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Occurrence of Oral, Oropharyngeal and Laryngeal Cancers in Saurashtra Region, Gujarat, India A study of 1,006 cases of Oral Lesions

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Abstract

Background: Cancer of the oral region is a major health problem in India and across the world. It is a lifestyle related cancer mainly associated with use of tobacco, alcohol, betel nut, poor oral hygiene etc. Early screening and diagnosis of premalignant and malignant lesions is important to improve patient outcome. Histopathological examination of the biopsies remains the gold standard for diagnosis.

Materials and Methods

This was a retrospective study carried out over a period of three years i.e., 2019 to 2021 in the Department of Pathology at Shree M.P. Shah Medical College, Jamnagar, Gujarat. A total of 1006 cases of oral biopsies were studied for the parameters such as age, sex, site involved, presence of risk factors (e.g., use of tobacco), type of lesion and immunohistochemistry marker positivity.

Aims and Objectives

1. To study the year-wise distribution oral, oropharyngeal and laryngeal premalignant and malignant lesions in Saurashtra Region of Gujarat, India.
2. To analyze cases of oral malignancies in this region with regard to gender, age, site involved, type of lesion, history of tobacco exposure etc.

Results: Out of 1006 cases studied, 832 (82.7%) were malignant and remaining 174 (17.29%) were found pre-malignant on histopathological examination. The Male: Female ratio was found to be 5.1:1. The largest number of patients were seen in the age group of 41 - 60 years. The most common site involved in our study was buccal mucosa. Squamous cell carcinoma was the most common lesion among the malignant lesions.

Conclusion: Cancers of oral cavity, pharynx and larynx are highly prevalent in males of this region and are associated with lifestyle related factors such as tobacco use, alcohol intake etc. Histopathological examination and typing of the lesion is important for confirmation of malignancy.

Keywords: Oral cancer, malignant, premalignant, Pseudo-epitheliomatous hyperplasia, tobacco exposure

Introduction

Oral cancer mainly refers to a malignant lesion of oral mucosal epithelium showing squamous differentiation i.e., oral squamous cell carcinoma. Similarly, squamous cell carcinoma can also arise in the mucosa of pharynx and larynx. The oral cavity starts at the level of lips and ends at the anterior surface of the faucial arch. The oropharynx includes base of tongue, lateral & posterior pharyngeal walls, tonsillar pillars and soft palate. The hypopharynx includes pyriform sinuses and post cricoid region. The larynx is divided into supraglottic, glottic and subglottic regions.

Globally over 300,000 new cases of oral cancer are diagnosed annually, with particularly high incidence rates in Asia^[1]. Oral cancer is the sixth most common type of cancer across the world with India contributing to almost one-third of the total burden of cases^[2]. It ranks among the top three types of cancer in the country.^[3] India has the greatest number of oral cancer cases than any other nation worldwide and recently came to be known as "The Oral Cancer Capital of the World"^[4].

Saurashtra region comprises the south-western part of Gujarat state in India. The rising burden of oral carcinomas in this region is the result of high prevalence of tobacco consumption by the population in various forms (smoke as well as smokeless products). Every 4 out of 10 residents in this region, is found to be a chronic tobacco chewer^[5].

The oral cavity is at continuous exposure to both inhaled and consumed carcinogens. Therefore, it is one of the most common site for origin of malignant neoplasms [6]. The most common malignancy of oral region is squamous cell carcinoma which is typically preceded by a premalignant oral epithelial lesion. The most widely accepted marker to assess the risk of a premalignant lesion eventually undergoing malignant transformation is the presence and grade of dysplasia in the lesion [7].

Aims and Objectives

1. To study the year-wise distribution oral, oropharyngeal and laryngeal premalignant and malignant lesions in Saurashtra Region of Gujarat, India.
2. To analyze cases of oral malignancies in this region with regard to gender, age, site involved, type of lesion, history of tobacco exposure etc.

Type of Study: Retrospective Study of 3 Years. (From January 2019 - December 2021)

Material and Methods

- **Place of Study:** At Department of Pathology, Guru Gobindsingh Government Hospital, Shri M. P. Shah Government Medical College, Jamnagar.
- **Design of Study:** Retrospective Study.
- **Duration of Study:** 3 Years. (From January 2019 - December 2021)
- **Sample size:** Total 1006 Specimen Received.
- **Sample Type:** Incisional, excisional and punch biopsies.

Specimen Processing

- Received biopsy specimens after adequate fixation in 10% buffered formalin, were routinely processed and embedded in paraffin wax. Multiple sections are obtained and stained with Hematoxylin and eosin. All specimens were examined by light microscopy and histopathological diagnosis was given on the basis of morphology and immunohistochemistry was performed wherever necessary. The data of such cases was manually retrieved year-wise from the records maintained in the department of pathology and compiled in an Excel sheet and analysed for parameters such as age, sex, site of lesion, presence of tobacco exposure, histopathological diagnosis and immunohistochemistry marker positivity. The institutional ethics committee approved the study.

- **Inclusion Criteria:** All cases of oral mucosal biopsies that were clinically suspicious and histopathologically confirmed as premalignant or malignant lesions were included in the study.
- **Exclusion Criteria:** Inflammatory, Non- neoplastic lesions such as developmental cysts and neoplastic lesions of benign nature, soft tissue tumors, epithelial tumors originating from sites other than the squamous epithelial lining (for eg: tumors of minor salivary glands) were excluded from the study. Cases with inadequate diagnostic material were excluded from the study.

Results

- A total of 1,098 biopsies with clinical suspicion of either a premalignant lesion or malignancy, were received in this institute during the study period of 2019 – 2021. Out of these 1,098 biopsies, a definite opinion could be given in 1,006 cases. Biopsies from remaining 92 cases although clinically suspicious of malignancy, had insufficient diagnostic material and therefore were inadequate for opinion. Such cases were excluded from the present study.
- Out of 1,006 biopsies diagnosed, 832 (82.7%) cases were diagnosed as malignant lesions and remaining 174 (17.2%) were premalignant lesions.
- The year-wise distribution of cases is shown in Table 1.
- Among the malignant cases 359 (43.14%) cases were well differentiated, 424 (51%) cases were moderately differentiated, 24 (2.8%) cases were poorly differentiated squamous cell carcinoma. 25 cases were of variants of squamous cell carcinoma. The distribution of cases according to the type of lesion is shown in Table 2.
- Age distribution of malignant cases showed, majority of the patients the age group of 41 to 60 years (Figure 1).
- Male: Female ratio of malignant cases was found to be 5.5:1 (Figure 2).
- Most common site of involvement was buccal mucosa (27.04%) followed by tongue (19%) (Table 3)
- More than 90% patients (both malignant and premalignant cases) had history of tobacco consumption in one or other form (Table 4)
- Immunohistochemistry marker study using p63 and CK5/6 was performed in all cases of poorly differentiated malignancies which showed positive results in all cases. (Figures 5 & 6).

Table 1: Year-wise distribution of received biopsies

Year	Total No. of biopsies received	Biopsies Reported as Malignant	Biopsies Reported as Premalignant	Biopsies Inadequate for opinion
2019	403	275	56	72
2020	320	263	45	12
2021	375	294	73	8
Total	1098	832	174	92

Table 2: Distribution of cases according to type of Lesion

Type of Lesion	No. of Cases
Premalignant Lesions	
1. Mild Dysplasia	61
2. Moderate Dysplasia	44
3. Severe Dysplasia	34
4. Verrucous Hyperplasia	18

5. Pseudoepitheliomatous hyperplasia with dysplasia	17
Malignant Lesions	
1. Conventional SCC	
Well-Differentiated	359
Moderately Differentiated	424
Poorly Differentiated	24
2. SCC Variants	
Basaloid SCC	1
Papillary SCC	3
Sarcomatoid SCC	2
Verrucous Carcinoma	19
Total	1006

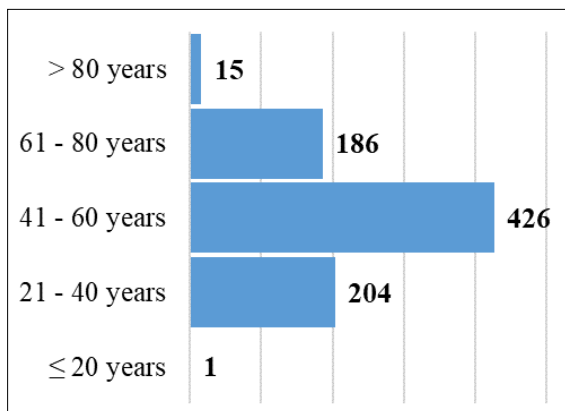


Fig 1: Age Distribution of Malignant Cases

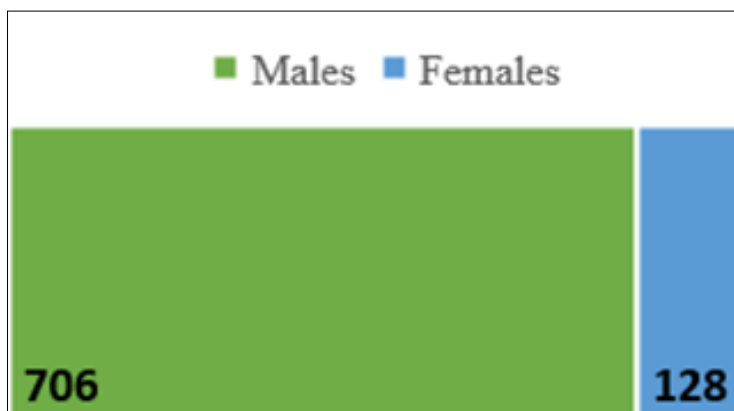


Fig 2: Gender Distribution of Malignant Cases

Table 3: Site-wise Distribution of Malignant Cases

Table 3. Site-wise Distribution of Malignant Cases					
Oral Cavity	No. of Cases	Pharynx	No. of Cases	Larynx	No. of Cases
1. Lip	29	1. Base of tongue	37	1. Supraglottis	119
2. Gingivobuccal sulcus	26	2. Tonsillar region	31	2. Glottis	25
3. Tongue	156	3. Soft Palate	20	3. Subglottis	3
4. Floor of mouth	17	4. Post. Pharyngeal wall	19		
5. Buccal Mucosa	228	5. Pyriform fossa	22		
6. Hard Palate	27	6. Post cricoid region	22		
7. Alveolar Region	20				
8. Retromolar Trigone	31				
Total	534	Total	151	Total	147

Table 4: Tobacco Consumption

Form of Consumption	No. of Cases (%)
Smoking	12%
Chewing	47%
Smoking + Chewing	20%
Smoking + Chewing + Alcohol	13%
No History	08%

Discussion

In the present study, a slight decline was found in the number of received biopsies during the three consecutive years; this might possibly be due to the effect of imposed curfews and lockdown along with more focus towards COVID 19 patients during the pandemic period that began in 2020. 75% cases were diagnosed as malignant in this study and most common type of malignancy found was moderately differentiated squamous cell carcinoma. This shows the high prevalence of oral squamous cell carcinoma in this region. Our finding was in accordance to the studies done by Raychaudhari *et al.* (2020) and Rathva (2020) where moderately differentiated type of squamous cell carcinoma was most common [8, 9].

There was a male preponderance in our study with the male to female ratio of 5.1:1. This might be due to heavy tobacco

and alcohol consumption by males in this region as compared to females. Our findings are similar to that of Raychaudhuri *et al.* (2020) who reported 5.5:1 ratio and Tandon A (2018) who reported 3.26:1 [8, 10].

Tobacco consumption was the most important risk factor in the present study with more than 92% of cases having a history of tobacco exposure either in the form of smoke or smokeless products; while no history of addictions could be obtained in 8% cases. Tobacco chewing alone contributed to 47% while history of smoking along with chewing was found in 20%. Only 13% of these cases gave history of alcohol consumption. ‘Mava-Masala’ a type of smokeless tobacco product is the most common form of tobacco used by the male population in this region whereas females in this region are more commonly addicted to ‘bajjar’ chewing. Bajjar is form of tobacco tooth powder traditionally used in India, in particular by women in state of Gujarat. The product has the appearance of a fine dry powder and is typically applied to the teeth and gums.

Majority of the malignant cases were in the age group of 41 to 60 years followed by 21 – 40 years age group. Babu C (2021) and Saraswathi *et al.* (2006) also reported majority of oral malignancies in the 41 to 60 years age group [11, 12]. Thus, proving oral squamous cell carcinoma to be common

in older adults. However, a large number of cases of oral malignancies were also found in the younger age group (<40yrs).

On the basis of site of involvement, buccal mucosa (27.04%) was found to be most frequently involved subsite in the oral cavity followed by tongue (19%). This might be due to increased usage of smokeless tobacco in this region. Sahu PK (2019) also reported that the buccal mucosa was the most frequently involved site (25.78%), followed by tongue (21.09%). However, Mehrotra *et al.* (2005) reported that larynx was the most common site [13, 14].

Pseudo-epitheliomatous hyperplasia is a reactive proliferation of mucosal epithelium associated with various etiologies, both neoplastic and non-neoplastic. Microscopically, it is seen as proliferation of squamous epithelium with broadened rete ridges, presence of few

mitotic figures and lack of cellular atypia. It is a close mimicker of malignancy when it presents with atypia and dysplastic features. Small sized tissues, improper orientation, and dense inflammations in various lesions makes it challenging for pathologists to differentiate pseudo-epitheliomatous hyperplasia with dysplasia from frank squamous cell carcinoma [15]. Also, 92 biopsies in the present study which were clinically suspicious of malignant etiology, were inadequate for opinion on histopathology due to inadequate depth of biopsy because of which invasion could not be identified in these lesions. It is therefore important that an incisional biopsy is of sufficient size and depth to include part of the advancing front of the tumour. Ideally, the deep front should be included, but if not, as in large tumours, the peripheral (lateral) front is often sufficiently representative for assessment [16].

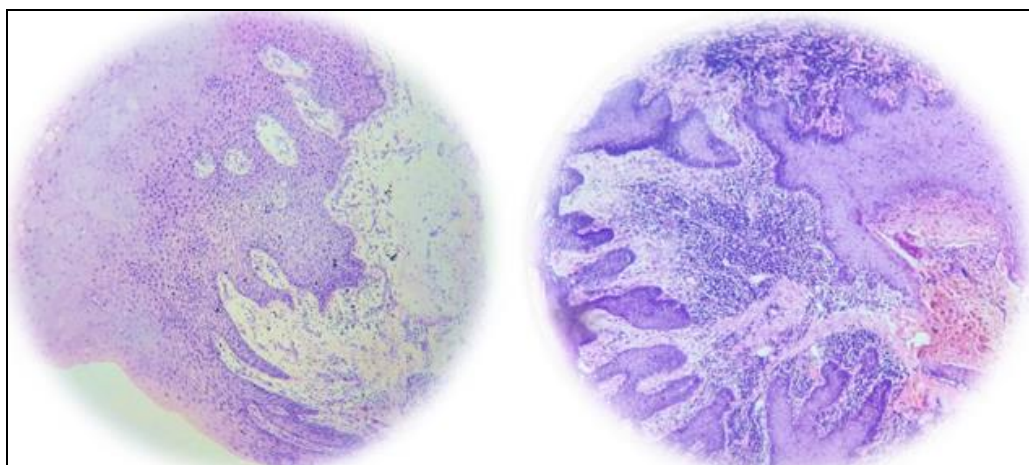


Fig 3: Pseudo-epitheliomatous Hyperplasia with Dysplasia (20x)

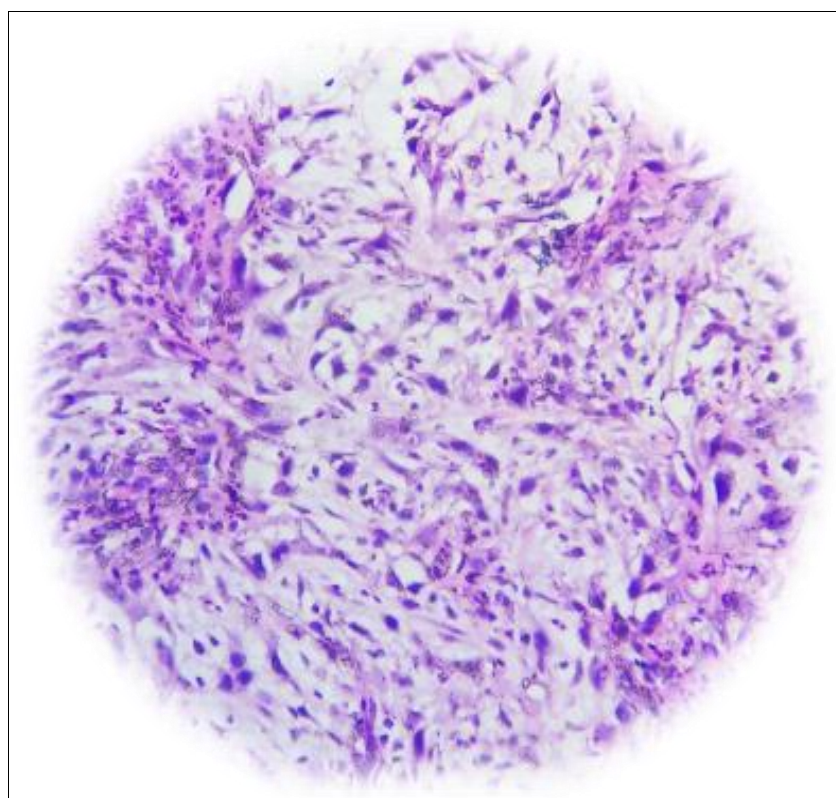


Fig 4: Photomicrograph of Sarcomatoid SCC (40x, H&E)

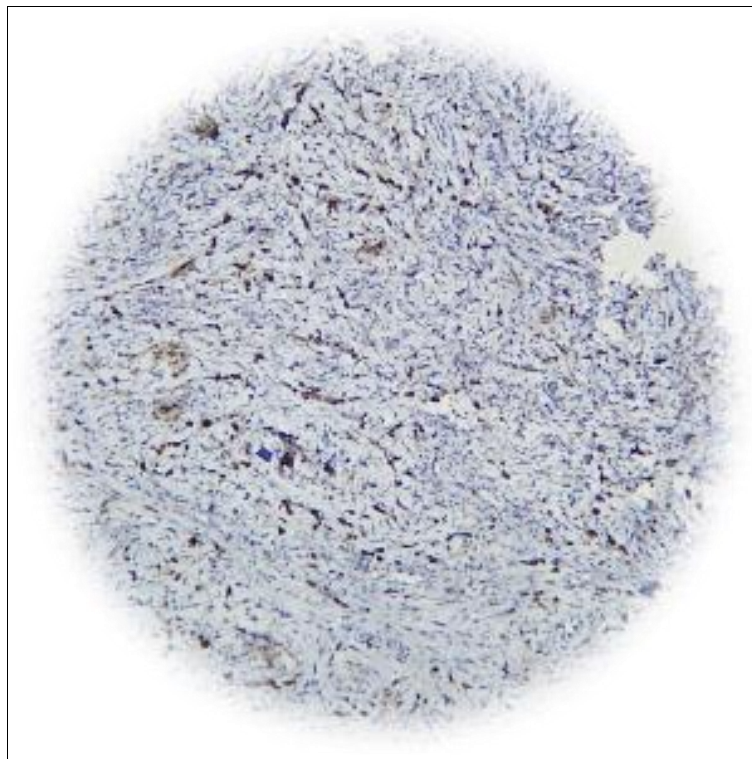


Fig 5: Immunohistochemistry – p63 Positivity in Sarcomatoid SCC (20x)

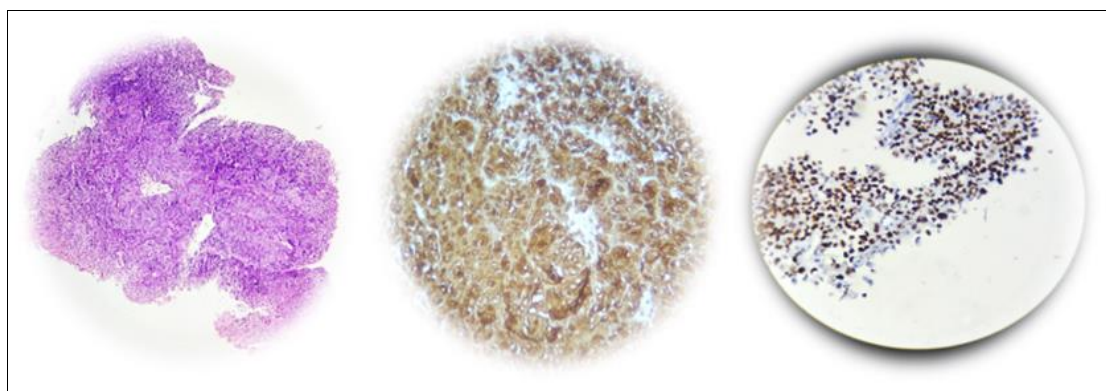


Fig 6: A) Poorly Differentiated B) CK 5/6 Positive C) p63 Positivity SCC (H&E)

Conclusion

This study concluded that squamous cell carcinoma of oral cavity, pharynx and larynx is highly prevalent in Saurashtra region of Gujarat state in India, particularly in middle aged males. However, cases are rising at an alarming rate in younger individuals due to early indulgence into addictive habits. This is in spite of the awareness being created about the harmful effects of tobacco and alcohol consumption by the government on various platforms such as social-media, launching tobacco control programme, ban on tobacco chewing and smoking in public places.

Proper management of an oral lesion begins with a correct diagnosis and histopathological assessment of formalin-fixed biopsy tissue specimens remains the gold standard for diagnosis and pathological staging in routine clinical practice which can be supplemented by immunohistochemistry wherever necessary. Adequacy of the size of biopsy is an important factor in the early diagnosis of these lesions. Increase in awareness among the population regarding usage of harmful substances and regarding early screening of oral lesions so as to detect premalignant and malignant lesions in an early stage to

prevent adverse outcomes and improve overall prognosis are the targets yet to be achieved in developing countries like India.

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Not available

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