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Original Research Article

Chronic oral non-healing ulcer with a history of tobacco consumption leads to malignancy: A prospective cross-sectional study in Western Maharashtra, India

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ABSTRACT

Background: Oral ulcerations are more frequently seen in day-to-day dental practice nowadays. These ulcers are usually ignored in initial presentations. The oral mucosa has a good healing prospectus and hence nonmalignant lesions heal fast. The oral ulcers that don't heal form a significant number and are presented to dental clinics for evaluation. Usually, oral ulcers with a habit of tobacco consumption are frequently encountered. Tobacco has been traditionally used in India in various forms like smoking and chewing. But nowadays tobacco has been mixed with many adjuncts and used. They are commercially sold as gutkha pouches. Usually, individuals are exposed to tobacco at a very young age and eat for a longer duration of lifespan (i.e. start young and eat old). This has led to alteration in the oral mucosal defense mechanism and chances for potential malignant conversion are enormous. India has the highest incidence of oral cancer in the world and tobacco is one of the major cause of oral cancer. Hence, in this study, we evaluated patients reporting with chronic oral non-healing ulcers and having tobacco habits for their malignant conversion.
Materials and Methods: Patients reporting to Sharada Dental Hospital Miraj during a period of 5 years from 2017 to 2022 were included in the study. A total of 250 patients with chronic nonhealing ulcers belonging to the semi-urban district of Sangli in Western Maharashtra (India) were studied. All these patients had a positive tobacco consumption history and presented with oral non-healing ulcers with a duration of more than 2 months. An incisional biopsy was taken from the suspected lesion and sent for histopathological evaluation.
Results: A total of 250 patients with tobacco habits were presented with oral non-healing ulcers during the study period. A biopsy was performed for all suspected cases. Out of 250 patients, 201 patients had Squamous cell carcinoma and the other 49 were hyperkeratosis, inflammatory fibrous hyperplasia, irritational fibroma, Pyogenic granuloma, and angiomatous hyperplasia. Among 201 OSCC cases, 162 (80.59%) were males and 39(19.4%) were females.
Conclusion: From our study, we can say that chronic oral non-healing ulcer with a positive tobacco consumption history is more likely to be a squamous cell carcinoma.

1. Introduction

A century ago, malignant tumors were considered as wounds that do not heal. Non-healing ulcers and oral

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pain were the most common reasons for the first clinical examination, very often in an advanced tumor stage. Non-healing ulcers associated with persistent inflammatory factors have been previously correlated with the development of Oral Squamous Cell Carcinoma (OSCC).[1–3]

India has the highest incidence of oral cancer in the world and tobacco is one of the major cause of oral cancer. Because of the health risks and healthcare costs, tobacco use has been framed as an epidemic in itself.[4] Tobacco has been traditionally used in various forms like smoking and chewing. The most prevalent form of tobacco use in India is smokeless tobacco and commonly used products are Mawa, khaini, gutkha, betel quid with tobacco, and zarda. Smoking forms of tobacco used are bidi, cigarette, and hookah. The peer effect of eating in small groups is also noted in the Indian population.[4] Diagnosis of oral ulceration can be challenging and requires careful clinical examination and history taking. It is important to understand that oral manifestations may represent part of a larger problem.[5]

A biopsy is also required of those oral mucosal surfaces that show important and persistent color changes that become very white, red, or pigmented, or changes in appearance like cracking, proliferation, or ulceration, with deep-lying hard masses detected upon palpation. Also, evaluation is required of premalignant mucosal lesions or states such as oral lichen planus or leukoplakia, in persistent atrophic-erosive areas.[6] A biopsy may be indicated to establish a true diagnosis. Any unexplained ulcer found in the oral cavity that does not resolve in 2 weeks should be evaluated microscopically.[6] Hence the present study was designed to determine the prevalence of oral cancer in patients presenting with chronic oral nonhealing ulcers.

2. Materials and Methods

Patients reporting to Sharada Dental Hospital Miraj during a period of 5 years from 2017 to 2022 were included in the study. A total of 250 patients of both sexes with chronic nonhealing ulcers belonging to the semi-urban district of Sangli in Western Maharashtra (India) were the study sample. Patients having a nonhealing ulcer with a duration of more than 2 months were included in the study. All these patients had a positive tobacco consumption history in the form of either smoking or chewing form (more than 5 years). An informed consent was taken from the patients for participation in the study.

After a thorough clinical examination of the oral cavity, a history of tobacco consumption was noted in specially designed proforma, which included demographic details, tobacco consumption history its type, frequency, quantity, and duration of consumption. An incisional biopsy was taken from the suspected region and sent for histopathological evaluation.

3. Result

In our study, incisional biopsies of 250 patients with non-healing ulcers were performed. Out of which 201 cases were positive for squamous cell carcinoma. The most frequent lesions observed were well-differentiated squamous cell carcinoma 182 (90.54%) followed by 17(8.45%) moderately differentiated, 2(0.99%) poorly differentiated squamous cell carcinoma respectively (Chart 1). The series shows a slight male predominance of 162(80.25%) males and 39 (19.39%) females (Table 1). The age range was 16-87 years with 53.7 mean age and a standard deviation of 12.1 years. The highest frequency of the disease was among the age group of 31–60 years (Table 2). Regarding the location, the most frequent lesions were associated with the mandible then the maxilla. Of the 201 cases 46 (22.88%) cases occurred in the right lower posterior alveolus and 77 (38.30%) left lower posterior alveolus of the mandible. Right upper posterior alveolus 7 (3.48%) and left upper posterior alveolus 13 (6.46%) of maxilla respectively. The left lateral border of the tongue 14(6.96%) showed more cases compared to the right lateral border of tongue 9(4.47%) (Table 3). The lesion on the hard palate was seen only in males 3 (1.85%) (Table 4).

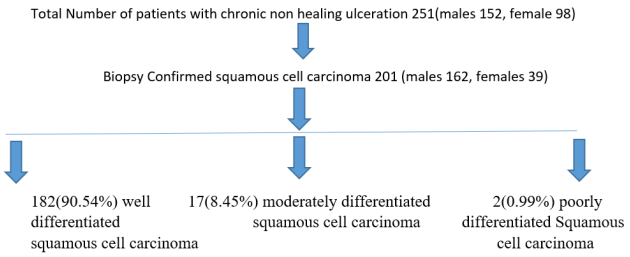

Chart 1: Distribution of study samples

Figure 1: Chronic nonhealing ulcer on buccal mucosa

Table 1: Distribution of lesions with the gender

Name of the Lesion	**No in males**	**No in females**
Well differentiated Squamous cell carcinoma	146 (72.6%)	36 (17.91%)
Moderately differentiated Squamous cell carcinoma	15 (7.16%)	2 (0.99%)
Poorly differentiated Squamous cell carcinoma	1 (0.49%)	1 (0.49%)
Total	162 (80.25%)	39 (19.39%)

Table 2: Distribution of lesions according to the age group

Age group	**Well differentiated Squamous cell carcinoma**	**Moderately differentiated Squamous cell carcinoma**	**Poorly differentiated Squamous cell carcinoma**	**Total**
<30	1 (0.54%)	1 (5.88%)	0	2 (0.99%)
30-60	135 (74.1%)	11 (64.70%)	1 (50%)	147 (73.13%)
>60	46 (25.27%)	5 (29.41%)	1 (50%)	52 (25,87%)
Total	182	17	2	201

Table 3: Distribution of lesions according to the location

Location	**No of lesions (Percentage)**
Right lower posterior alveolus	46 (22.88%)
Left lower posterior alveolus	77 (38.30%)
Right upper posterior alveolus	7 (3.48%)
Left upper posterior alveolus	13 (6.46%)
Right lateral border of tongue and floor of mouth	9 (4.47%)
Left lateral border of tongue and floor of mouth	14 (6.96%)
Left buccal mucosa	11 (5.47%)
Right buccal mucosa	12 (5.97%)
Lower labial GBS	9 (4.47%)
Hard Palate	3 (1.49%)
Total	201

Table 4: Distribution of lesion location according to the gender

Location	**Males**	**Females**
Right lower posterior alveolus	40 (24.69%)	6 (15.38%)
Left lower posterior alveolus	64 (35.90%)	13 (6.46%)
Right upper posterior alveolus	5(3.08%)	2 (0.99%)
Left upper posterior alveolus	6 (3.70%)	7 (4.32%)
Right lateral border of tongue and floor of the mouth	8 (4.93%)	1 (0.49%)
Left lateral border of tongue and floor of the mouth	10 (6.17%)	4 (1.99%)
Left buccal mucosa	8 (3.98%)	3 (1.49%)
Right buccal mucosa	10 (4.97%)	2 (0.99%)
Lower labial GBS	8 (0.49%)	1(0.61%)
Hard Palate	3 (1.85%)	0
Total	162	39

4. Discussion

Any trauma and inflammation of the oral cavity heal rapidly.[1,4] However, once the ulcer takes the chronic stage its healing capacity decreases thereby causing various complications. Oral squamous cell carcinoma (OSCC) is a well-known malignancy that accounts for more than 90% of all oral cancers. Pain is a common symptom in oral cancer patients, representing 30–40% of their main complaints. Although pain is the main symptom, it usually arises only when the lesions have reached a remarkable size, and is the time when the patient requests medical assistance. Thus, early carcinomas often go unnoticed because they are asymptomatic. The commonly identifiable etiological factors for OSCC were the use of pan-tobacco chewing, smoking, and alcohol. Tobacco and areca nut products are major risk factors implicated in oral cancer with numerous studies pointing to their role in the carcinogenic mechanism. The risk is directly related to the duration, frequency, and form of tobacco/pan-tobacco usage. Oral ulcers leading

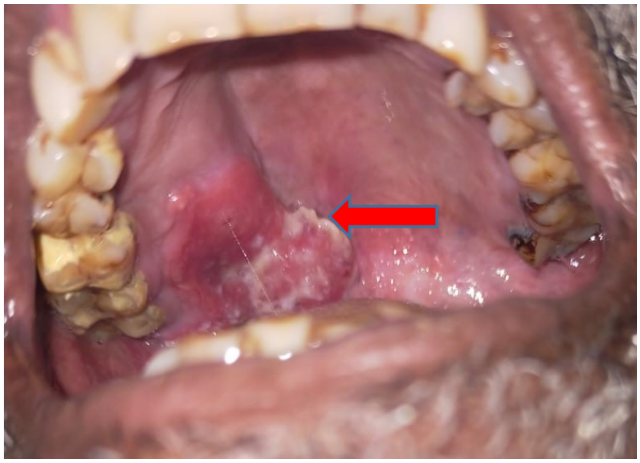

Figure 2: Chronic nonhealing ulcer on hard palate

Figure 3: Chronic nonhealing ulcer on buccal mucosa

to mass disfigurement and unaesthetic appearance have been noted in many of our cases, but still, this has not motivated patients to quit tobacco. Many of our cases were still having the habit of tobacco consumption even after knowing they had oral non-healing ulcers. This is not just mere ignorance but a hazardous addiction to tobacco. From our study, we can say that a chronic non-healing oral ulcer with a positive tobacco consumption history is more likely to be a squamous cell carcinoma. These patients were further treated with surgical management. All patients are under regular follow-up. However, the question arises regarding preventing this transformation of oral ulcers. As per the literature review, oral mucosa has a good healing capacity. Any trauma and inflammation of the oral cavity heal rapidly. But once the ulcer takes the chronic stage its healing capacity decreases thereby causing various complications.[2,3,7]

In the present study 147 (73.13%) lesions were present among the age group of patients between 31 and 60 years, whereas a study conducted by Gurunathan et and Satorres et al. reported that 49% of the lesions were present among the patients in the age range 40–60 years.[8,9] Our results were almost similar to this study as we encountered only 2 (%) cases in an age range of less than 40 years. Oral cancer is considered to be a disease of old age. The predominance in age above 40-60 years as be attributed to longer exposure to the causative agent.

The relationship between oral ulceration and tobacco has been studied precisely. Tobacco has been proven to be carcinogenic. Tobacco and its products are investigated and many studies have reported their malignant potential.[1,4,10,11] There are more than 50 different tobacco brands in the Indian market. These are ready-made pan mixtures developed by local tobacco companies in Southeast Asia and India.[10,11] We have noted in our study that tobacco was consumed in the form of plain chewing or mixed with many ingredients to form mawa, these mixtures have synoptic effects. In the Indian subcontinent, tobacco mixed with many ingredients called MAWA is consumed by many patients belonging to poor socio-economic sectors. Even commercially available tobacco mixed pouches called Gutkha consumption is rampant. Gutkha has a big market. These pouches are small ready-made mixtures with attractive packaging, inexpensive and easily available to the general public, and therefore their consumption is enormous. They are highly advertised and marketed and frequently claimed to be safe products.

Male predominance of 80.25% was noted in our study. Many similar studies by Gurunathan et al. and Satorres et al. Hatice Hosgor et al. have shown a similar gender prevalence.[8,9,12] This could be attributed to the tobacco habit being more practiced in males. These have created addiction and caused havoc in public life. Several other recent studies have shown an increase in the number of affected females, with a mean male: female ratio lower than 2:1, probably due to changes in social and daily activities associated with modern women's social profile and way of living.[13,14] The incidence of oral cancer in patients consuming tobacco has been noted in all our cases. A similar observation is found in a study conducted by Archana A et al. and X Jiang et al.[12,15]

Most of the cases in our study showed oral cancer involving the lower alveolus (22.88% right and 38.30% left lower posterior alveolus of mandible). Ulaganathan, et al. named oral cancer involving lower alveolus (36.1%) along GBS and Retromolar tragone as Indian Oral Cancer.[8]

The incidence of this is high in all the studies.[7,8,16] This involvement is considered mainly due to the more likely placement of quid on this site. The habitual confinement of this type of activity has led to the alteration of the Oral mucosal defense mechanism.

The tongue forms an important organ for speech. Even a sharp tooth cusp or any small sharp object causes intolerable pain.[3] The tongue is considered to be the more sensitive organ. In our study, we found (6.96%) on the left and (4.47%) on the right lateral border of the tongue, and a few tongue ulcers were innocuous and diagnosed only after biopsy. But in a study done by Fábio Ramôa Pires, Amanda Barreto Ramos et al showed most common affected sites (37%) were the border of the tongue, alveolar mucosa/gingiva (20%), and floor of mouth/ventral tongue (19%).[13] However, few of our cases had large proliferative growth. Altered speech along with difficulty in eating food had not stopped patients from consuming tobacco.

There were only a few male cases 3 (1.85%) involving palate in our study. Even many studies done in the Indian subcontinent report fewer cases involving palate.[16–20] The literature search reveals smokeless form of tobacco is less predominant in palate cancer cases.[11] The habit of smoking was less reported in our cases compared to the chewing habit.

Most of our patients were aware of having a chronic ulcer which is not healing in nature. They also know the potential conversion of this type of lesion into malignancy. Even a few patients self-diagnosed themselves as having Oral Cancer. Few of our patients considered this a stigma in society and thus avoided its examination and further treatment. All these patients were counseled and were sent for further surgical management.

Nowadays leading film actors who are idols for the masses are seen promoting tobacco company advertisements, this type of practice is drawing young people to the world of tobacco. It's a form of Chakravuha (Vedic Term which depicts only entry towards death with no road to exit). Hence, tobacco consumption once started will lead to addictions, which might lead to oral cancer.

5. Conclusion

The findings in the present study reveal a high prevalence of oral cancer in patients presenting with chronic oral non-healing ulcers. Early diagnosis of these non-healing ulcers is the most important factor for improving patient's survival rates and minimizing the extent of surgical requirements. Tobacco either in chewing or smoking form has a high chance of converting nonhealing oral ulcers into malignancy. Hence, close follow-up and systematic evaluation are required in patients having a history of tobacco consumption. Education about the fatal effects of tobacco consumption is necessary at a broader scale. Tobacco consumption should be discouraged and mass awareness programs in school education programs, social reforms and habit-breaking NGOs, deaddiction centers, and tobacco cessation centers should be promoted.

6. Ethics Approval

Informed Consent taken from each patient.

7. Source of Funding

None.

8. Conflicts of Interest

There are no conflicts of interest.

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