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Original article

Epidemiological Landscape of Oral Tumors in Benghazi: A Retrospective Analysis

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ABSTRACT

The oral mucosa can be affected by non-neoplastic and neoplastic lesions, which significantly contribute to patients' mortality and morbidity, particularly with late detection. The study aimed to evaluate the demographic features, clinical presentations, histopathological features, and risk factor associations of oral cavity tumors. The study was a retrospective study at the Faculty of Dentistry, University of Benghazi, using the records of 164 patients who had been diagnosed with oral cavity tumors, which were clinically and by biopsy in the period from 2016 to 2019. The results showed that benign oral cavity tumors accounted for 74.4%, and premalignant oral cavity tumors were 9.7%, while malignant oral cavity tumors15.9%. The mean age of patients was approximately 40 years old. The major clinical presentation of oral cavity tumors was painless swelling (73.8%), affecting the jaw (29.9%) commonly. According to the tumor origin, 75% of cases had non-odontogenic tumors, with benign tumors being predominantly of mesenchymal origin (98.1%), and premalignant lesions were more significantly associated with mixed tissue origin (26.7%). Malignant tumors occurred most commonly associated with tissues derived from salivary glands (68.7%). We conclude that histopathological analysis is important in the establishment of the definitive diagnosis and early detection of oral cavity tumors.

Introduction

The oral cavity, commonly referred to as the mouth or buccal cavity, is the first part of the digestive system and is composed of various anatomical structures that work together to perform a range of important functions. Anatomically, it is divided into the vestibule and the oral cavity proper. The palate constitutes the roof, and the mylohyoid muscles constitute the floor; its greater part is occupied by the tongue. The lateral wall is formed by the cheeks and retromolar areas [1]. The oral cavity has an important function as it helps in digestion, articulation, respiration, and taste [2]. The mucosa of the oral cavity is mainly lined by stratified squamous epithelium with an underlaying submucosa that contains minor salivary glands, lymphoid elements, and abundant sensory innervation for both immune surveillance and sensory function [3].

The oral mucosa can be affected by non-neoplastic and neoplastic lesions. It reflects or manifests the underlying systemic disease, as oral health is integral to general health [4]. Neoplastic and tumor-like lesions of a wide range can be seen in the oral cavity, including benign, premalignant, and malignant lesions [5]. Benign tumors are generally well-circumscribed, slow-growing, with minimal tendency for metastasis. Their classification includes fibromas, papillomas, pyogenic granulomas, giant cell granulomas, lipomas, hemangiomas, and lymphangiomas [6]. Premalignant lesions include leukoplakia, erythroplakia, oral lichen planus, oral submucous fibrosis, actinic keratosis, and discoid lupus erythematosus, all of which have a potential risk of malignant transformation [7]. Maliganat tumors of the oral cavity result from uncontrolled cellular proliferation. Malignant tumours include squamous cell carcinoma, basal cell carcinoma, verrucous carcinoma, malignant melanoma, mucoepidermoid carcinoma, and ameloblastic carcinoma [8]. The Major contributing risk factors include tobacco exposure, areca nut chewing, alcohol intake, nutritional deficiencies, genetic predisposition, ultraviolet radiation, mate consumption, microbial infections, and chronic mechanical irritation [9].

Oral cavity carcinoma continues to be an important public health problem worldwide. It is the sixth most common cancer among men and the tenth among women in developing countries, based on 1984 data from the World Health Organization [10]. Taking a biopsy is essential to establish a definitive diagnosis based on the lesion's histological characteristics and in relation to its clinical progression. It gives baseline information about the disease, prognosis, and prevalence, which will facilitate planning an appropriate management. This study aims to analyze the frequencies, demographic distribution, and types of the most common oral cavity tumors and to study the clinical presentation and their correlation with different oral cavity tumors and risk factors using the records of the oral pathology department at the faculty of dentistry from 2016 to 2019.

Material and Methods

A retrospective study was conducted at the Faculty of Dentistry, University of Benghazi, between 2016 and 2019. A total of 164 patients of both genders were diagnosed with oral cavity tumors. Data were obtained

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and collected from the archives of the Oral Pathology Department and classified according to demographic and clinical data, including age, gender, smoking status, clinical presentation, anatomical site of the lesion, incidence of different tumor types, and histopathological findings. Hematoxylin and Eosin-stained sections were independently re-examined under a light microscope by a professional histopathologist to establish the final diagnosis.

Based on pathohistological criteria, the data were classified into benign, premalignant, and malignant oral cavity tumors, and further analyzed to study their correlation with different clinical variables and potential risk factors. Data were evaluated and compared with other findings reported in other similar studies.

Statistical Analysis was carried out using the package Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics, including mean, standard deviation, median, mode, frequencies, and percentages, were presented as tables and figures. Fisher's Exact Test was used to assess the association; a p-value < 0.05 was considered a significant association.

Results

A total of 164 cases of oral cavity tumors were included in the study. Among these, 122 cases (74.4) were diagnosed with benign tumors, 16 cases (9.7%) were premalignant lesions, and 26 cases (15.9%) were malignant oral cavity tumors (Figure 1).

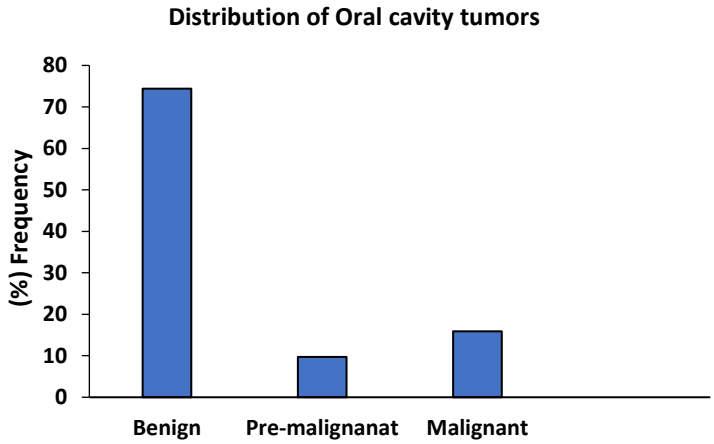

Figure 1. Distribution of oral cavity tumors according to histopathological diagnosis

The mean age of the patients in the study was approximately 40 years, which was categorized into patients aged ≤40 years who accounted for 93 cases (56.7%), and those aged>40 years accounted for 71 cases (43.3%) (Figure 2).

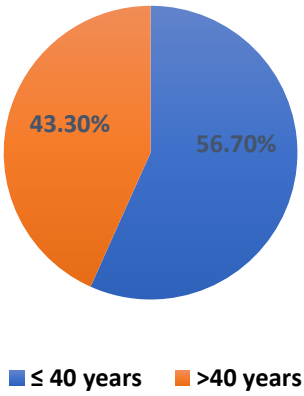

Figure 2. Age distribution of oral cavity tumors

Out of 164 cases, 94 cases (57.3%) were female patients, and 70 (42.7%) were male patients, which indicates female predominance (Figure 3).

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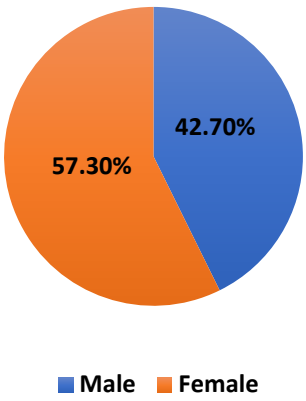

Figure 3. Gender distribution of oral cavity tumors

Regarding smoking status, our results showed non-smokers were the majority, which constituted 67% (110), while 32.9% (54 cases) were smokers (Figure 4).

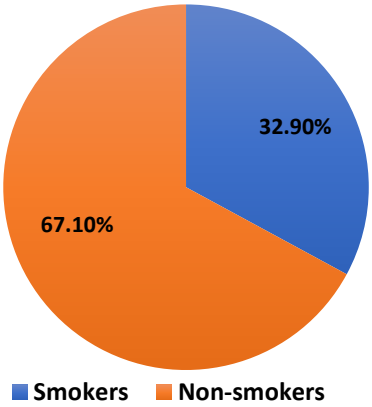

Figure 4. Distribution of oral cavity tumors according to smoking status

The clinical presentation of oral cavity tumors was swelling only in 121/164 cases (73.8%), while swelling with pain, bleeding, and ulceration in 30/164 cases (18%), and swelling and bleeding only in 13/164 cases (7.9%) (Figure 5).

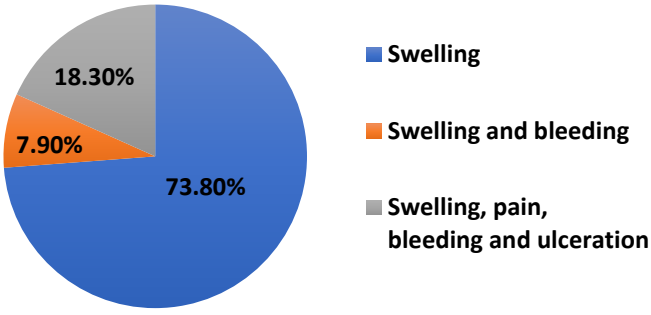

Figure 5. Distribution of oral cavity tumors according to clinical presentation

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Regarding tumor localization, the commonest site of oral cavity tumors was seen in the jaw 29.9% (49 cases), and then buccal mucosa (29 cases, 17.7%), followed by tongue and gingiva, each constitutes about 13.4%. Lip and palate were equally distributed and accounted for about 10.9%, whereas the floor of the mouth was the least affected site (6 cases, 3.8%) (Figure 6).

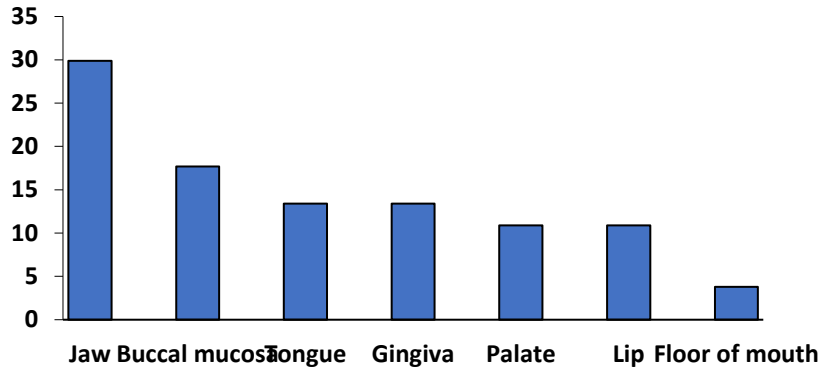

Figure 6. Anatomical distribution of oral cavity tumors

According to the tumor origin, out of 164 cases of oral cavity tumors, 123 cases had non-odontogenic tumors (75%), while 41 cases had odontogenic tumors (25%) (Figure 7).

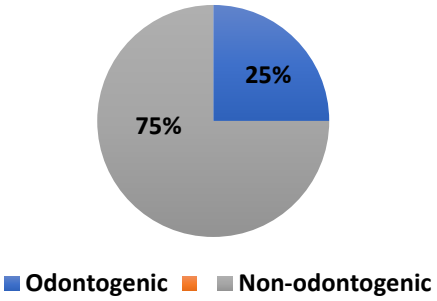

Figure 7. Distribution of oral cavity tumors according to tumor origin

Benign tumors were predominantly of mesenchymal origin (98.1%), whereas premalignant lesions were more frequently associated with mixed tissue origin (26.7%). Malignant tumors occurred most commonly in tissues derived from salivary glands (68.7%). Test of significance showed a statistically significant association (Table 1).

Table 1. Comparison of benign, premalignant, and malignant oral cavity tumors according to mesenchymal, epithelial, mixed, and salivary gland origins. Significant association observed ($p < 0.05$)

Type of lesion	**Distribution of tissue origin of oral cavity tumors (number of cases and percentages)**					**Total**
	Epithelial	Mesenchymal	Mixed	Salivary gland	Hemato lymphoid	
Benign	37 (67.3%)	52 (98.1%)	22 (73.3%)	5 (31.3%)	6 (60%)	122 (74.4%)
Pre-malignant	8 (14.5%)	-	8 (26.7%)	-	-	16 (9.7%)
Malignant	10 (18.2%)	1 (1.9%)	-	11 (68.7%)	4 (40%)	26 (15.9%)
Total	55 (100%)	53 (100%)	30 (100%)	16 (100%)	10 (100%)	164 (100%)

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Discussion

The oral mucosa can be affected by non-neoplastic and neoplastic lesions. It reflects or manifests the underlying systemic disease, as oral health is integral to general health [4]. Oral cancer is increasing with the annual incidence, with a high mortality rate reported in less developed countries. It is a habit of the accumulative factors throughout population aging and cancer-provoking factors expansion [11]. A total of 164 cases of oral biopsies were conducted during the study period to determine their demographic distribution, clinical pattern, site of distribution, histopathological characteristics, and associations with possible risk factors. According to histopathological examination, our results showed that the majority of cases were diagnosed with benign tumors, whereas premalignant and malignant lesions constitute smaller but clinically significant proportions. This is consistent with previous studies that showed benign oral tumors are more frequent than malignant tumors [12-14]. The mean age of the cases was approximately 40 years, with more than half of the patients aged 40 years or younger. It has been shown that oral cavity tumors follow an age-related pattern, as they may start as benign tumors in the younger age group and then undergo malignant transformation with chronic exposure to carcinogenic factors and prolonged mucosal insult, which contributes to the higher incidence of malignancies in older patients [15, 16]. Female patients were observed to be more commonly affected by oral cavity tumors than males in the study cohort. However, this was not a significant association; it contrasts with other studies that reported a male predominance for malignant oral tumors, which may be attributed to the more common use of tobacco and alcohol among men [17, 18].

Regarding smoking status, the results showed smokers had a lower proportion of oral cavity tumors. Tobacco smoking has been shown to be one of the strongest risk factors of oral cavity malignancies due to its role in epithelial dysplasia, DNA damage, and carcinogenic exposure (15,17). However, our findings did not establish the association between smoking and the development of possibly malignant and malignant oral lesions because most of the population sample was female; further studies should be conducted to establish this association with different types of oral cavity tumors. Clinically, swelling was the predominant presenting symptom among all tumor types. However, malignant and premalignant lesions more commonly present with combined symptoms such as pain, bleeding, or ulceration, indicating a more aggressive nature of these lesions. This pattern of presentation is concomitant with other previous studies where malignant tumors commonly manifest with symptoms signifying tissue destruction or ulceration [19, 20]. Most of the oral cavity tumors were non-odontogenic in the study cohort. A study conducted by Elarbi *et al.* and El-Gehani *et al.* was consistent with our observation, as they showed that benign non-odontogenic oral cavity tumors were the predominant type [21, 22]. However, this observation is contradictory to Daley & Wysocki (2003), who claim that most of odontogenic tumors are benign despite their histologic type and biological behavior [12].

According to the anatomical localization of tumors, the results showed that the jaw, buccal mucosa, lip, and gingiva were the most common sites of the oral cavity. However, studies have shown that malignant tumors were most common in the palate, tongue, and floor of the mouth because of their higher susceptibility to malignant changes due to increased exposure to carcinogens and the presence of thin, non-keratinized mucosa [15, 23]. Further study of the distribution of different types of tumors and their relation to anatomical distribution was needed in this study. Histopathologically, benign tumors were primarily of mesenchymal origin, whereas premalignant lesions showed a mixed tissue origin. Malignant tumors were most frequently derived from salivary gland tissues, which was further supported by other epidemiological studies that demonstrated a notable problem of malignant salivary tumors in different populations [23, 24].

Conclusion

The associations of the types of oral cavity tumors with tissue origin, anatomical location, and clinical presentations highlight the importance of early detection strategies. Additional attention in evaluating the patients with lesions seen in high-risk intraoral sites or those with alarming symptoms, such as pain, bleeding, or ulceration, is needed. Future suggestions involve further studies to be conducted with a larger sample size and collaborations of multiple dental care centers to validate these results and examine additional risk factors, including alcohol, genetics, and environment. Improving local registries and diagnostic facilities might allow for better handling of oral cavity tumors.

Conflict of interest. Nil

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