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Original Article

Histomorphometric features of oral tumours in Hyderabad, Pakistan.

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Abstract:

Introduction: Oral cancers (oral cavity cancers) are the eleventh most commonly occurring cancers globally. The annual incidence of oral cancer is around 0.27 million cases while 0.13 million cases of pharyngeal cancers excluding nasopharynx occurring in developing countries. The incidence and mortality caused by these cancers show variability according to the geographic location in which it is diagnosed.

Objectives: To evaluate the histomorphometric features, tumours arising at oral region, among patients in Isra University, Hyderabad.

Methodology: This cross-sectional study was conducted at Isra University Hyderabad between January 2018 to December 2020. Patients; aged 18 or above of either gender; presented with chronic oral ulcer for ≥ 3 months duration, growth or swelling in the oral cavity were included in the study after taking consent. The morphological and histopathological findings of all the tissues after taking biopsy from the lesion were evaluated and finding recorded in a pre-design proforma.

Results: During study period total 143 biopsies performed; 89(62.2%) were male patients while 54(37.8%) were female patients. Most (39.20%) of the patients belongs to age group of 43-52 years. Most commonly involved tumors location was the buccal mucosa/cavity (34.2%) followed by gums and alveolus (25.2%). Biopsy data after histopathological evaluation revealed that majority of patients were suffering from the squamous cell carcinoma (92.3%). Majority (35.0%) of patients were in stage II of TNM staging while half (50.3%) of the patients were in advance stages (stage III and IV).

Conclusion: Buccal mucosa/cavity is the most common anatomical site for oral carcinoma with predominance of middle age group and male. Oral squamous cell carcinoma is the most prevalent oral cancer with majority of patients presented in advance stages (III and IV) and grade (II) of tumor.

Keywords: Buccal mucosa, Oral tumors, Squamous cell carcinoma.

Introduction:

Oral cancers (oral cavity cancers) are the eleventh most commonly occurring cancers globally. The annual incidence of oral cancer is around 0.27 million cases while 0.13 million cases of pharyngeal cancers excluding nasopharynx occurring in developing countries.[1, 2]

The incidence and mortality caused by these cancers show variability according to the geographic location where it is diagnosed.[3] Regions of the world characterized by the higher incidence of oral cancer includes: South and Southeast Asia (e.g. Pakistan, India etc.), Western and Eastern European regions (e.g. France, Hungary etc.) parts of Latin America and the Caribbean and the Pacific regions.[4,5] Among South Asian countries;

India, Sri Lanka and Pakistan showed the highest incidence of oral cancer in the region. However, in the last decade an increase was observed in the percentage of young patients.[6, 7]

The underlying pathologies of oral and maxillofacial nature are varied, and can array from inflammatory lesions to benign or malignant neoplasms. These lesions can arise either from soft tissue or bone but may also involve both structures of the oral or maxillofacial region. Oral lesions can be either benign or malignant. Benign lesions are usually inflammatory or consequences of a reaction to some kind of irritation or low-grade injury whereas malignant lesions are characterized with progressive autonomous growth.[8] The etiology of most benign and malignant tumors is unknown. The role of predisposing genetic factors such as genetic mutation, P53 suppression, gene alteration and role of chemicals such as arsenic etc., irradiation, viral infections HPV, HIV, EBV is well documented.[9] Environmental factors such as chewable tobacco (Snuff) and moist snuff (Naswar) Betel quid (Paan) cause a rise in incidence of oral tumors. Alcohol is an important co-factor when combined with smoking to give rise to oral pathologies.[10, 11] The patients with oral/maxillofacial lesion are either symptomatic or asymptomatic. Symptoms may vary according to the stage, mode and nature of presentation. It may present as a mild swelling to huge ulceration and mass. The clinical presentation of benign oral soft tissue masses can sometimes resemble malignant tumors. The clinicians face a challenge in diagnosis of such lesions based primarily on examination, clinical presentation and physical status of the suffering patients.[6,7] Diverse morphological features and unpredictable prognosis remains the major factor to attract considerable medical interest of researchers.[12] Very limited studies and scanty data is available regarding condition of salivary gland tumors and its geographical distribution as well as environmental and hereditary factors involvement or impact upon the cancer.

Objective:

To evaluate the histomorphometric features, tumors arising at oral region, among patients in Isra University, Hyderabad.

Methodology:

This cross-sectional study was conducted at the department of pathology, ISRA University Hyderabad for the duration of three years from January 2018 to December 2020. Ethical approval for the present study was granted by the Ethical review committee of Isra University, Hyderabad. All the patients, aged 18 or above of either gender, admitted in the Isra university with complains of chronic oral ulcer for ≥ 3 months duration, growth or swelling in the oral cavity were included. Patients proven on biopsy to have benign tumor, those not willing for histopathological analysis of their oral ulcer or swelling were not included in the study. Each patient having suspicious lesion was informed about the purpose and procedure of the study and informed written consent obtained. Demographic and personal information inquired and recorded on a semi-structured proforma. The mode of clinical presentation and anatomical location of lesion were noted in a written as well as photographic records. After taking all aseptic measure punch biopsy of suspicious lesion performed electively, tissue retrieve stored in a glass jar filled with 10% formalin. The collected specimen immediately transferred to the pathological laboratory. The gross examination of these specimens was performed and recorded as per guidelines provided by the Royal College of pathologists UK.[13] For the purpose of histopathological evaluation, all the tissues from biopsies in sufficient size (up to 4-µm thickness) were processed under the standard conditions by passing in xylene for clearing and embedded in paraffin wax that were latter cut manually using rotary microtome. The collected tissues sections were then stained with Hematoxylin and Eosin (H&E) for examination under the light microscope (Olympus BX51, Tokyo, Japan). Histopathological details were recorded and all tumors of oral region were documented in the study proforma and the tumor registry of histopathology laboratory. Statistical analysis of data was performed in SPSS version 24.0. The collected data was then computed and presented as frequencies and proportions. For controlling the effect modifiers, stratification of gender and age to determine their effects on the outcomes.

Results:

Out of total suspected malignant tumors in oral regions, 143 biopsies fulfilled the selection criteria. Among the biopsies, majority 89(62.2%) belongs to male patients while 54(37.8%) belongs to female patients. The mean age of patients with suspected malignant biopsies was 45.1±5.2 (ranges from 21to 64 years). Most of the patients belongs to age group of 43-52 years. (Figure 1)

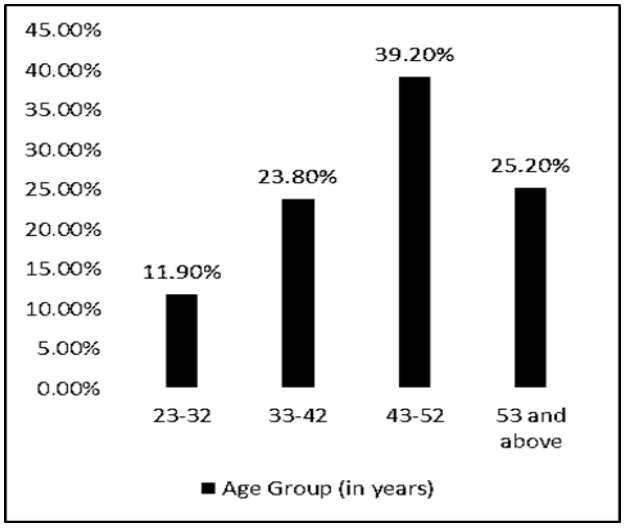

Figure No 1: Age-group wise distribution of patients

As far as the anatomical location of the lesion is concern, most common site was buccal mucosa/cavity followed by gums and alveolus while palate was involved in least number of cases.

Table I: Anatomical distribution of tumor (n=143)

Tumour Location	Total n (%)	Male n	Female n
Buccal Mucosa/cavity	49(34.2)	31	18
Floor of mouth	18(12.6)	10	8
Gums and alveolus	36(25.2)	24	12
Lips	10(7.0)	6	4
Palate	09(6.3)	05	04
Tongue	21(14.7)	13	08
Total	**143**	**89(62.2)**	**54(37.8)**

Biopsy data for histopathological evaluation revealed that 922.3% of patients were suffering from the squamous cell carcinoma (SCC), 3.5% adenocarcinoma, 2.8% verrucous carcinoma and 1.4% cystic carcinoma. Findings of tumor histopathological analysis in terms of TNM staging and Histological grading are presented in Table II. Based on findings, majority of patients were in stage II of TNM staging while half of the patients were in advance stages (stage III and IV). The prevalence of different TNM staging was significantly higher among male patients compared with females. The histological grading of tumors showed that moderately differentiated tumors (grade II) were more prominent in study patients.

Table II: Histopathological evaluation (staging and grading) of oral tumors (n=143

Tumour Histopathology	Male 89(62.2)	Female 54(37.8)	Total n(%)
TNM Staging			
I	13(62.0)	8(38.0)	21(14.7)
II	30(60.0)	20(40.0)	50(35.0)
III	22(66.7)	11(33.3)	33(23.1)
IV	24(61.6)	15(38.4)	39(27.2)
Histological Grades			
Grade I	33(63.4)	19(36.6)	52(36.4)
Grade II	52(61.2)	33(38.8)	85(59.4)
Grade III	4(66.7)	2(33.3)	6(4.2)

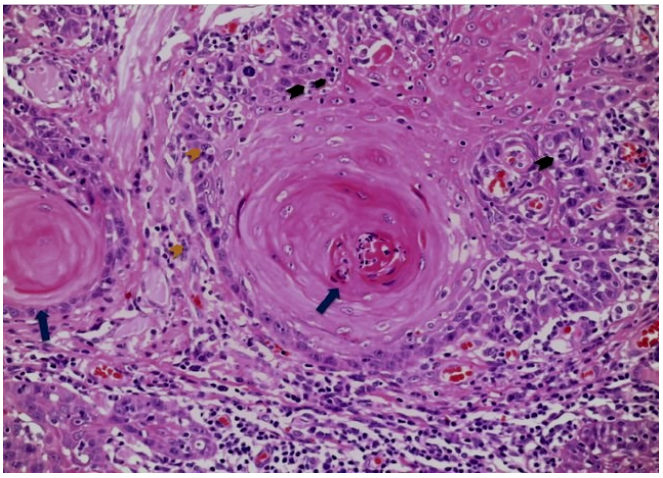

Figure No 2:
Photomicrograph image showing the squamous cell carcinoma of oral cavity (H&E 20x) with invasion and reaction of surrounding tissues. Blue arrows pointing the degree of keratinization. Orange arrowheads showing nuclear pleomorphism. Black arrowheads à Pointing mitosis

Discussion:

Medical Oral cancer is one of the most cancers with constantly rise in the incidence and poor survival rate reported worldwide. Diagnosis of oral cancers at the earliest stages is the key to minimize the mortality

linked with these cancers.[7] Pakistan is amongst the top 3 countries with the highest number of cancer rates for lip and oral cavity cancer.[6] With the significant rise in use of tobacco products and betel nuts poses serious threat to increase in the oral cancer cases in the country. While on the other hand lack of awareness and diagnostic facilities, there is a trend of diagnosing of such cases at relatively advance stage in Pakistan.[12-14]

The current study was designed with an objective to evaluate the histomorphometric features of oral region tumors. In the present study oral cancers were more prevalent among male (62.2%) compared with female (37.8%). These findings are consistent with that reported by global cancer inventory 2020 reported the higher prevalence of oral cancers in the country among male compared to female. Tandon A. et al. reported 76% of male patients with oral cancer in their study.[15] Moreover, Toscano de Brito R et al and Imtiaz AS et al. also reported the higher incidence of oral cancer among male participants that are consistent with findings of the present study.[16, 17]

The mean age of patients in this study was 45.1±5.2 with majority 39.2% cases belong to age group 43-52 years while a considerable number of patients belongs to age 33-42 years. Although Alamgir MM et al. reported highest number of cases between 41-60 years of age; yet they also found substantial number of patients in younger age bracket (31-40 years).[14] This increase in number of cases in young and middle age group may be due to rising trend of early exposure to tobacco products and beetle nut as well as beetle quid in Pakistani population.

Lingual tumors (tumor of tongue) and tumors in the floor of mouth are more common in Western countries like USA; while in Pakistan and India, tumors in the buccal mucosa/ cavity and gingivo-buccal sulcus or alveolus / gums are more commonly affected due to high consumption of tobacco products, betel quid etc. and placement of these in the oral cavity.[4, 6] Current study found that the commonest anatomical site of oral cancer was buccal mucosa/cavity (34.2%) followed by gums and alveolus (25.2%), tongue (14.7%) and floor of mouth (12.6%). While least common sites were lips and palate (7.0% and 6.3%) respectively. Published literature from India and Pakistan also showed buccal mucosa/cavity as the common site of origin.[12,14,15,17-19] In contrast, tongue as commonest site of tumor have been reported by Toscano de Brito R; while alveolus followed by tongue was the commonest site reported by Baig MS. et al.[16, 20]

Histopathological (biopsy) findings of tumors of patients in the current study revealed that that majority (92.3%) of tumors were squamous cell carcinoma while a small proportion of adenocarcinoma (3.5%), verrucous carcinoma (2.8%) and cystic carcinoma (1.4%). A large number of studies worldwide also reported that the squamous cell carcinoma is the predominant histopathological type of oral tumour.[4,6,9, 15,21,22] This endorse the findings of the present study.

Histological grading and staging of tumor is the key variable that is associated strongly with the aggressiveness of any malignant tumor and their spread. Lack of proper diagnosis of these carcinomatous tumors at early stages is a major problem of developing countries like Pakistan that adversely effects the outcome of the disease.[12,17] This study demonstrated the same as most of the cases were in advance stages. In the present study majority of cases were in stage II (35.0%) while 27.2% cases were in stage IV, 23.1% in stage III and 14.7% in earliest stage I. Toscano de Brito R. et al. reported that over two third (65.5%) of their patients were diagnosed in advance stages (stage III and IV) while 32.5% cases were diagnosed at stage I and II.[16] Similarly, Singh et al. reported that higher prevalence (>63.0%) of their patients in advance stage.[23] These findings are in agreement with finding of current study.

Histological grading is important and it is reported as grade. In the present study most(59.4%) tumor were of grade II; Zafar M et al. reported that most of their cases (55.0%) were in grade II while 20% were grade III.[24] Alamgir MM et al. also reported the higher prevalence (59%) of tumors in grade II.[14] Higher grade at presentation/diagnosis reflect lack of awareness or access to health care facility leading to late diagnosis with resultant poor prognosis.

Conclusion:

Grade III/IV squamous cell carcinoma arising from buccal mucosa/cavity among middle aged male is the most prevalent oral carcinoma in our population.

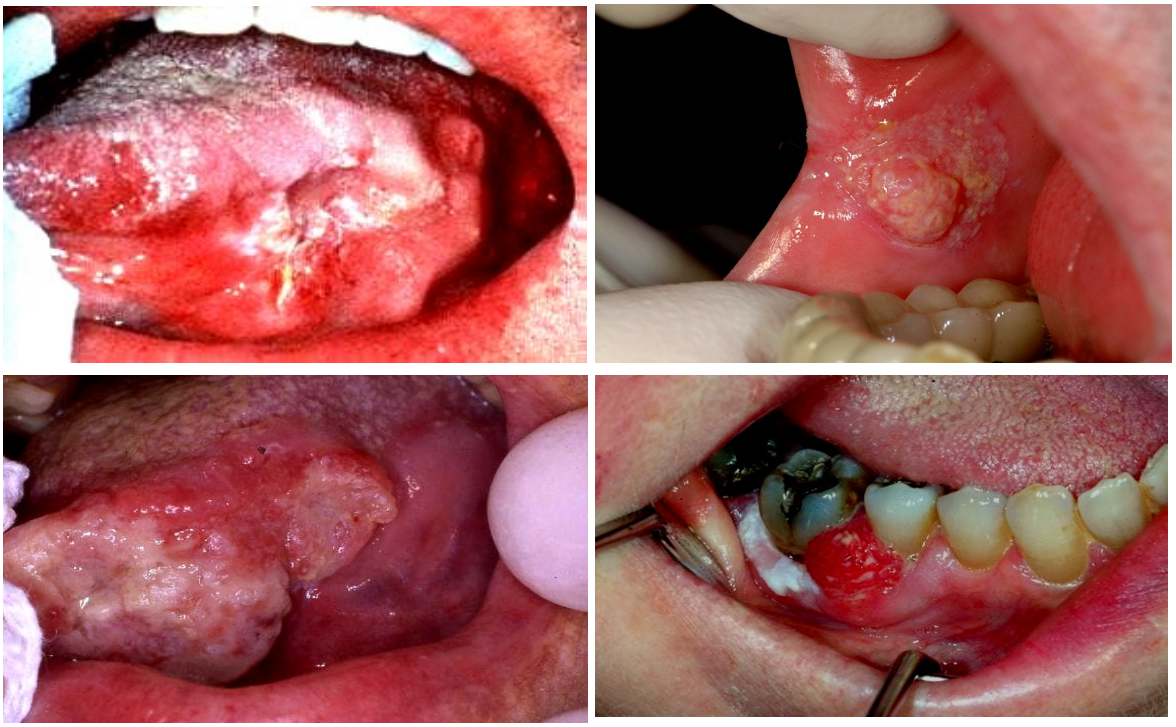

Figure No 3: Clinical pictures showing lesions and tumors over Tongue, Buccal mucosa, Floor of mouth and alveolus

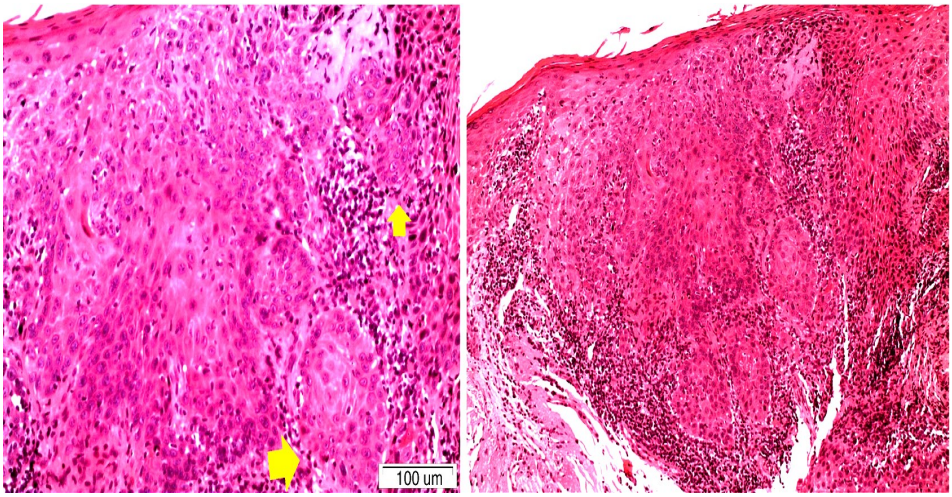

Figure No 4: Photomicrograph image showing the squamous cell carcinoma of oral cavity (H&E 200x & 100x) showing severe dysplasia and micro invasion of squamous cell carcinoma
Yellow arrowheads showing a nest of neoplastic cells invading lamina propria and penetrating the basal membrane.

Recommendation:

National cancer registry is needed to be develop in Pakistan. As link of oral cancer with tobacco product is established, strict legislations against sale of tobacco products especially among youngsters should be executed with spirit and zeal.

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Conflict of interest:

The authors declare no conflict of interest.

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