

Clinicopathological Profile of Oral Cavity Lesions: A Cross-Sectional Study

Dhanush H.C.¹, Swathi G.², Navya D.³

¹Assistant Professor, Department of ENT, BGS Medical College and Hospital, Bangalore, Karnataka, India

²Consultant Department of Dermatologist, Nandi Chest and Skin Clinic, Chikkamagaluru, Karnataka, India

³Senior Resident, Department of Ophthalmology, Chikkamagaluru Institute of Medical Sciences, Karnataka, India

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Corresponding Author: Dr. Navya D.

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Abstract:

Background: Oral cavity lesions comprise a heterogeneous group of inflammatory, infective, benign, potentially malignant, and malignant disorders. Their clinicopathological evaluation is essential for early diagnosis, appropriate management, and prevention of malignant transformation, particularly in populations with a high prevalence of tobacco and areca nut use.

Objectives: To evaluate the demographic, clinical, and histopathological profile of oral cavity lesions, determine their anatomical distribution, assess the frequency of benign, premalignant, and malignant lesions, and correlate clinical diagnoses with histopathological findings.

Methods: This hospital-based cross-sectional observational study included 110 adult patients with clinically evident oral cavity lesions who underwent biopsy or surgical excision with histopathological examination. Demographic characteristics, lesion site, clinical diagnosis, and histopathological findings were recorded and analyzed. Clinicopathological correlation and associations between demographic variables and malignancy were assessed using appropriate statistical tests.

Results: The mean age of the patients was 48.6 ± 15.4 years, with the majority (43.6%) aged 41–60 years. Males constituted 61.8% of the study population. The buccal mucosa was the most commonly affected site (34.5%), followed by the tongue (20.9%). Clinically, oral squamous cell carcinoma (35.5%) was the most frequent diagnosis, followed by leukoplakia (18.2%) and oral submucous fibrosis (15.5%). Histopathological examination revealed malignant lesions in 40.0% of cases, potentially malignant disorders in 25.5%, benign neoplasms in 20.0%, and inflammatory/non-neoplastic lesions in 14.5%. Squamous cell carcinoma was the predominant histopathological diagnosis (40.0%). Clinicopathological concordance was observed in 87.3% of cases, while 12.7% demonstrated discordance. Malignant lesions were significantly associated with age greater than 40 years ($P = 0.002$), whereas gender showed no significant association ($P = 0.47$).

Conclusion: Oral cavity lesions predominantly affected middle-aged males, with the buccal mucosa being the most common site involved. Oral squamous cell carcinoma constituted the largest proportion of lesions. Histopathological examination remains indispensable for definitive diagnosis and facilitates early detection of malignancy, underscoring the importance of routine oral screening, timely biopsy, and tobacco-control strategies.

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Introduction

Oral cavity lesions encompass a broad spectrum of pathological conditions ranging from inflammatory and infective disorders to benign neoplasms, potentially malignant disorders (PMDs), and invasive malignancies. These lesions significantly contribute to morbidity due to pain, functional impairment, cosmetic disfigurement, and, in malignant cases, increased mortality. Accurate diagnosis requires a comprehensive clinical examination complemented

by histopathological evaluation, which remains the gold standard for definitive diagnosis.[1]

Oral cancer is among the most common malignancies worldwide, with oral squamous cell carcinoma accounting for nearly 90% of all oral malignancies. The burden is particularly high in South Asian countries, including India, owing to the widespread use of tobacco, areca nut, betel quid, smoking, and alco-

hol consumption.[2,3] Early recognition of oral potentially malignant disorders such as leukoplakia, erythroplakia, oral submucous fibrosis, and lichen planus is crucial, as timely intervention can reduce the risk of malignant transformation.[4]

The clinicopathological spectrum of oral cavity lesions varies according to age, sex, anatomical site, lifestyle habits, and geographic region. Understanding these patterns facilitates early diagnosis, guides treatment planning, and aids in developing preventive strategies. However, regional epidemiological data remain limited in many parts of India. Therefore, this study aims to evaluate the demographic, clinical, and histopathological profile of oral cavity lesions and determine their distribution in patients attending a private nursing home.[5]

Aim: To evaluate the clinicopathological profile of oral cavity lesions in patients attending a private nursing home.

Objectives

1. To determine the demographic profile of patients with oral cavity lesions.
2. To evaluate the anatomical distribution of oral cavity lesions.
3. To classify oral cavity lesions based on histopathological diagnosis.
4. To correlate clinical diagnosis with histopathological findings.
5. To determine the frequency of benign, premalignant, and malignant oral cavity lesions.

Materials and Methods

Study Design

- **Type of study:** Hospital-based cross-sectional observational study.
- **Study setting:** Otorhinolaryngologist in collaboration with the a Dermatologist, Ophthalmologist and Pathologist at a private nursing home.
- **Study duration:** 18–24 months.
- **Study population:** Patients presenting with clinically diagnosed oral cavity lesions who undergo biopsy or surgical excision with histopathological examination.

Table 1: Age Distribution

Age Group (Years)	Number	Percentage (%)
≤20	11	10.0
21–40	28	25.5
41–60	48	43.6
>60	23	20.9
Total	110	100

Table 2: Gender Distribution

Gender	Malignant	Non malignant	Total	Percentage
Male	29	39	68	61.8
Female	15	27	45	38.2
Total	44	66	110	100

Inclusion Criteria

- Patients aged ≥18 years with clinically evident oral cavity lesions.
- Patients willing to provide informed consent.
- Patients undergoing biopsy or excision for histopathological diagnosis.

Exclusion Criteria

- Recurrent lesions with previous histopathological diagnosis.
- Inadequate or inconclusive biopsy specimens.
- Patients refusing consent.

Sample Size: For a descriptive cross-sectional study, the sample size can be calculated using:

$$n = \frac{Z^2 \times p \times q}{d^2} = \frac{1.96^2 \times 0.5 \times 0.5}{0.10^2} = 96.04$$

Where:

- **Z** = 1.96 (95% confidence level)
- **p** = 50% (expected prevalence, used when prevalence is uncertain)
- **q** = 1 – p = 50%
- **d** = 10% absolute precision

$$n = \frac{1.96^2 \times 0.5 \times 0.5}{0.10^2} = 96.04$$

$$n = \frac{3.84 \times 0.25}{0.01} = 96.04$$

Thus, the minimum sample size required is 96 patients. Accounting for approximately 10% incomplete or inadequate biopsy specimens, a final sample size of 106–110 patients are appropriate.

Results

Demographic Characteristics: A total of 110 patients with oral cavity lesions were included in the study. The mean age was 48.6 ± 15.4 years (range: 18–82 years). The majority of patients belonged to the 41–60 years age group (43.6%), followed by 21–40 years (25.5%), >60 years (20.9%), and ≤20 years (10.0%).

There were 68 males (61.8%) and 42 females (38.2%), with a male-to-female ratio of 1.6:1.

Distribution of Oral cavity Lesions According to Anatomical Site: The buccal mucosa was the most frequently involved site (34.5%), followed by the

tongue (20.9%), lower alveolus (12.7%), lip (10.9%), hard palate (8.2%), floor of mouth (7.3%), and retromolar trigone (5.5%).

Table 3: Anatomical Distribution of Oral Cavity Lesions

Site	Number	Percentage (%)
Buccal mucosa	38	34.5
Tongue	23	20.9
Lower alveolus	14	12.7
Lip	12	10.9
Hard palate	9	8.2
Floor of mouth	8	7.3
Retromolar trigone	6	5.5
Total	110	100

Clinical Diagnosis: The most common clinical diagnosis was oral squamous cell carcinoma (35.5%), followed by leukoplakia (18.2%), oral submucous

fibrosis (15.5%), fibroma (10.9%), pyogenic granuloma (9.1%), mucocele (5.5%), and other lesions (5.5%).

Table 4: Clinical Diagnosis

Clinical Diagnosis	Number	Percentage (%)
Oral squamous cell carcinoma	39	35.5
Leukoplakia	20	18.2
Oral submucous fibrosis	17	15.5
Fibroma	12	10.9
Pyogenic granuloma	10	9.1
Mucous retention cyst	6	5.5
Others	6	5.3
Total	110	100

Histopathological Diagnosis: Histopathological examination revealed that malignant lesions constituted 40.0%, potentially malignant disorders 25.5%, benign neoplasms 20.0%, and non-neoplastic in-

flammatory lesions 14.5%. Histopathological examination identified five additional malignant lesions that were clinically diagnosed as benign or potentially malignant, contributing to the observed clinicopathological discordance

Table 5: Histopathological Classification

Histopathological Diagnosis	Number	Percentage (%)
Malignant lesions	44	40.0
Potentially malignant disorders	28	25.5
Benign neoplasms	22	20.0
Inflammatory/non-neoplastic lesions	16	14.5
Total	110	100

Spectrum of Histopathological diagnoses: The overall histopathological spectrum showed squamous cell carcinoma as the most common diagnosis, followed by leukoplakia with dysplasia, oral submu-

cous fibrosis, fibroma, pyogenic granuloma, mucocele, papilloma, lichen planus, and other lesions. Among the malignant lesions, well-differentiated squamous cell carcinoma was the predominant subtype. 5 leukoplakia cases showed no dysplasia

Table 6: Histopathological Spectrum

Histopathological Diagnosis	Number	Percentage (%)
Squamous cell carcinoma	44	40.0
Leukoplakia with dysplasia	15	13.6
Oral submucous fibrosis	13	11.8
Fibroma	12	10.9
Pyogenic granuloma	10	9.1
Mucocele	6	5.5
Papilloma	5	4.5
Lichen planus	3	2.7
Others	2	1.9
Total	110	100

Clinicopathological Correlation: Clinical diagnosis are concordant with histopathological diagnosis

in 96 of 110 cases (87.3%), while 14 cases (12.7%) showed discordance.

Table 7: Clinicopathological Correlation

Correlation	Number	Percentage (%)
Concordant	96	87.3
Discordant	14	12.7
Total	110	100

Association Between Age and Malignant Lesions:

Malignant lesions were significantly more common in patients aged more than 40 years ($P = 0.002$).

Table 8: Age Versus Malignancy

Age Group	Malignant	Non-Malignant	Total
≤40 years	8	31	39
>40 years	36	35	71
Total	44	66	110

Chi-square = 9.84, $P = 0.002$

Association Between Gender and Malignant Lesions: Malignant lesions were observed more frequently among males (29/68; 42.6%) than females (15/42; 35.7%), but this difference was not statistically significant ($P = 0.47$).

Discussion

The present study demonstrated that oral cavity lesions were most frequently encountered in the 41–60-year age group, with a clear male predominance. Similar demographic findings have been reported in Indian studies, which attribute the higher incidence to prolonged exposure to tobacco, areca nut, smoking, and alcohol, all of which are established risk factors for oral potentially malignant disorders and oral squamous cell carcinoma (OSCC).[5-9]

The buccal mucosa was the commonest site involved in the present study. This observation is consistent with Indian epidemiological data, where smokeless tobacco and betel quid are commonly retained in the buccal vestibule, resulting in chronic mucosal irritation and carcinogenesis.[5-10] The tongue was the second most frequently affected site, particularly among malignant lesions, which is comparable with reports from tertiary care centres across India.

Histopathologically, OSCC was the most frequent diagnosis, followed by leukoplakia and oral submucous fibrosis. Similar findings have been reported in Indian hospital-based studies, reflecting the persistently high burden of tobacco-associated oral cancer in the country.[7-12] The relatively high proportion of potentially malignant disorders in our study highlights the importance of early identification and surveillance to prevent malignant transformation.

The clinicopathological correlation observed in the present study was high, reaffirming that histopathological examination remains the gold standard for definitive diagnosis. Previous Indian studies have

similarly emphasized that biopsy is mandatory for persistent oral lesions because clinical appearance alone may not reliably differentiate benign, premalignant, and malignant lesions.[10-15] Therefore, careful clinical examination combined with timely histopathological evaluation is essential for improving diagnostic accuracy and patient outcomes.

Conclusion

Oral cavity lesions predominantly affect middle-aged males, with the buccal mucosa being the most commonly involved site. Oral squamous cell carcinoma remains the leading histopathological diagnosis, emphasizing the continuing burden of tobacco-related disease in India. Routine oral screening, early biopsy of suspicious lesions, and histopathological confirmation are essential for early diagnosis and appropriate management. Public health initiatives focusing on tobacco cessation and awareness of potentially malignant disorders can substantially reduce oral cancer-related morbidity and mortality.

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