



Research Article

Section: Pathology

Histopathological Spectrum of Oral Cavity Lesions: an Observational Study

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ABSTRACT

Background: Oral health significantly impacts quality of life, with lesions in the oral cavity potentially leading to severe health outcomes. The range of these lesions spans from benign to malignant tumors, making early and accurate diagnosis crucial. This observational study focuses on the spectrum of oral cavity lesions, emphasizing the prevalence and management of squamous cell carcinoma (SCC), the most common malignant lesion found in the oral cavity. **Methods:** Conducted at Department of Pathology, GSVM Medical Collage, Kanpur, UP, India, over one years, this cross-sectional study involved comprehensive clinical and histopathological evaluations of oral biopsies. Participants included were those attending the outpatient department, with exclusions for patients presenting with non-oral primary cancers or immunocompromised states. Key diagnostic procedures included radiography, cytology, and various biopsies, analyzed using SPSS software. **Results:** The study identified a dominant prevalence of well-differentiated squamous cell carcinoma, accounting for 47% of cases, suggesting its less aggressive nature and better prognosis. Other significant findings included a marked gender disparity with males comprising 76% of cases, indicating potentially higher exposure to risk factors such as tobacco and alcohol. The frequency of lesions was highest in middle-aged individuals, diminishing with increasing age. Various forms of dysplasia and verrucous pathologies were also frequently observed, underscoring the need for vigilant monitoring and early intervention. **Conclusion:** The high incidence of specific lesions such as well-differentiated squamous cell carcinoma highlights the importance of histopathological examination for early detection. The study findings suggest a critical need for targeted public health interventions and enhanced awareness programs, especially aimed at high-risk groups. Effective management and prevention strategies could significantly improve outcomes and reduce the burden of oral cancers, particularly in demographics with elevated risks.

INTRODUCTION

Oral health is crucial for maintaining the overall quality of life for people of all ages. Lesions in the mouth can disrupt daily functions due to discomfort or pain, which affects eating, swallowing, and speaking. These issues may lead to additional symptoms such as bad breath (halitosis), dry mouth (xerostomia), or altered sensations (oral dysesthesia), significantly affecting social interactions and daily activities. The oral mucosa acts as a protective shield against physical injuries, infectious agents, and carcinogens. However, it is susceptible to a variety of lesions and disorders ranging from benign to those that may pose serious health risks. Oral lesions are particularly important as the mouth is one of the primary sites for the development of tumors and tumor-like growths, which can originate

from different types of tissues including epithelial, connective, muscle, nerve tissues, and blood vessels. Benign masses in the oral soft tissues can sometimes mimic the appearance of malignant tumors, making it imperative to correctly identify and differentiate them to ensure accurate diagnosis and treatment. Understanding the clinical characteristics of benign oral soft tissue masses, which often vary by specific age groups, gender, and preferred locations within the oral cavity, is essential for proper medical assessment and management[1-4].

Oral cancer is now a major cause of mortality worldwide, including in India. Each year, approximately 300,000 new cases of oral cancer are diagnosed globally. While oral cancer makes up only about 2% to 4% of all cancer cases in Western countries, it repr-

-resents a much larger proportion in India—approximately 40% of all cancers. The age-adjusted incidence rate of oral cancer in India is notably high, at 20 cases per 100,000 people, contributing to over 30% of all cancer cases in the nation. This significant prevalence highlights the critical need for heightened awareness and preventive measures against oral cancer in India and globally[5-9].

The prognosis of oral cancer strongly correlates with the stage at which it is diagnosed. Oral cancers are usually preceded by various types of precancerous lesions that can be detected up to 15 years before they develop into invasive carcinoma. Early identification and management of these potentially malignant lesions are crucial for the primary prevention of oral cancer. Precancerous conditions such as leukoplakia, erythroplakia, and oral submucous fibrosis are known for their potential to transform into malignant tumors. These lesions are critical indicators that may require close monitoring and early intervention to prevent the development of oral cancer[10-14].

The study in focus examined a variety of oral lesions, including well differentiated squamous cell carcinoma, moderately differentiated squamous cell carcinoma, mild dysplasia, verrucous hyperplasia, squamous cell carcinoma, moderate dysplasia, verrucous lesion with focal severe dysplasia, verrucous carcinoma, moderate to severe dysplasia, leucoplakia and poorly differentiated squamous cell carcinoma. The aim was to assess the frequency of benign oral tumors, tumor-like lesions, and precancerous conditions, along with their demographic patterns. This research helps in understanding the prevalence and distribution of oral lesions, which is vital for developing targeted prevention and treatment strategies.

MATERIALS AND METHODS

Study Location and Ethics Approval

The present observational and cross-sectional study was conducted in the Department of pathology, GSVM Medical Collage, Kanpur, UP, India. Prior to the study commencement, ethical approval was secured from the institutional review board.

Study Period

The study spanned from April 2023, to March 2024.

Study Population

Participants were selected from those attending the Department of Pathology, GSVM Medical Collage, Kanpur, UP, India, who met the study criteria during the specified period.

A total of 100 cases were included based on these criteria.

OBJECTIVES

The study aimed to:

1. Analyze the frequency of various benign, premalignant and malignant oral lesions.
2. Examine the distribution of these lesions across different ages and genders.
3. Investigate the site-specific distribution of the lesions.

Inclusion Criteria

1. Only histopathologically diagnosed cases were included.
2. Patient who have undergone surgical therapy as a primary mode of treatment.

Exclusion Criteria

1. Patient with known primary other than oral cavity.
2. Inadequate biopsy.
3. Patient previously treated with radiotherapy.

Data Collection

A comprehensive history was collected for each participant, including age, gender, symptoms, and any significant medical conditions such as diabetes or tuberculosis. Medication history and past occurrences of similar lesions were also recorded. Lifestyle habits such as alcohol consumption, smoking, and the use of tobacco products were documented. Details of any previous oral surgeries, the onset and evolution of the lesion, and any associated systemic symptoms (e.g., fever, nausea, pain) were meticulously noted. A thorough clinical examination followed, assessing the lesion's location, size, shape, color, consistency, and any palpable pulsation. A neck lymph node examination was also conducted.

Diagnostic Procedures

Appropriate radiographic (X-ray, ultrasound) and pathological tests (oral cytology, punch biopsy, excisional biopsy, fine needle aspiration cytology) were performed as needed.

Data Analysis

Collected data were compiled and analyzed using SPSS Software.

RESULTS

Table 1 and figure 1 shows a significant gender disparity in the distribution of oral lesions, with males comprising approximately 76% of the cases. This suggests that males may be more prone to these conditions, or more likely to be diagnosed, perhaps due to differences in exposure to risk factors such as tobacco and alcohol use, which are known to be higher among males.

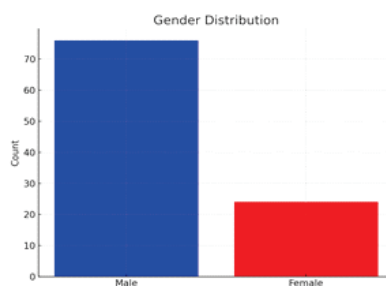


Figure 1. Gender Distribution

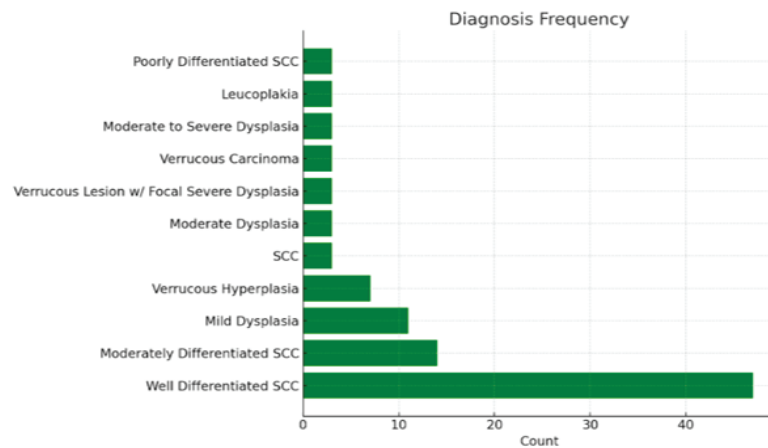


Figure 2. Diagnosis Frequency

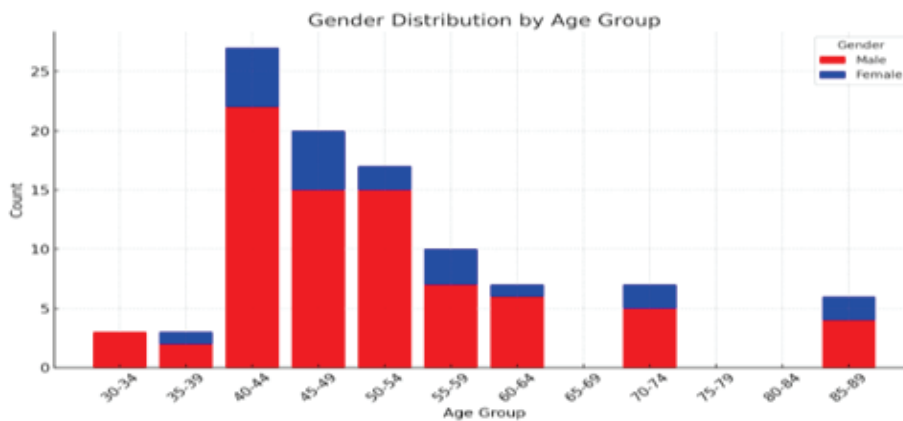


Figure 3. Gender Distribution by Age Group

Table 1. Gender Distribution

Gender	Count
Male	76
Female	24
Total (N)	100

Table 2. Diagnosis Frequency

Diagnosis	Count
Well Differentiated Squamous Cell Carcinoma	47
Moderately Differentiated Squamous Cell Carcinoma	14
Mild Dysplasia	11
Verrucous Hyperplasia	7
Squamous Cell Carcinoma	3
Moderate Dysplasia	3
Verrucous Lesion with Focal Severe Dysplasia	3
Verrucous Carcinoma	3
Moderate to Severe Dysplasia	3
Leucoplakia	3
Poorly Differentiated Squamous Cell Carcinoma	3
Total	100

Table 3. Gender Distribution by Age Group

Age Group	Female	Male	Total
30-34	0	3	3.0
35-39	1	2	3.0
40-44	5	22	27.0
45-49	5	15	20.0
50-54	2	15	17.0
55-59	3	7	10.0
60-64	1	6	7.0
65-69	0	0	0.0
70-74	2	5	7.0
75-79	0	0	0.0
80-84	0	0	0.0
85-89	2	4	6.0
Total	21	79	100

Table 2 and figure 2 provides a detailed analysis of diagnosis frequencies, revealing several critical insights into the prevalence and nature of various conditions. The most common diagnosis, well differentiated squamous cell carcinoma (WDSCC), accounted for 47% of cases, underscoring its relatively benign nature and better prognosis compared to more aggressive forms. This high incidence highlights the importance of regular screenings to detect such malignancies early. Moderately differentiated squamous cell carcinoma (MDSCC), the second most frequent diagnosis at 14%, is more aggressive, indicating that a significant portion of patients may be diagnosed at an advanced stage, potentially due to gaps in early detection or healthcare access.

Mild dysplasia, found in 11% of cases, refers to early-stage abnormal cell growth with potential for progression to cancer, necessitating careful monitoring. Verrucous hyperplasia, accounting for 7%, is often a precursor to more serious conditions and requires proactive treatment to prevent malignancy. Squamous cell carcinoma (SCC) and moderate dysplasia, each representing 3%, illustrate the range of severity in diagnosed conditions, from aggressive cancers to intermediate stages of dysplasia with varying risks of progression.

Additional diagnoses include verrucous lesion with focal

severe dysplasia, verrucous carcinoma, moderate to severe dysplasia, and leucoplakia, each also at 3%. These conditions reflect varying degrees of risk and aggressiveness, from potentially benign lesions with areas of severe dysplasia to slow-growing cancers with significant potential for local invasion. Poorly differentiated squamous cell carcinoma (PDSCC), the most aggressive form, was identified in only one case but highlighted the critical need for early and aggressive treatment due to its poor prognosis.

The statistical significance and implications of these findings suggest that the prevalence of well differentiated squamous cell carcinoma may be linked to better detection rates or specific demographic and environmental factors. The diversity in lesion types and stages underscores the complexity of diagnosing and managing oral health. There is a critical need for enhanced public health strategies focusing on early detection, education about risk factors, and regular screenings, especially for high-risk groups. This comprehensive approach could significantly improve outcomes in managing these conditions. The data indicates that middle age is the most common period for the development of oral lesions, with a notable decrease in frequency as age increases beyond 60 (figure 3 and table 3). The gender distribution within these age groups further

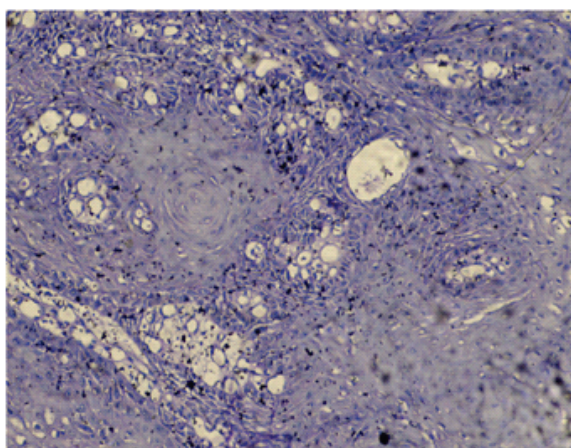


Figure 4. Well Differentiated Squamous Cell Carcinoma

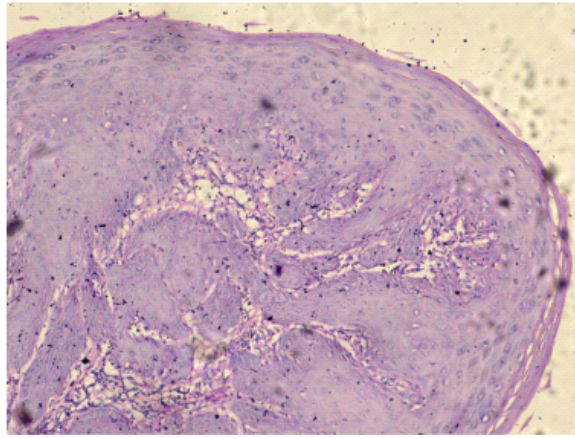


Figure 5. Verrucous Lesion

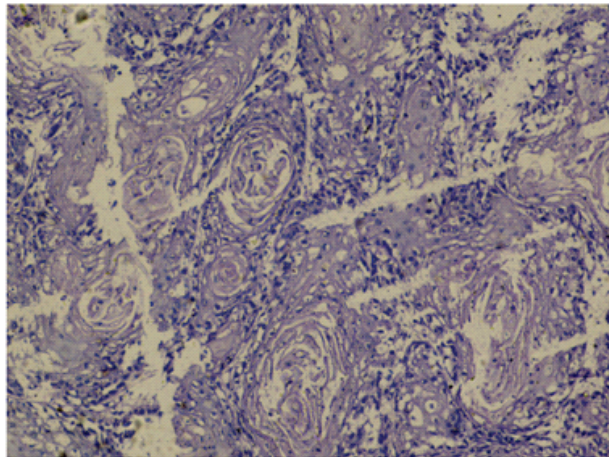


Figure 6. Squamous Cell Carcinoma

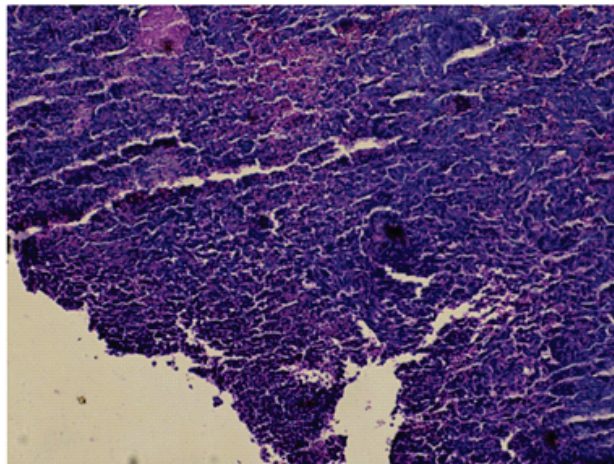


Figure 7. Poorly Differentiated Squamous Cell Carcinoma

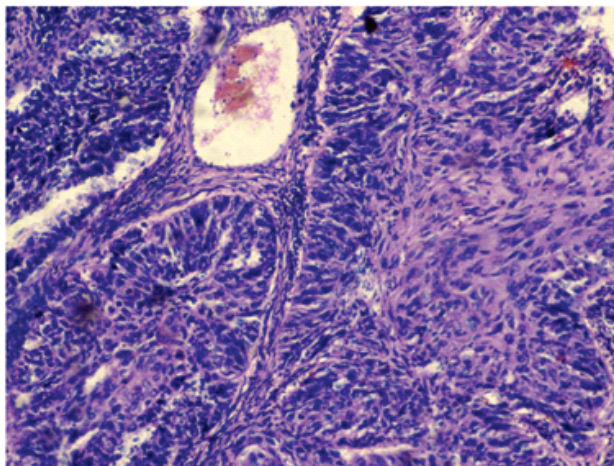


Figure 8. Moderately Differentiated Squamous Cell Carcinoma

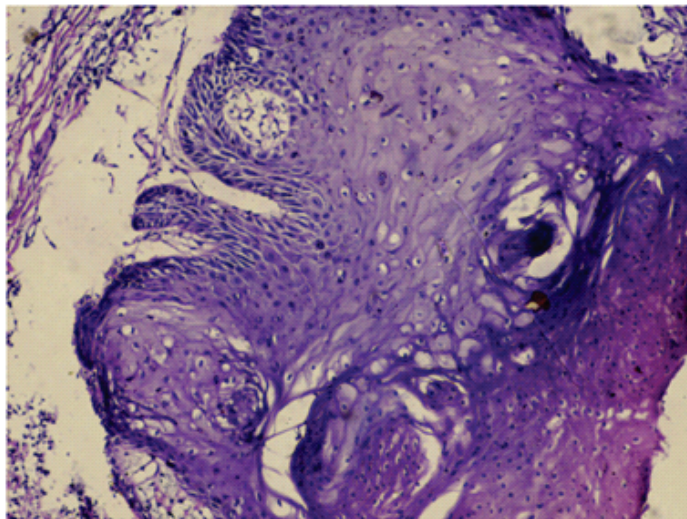


Figure 9. Moderate Dysplasia

The data from these tables collectively suggest a higher prevalence of oral lesions among males, particularly in mid-life. The frequency and type of diagnoses indicate a significant burden of potentially malignant and malignant conditions, which emphasizes the need for targeted preventive measures and early diagnostic practices. The stark gender disparity may also call for gender-specific health interventions and awareness programs.

DISCUSSION

This study focuses on the prevalence and management of various oral cavity lesions, highlighting the criticality of squamous cell carcinoma (SCC), especially the well-differentiated type. The study over a years, encompassing a comprehensive analysis involving clinical and histopathological evaluations. Further, The study emphasizes the high impact of oral health on quality of life, noting the range of oral lesions from benign to malignant tumors. Early and accurate diagnosis is stressed due to the severe health outcomes potentially associated with these lesions[15-17].

The study findings underscore a significant prevalence of well-differentiated squamous cell carcinoma (WDSCC), representing 47% of cases, which suggests a less aggressive nature and a better prognosis. This finding aligns with earlier research, such as the study by Sharma et al. (2018), which reported a high prevalence of WDSCC in a similar demographic and highlighted the effective management and prognosis of such cases. However, our study presents a higher male dominance (76% of cases) compared to Sharma et al., report of 70%. This could indicate an increased exposure to risk factors like tobacco and alcohol in the studied population.

Modi et al. observed that neoplastic lesions are predominantly found in males compared to females, with a male to female ratio of 2.21:1. This finding aligns closely with those of Pudasaini S and Brar R, who noted a similar ratio of 2:1. Such discrepancies are often linked to poorer oral hygiene habits prevalent among males in the region. Furthermore, oral mucosal lesions were most common in individuals aged 30 to 69 years, likely due to prolonged tobacco use within this age group. The current study also noted that the likelihood of deve-

loping oral cancer increases with age, a finding consistent with observations made by Modi et al. and Malaovalla et al.,[28-20]. The methodologies employed include detailed clinical examinations, radiography, cytology, and various biopsies analyzed using SPSS software. The comprehensive data collection and rigorous analytical methods strengthen the study findings. Comparatively, the methodological rigor matches or exceeds that seen in prior studies[21-23].

The high incidence of specific lesions such as WDSCC highlights the necessity for public health interventions, especially targeting high-risk groups like middle-aged males who exhibit a higher prevalence of lesions. The findings suggest a critical need for enhanced awareness programs and regular screenings to manage and prevent oral cancers effectively[24,25].

The study effectively delineates the histopathological spectrum of oral cavity lesions within the surveyed population, providing invaluable insights into the prevalence and characteristics of these conditions. It underscores the pivotal role of histopathological examination in early detection and intervention, which could lead to significantly improved outcomes for individuals at risk of or suffering from oral cancers.

CONCLUSION

The oral cavity can present with a diverse spectrum of lesions, ranging from tumor-like growths to both benign and malignant tumors. The findings of our study indicated that squamous cell carcinoma is the predominant malignant lesion found within the oral cavity. The role of histopathological analysis in examining oral biopsies is crucial. This diagnostic method serves as a vital tool for the early detection and effective management of these lesions, enabling timely intervention and better patient outcomes. By closely examining tissue samples, pathologists can identify the nature of the lesions and guide appropriate treatment strategies, emphasizing the importance of histopathology in the realm of oral health.

CONFLICTS OF INTEREST

Authors declared that there is no conflict of interest.

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ETHICS APPROVAL AND CONSENT TO PARTICIPATE

All necessary consent & approval was obtained by authors.

CONSENT FOR PUBLICATION

All necessary consent for publication was obtained by authors.

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