

Spectrum of Oral and Maxillofacial Tissue Biopsies at the Foremost Tertiary Institution in The Gambia: A Retrospective Review

Abstract

Introduction: Sub-Saharan Africa has a heavy burden of oral diseases and cancers. Also, there is a dearth of published records of oral pathology services in The Gambia. Therefore, this review aimed to determine the prevalence of biopsied oral and maxillofacial lesions in order to ascertain the uptake of oral histopathology services at the foremost tertiary institution in The Gambia. **Materials and Methods:** This was a retrospective study performed at the Pathology Department of Edward Francis Small Teaching Hospital. Reports of all oral and maxillofacial biopsies submitted for the period 2012 to 2021 were reviewed and data were extracted. Descriptive analysis was done using SPSS software, version 26. **Results:** Total number of biopsy reports was 158 representing 0.02% over the study period. The mean age of patients was 34.3 ± 19.7 years, the 3rd decade was the peak age of presentation and male-to-female ratio was 1:1.6. Majority (65/41.1%) of the cases were benign neoplastic lesions, and the mandible was the most (21/13.3%) common site of biopsy. Reactive lesions were the predominant (34/21.5%) group and squamous cell carcinoma had the highest (24/15.3%) number of lesions while odontogenic tumours constituted six cases only (3.8%). **Conclusion:** The findings of this study showed low uptake of oral histopathology services while biopsied oral and maxillofacial lesions were prevalent in female patients in the third decade of life. Also, the mandible was the most affected site whereas benign neoplastic diagnoses were most common. However, this study recorded a higher proportion of malignancies than some previous studies.

Keywords: Oral and maxillofacial, biopsy, histopathology service, The Gambia

Introduction

The expression “biopsy” signifies taking tissue samples for the intention of microscopic inspection, in order to arrive at a conclusive diagnosis on the foundation of histopathological features.^[1,2] Thus, tissue biopsies are often essential for definitive diagnosis of oral and maxillofacial lesions, treatment planning, and prognostication.^[3,4]

Additionally, the oral and maxillofacial region is a composite anatomical area which consists of the oral cavity and its adjoining tissues. It is a complex and diverse relationship of the various structures within the head and neck region including the jaws, teeth, salivary glands, temporomandibular joint, facial muscles, and orofacial skin.^[5] Similarly, oral and maxillofacial pathology has a number of justly niche areas, principally in the lesions relating to the teeth and jaws, which comprise most of the pathology of the region.^[6,7]

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Also, oral biopsy services are a part of oral diagnostic procedures carried out at reference centres for the specimens of orofacial pathologies received from within and outside the hospital.^[2,8-15] However, in the absence of oral pathologists, general pathologists are often seen fulfilling this role.^[16]

Furthermore, there are various reports of studies on the prevalence of oral biopsy lesions in different climes.^[8,10,12-15,17] These studies have slightly varied outcomes; principally reporting a preponderance of oral biopsies for women,^[8,10,12,17,18] and the mandible.^[8,10,12] Also, benign lesions have been reported to predominate in oral biopsies.^[8,10,13]

To an extent, local, economic, cultural, and social differences can affect the occurrence of oral diseases in specific regions.^[2,9,11] Therefore, highlighting epidemiological, topographical, and ethno-cultural predispositions and comparisons amongst diverse populaces, offers the prospect of

How to cite this article: Leigh O, Akinyamoju AO, Ogun GO, Okoje VN. Spectrum of oral and maxillofacial tissue biopsies at the foremost tertiary institution in The Gambia: A retrospective review. J West Afr Coll Surg 2023;13:1-5.

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Received: 06-Aug-2022

Accepted: 08-Mar-2023

Published: 27-Jun-2023

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Access this article online

Website:

www.jwacs-jcoac.com

DOI: 10.4103/jwas.jwas_168_22

Quick Response Code:



comparing health service requirements in different nations and communities.^[2,8,10,11]

Despite the availability of pathology services in parts of sub-Saharan Africa, there are often shortages in personnel and infrastructure,^[19,20] in spite of the burden of oral diseases and cancers.^[21] Worse still, is the low awareness regarding the practice of dentistry and its subspecialties in the West Africa sub-region,^[21] evidenced by dearth of published records of oral pathology services in The Gambia. However, the existence of strong pathology services has contributed to major scientific and clinical advances.^[19] Presently at the foremost teaching hospital in The Gambia, the use of oral and maxillofacial histopathology service is unknown. Thus, this review aims to determine the prevalence of biopsied oral and maxillofacial lesions, in order to ascertain the uptake of histopathology services at the foremost tertiary institution in The Gambia. This would help to shed light on the oral disease burden, while providing data to influence effective policy formulation.

Subjects and Methods

This was a retrospective study to review the oral biopsy reports at Pathology Department, Edward Francis Small Teaching Hospital (EFSTH) Banjul, The Gambia. This laboratory serves as the reference centre for histopathology services in The Gambia. Archival records of all biopsies submitted at the Pathology laboratory, for the period 2012–2021 were retrieved. Cases relating to the oral and maxillofacial region were identified and selected for inclusion in the study. The oral cavity was defined by an area extending from the vermilion border of the lips to a plane between the junction of the hard and soft palate superiorly and the circumvallate papillae of the tongue inferiorly. This region includes the buccal mucosa, upper, and lower alveolar ridges, floor of the mouth, retromolar trigone, hard palate, and anterior two thirds of the tongue. Similarly, cases involving the jaws, salivary glands, and facial tissues were also included. Only entries with signed reports were included in the study. For repeat and recurrent biopsies, the later diagnoses were taken if different, whereas those with the same diagnoses were recorded once. Reports with inconclusive diagnosis were excluded. Data, including age, gender, site of lesion, and histopathological diagnosis were extracted from the histopathology reports of the selected cases using a data collection form.

Subsequently, lesions were grouped into either neoplastic (benign or malignant) and non-neoplastic. They were further categorised into 16 broad diagnostic groups as follows: reactive lesions; cystic lesions; pulp and periapical lesions; giant cell lesions; fibro-osseous lesions; odontogenic tumours; epithelial tumours; salivary gland tumours; mesenchymal tumours; haemato-lymphoid neoplasms; salivary gland diseases; inflammatory/microbial diseases; ulcerative lesions, collision tumours; normal tissue and miscellaneous.^[10] All data were analysed using the Statistical

Package for Social Sciences (SPSS) software version 26 (IBM Corp., Armonk, N.Y., USA). Descriptive analysis was done while data were presented using summary statistics such as frequency tables, charts, means, and standard deviation. Ethical approval was obtained from the EFSTH Ethical Review Board (EFSTH_REC_2022_028).

Results

Over the study period, 164 histopathologic reports of oral and maxillofacial biopsies constituted 0.02% of 7797 biopsies processed over the 10-year period under review. Six (3.8%) of these either had deficient information in the demographics and/or clinical information, or were indeterminate in the diagnosis. Subsequently, those that failed the inclusion criteria were excluded from further consideration while 158 reports that met the inclusion criteria were subjected to analysis.

Thus, the mean number of cases diagnosed per year was 15.8 cases. Of the 158 cases available, 14 cases (8.9%) didn't have their ages recorded. Consequently, mean age was 34.3 ± 19.7 , while peak age group was the third decade of life (36/22.8%). Females (99/62.7%) constituted the most affected gender and male-to-female ratio was 1:1.6.

Furthermore, in this study, twenty different sites were recorded as biopsy sites. The most commonly biopsied sites were the mandibular bone (21/13.3%), lips (20/12.7%), gingivae (17/10.8%), cheeks (16/10.1%) and maxilla (15/9.5%) [Table 1]. Also, about 99/62.6% of the biopsies were reported as neoplastic lesions while non-neoplastic lesions made up 59/37.4% cases. Thus, benign neoplastic lesions were 65/41.1% cases while malignancies were 34/21.5% cases.

Overall, 55 diverse diagnoses were made from the cases sent for histopathology. The most frequently diagnosed lesion was squamous cell carcinoma (24/15.3%), followed by pyogenic granuloma (20/12.7%) and pleomorphic adenoma as well as haemangioma, both recording 11/7.0% of cases [Table 2]. Ameloblastoma recorded only 5 (3%) cases [Table 2]. In addition, the most frequently diagnosed category of lesions were reactive lesions (34/21.5%), mesenchymal tumours (32/20.3%), epithelial tumours (31/19.6%) and salivary gland tumours (22/13.9%) [Table 3]. Odontogenic tumours constituted 6 cases only (3.8%).

Discussion

Oral pathology specialists' training in Africa, appeared to be taking place in only a few sub-Saharan countries as at 2014.^[22] This may have inadvertently affected the findings from this study. Consequently, the number of oral and maxillofacial biopsies received in the pathology department over the study period was much less compared to what was recorded in previous studies.^[13,17] This study recorded 158 requests over a 10-year study period while Ali *et al.*,^[17] in Saudi Arabia and Oliveira e Silva *et al.*,^[13] in Brazil reported

Table 1: Site distribution of oral and maxillofacial lesions

Site	Frequency <i>N</i> = 158	%
Jaws		
Mandible	21	13.3
Maxilla	15	9.5
Oral cavity		
Lips	20	12.7
Gingivae	17	10.8
Tongue	10	6.3
Buccal mucosa	10	6.3
Palate	9	5.7
Sublingual	3	1.9
Labial mucosa	1	0.6
Floor of mouth	1	0.6
Unspecified oral cavity sites	7	4.4
Salivary glands		
Submandibular	14	8.9
Parotid	8	5.1
Face		
Cheeks	16	10.1
Nose	1	0.6
Temporal region	1	0.6
Forehead	1	0.6
Angle of mouth	1	0.6
Neck		
Lateral neck	2	1.3

3,150 and 13,522 requests respectively over a 10-year study period. Similarly, previous African studies have recorded a higher prevalence of oral and maxillofacial biopsies.^[8,10,23,24] The lower numbers reported in this study may be partly due to the relatively lower population of The Gambia in comparison to the higher population obtained in the countries of previous studies. Thus, more people would tend to present for evaluation in these countries. Similarly, most previous studies were conducted in centres with established oral pathology services and specialists while the present study was conducted in a centre with evolving training in dental specialties. Therefore, oral pathology is yet to be well recognized. Hence, patients would tend to seek treatment more at known centres.

Notwithstanding, the outcomes in this study were comparable to those recorded in previous studies. The mean age of cases recorded in this study was 34.3 ± 19.7 , which was largely similar to what was recorded in earlier studies.^[8,10,12,17] Also, the peak age group of occurrences of oral and maxillofacial lesions recorded in this study was the third decade of life (36/22.8%). This was similar to what was obtained in a prior study.^[10] This finding however differed from those by Soyele *et al.*,^[8] Moridani *et al.*,^[12] as well as Takashima and Etges,^[18] who reported the peak age range of third and fourth decades, third to fifth decade and fifth decade, respectively. Also, a female preponderance of biopsied oral and maxillofacial lesions has been reported by most studies which was in agreement with findings in this study.^[8,10,12,17,18] Contrary to this finding is the study

Table 2: Histopathology of prevalent oral and maxillofacial lesions

Histological diagnosis	Frequency <i>N</i> = 158	%
Neoplastic		
Malignant		
Squamous cell carcinoma	24	15.3
Adenoid cystic carcinoma	4	2.5
Muco-epidermoid carcinoma	3	1.9
Adenocarcinoma NOS	1	0.6
Basal cell carcinoma	1	0.6
Rhabdomyosarcoma	1	0.6
Total (<i>n</i>)	34	21.5
Benign		
Pleomorphic adenoma	11	7.0
Haemangioma	11	7.0
Ameloblastoma	5	3.0
Squamous papilloma	4	2.5
Ossifying fibroma	4	2.5
Lipoma	3	1.9
Lymphangioma	3	1.9
Neurofibroma	3	1.9
Osteoma	3	1.9
Fibrous dysplasia	2	1.3
Fibro-lipoma	2	1.3
Warthin's tumour	2	1.3
Giant cell granuloma	2	1.3
*Others	10	6.3
Total (<i>n</i>)	65	41.1
Non-neoplastic		
Reactive		
Pyogenic granuloma	20	12.7
Irritation fibroma	7	4.4
Chronic inflammation	6	3.8
Cystic		
Epidermoid cyst	4	2.5
Dentigerous cyst	3	1.9
Inflammatory/microbial		
TB lymphadenitis	2	1.3
Salivary gland diseases		
Ranula	2	1.3
**Others	15	9.5
Total (<i>n</i>)	59	37.4

*Others—consisted of 10 benign neoplastic diagnoses that recorded one case each—Angioma, angiofibroma, chondroma, fibromatosis, fibromyxoma, monomorphic adenoma, rhabdomyoma, verruca vulgaris, seborrheic keratosis, keloids

**Others—consisted of 15 non-neoplastic diagnoses that recorded one case each—Bone tissue, fibro-epithelial polyp, fungal sinusitis, granulomatous inflammation, inflamed cyst, keratinised cyst, lingual lymphoid tissue, odontogenic cyst, osteomyelitis, pseudocyst, radicular cyst, thyro-glossal duct cyst, sarcoidosis, sialadenitis, chronic lymphadenitis

by Chidzonga *et al.*,^[24] who reported a male preference in their study. The few differences seen in the demographics of previous studies and that of the present study may be due to variations in how oral health care is being accessed in different climes by patients.

Table 3: Frequency distribution of categories of oral and maxillofacial lesions

Categories of lesions	Frequency N = 158	%
Reactive lesions	34	21.5
Mesenchymal tumours	32	20.4
Epithelial tumours	31	19.6
Salivary gland tumours	22	13.9
Cystic lesions	13	8.2
Inflammatory/microbial diseases	7	4.4
Odontogenic tumours	6	3.8
Fibro-osseous lesions	6	3.8
Salivary gland diseases	3	1.9
Giant cell lesions	2	1.3
Developmental	1	0.6
Normal tissue	1	0.6

Additionally, various sites within the oral and maxillofacial complex may be affected by diseases. The most commonly biopsied site reported in this study was the mandibular bone which was corroborated by similar findings from previous studies.^[8,10,12] These findings were, however, contrary to that of Takashima and Etges^[18] who recorded maxillary and mandibular gingivae as the most common sites affected in their study.

Furthermore, in this study, the nature of the samples examined was found to be predominantly benign neoplastic in nature. This finding is in concert with most previous studies which also recorded a predominantly benign nature of biopsied lesions.^[8,10,13] However, the present study, like previous studies conducted in Nigeria, recorded a higher proportion of malignancies in comparison to other previous studies by Ali *et al.*,^[17] Oliveira e Silva *et al.*,^[13] and Moridani *et al.*^[12] Curiously, it remains to determine if this finding suggests a higher prevalence of oral and maxillofacial malignancies in West Africans relative to other climes, since this study and other previous studies conducted in this subregion have recorded higher proportions of malignancies. However, poor and non-existent cancer management protocols in sub-Saharan Africa,^[19] as well as late presentation may explain the pooling of malignancies observed in these studies.

Furthermore, previous studies have reported reactive lesions as the most prevalent category of oral biopsy cases.^[9,10,12] Such was the finding in this study where reactive lesions constituted the most common group of lesions. This finding, however, contrasted with the study by Soyele *et al.*,^[8] who reported odontogenic tumours as the most common category of lesions. The prevalence of odontogenic tumours in the present study was low, representing 6(3.8%) of cases which is much less than what was obtained from previous studies in Nigeria.^[8,10] This again, may be due to low presence of specialists in oral and maxillofacial surgery as well as oral pathology specialists, in The Gambia. Wherein the patients tend to travel to

neighbouring countries for treatment. Curiously, this study recorded squamous cell carcinoma as the most frequently diagnosed lesion, which is contrary to findings by previous studies which reported benign lesions/tumours as their most frequently diagnosed lesion.^[10,14,18,25] The predilection for squamous cell carcinoma, as the most commonly seen lesion, overall, in this study, could be related to the high prevalence of tobacco smoking (known carcinogenic agent) observed in The Gambia.^[26]

The present study examined the oral and maxillofacial biopsies submitted to a surgical general pathology laboratory and described their prevalence rather than the prevalence of these diseases in The Gambia. The cases in our records may not constitute the entirety of oral lesions seen over the study period, but most likely would comprise the majority because the study location is the only tertiary health centre for the country. Also, cases excluded for failing to meet the inclusion criteria, may be sizeable enough to impact the outcome of the study.

In conclusion, the findings of this study showed low uptake of oral histopathology services while biopsied oral and maxillofacial lesions were prevalent in female patients and patients in the third decade of life. Also, the mandible was the most affected site whereas benign neoplastic diagnoses were most common. However, this study recorded a higher proportion of malignancies than some previous studies. This study underscores the need for increased awareness of dental and maxillofacial diseases in The Gambia as well as place emphasis on specialisation training. These measures would ensure that more patients have access to basic oral care.

Acknowledgement

The authors would like to thank the staff of the Pathology Laboratory, Edward Francis Small Teaching Hospital, The Gambia, for their technical assistance in this study.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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