

## A Clinicopathological Evaluation of Oral Mucosal Lesions in Patients with Smokeless Tobacco Addiction at Tertiary Health Care Center

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### Abstract

The various smokeless tobacco habits practiced throughout the world include tobacco chewing and snuff dipping. Smokeless tobacco products have been linked to precancerous and cancers of oral cavity for long. The aim of the present study was to record various mucosal lesions associated with smokeless tobacco usage and to ascertain the prevalence of dysplasia in them by histopathological evaluation and to see the extent of disease seen among patients associated with a habit of smokeless form of tobacco.

**Materials and Methods:** 112 patients with the clinical diagnosis of smokeless tobacco related lesions were selected. A detailed description of the clinical presentation of the lesion was noted and the patients were subjected to incisional biopsy followed by a histopathological evaluation.

**Results:** 38 (33.93%) of the patients were confirmed cases of Carcinoma followed by 23 (20.54%) with OSMF and 20 (17.86%) with aphthous ulcers. Rest of the final diagnosis were distributed wide. We found that buccal mucosa was the most commonest site of lesion with the incidence of about 37.5% followed by tongue among 20.54%. Pre-malignant lesions was found among 74 (66.07%) patients included in our study where as 38 (33.93%) patients found with malignant lesions.

**Conclusion:** Thus, the study highlights the role of detecting oral mucosal lesions and screening high-risk patients on a regular basis and also reaffirms the importance of public education, stressing the risk factors for oral cancers.

**Keywords:** Smokeless Tobacco; Oral Mucosal Lesions; Premalignant Lesion; Oral Carcinoma

### Introduction

For hundreds of years, tobacco has been smoked, chewed, and inhaled in various Forms [1]. Smokeless tobacco (SLT) is a broad encompassing term that includes both chewing tobacco and snuff. Three types of Smokeless tobacco are commonly manufactured: loose-leaf chewing tobacco, moist snuff, and dry snuff [2]. Smokeless tobacco usage is influenced by various factors such as individ-

ual attitude, stress, workload, availability, advertising campaigns, etc. In case of mucosal lesions in the oral cavity, even the finest radiological examination contributes little, when compared to direct visualization techniques. Oral lesions usually manifest clinically as one of the following: change in colour and contour, swelling, ulcers, ulcero-proliferative, vesiculo-bullous or surface textural changes and at the histological level-inflammation, vacuolization, epithe-

lial atrophy, acanthosis, hyperkeratosis/hyperparakeratosis. The principle changes seen in the oral cavity related to Smokeless tobacco use include oral mucosal lesions (OMLs) typically defined as SLT-induced keratoses (STKs) and Tobacco pouch keratosis, recurrent aphthous ulcers, oral submucosal fibrosis, leukoplakia and proliferative verrucous leukoplakia, erythroplakia, oral lichen planus, dysplasia and oral cancer [3]. In India, use of tobacco is very common and culturally acceptable among both the genders. The large-scale morbidity and mortality caused by oral cavity cancers is largely preventable. Screening of oral cavity results in detection of precancerous lesions which may further progress in due course of time to invasive oral cancers. There is an urgent need to assess the efficacy and effectiveness of oral cancer prevention and screening in general and high-risk population.

### Aims and Objectives

The aim is to evaluate clinicopathology of oral mucosal lesions in smokeless tobacco addiction coming to tertiary health care center. Objectives are to study the pattern and presentation of different types of premalignant and malignant lesions among various subgroups of smokeless tobacco users, also to know the malignant transformation as a multistep process that should be approached from the clinicopathological standpoint and to Promote healthy oral hygiene and regular screening in asymptomatic smokeless tobacco users.

### Materials and Method

It is 2 year study was conducted in the ENT department of MGM hospital, a tertiary care referral center. Patients presenting to the outpatient department with oral mucosal lesions with addiction of amokeless tobacco were included in the study. A detailed clinical workup including personal history and habits were done. Patients were observed for resolution of the lesions; those which persisted despite treatment were biopsied to diagnose the underlying pathology. Patients were counseled about the potential of malignancy and advised complete abstinence from tobacco. Photo-documentation of the lesions was done.

After satisfying criteria total 112 number of patients were enrolled in this study for 2 years starting from December 2020 to December 2022. Both male and female genders above age of 16 years were included in study. After the approval of Institutional ethical committee approval, an informed written consent from the

patients were attained before taking up the study. The selected patients were questioned regarding their tobacco related habits which included the type, frequency and duration of tobacco usage. This was followed by recording case history and a detailed description of the clinical presentation of the lesion. The predesigned Performa was used to record the data. The standardized performa included patient's demographic details such as age, sex, educational status, occupational details and types of habit and frequency of habit. Further habit associated mucosal lesions were recorded. Once a suspicious lesion was found, further examination i.e. Biopsy was conducted under local anaesthesia. The collected data was entered in spread sheet.

### Results

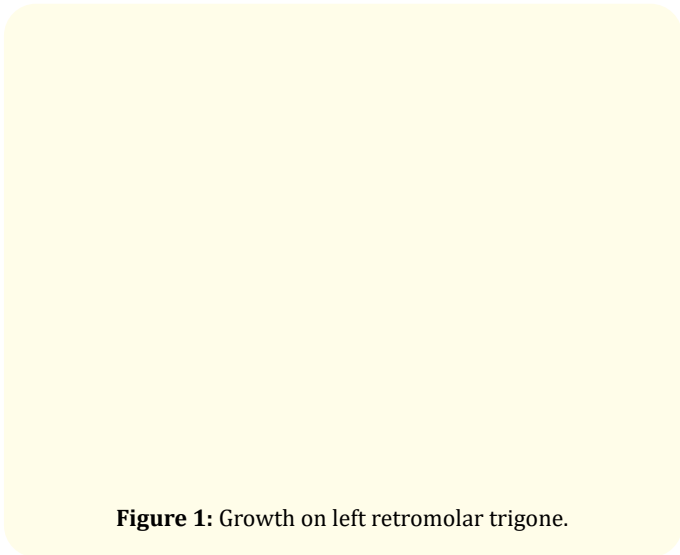
The present study was done to record various mucosal lesions associated with smokeless tobacco usage in relation to age, sex, duration and frequency of habit and to evaluate their histopathologic findings. In the total sample size of one hundred twelve(112) patients, 81 (72.32%) were males and 31 (27.68%) were females with a mean age group of 41-60 years. Co-morbidities were seen associated more in males (96%) than in females (4%). Oral submucous fibrosis was 24.11 times significantly more in males compared to females with  $p < 0.001$ .

In the total sample of 112 lesions, 38 (33.93%) were oral carcinoma (Figure 1), 23 (20.54%) were oral submucous fibrosis (Figure 2 and 3), 15 (13.39%) were aphthous ulcer, 10 (8.93%) were leukoplakia (Figure 4), 10 (8.93%) were smokeless keratosis (Figure 5), 9 (8.04%) were melanoplakia, 3 (2.68%) were erythroplakia (Figure 6), 2 (1.79%) were gingivitis and 2 (1.79%) were glossitis (Graph 1).

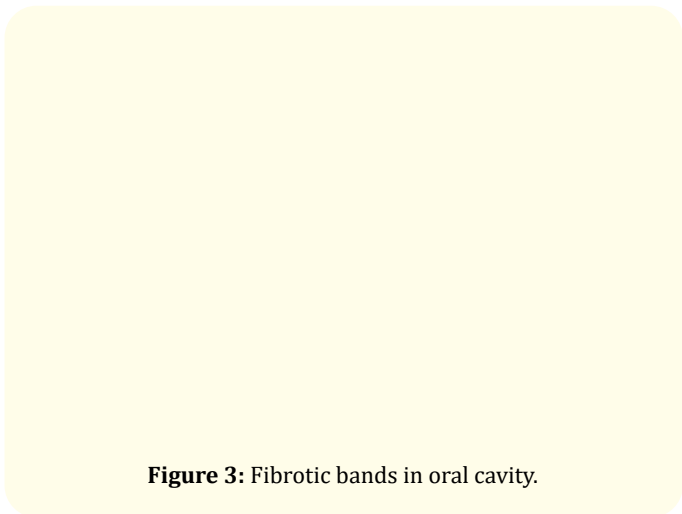
Of the 112 lesions, 42 (37.5%) were located on the buccal mucosa and 23 (20.54%) on the tongue. The other sites affected in the decreasing order of frequency were faucial pillar 17 (15.18%), retromolar trigone 9 (8.04%), palate 8 (7.14%), labial mucosa 8 (7.14%) and gingival 5 cases with a percentage of 4.45% (Graph 2). Oral carcinoma showed the highest occurrence in the buccal mucosa which shows more site predilection ( $p < 0.001$ ). Leukoplakia occurred predominantly in the buccal mucosa and commissural areas.

In the smokeless tobacco, the most common habit of consumption associated with the lesions was the use of betel quid with tobacco by chewing in 97 cases, dipping with spitting in 35 cases and 15 cases were of local application.

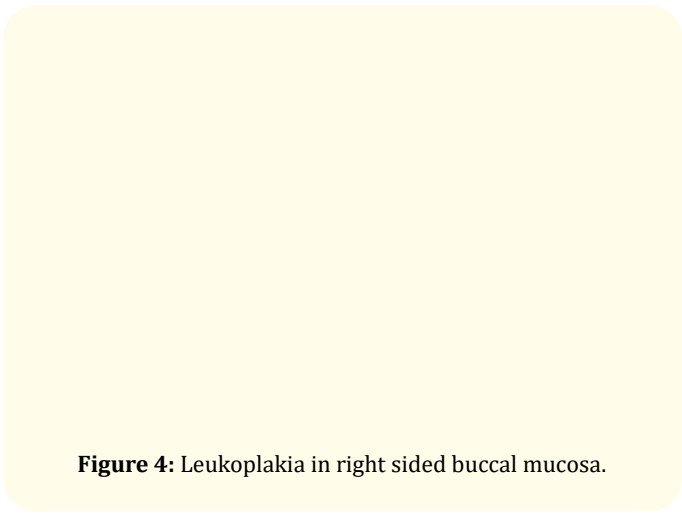
Out of the total size, 59 lesions (52.68%) occurred within 10 years duration of habit; 31 lesions (27.68%) between 11 and 20 years while the remaining 22 lesions (19.64%) occurred with the habit duration greater than 20 years. 62 lesions (55.36%) occurred with a frequency of 1 to 5 times of tobacco usage per day, 36 lesions (32.14%) occurred with the frequency ranging between 6 and 10 times per day and another 14 lesions (12.50%) with a frequency greater than 10 times per day.



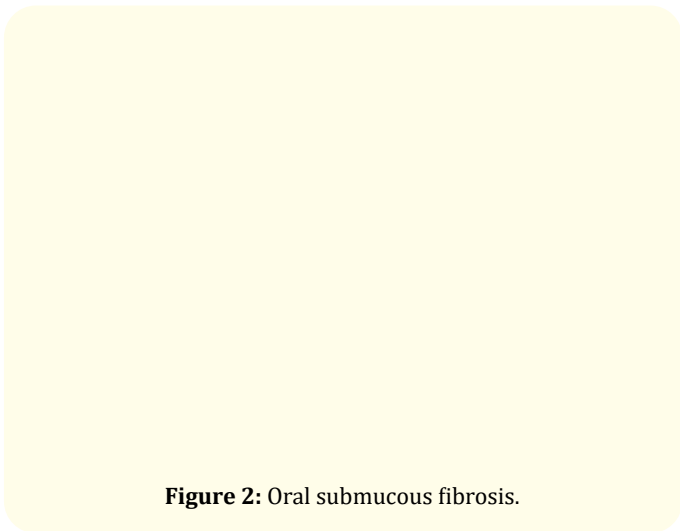
**Figure 1:** Growth on left retromolar trigone.



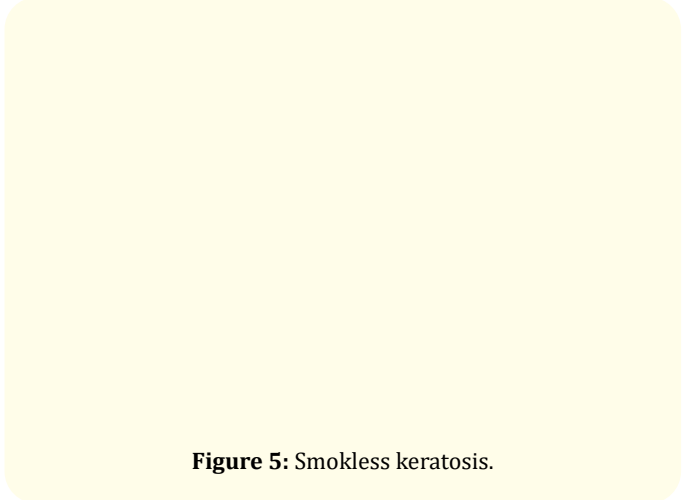
**Figure 3:** Fibrotic bands in oral cavity.



**Figure 4:** Leukoplakia in right sided buccal mucosa.



**Figure 2:** Oral submucous fibrosis.



**Figure 5:** Smokless keratosis.

**Figure 6:** Erythroplakia on right buccal mucosa.

## Discussion

As per the Global Adult Tobacco Survey conducted in the year 2009, almost 35% of adults in India are using tobacco in different forms [4]. Of these, 47.9% are males and 20.3% females. The average age at initiation was found to be 17.9 years. Nearly one-third, about 29.9% of adults were exposed to second-hand smoke at the workplace, 52.3% at home and 29% at other public places [5,6]. Smokeless tobacco (SLT) is available in many forms in India which has been widely used by all the social groups, including women, especially in rural areas. There is a wide spectrum of morbidity and mortality related to SLT use, both among men and women. Hence, the present study was conducted to evaluate the clinicopathology of oral submucosal lesions in patients with smokeless tobacco addiction presenting to tertiary care hospital and to analyse the risk pattern, distribution of lesions and their presentation.

In the present study, we observed that the incidence of study population aged between 41 to 60 years was higher, accounted for about 55 (49.11%) followed by 29 (25.89%). 22 (19.64%) were aged between 61 to 80 years, 5 (4.46%) aged  $\leq 20$  years and the rest one patient was aged more than 80 years. Similarly, in Yuvaraj BY, *et al.* majority of the patients were aged between 15 to 24 years (255/829), followed by 25 to 34 years and 35 to 44 [7]. Another similar study by Ramani VK, *et al.* had reported that the average age of their patients was  $54.9 \pm 12.5$  years. The higher incidence of study samples in Ramasamy J, *et al.* were in 4<sup>th</sup> decade in group A. Those in Group B and C were in their 6<sup>th</sup> decade [5,8]. where A: only chewing tobacco, Group B: Only smoking and Group C: Both chewing and smoking.

Out of 112 study population, there were 81 (72.32%) and 31 (27.68%) males and females. Yuvaraj BY, *et al.* had conducted the similar study but among the woman population only. Whereas in Ramani VK, *et al.* 94% of them were males and only 6% females observed among the study population. Ramasamy J, *et al.* had found that 88.8% of their study population being males and 11.2% of them were female. Group B and C had only male patients [5,7,8].

50 (44.64%) had presented with difficulty swallowing or mouth opening followed by 19 (16.96%) with ulcers. 15 (13.39%) had developed the swelling and 9 (8.04%) complained of growth. 7 (6.25%) each had observed to be pain and lesions in the mouth. 1 (0.89%) each had bad breath, scarring and deviation of the tongue.

**Graph 1**

Muthukrishnan A, *et al.* explains that Lateral margins of tongue and floor of mouth are the high-risk sites due to pooling of tobacco fluid in this horse-shaped area of the mouth. In later stages, the limitation of mouth opening, rigidity of tongue and metastasis to lymph nodes are comparatively common. Buccal carcinoma with extraoral fungation are also expected lesions [9].

Based on the data obtained, we observed that 42 (37.5%) of the patients had developed lesions over buccal mucosa followed by 23 (20.54%) over tongue. 17 (15.18%) had developed over faucial pillars. 9 patients at RMT, 8 each in mouth and palate, 5 patients in GBS. Whereas in Ramasamy J, *et al.* Group A patients: OSMF and chewer's mucositis were found to be more compared to other lesions. Male patients had a higher incidence of lesions than females. 55 patients were presented with OSMF. Tobacco pouch keratosis was seen among 7 individuals, Lichenoid reaction was seen among 7 patients, OSCC was seen among 6 individuals, Lichen planus and candidiasis were found among one patient, respectively [5].

### Graph 2

Among the patients in Group B, smoker's palate in 17 and smoker's melanosis in were found to be the most predominant lesions evident among this group, followed by leukoplakia and combined lesion of leukoplakia with smoker's melanosis among 6 each were seen. Central papillary atrophy of the tongue, candidiasis and leukoedema were also seen with lesser incidence. Among the mixed habit which was designated as C Group in their study, OSMF was found among 10 patients and it was the higher incidence and other individual lesion like smoker's melanosis among 6, carcinoma 5, leukoplakia in 4 patients, tobacco pouch keratosis and lichen planus were also seen in one each. Combined lesions like smoker's melanosis with leukoplakia, OSMF with leukoplakia, smoker's melanosis and leukoplakia along with OSMF, smoker's melanosis with OSMF were also seen [5].

Binmadi N., *et al.* who had aimed at similar outcome found that SLT lesions in the oral cavity were usually focal lesions, accounting for about 76.3%. The most preferred placement site by SLT users was the mandibular posterior vestibule [10].

Of all the clinical diagnosis, carcinoma was the frequent finding among 38 (33.93%) patients included in our study followed by 23 (20.54%) with fibrosis. 13 each were diagnosed with inflammation and ulcers, 10 patients had smokeless keratosis, 10 patients with leukoplakia and 9 with melanoplakia. 15 patients were found to be having aphthous ulcers and 3 patients had erythroplakia. Straif, *et al.* while analysing the pathophysiology of oral lesions due to SLT, verified with the evidences that SLT components could affect human epithelial cells and fibroblasts by increasing the production of reactive oxygen species, cell turnover, collagen synthesis, and gingival blood flow or DNA damage, which causes oral mucosal changes and may progress to SCC. Hence, the observed lesions in this present clinical trial [11].

With the above discussion we could observe that the oral lesions have wide clinical and morphological variation. Hence, the present study has been one of the reliable evidence for the clinical as well as morphological presentation of oral lesions among the patients with smokeless tobacco consumption at our epidemiological area.

### Conclusion

Incidence of smokeless tobacco associated lesions was higher among the patients aged between 41 to 60 years with overall prevalence of male gender. 97 (86.61%) had habit of chewing as the mode of Smokeless tobacco followed by 35 (29.47%) dipping with spitting. 55.36% (62/112) patients were consuming tobacco for  $\leq 5$  times/day. Majority of the patients were consuming tobacco for  $\leq 10$  years accounting for about 59 (52.68%). Buccal mucosa was the most common site of lesion (37.5%) followed by tongue among 20.54%. carcinoma was the frequent finding among 38 (33.93%) patients included in our study followed by 23 (20.54%) with oral submucous fibrosis. Higher incidence of oral lesions were positively associated with increased duration of consumption of SLT. We concluded that the incidence of oral mucosal lesions being carcinomatous, among the patients with habits of SLT is not negligible, hence, screening all the patients with habitual history of SLT consumption is must in order to determine the type of lesion as well as early treatment among them.

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