

Retrospective analysis of oral squamous cell carcinoma cases at a tertiary care hospital in Navi Mumbai: our experience

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Abstract

Aim: To analyze the prevalence of oral squamous cell carcinoma (OSCC) and the associated factors in a tertiary care hospital at Navi Mumbai over a period of 5 years.

Method: A retrospective study of 200 cases which includes operated cases of OSCC at Tertiary Care Hospital, Navi Mumbai from January 2016 to Jan 2021 was performed. Data of patient’s age, gender, site of

primary lesion, risk factor, histopathological differentiation, reconstruction modality and follow up data was collected and analyzed.

Result: OSCC in our study commonly belonged to age group of >50 years (45%) with male to female ratio of 2:1.3. Most common site involved was mandibular alveolus (62.5%) followed by buccal mucosa (17.5%), smokeless tobacco was the most common risk factor associated. Chronic dental trauma was associated with carcinoma of lateral border of tongue and buccal mucosa. Majority of OSCC belonged to well differentiated group (58.5%). In a follow up of 106 patients 14 deaths were noted. Most common site of metastasis was lungs and spine.

Conclusion: The study was carried out in rural area of Navi Mumbai. It provides a valuable data on prevalence, prognosis of OSCC and also on relation of risk factor with the site of primary lesion. Prevention and early diagnosis remains the key to reduce the burden of OSCC.

Keywords: Oral squamous cell carcinoma, tobacco, dental trauma.

Introduction

Head and neck cancer grouped together is the sixth most common cancer in the world. Squamous cell carcinomas are the most prevalent form of oral malignancies. (ICD10: C06.9)[1]

Table 1: Prevalence of oral squamous cell carcinoma at various sites of oral cavity.

Age / Site	Mandibular Alveolus	Tongue	Buccal Mucosa	Maxillary Alveolus	Lip
20-30 years	7	2	1	-	-
31-40 years	21	9	4	2	2
41-50 years	43	9	10	1	1
>50 years	54	9	20	2	3
Total	125	29	35	5	6
%	62.5%	14.5%	17.5%	2.5%	3%

20 per 100000 people in India are affected by oral cancer which accounts for 30% of all new cases annually.[2]

Incidence rate of Oral squamous cell carcinoma varies widely by geographic location.[3] Etiological factor for oral cancer mainly includes tobacco (smoking or smokeless form), alcohol, chronic irritation from a fractured tooth or a ill-fitting dentures, rare risk factors include dietary factors, human papilloma virus (HPV) infection, genetic factors etc.[4]

This study was conducted at rural area of Mumbai at a Tertiary care Hospital with an objective to evaluate the prevalence of oral squamous cell carcinoma (OSCC) and co-related clinical, histopathological and follow up data.

Material and Method

Data of total number of cases operated at a Tertiary care hospital in Nerul Navi Mumbai was reviewed from January 2016 to January 2021. Retrospective study was carried out on 200 clinically diagnosed and histopathologically confirmed cases of Oral squamous cell carcinoma. Patient not willing for biopsy and inoperable cases were excluded. . Statistical analysis of factors like age, gender, site of primary lesion, associated risk factor, histopathological differentiation, reconstruction modality and prognosis of the patient was carried out. The study is approved by Institutional ethical committee board.

Table 2: Site wise classification of associated risk factor

	Mandibular Alveolus	Tongue	Buccal Mucosa	Maxillary Alveolus	Lip	Total
Tobacco (smoking or smokeless)	83	15	19	5	5	127
Tobacco (smoking or smokeless) + Alcohol	19	-	6	-	1	26
Tobacco + Arecanut	9	-	9	-	-	18
Multifactorial (tobacco+ alcohol+ arecanut)	14	-	-	-	-	14
Only localized trauma	-	5	1	-	-	6
Localized trauma +Tobacco	-	9	-	-	-	9

Table 3: According to the Reconstruction Modality.

Site/Recons	Primary Closure	Loco-Regional Flap	Microvascular Free Flap	Skin Graft
Lip	3	2	1	-
Tongue	18	-	10	1
Mandible alveolus	-	102	23	-
Buccal mucosa	14	13	1	7
Maxilla	-	1	-	4

Table 4: According to the Histological Differentiation of Cases.

	Mandibular alveolus	Maxillary alveolus	Buccal mucosa	lip	Tongue
Well differentiated	70	4	20	4	19
Moderately differentiated	50	1	14	2	10
Poorly differentiated	5	-	1	-	-

Result

According to the study of 200 cases considering their age, gender, site, risk factor, histological differentiation, reconstruction modality and prognosis. Males were (70%) more commonly affected than female (30%). Highest prevalence of oral squamous cell carcinoma was seen at age group above 50 years (45 %) followed by 41-50 years (31.5%). [Table 1] The study classifies the anatomical distribution of involved area as follows: Carcinoma of Mandibular alveolus, buccal mucosa, Maxillary alveolus, tongue and lip. The common risk factors listed are Tobacco (smoking or smokeless), Alcohol, arecanut

chewing and presence of sharp tooth causing localized trauma. Most common affected anatomical site was Mandibular alveolus (62.5%) followed by buccal mucosa (17.5%), tongue (14.5%), lip (3%) and maxilla (2.5%). [Table 1] Out of 125 cases of carcinoma of mandible (72.8%) were males (27.2%) and were females. Most common age group that was affected was above 50 years (43.2%). Most common risk factor was tobacco (smoking and smokeless form) accounting for 83 cases. [Table 2] In which Mishri application was more common in females and alcohol consumption was more common in males. Tobacco with alcohol consumption

accounted for 19 cases.[Table 2] 81.6% cases of CA mandibular alveolus were reconstructed using loco-regional flap most commonly PMMC flap. 18.4% cases were reconstructed using free flap.[Table 3] Second most common site affected was Buccal mucosa total of 35 cases of ca buccal mucosa accounted for (17.5%) of all cases out of which (60%) male and (40%) female were affected. Most common age group that was affected was between >50 years (57.14%).[Table 1] Most common risk factor was tobacco chewing however 9 cases should habit of aracanut chewing along with tobacco. 1 case showed localized trauma by sharp tooth edges to be the only risk factor, with no other habits present.[Table 2] 40% cases of CA buccal mucosa cases were reconstructed with primary closure, in 20% cases skin graft was used. 34.28% cases were reconstructed using nasolabial flap and only in 1 cases Radial forearm flap was used.[Table 3] Carcinoma of Tongue accounted for (14.5%)of all cases. Males (79.31%) were more commonly affected the females (20.68%). Equal distribution was seen between age group 31-40 years 41-50 years and above 50 years.[Table 1] Most common risk factor remains tobacco however 5 cases should only localized trauma by sharp tooth as a risk factor with no other habits.[Table 2] 31.03% cases were reconstructed using radial forearm flap, only 1 case was reconstructed using ALT flap rest cases primary closure was done.

[Table 3] Fourth most common affected site was lip with 6 cases showing male (66.66%) more commonly affected then females (33.33%). Most common age group affected was above 50 years (50%).[Table 1] 2 cases were treated using karapandzic flap, only 1 case was reconstructed using radial forearm.[Table 3] Fifth most common site was carcinoma of maxillary alveolus (2.5%), male more commonly affected then female. With equal amount of cases present in age group 31-40 years and above 50

years. 80% reconstruction was using skin graft and obturator only 1 cases was treated using temporalis flap reconstruction.[Table 3] Both the sites showing tobacco to be the most common etiology.

Discussion

Oral and pharyngeal cancer grouped together is the sixth most common cancer in the world. Globally the annual estimated incidence is around 275000 for oral cancer.[5] Oral cancer rank among the top three type of cancer in India. Age-adjusted rates of oral cancer in India are high, that is 20 per 100,000 population and accounts for over 30% of all cancers in the country.[2] A variation in the site of oral cancer is seen according to different geographic location due to difference in prevalence of risk factor.[3]

This retrospective study of 200 cases includes 140 male cases and 60 female cases shows male are more commonly affected then females. Which is similar to worldwide incidence of OSSC where males are more affected than female. [6] However in a study conducted by (Muscat JE, Riche JP, Thompson S, Wynder EL, 1996) found there was increased risk among women with the habit of tobacco smoking or chewing and alcohol for developing oral cancer intake when compared to men with same habits.[7] Older women with Hormonal changes, nutritional deficiencies of vitamins and minerals are at increase the risk of oral cancer.

In a study in Andrapradesh population by J.J. pindborg et al (1971) Female to male ratio was 1.7:1 showing that females were more commonly affected then males due to the habit of smoking 'Chutta' (reverse smoking) i.e. the burning end is inside the mouth.[8] In a study at Lonhi Maharashtra by Parul tendon et al. (2017) incidence was more common in male than female.[9]

According to a study by franchiseschi s et al.(2000) in Bangalore, the incidence rate of oral cancer in women

exceeded that of males. Most of the cases belong to age group >50 years of age.[10]

According to this study the most common site involved was the mandibular alveolus (62.5%) followed by buccal mucosa (17.5%), tongue (14.5%) and lip (3%). Least involved site was maxillary alveolus and palate (2.5%). Posterior mandible was most commonly involved. Shenoi et al. (2012) in their study also found mandibular alveolus to be the most common site involved.[11] However a study in Allahabad by Ravi Mehrotra et al.(2008), tongue was reported as the most common site affected.[12] According to a study Epidemiology of oral cancer in Asia by Rao et al. (2013) tongue is the leading site among oral cancer in India.[13]

Tobacco chewing stays the most common risk factor for oral cancer according to the study. Tobacco product mainly includes smokeless and smoked form.[14] Smokeless tobacco mainly includes three types chewing tobacco, moist snuff and dry snuff.[14] Toxicity and psychotropic effect of tobacco is increased when SLT are combined with betel leaf, sliced aracanut and lime. Panparak, Mawa, Gutka, kharra khainni, and Zarda are examples of a mixture of powdered tobacco, lime and aracanut.[14] Chewing of the areca nut (betel quid) releases large amounts of reactive oxygen species which also act as genotoxic agents involved in oral cancer associated with the use of chewing tobacco.[14][15]

In this study 18 cases consumed tobacco with aracanut, 26 cases consumed tobacco with alcohol and 14 cases showed exposure to all three risk factors i.e. tobacco aracanut and alcohol. Use of tobacco and alcohol shows higher risk of OSSC. Mishri application was found more common in females and use of alcohol with tobacco was more common seen in males according to this study. Alcohol dehydrates cell membrane which allows carcinogens in tobacco to permeate the oral tissue.[16]

Individual who are alcohol addicts generally show nutritional deficiency which can also reduce body's ability to use antioxidants to prevent cancer formation.[16] Reactive oxygen and nitrogen species formed can also cause damage to cellular components.[17]

Localized trauma caused by sharp edge of tooth is also one of the common risk factor encountered in the study specially associated with carcinoma tongue and buccal mucosa total 6 cases were associated with only localized trauma as a risk factor with no other habits. According to literature chronic trauma can cause cancer by 2 mechanism, either by causing DNA damage or by releasing inflammatory mediators like TNF, cytokine and PG which can result in genetic changes causing DNA damage, prevention of apoptosis, inability to repair etc. resulting to cancer.[18] A retrospective study in Australia by (Perry BJ, Zammit AP, Lewandowski AW, Bashford JJ, Dragovic AS, Perry EJ, et al; 2015) also suggested lateral border of tongue to be the most common site associated with chronic dental trauma [19].

Majority of the reconstruction was done using a loco-regional flap (59%) in which PMMC flap (44%) was most commonly used for reconstruction of oral squamous cell carcinoma involving alveolus. Radial forearm was the most common free flap used for reconstruction of Ca tongue followed by buccal mucosa and alveolus.

Most of the cases in the study belonged to well differentiated SCC group (58.5%) followed by moderately differentiated group (38.5%). Only 6 cases of poorly differentiated SCC were present and were majorly associated with buccal mucosa and mandibular alveolus with SLT as a risk factor. A follow up of 106 patients was obtained due to inability to follow up with patient residing out of the state. A mortality of 13.20% i.e. 14 cases was observed. From 14 cases, post op sepsis was seen in 8 cases, distant metastasis was seen in 4 cases (commonly

lungs and spinal metastasis) and 2 cases of cardiac arrest. In follow up of 106 patients mortality was most common in well differentiated group i.e. 7 cases, 6 cases belonged to moderately differentiated group and only 1 case of poorly differentiated group was noted. 1 case reported with intra-operative complication of peronia-magna which was planned for reconstruction with free fibula graft. Most common post-operative complication includes gaping and infection of neck suture line and in severe cases presence of Oro-cutaneous fistula or communication.

Conclusion

The retrospective study has summarized cases of OSCC operated in Tertiary care hospital at Navi Mumbai and it highlights the following points Most of the cases belong to age group >50 years of age (45%) Males are more commonly affected than females. Carcinoma of mandibular alveolus was more commonly found followed by buccal mucosa associated with smokeless tobacco as the most common risk factor. Risk factor associated play a crucial role in understanding the site of the primary lesion. Use of aracanut along with tobacco most commonly reported carcinoma of buccal mucosa alone or along with carcinoma of alveolus whereas chronic dental trauma as mentioned was most commonly associated with carcinoma of lateral border of tongue and buccal mucosa.

Alcohol increases the absorption on of Carcinogens from the tobacco, few cases of Carcinoma of mandibular alveolus along with floor of mouth was encountered with use of alcohol along with tobacco. Majority of OSCC belonged to well differentiated group (58.5%). In a follow up of 106 patients 14 deaths were noted. Most common site of metastasis was lungs and spine.

Prevention and early diagnosis of OSSC is key, reduction on the exposure to risk factor can be achieved by increasing awareness and education among the low socioeconomic group and by increasing restriction on

consumption of tobacco aracanut and alcohol. Beside this regular dental checkup plays a crucial role in early detection of lesion, counseling patient in stoppage of habit using nicotine replacement therapy and addressing chronic dental trauma at early stage.

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