

Association between the site of occurrence and pathological TNM staging in oral squamous cell carcinoma

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Abstract:

Oral cancer is a worldwide health problem. Risk factors for oral squamous cell carcinoma (OSCC) are tobacco, alcohol, betel nuts, viral infection and dietary habit. The site of occurrence of the OSCC differs substantially between different people groups mainly because of variations in the prevalence of risk factors. The prognosis varies based on the site. pTNM is also one of the most useful tools for the prediction of prognosis. Therefore, it is of interest to correlate the pTNM staging with the site of occurrence of the lesion using 36 OSCC case reports. The results revealed 36.11% of the lesion occurred in buccal mucosa. Stage III pTNM was most prevalent in buccal mucosa and tongue and Stage IV pTNM in the retromolar trigone region by significant association with p value < 0.05. Thus, we report that lesions occurring in the Retromolar region, tongue and buccal mucosa need to be given special attention, as they are associated with early metastasis and poor prognosis. Early diagnosis and appropriate treatment protocol will improve the quality of life for the patients.

Keywords: oral squamous cell carcinoma; TNM staging; buccal mucosa; prognosis; Tongue.

Background:

Oral cancer is a worldwide health problem. The World health organization (WHO) predicts a continuous increase in the number of patients with oral cancer in the near future [1]. In India, the

incidence of oral cancer is about 30-50% of whole body tumors [2,3]. The site of occurrence of oral squamous cell carcinoma (OSCC) differs substantially between different states mainly because of variations in the prevalence of risk factors [4]. The risk factors

associated are tobacco, alcohol, betel nut and various other factors like viral infection and dietary habits [5,6]. Even genetic factors and some carcinogenic effects on normal cells of the respiratory and digestive system may lead to squamous cell carcinoma [5,7,8]. OSCC may occur anywhere in the oral cavity but is more common in the tongue, buccal mucosa, lower lip and floor of the mouth [4]. Features of these regions greatly facilitate carcinoma spreading to regional lymph nodes or to distant organs [9,10]. The ability to metastasis to lymph nodes or organs varies for each of these sites. In patients with head and neck squamous cell carcinoma, the prognosis is based on pTNM, which is highly useful, especially to access essential features of cancer, such as local infiltration, regional dissemination and distant metastasis [4,11]. Sabba *et al.* found that keratinization and tumor thickness presented a statistically significant correlation with overall survival [12]. In 1989, Bryne *et al.* stated that the histopathological features at the invasive tumor front could be useful to determine the prognosis [13,14]. Byrne *et al.* in 1998 focused their studies mainly on clinical parameters and prognosis based on keratinization, mode of invasion, lymphatic infiltration, histopathological characteristics at the invasive tumors front of the lesion [15]. Therefore, Invasion pattern was very important to be noted in histopathological staging system and had most important correlation with clinical parameters, such as metastasis and recurrence [13,16]. In 2017, the 8th edition of the UICC and AJCC (AJCC 8) staging manual was released with introduction of two major changes for oral squamous cell carcinoma, which includes the incorporation of the tumor depth of invasion (DOI) in the T stage and incorporation of extracapsular

spread (ECS) in the N stage [17]. DOI varies from clinical tumor thickness in that it signifies the distance from the theoretical reconstructed normal mucosa basement membrane to the last malignant cell in the invasive tumor front [17,18]. It is verified that this type of staging is more complex and heterogeneous. The pathological stage is also found to vary between the various OSCC subtypes and the site of the lesion [19]. Therefore, it is of interest to correlate the pTNM staging with the site of occurrence of the lesion using 36 OSCC case reports.

Materials and Methods:

A retrospective study on oral squamous cell carcinoma patients was conducted in the department of oral pathology, Saveetha dental college. After searching through the archives, 36 excision cases of OSCC between the periods June 2019 to March 2020 were included in the study. The scientific review board of Saveetha Dental College and hospital approved the study. Demographic data including age, gender, habit, site of lesion, histopathological diagnosis and pTNM staging were recorded and tabulated. Records with unclear clinical variables and incisional biopsy data are excluded from the study. Inclusion criteria mainly based on pathological staging of TNM. For result, analysis of the descriptive statistics the microsoft excel 2013 was used, For the analysis of frequency and percentage of the study, SPSS software 20.0 version was used. For the correlation between different variables with pTNM staging, chi- square test was used. The level of significance was fixed at 0.05 and the confidence interval at 95%.

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Result and Discussion:

36 patients with OSCC were included in the study, the demographic data show that 80.56% were males and 19.44% were females (Figure 1). The age ranged between 40-70 years with a mean age of 55.44 years (Figure 2). Regarding the anatomical site of lesion, the most common site was buccal mucosa comprising 36.1% of the cases followed by tongue with 33.33% and then the retromolar trigone comprising 11.1% of the cases (Figure 3). On evaluating the histopathological grading, the most commonly grade SCC was well-differentiated squamous cell carcinoma (WDSCC), which included 72.22% of the cases followed by moderately differentiated squamous cell carcinoma (MDSCC), which was seen in 22.22%. verrucous carcinoma was diagnosed in 2.778% (Figure 4). Concerning TNM staging, 13 cases were stage III which comprised 36.11% of the cases and 11 cases show Stage IV exhibit the percentage of 30.56%. Stage II was seen in 9 cases comprising 25% of the cases stage and then 3 cases exhibited stage I (Figure 5). It was found that all the lesions in the retromolar region were in stage IV pTNM staging. Both buccal mucosa and the tongue exhibited that most of their cases were stage III. Correlation between the site of occurrence of oral squamous cell carcinoma and pTNM staging showed statistical significance with a p value of 0.031 (Figure 6). Prognosis of oral squamous cell carcinoma patients is varied due to different histopathological and clinical features of this entity [20]. pTNM acts as a single most common predictor of outcome and prognosis in oral squamous cell carcinoma patients [21]. It helps to decide the treatment protocol on whether chemotherapy or radiotherapy is necessary [22]. Regarding clinical data, the sample showed that maximum patients were male and the average age was 55.4 years. No patients under the age of 30 were registered. The results were consistent with other literature, which also states that male predilection is seen in OSCC and this is mainly attributed to the prevalence of tobacco habits more among men than among women [4,12,23,24,25]. However, Suresh et al diverged from the results of the study because he noticed female predominance [26]. The gender may vary in magnitude across cultures due to different habitual patterns and this could also be due to the changing habit trends among the female population [27]. The result also showed that buccal mucosa was the most commonly affected region followed by the tongue. This is consistent with other literature where also similar findings were found [25, 26 28]. But studies by Costa et al., Varela et al., Bundgard et al. and Manuel et al. were not in agreement [4,29,30]. Usage of tobacco pouch for prolonged duration in the anatomical site mainly in the buccal mucosa ultimately leads to irritation, ulceration and finally to malignancy. The regional differences seen may be attributed to the

different forms of tobacco consumed by the different population groups. In north India, pan and gutkha chewing are more common than smoking mainly in Maharashtra area. Whereas in the south Indian population smoking is more prevalent. WDSCC was the most common histopathological diagnosis followed by MDSCC, which is in accordance with study by Suresh *et al.* Sharma et al and Nasser *et al.* [25, 26, 31, 32]. TNM classification is most commonly used to predict the prognosis of squamous cell carcinoma. However, there is some divergence concerning tumor staging. The percentage of pTNM staging is higher when compared with computed tomography and magnetic resonance, it is perfectly used for classification and staging of neoplasm [3]. It is feasible to admit that the results obtained by histopathological assessment are more accurate for prognosis [33,34,35,36]. Most of the cases in the study were stage III and stage IV, which was in accordance with study by Costa *et al.* [4]. This can be attributed to delayed diagnosis. Hence more awareness needs to be raised among the general public, as early diagnosis equals good prognosis. When the site of occurrence of oral squamous cell carcinoma was correlated with pTNM staging, statistically significant correlation was achieved. Stage IV was more prevalent in retromolar trigone region and Stage III in buccal mucosa and tongue when compared with other sites. Advanced stage of OSCC associated with regional and distant metastasis is more common in retromolar region, buccal mucosa and tongue because of its close proximity to the lymph nodes and vascularity, the abundance of muscle could also lead to cancer metastasis more rapidly than other sites [37]. Limitation of this study is the small sample size, which could have influenced the result of the study. Study including a larger population size can be done in the future to come to a more comprehensive result.

Conclusion:

Within the limits of the study we conclude that 36.11% of the lesion occurred in buccal mucosa. Stage III pTNM was most prevalent in buccal mucosa and tongue and Stage IV pTNM in the retromolar trigone region by significant association with p value < 0.05. Thus, we report that Lesions occurring in the Retromolar region, tongue and buccal mucosa need to be given special attention, as they are associated with early metastasis and poor prognosis. Early diagnosis and appropriate treatment protocol will improve the quality of life for the patients.

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Conflict of interest:

The authors declare no potential of interest.

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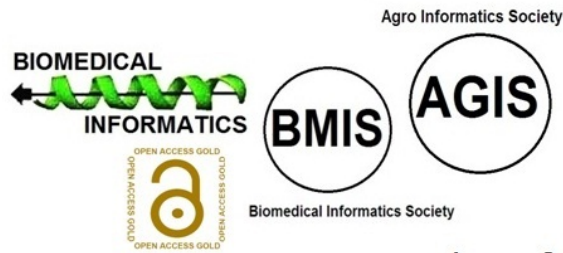
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