

Histopathological Patterns of Oral Lesions among Sudanese Patients

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Abstract

Background/objective: Recently, Oral cancer mortality and morbidity is very high in Sudan, particularly among men due to the habit of Smokeless tobacco use. The study aimed to investigate the Histopathological patterns of oral lesions and to determine whether the lesion aggressiveness is age specific. **Materials and Methods:** The study was conducted as a descriptive retrospective study on oral lesions biopsies in Khartoum - Sudan. The data were collected from examination of biopsies and patients records. All oral biopsies were examined and classified as laboratory based by well professional pathologist using Hematoxylin & Eosin standard method. The statistical analysis was performed by the statistical package for social sciences (SPSS) for Windows computing program version 20. **Results:** Of the 115 subjects, there were 81 (70.4%) malignancy, benign lesion 18 (15.7%), inflammation 12 (10.4%) and 4 (3.5%) of cases as other conditions. Regarding The distribution of malignancy by age groups, among 46 individuals at age group < 40 years there were 27 cases constitute 58.7%. Of 42 individuals at age group 40 – < 60 years there were 29 malignant cases constitute 69% and 92.6% of population at 60 years or more with malignancy. **Conclusions:** It could be concluded that the majority of patients with oral lesions who underwent surgical intervention presented late and proved to have malignancy, and lesion aggressiveness is age specific. The study suggested the implementation of popular orientation of health education and oral screening program.

Keywords

Malignancy, Histopathological Pattern, Oral Lesions, Sudan

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1. Introduction

Oral cavity extends from skin-vermilion junction of lips to junction of hard and soft palate above and to line of circumvallate papillae below. It is composed of buccal mucosa, tongue, gingiva, with the presence of the two lips at its entrance. The major and minor salivary glands open by different ducts into the oral cavity. In the cavity the food is masticated, mixed with saliva and formed into bolus (1). Clinically, benign tumors and tumor-like conditions include

eosinophilic granuloma, fibroma, granular cell tumor, keratoacanthoma, leiomyoma, osteochondroma, lipoma, schwannoma, neurofibroma, papilloma and rhabdomyoma. Benign epithelial tumors include: Squamous cell papilloma, mainly affects adults and consists of stratified squamous epithelium supported by a vascular connective tissue core, Adenoma arises from minor salivary glands. They form smooth, round, swellings and are most frequently found on

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the palate. Oral cancer is a common cancer and constitutes a major health problem in developing countries, representing the leading cause of death (2). Some 95% of malignant neoplasms affecting the oral cavity are squamous cell carcinomas. Squamous cell carcinoma (SCC) is an epithelial malignancy with morphologic features of squamous cell differentiation (3). Oral squamous cell carcinoma (OSCC) poses a major health risk and is one of the leading causes of mortality. Distribution of the incidence of OSCC varies across the world with south-central Asia and Africa leading, followed by eastern and central Europe, and to a lesser extent Australia, Japan, and the United States. In the United States alone, about 17 new cases/100,000. Oral cancer is the fifth most common and sixth leading cause of cancer-related mortality per year globally (4). A key factor in the lack of improvement in prognosis over the years is the fact that a significant proportion of oral squamous cell carcinomas (OSCCs) are not diagnosed or treated until they reach an advanced stage. This diagnostic delay may be caused by either patients (who may not report unusual oral features) or by health care workers (who may not investigate observed lesions thoroughly) and it is presumed that such delays are longer for asymptomatic lesions. The prognosis for patients with OSCC that is treated early is much better, with 5-year survival rates as high as 80%. In addition, the quality of life improves after early treatment, because cure can be achieved with less complications and less aggressive treatment than is necessary for advanced lesions (2). A significant proportion of oral squamous cell carcinomas (OSCCs) develop from premalignant lesions such as leucoplakia and oral submucous fibrosis. Histological examination of tissue remains the gold standard for diagnosis and identification of oral lesions. Generally oral diseases are major health problems in developing countries including Sudan, many studies explain due to the local life style habits such as use of smokeless tobacco "Toombak", which is known to contain high level of the potent carcinogenic component of the tobacco (TSN) (5). Toombak, was introduced to Sudan approximately 400 years ago. It is always processed into a loose moist form and its use is widespread in the country. Tobacco used for manufacture of the Toombak is of the species *Nicotiana rustica* and the fermented ground powder is mixed with an aqueous solution of sodium bicarbonate. The resultant product is moist, with a strong aroma, highly addictive and its use is widespread particularly among males. Its pH range is 8-11, moisture content ranges 6-60% and nicotine content is from 8 to 102 mg/g dry wt and tobacco specific nitrosamines TSNA contents in micrograms (N'-nitrosoanatabine NAT 420-1550; 4-(methyl-nitrosamino)-1-(3-pyridyl)-1-butanone NN 620-7870; N'-nitrosoanatabine NAT 20-290) (6). Toombak dippers develop a clinically and histologically characteristic lesion at the site of dipping. The risk for cancer of the oral

cavity among Toombak users was high (RR 7.3-73.0-fold) (7) tobacco specific nitrosamines present in Toombak possibly acting as principal carcinogens, So the use of Toombak plays a significant role in etiology of oral squamous cell carcinomas (OSCCs) (8), and suspected to be associated with neoplasm of salivary glands (9-10). Majority of local studies focused on chemical nature of "Toombak" and correlated that with oral squamous cell carcinoma, but there were no traced studies investigated the general patterns of oral lesions among Sudanese whatever the risk factor. The aim of this study was to investigate Histopathological pattern of patients with oral lesions and to determine whether the lesions aggressiveness is age-specific.

2. Materials and Methods

2.1. Study Design

This is a descriptive retrospective study on oral lesions biopsies in Khartoum, Sudan.

2.2. Study Population and Sampling

One hundred and fifteen (115) paraffin embedded biopsies of oral lesions taken from patients underwent surgical operations, aged between 10 – 90 years with a mean age of 47±5 years. The sample size was total coverage of population (115) referred to the two major center in Khartoum (National laboratory, STAK) and Khartoum hospital- Sudan), during the period from 2012 to 2013.

2.3. Ethical Clearance

The study was approved by the Faculty Research Board of Sudan University for Science and Technology in collaboration with Ministry of Health ethical approval committee.

2.4. Processing of Samples

The data were collected from examination of collected biopsies and from patients' records. All oral biopsies were examined and classified as laboratory based. Sections of 5 µm thickness were obtained from biopsies using a rotary microtome and examined by well professional pathologist using Hematoxylin & Eosin adopting Mayer's procedure (11).

2.5. Statistical Analysis

Statistical analysis was performed by the SPSS version 20.0. The results were tested by chi-square. P value lower than 0.05 was accepted as statistically significant.

3. Results

This study investigated 115 subjects, their ages range from

10 to 90 with a mean age of 47 ±18 years. Among these 115 participants, 61 (53.0%) male and 54(47.0%) female, as shown in Table (1).The population distributed by age group as 46 (40%) less than 40 years, 42 (36.5%) range from 40 - < 60 years and 27 (23.5%) at 60 years or more. According to the anatomical site, the lesions classified as Buccal mucosa 18 (15.7%), Lower lip 13 (11.3%), Tongue 18 (15.7%), Salivary glands 26 (22.6%), Gingiva 8 (7%), Palate 7 (6.1%), Mandible 22(19.1%) and Glottis 3 (2.6%) as shown in Table (2). The laboratory diagnosis of subjects gave the results of malignancy 81 (70.4%), benign lesion 18 (15.7%), inflammation 12 (10.4%) and 4 (3.5%) of cases as other conditions (demonstrated in Table (2)). The sub classification distribution of (81) malignant lesions as shown in Table (3) was Squamous cell carcinoma 55 (67.9%), Lymphoma 2 (2.5%), Mucoepidermoid carcinoma 5(6.2%), Adenocarcinoma 15(18.5%) and Ameblastoma 4(4.9%), and according to the benign lesions, the population classified as having Adenogenic cyst 4 (22.2%), Pleomorphic adenoma 10 (55.6%), Fibroma 3 (16.7%) and Hemingioma 1 (5.6%).When evidence of malignancy correlated with gender variable, the study showed 42 (68.9%) of male and 39 (72.2%) of female having malignant tumor, The distribution of malignancy regarding age groups, among 46 individuals at age group < 40 years there were 27 cases constitute 58.7%. Of 42 individuals at age group 40 – < 60 years there were 29 malignant cases constitute 69% and 92.6% of population at 60 years or more with malignancy as shown in Table (4).

Table (1). Distribution of the Study Population by Age and gender among Sudanese patients

Age (years)	Parameters	
Mean	47	
SD	18	
Minimum	10	
Maximum	90	
Gender	Freq. (n=115)	%
Male	61	53.0
Female	54	47.0

Table (2). Distribution of oral lesions by anatomical sitesand Laboratory diagnosis among Sudanese patients

		Freq. (n=115)	%
Site of lesion	Salivary glands	26	22.6
	Mandible	22	19.1
	Buccal mucosa	18	15.7
	Tongue	18	15.7
	Lower lip	13	11.3
	Gingiva	8	7.0
	Palate	7	6.1
	Glottis	3	2.6
Lab. Diagnosis	Malignancy	81	70.4
	Benign tumor	18	15.7
	Inflammation	12	10.4
	Others	4	3.5

Table (3). Distribution of the Study Population by class of malignancy among Sudanese patients

Class of malignancy	Frequency (n = 81)	%
Squamous cell carcinoma	55	67.9
Adenocarcinoma	15	18.5
Mucoepidermoid carcinoma	5	6.2
Ameblastoma	4	4.9
Lymphoma	2	2.5
Total	81	100.0

Table (4). Relationship between agegroups and diagnosisamong patients

Age of patient	Lab. diagnosis	Malignancy	Benign tumor	Inflammation	Others	Total
< 40 years	Count	27	12	5	2	46
	%	58.7%	26.1%	10.9%	4.3%	100.0%
40-<60 Years	Count	29	4	7	2	42
	%	69.0%	9.5%	16.7%	4.8%	100.0%
60 years and more	Count	25	2	0	0	27
	%	92.6%	7.4%	0.0%	0.0%	100.0%
Total	Count	81	18	12	4	115
	%	70.4%	15.7%	10.4%	3.5%	100.0%

Chi square = 13.8
P-value =0.032

4. Discussion

This study is a hospital-based descriptive retrospective design. It was conducted in Khartoum, Sudan during the period from2011 to 2012. The aim of the study was to investigate the patterns of oral lesions among Sudanese and to determine whether the lesion aggressiveness is age specific. The study investigated 115 subjects, their ages range from 10 to 90 with a mean age of 47 years. Among those 115

participants, 61 (53.0%) were male and 54(47.0%) were female.Based on the laboratory diagnosis our study showed varying lesion patterns including normal, inflammatory, pre malignant and malignant lesions. Of 115 subjects, 81 (70.4%) classified as having malignant lesions, 18 (15.7%) benign lesions, 12 (10.4%) inflammation and 4 (3.5%) of cases as other normal conditions. These prevalence and distribution figures indicatethat not all oral lesions are malignant,that may due to early diagnosis of some cases. The risk of

malignant transformation varies from site to site within the mouth and from population to population (12). A classic study of over 30,000 Indian villagers, performed with follow-up over 7 years, showed transformation rates between 10 and 24 / 100,000 per year (13). The present study showed the commonest site was salivary glands 26 (22.6%) followed by mandible 22(19.1%). These results are similar to findings from (14). Study among Sudanese, in which according to the anatomical site of lesion; a high frequency of oral lesions was seen among patients with salivary glands lesions.

In this study majority of (81) malignant cases was Squamous cell carcinoma constitute 67.9%, followed by adenocarcinoma 18.5%, mucoepidermoid carcinoma 6.2%, ameblastoma 4.9% and lymphoma 2.5%. These findings agreed with the reports by Amit and David, who found that oral squamous cell carcinoma (OSCC) poses a major health risk and is one of the leading causes of mortality. Distribution of the incidence of OSCC varies across the world with south-central Asia and Africa leading, followed by eastern and central Europe, and to a lesser extent Australia, Japan, and the United States(4). Among 46 individuals at age group < 40 years there were 27 cases constituting 58.7%. Of 42 individuals at age group 40 – < 60 years there were 29 malignant cases constituting 69% and 92.6% of population at 60 years or more with malignancy. Referring to age, in this study the median age distribution of OC was not different from what was reported in the literature, there was significant correlation (P-value =0.032) between the percent of malignancy and age, there was positive relationship between poor prognosis or tumor aggressiveness and age.

In conclusion, our investigation provided that not all oral lesions undergo surgical operations with poor prognosis. Although, the majority of malignant oral lesions are squamous cell carcinoma, there is a probability of other types of malignancy, Aggressiveness of tumor increase with age. Cancer registry is recommended as an essential part for cancer management in Sudan and the high incidence of cancer invites wide popular awareness about risk factors (particularly among elder population) and importance of early diagnosis of oral lesions.

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