0)
Total	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2(4.5)	0	2(1.6)
6. Fibro-osseous and osteochondromatous lesions																			
Fibrous dysplasia	0	0	0	4	1	1	2	1	0	1	0	0	0	0	0	0	3(6.8)	7(8.3)	10(40.0)
Ossifying fibroma	0	0	0	0	2	4	0	2	0	0	0	0	1	0	0	0	3(6.8)	6(7.1)	9(36.0)
Cemento-ossifying fibroma	0	0	0	0	0	4	0	2	0	0	0	0	0	0	0	0	0	6(7.1)	6(24.0)
Total	0	0	0	4	3	9	2	5	0	1	0	0	1	0	0	0	6(13.6)	19(22.6)	25(19.5)
7. Soft tissue and neural tumours																			
Neurofibroma	1	1	0	0	0	0	0	0	0	0	0	3	0	0	0	0	1(2.3)	4(4.8)	5(50.0)
Fibroma	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1(2.3)	0	1(10.0)
Capillary haemangioma	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	3(3.6)	3(30.0)
Lipoma	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1(1.2)	1(10.0)
Total	1	1	0	3	0	0	0	1	1	0	0	3	0	0	0	0	2(4.5)	8(9.5)	10(7.8)
8. Epithelial tumours and lesions																			
Keloid	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1(1.2)	1(50.0)
Squamous papilloma	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1(2.3)	0	1(50.0)
Total	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1(2.3)	1(1.2)	2(1.6)
																Total	44(100)	84(100)	128(100)

¶ Totals and percentages of the total sum (N) are marked with bold characters on this table.

[a] Gender percentages (in bold font within parenthesis) were calculated as the proportion of a diagnostic entity in each gender.

M, Male; F, Female; T, Total.

Table 2: Distribution of malignant oral and maxillofacial biopsies (N=39)¶

	Diagnosis	Age group 0-9		10 - 19		20-29		30-39		40-49		50-59		60-69		70-79		100-110		Total		
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M (%)	F (%)	T (%)
1	Acinic cell carcinoma	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1(2.6)	0	1(2.6)
2	Adenoid cystic carcinoma	0	0	0	0	1	0	3	1	0	0	0	2	1	1	0	0	0	0	5(12.8)	4(10.3)	9(23.1)
3	Basal cell adenocarcinoma	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1(2.6)	0	1(2.6)
4	Carcinoma ex-pleomorphic adenoma	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0		1(2.6)	0	1(2.6)
5	Clear cell odontogenic carcinoma	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1(2.6)	1(2.6)
6	Cutaneous plasmacytoma	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1(2.6)	1(2.6)
7	Ewing sarcoma	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1(2.6)	1(2.6)
8	Kaposi sarcoma	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2(5.1)	2(5.1)
9	Liposarcoma	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1(2.6)	0	1(2.6)
10	Metastatic tumour	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2(5.1)	2(5.1)
11	Mucoepidermoid carcinoma	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1(2.6)	0	1(2.6)
12	Osteosarcoma	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2(5.1)	2(5.1)
13	Rhabdomyosarcoma	1	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4(10.3)	0	4(10.3)
14	Squamous cell carcinoma	0	0	0	0	0	0	0	0	1	0	2	5	1	0	1	0	1	0	6(15.4)	5(12.8)	11(28.2)
15	Teratoma	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1(2.6)	0	1(2.6)
	Total	2	1	2	3	3	0	3	1	3	4	4	7	2	2	1	0	1	0	21(53.8)	18(46.2)	39(100)

¶ Totals and percentages of the total sum (N) are marked with bold characters on this table. The 80-89 and 90-99 age groups were omitted because there were no patients. M, Male; F, Female; T, Total.

There were 167 analyzed cases comprised of 65 males (38.9%) and 102 females (61.1%), male:female (m:f) ratio of 1:1.6, age range, 1 – 100 years and mean of 34.4±18.0 s.d. years. The cases mostly (37, 22.2%) clustered in the third decade. There were 38 (22.8%) paediatric (≤19 years) cases, 15 (39.5%) males, 23 (60.5) females and a mean of 13.3±4.8 years.

As shown on Table 1, the 128 (76.6%) benign cases found, had a mean age of 32.3±16.3 years, 44 (34.4%) male and 84 (65.6%) females (1:1.9 m:f ratio). Inflammatory and reactive lesions constituted 26.6% (n=34/128) and half of them were pyogenic granulomas. Odontogenic tumours (21.9%, n=28/128) were the most common of the 94 (73.4%) neoplastic cases. Ameloblastoma made up 18.0% (n=24/133) of all the tumours and comprised of 14 (58.3%) males and 10 (41.7%) females. It was the most common condition in males, (31.8%, n=14/44) but ranked third position in the females (11.9%, n=10/84). The patients' age ranged from 9 – 60 years and averaged 28.2±14.7 years. It was present in 8 (33.3%) children with 14.8±4.6 years mean age. Pleomorphic adenoma (75%, n=15/20) was the next most frequent, followed by fibrous dysplasia (40%, n=10/25) and ossifying fibroma (36%, n=9/25).

Table 2 shows that there were 39 malignant cases which composed 23.4% (n=39/167) of all the biopsies with 21 (53.8%) males and 18 (46.2%) females, and had a 1.2: 1 m:f ratio, a mean age of 40.9±21.6 years and peaked frequency (28.2%, n=11/39) in the 6th decade. The three most common malignant tumours were squamous cell carcinoma (SCC) (28.2%, n=11/39), adenoid cystic carcinoma (23.1%, n=2/39) and rhabdomyosarcoma (10.3%, n=4/39). SCC was the most common malignant tumour in each gender. Among the biopsies from male patients, this tumour constituted 15% (n=6/39) of all the malignant tumours and 29% (n=6/21) of those which occurred in males. Similarly, it constituted 13% (n=5/39) and 29% (n=5/18) of all the tumours and those in females respectively. Kaposi sarcoma, osteosarcoma and metastatic tumour each of which constituted 5.1% (n=2/39) were other cancers found.

The 8 paediatric cancer cases had a mean age of 9.6±4.6 years, formed 20.5% of the malignant and 4.8% of all the biopsies. Rhabdomyosarcomas (7.7%, n=3/39) were the most common cancers in this category (Table 2).

Discussion

The demographic characteristics of the patients observed in this study are comparable with those reported from other locations in Nigeria. The mean age is similar to findings at Ibadan (36.7±19.79 years[12] and 38.5±18.8 years[14]), Sokoto (33.3±19.9 years)[10], and Ife (36.1 years).[11] The peak age group and M:F ratio are also similar to findings at Ibadan and Sokoto.[10,12] More children, however, were found in a report from Brazil (6.6%) than in this work (22%).[15] Inflammatory and reactive conditions formed 29.1% (n=92/316) of all oral lesion biopsies at Sokoto, a figure larger than 20.4% (n=34/ 167) found in this study.[10]

Odontogenic tumours constituted 9.6% of 3,337 oral and maxillofacial lesions in one review.[16] And the finding of ameloblastoma as the most common odontogenic tumour is similar to reports by other authors.[11] Ameloblastoma, 18% (n=24/133) of all the neoplastic lesions in this work, is more than the reported 11.5% (n=204/1778) from Ibadan.[12] A study in Lagos reported a slightly lower m:f ratio of 1.1:1 in an analysis of 207 cases of ameloblastoma unlike 1.4:1 in this study.[17] In addition, some authors recorded average ages of 29.9±15.6 years[16] and 31.67 years[17] which are somewhat higher than the 28.2±14.7 years observed in this study. The mean age of 14.9±3.1 years in the 92 children odontogenic tumour cases reviewed by Ajayi et al., also differed only slightly from the 14.8±4.6 years found in this research.[18]

There were more males than females in a review of 54 oral cancer cases in Jos, north central Nigeria with a ratio of 1.2:1 similar to the results of this study.[6] Majority of the malignant tumours occurred in the 6th decade which differed from the 5th decade in a previous review of oral cancer reports from Nigeria and other parts of the world.[5]

Squamous cell carcinoma was the most common cancer just as previously reported in other parts of Nigeria.[10,12] And exposure to human papilloma virus is an emerging major risk factor for the development of this tumour in the oral cavity as documented by a number of authors.[19-22]

Conclusion

Inflammatory and reactive conditions were the most frequent of the benign lesions. Ameloblastoma and squamous cell carcinoma were the most common benign and malignant tumours, respectively, found in this study.

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