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Original Research Article

Histopathological Correlation of Oral Cavity Lesions: A Retrospective Analysis

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Abstract:

Background: Oral mucosa lesions consist of numerous types of lesions, such as inflammatory reactive lesions and precancerous lesions, together with malignant lesions. Histopathology testing plays a very important role in diagnosing these lesions because it is considered the "gold" test in the diagnosis process of the patient's problem.

Aim: To retrospectively evaluate the clinicopathological spectrum of oral cavity lesions and assess their histopathological correlation.

Methodology: This is a retrospective study that was conducted in the Department of Pathology, Institute of Medical Sciences and Research, ICARE, Haldia, West Bengal, India and Dr. Bidhan Chandra Roy Hospital, Haldia, West Bengal, India. The study involved a one-year study of 110 histopathologically confirmed lesions of the oral cavity. Data from the archives were analyzed statistically with regard to the demographic profile, anatomic site, and clinicopathological correlation.

Results: The majority of cases belonged to the age group of 41-60 years (42.7%), while 70.0% were males. Buccal mucosa (30.0%) was the most common oral part where lesions occurred, followed by tongue (25.5%) and gingiva (15.5%). Based on histopathology results, malignant lesions (35.5%) were the most common type, followed by inflammatory lesions (23.6%) and premalignant lesions (18.2%). Squamous cell carcinoma of mouth is the most common type of malignant lesions observed. In 83.6% of cases, there existed correlation and in 16.4%, discrepancy existed among clinical and histopathological features.

Conclusion: Middle-aged men showed a higher prevalence rate when it comes to oral lesions, with the buccal mucosa being the commonest region where oral lesions occurred. Additionally, there were many cases of lesions reported to be malignant, thus highlighting the need for diagnosis and treatment of these conditions. The pathological diagnosis is crucial for the establishment of a definite diagnosis, and it is a very useful tool when diagnosing oral lesions.

Keywords: Oral cavity lesions, Histopathology, Clinicopathological correlation, Oral squamous cell carcinoma, premalignant lesions, Oral pathology.

Introduction

The lesions of the oral cavity are a heterogeneous group of pathological conditions of the oral cavity involving all layers of the mucosa, soft tissues and hard

tissues [1]. These lesions can be a benign inflammatory and reactive lesions, a potentially malignant lesion or an invasive malignancy [2]. Pathological changes in the oral cavity can have a profound impact upon speech, mastication, swallowing, aesthetics and quality of life and are important markers of local and systemic health. Oral lesions may present in a variety of ways and a proper diagnosis is essential to patient management, which can be difficult [3].

The occurrence of lesions in the oral cavity is dependent on site and shows variation according to the geographical location of people, which depends on the social, economic and personal aspects of individuals. Lesions in the oral cavity pose a huge public health challenge in developing nations like India owing to tobacco consumption in various ways including smoking, smokeless tobacco, gutkha, and betel nut chewing [4]. These practices have been shown to play a significant role in causing premalignant lesions and oral cancers, especially oral squamous cell carcinoma (OSCC).

Oral cavity lesions are clinically expressed as ulcers, white patches, red lesions, swellings, nodules, plaques, vesicles or pigmented lesions. Many lesions have similar appearances and definitive diagnosis is difficult on clinical examination only, although some lesions have characteristic clinical features which aid diagnosis [5]. Therefore, pathological examination of the oral lesions is still the standard of the art for determining the nature and the severity of the lesions. The histopathological diagnosis is a confirmation of the clinical diagnosis, and helps to differentiate benign lesions from precancerous or cancerous, which will influence treatment of the patient [6].

Histopathological correlation is of utmost importance to the understanding of the biological behaviour of oral lesions. Helps pathologists and clinicians determine the architecture, morphology, degree of dysplasia, inflammatory changes and malignant changes of any tissue. The earlier that dysplastic changes and malignant lesions are identified, the better the treatment outcome and prognosis will be this can be done by the pathological evaluation of the specimen. Moreover, clinicopathological correlation aids in identifying any disparities that may arise from the observations made clinically compared to the microscopic findings, hence emphasizing the need for conducting biopsies on suspected lesions [7].

These days, a lot of emphasis has been put on oral precancerous disorders such as leukoplakia, erythroplakia, oral submucous fibrosis, and lichen planus due to the risk of becoming cancerous. The number of such lesions has risen significantly in recent times this is attributed to the change in lifestyles among youths, thus increasing exposure to carcinogens [8]. Histopathology of these disorders is crucial in preventing their progression to invasive cancer.

Different patterns of distribution and histopathological spectrum of oral cavity lesions have been reported in different studies in various populations [9]. Inflammatory and Reactive lesions are common lesions seen in routine practice, but malignant lesions still make up a significant portion of the specimens biopsied in tertiary care centers. Knowing the distribution of lesions in the oral cavity, their site, their histopathological features and their risk factors is of importance to be able to devise appropriate, diagnostic and preventive measures.

Although there have been advances in diagnosis techniques, histopathology is still the cornerstone for definitive diagnosis of oral lesions. Retrospective histopathology studies have been useful to understand the prevalence of diseases, the distribution of lesions, and clinicopathological relationships in certain

populations [10]. These studies add to the knowledge base and help health care professionals identify emerging issues and trends in oral diseases.

For this reason, the present study was conducted with the aim to find the spectrum of oral cavity lesions presented in a tertiary care teaching hospital and to study histopathological correlation of the lesion. The main objective of the study is to analyze the demographic profile, anatomical distribution, histopathological pattern and clinicopathological concordance of oral cavity lesions to add to the diagnostic accuracy and patient care.

Methodology

Study Design

The present study was a retrospective, observational study carried out to observe the spectrum of oral cavity lesions and correlate their histopathological aspects. The study was conducted with thorough review of the archived histopathological records and biopsy reports of patients who were diagnosed with oral cavity lesions. A retrospective design was used to examine the various demographic, clinical, anatomical, and histopathological patterns of oral cavity lesions seen in day-to-day practice.

Study Area

This study was conducted in the Department of Pathology, ICARE Institute of Medical Sciences & Research, Haldia, West Bengal, India, and in Dr. Bidhan Chandra Roy Hospital, Haldia, and West Bengal, India. It is a tertiary care teaching hospital serving large population of Haldia and nearby villages. The Department of Pathology receives biopsy and surgical specimens from various clinical departments such as Dentistry, Otorhinolaryngology, General Surgery and Oral and Maxillofacial Surgery, and thus plays a significant role in the diagnosis of oral cavity lesions.

Study Duration

The study was carried out for one year. All the eligible histopathological records of oral cavity lesions available in the departmental archives during this period were reviewed and analyzed.

Study Participants

Patients of all ages and sex undergoing biopsy or surgical excision of oral cavity lesions, and who had a final histopathologic diagnosis during the study period were included in the study population.

Inclusion Criteria

- Oral cavity lesions were clinically suspected and patients who had biopsy and histopathological examination.
- Oral cavity lesions including buccal mucosa, tongue, gingiva, palate, floor of mouth, alveolar mucosa and lips, histopathologically confirmed.
- Complete clinical, demographic and histopathological records of cases.
- All ages and both sexes.

Exclusion Criteria

- Records with incomplete clinical and histopathological information.
- Lack of adequate or poorly preserved biopsy specimens that were not adequate for definitive diagnosis.
- Recurrent lesions without primary histopathological documentation.
- Oral lesions secondarily involved from other parts of the body.

Sample Size

A total of 110 cases of oral cavity lesions were included in the study with histopathology confirmation. The selected cases covered a wide spectrum of oral pathological condition seen during the study period and were found to be sufficient to obtain clinicopathological and histopathologic correlation.

Data Collection Procedure

Histopathological records and pathology reports from the Department of Pathology were retrieved and systematically

reviewed. Data was collected by employing a structured data collection form, which was relevant. The variables that were recorded were patient age, gender, clinical presentation, anatomical site of the lesion, provisional clinical diagnosis, history of associated risk factors (tobacco chewing, smoking, alcohol consumption) and the ultimate histopathological diagnosis. All biopsies were managed in a routine way in the histopathological laboratory. The samples were subjected to fixation in 10% neutral buffered formalin and processed conventionally and embedded in paraffin wax blocks, cut at 4-5 microns and stained with Hematoxylin and Eosin (H&E). The lesions were examined in the histopathology slides and categorized as inflammatory, reactive, cystic, premalignant, benign neoplastic and malignant lesions based on diagnostic criteria. Correlation between the provisional and histopathological diagnosis was carried out by comparing the diagnoses. Distribution and frequency of various oral cavity lesions were studied with respect to age, sex, sites of lesions and histopathological category. All personal information was de-identified, and institutional ethical principles for studies based on retrospective analysis of records were adhered to.

Statistical Analysis

The data collected was then entered into Microsoft Excel spreadsheet and subsequently analyzed by employing the Statistical Package for the Social Sciences (SPSS) software version 27.0. Descriptive statistical methods were used to summaries the demographic characteristics, anatomical distribution of lesions and histopathological findings. All the continuous variables were tabulated as mean ± standard deviation and all the categoric variables were presented in the form of frequency and percentage. The correlation between clinical diagnosis and histopathological diagnosis were evaluated by Chi-square test. A p value < 0.05 was regarded as statistically significant. Results were presented in the form of tables and figures to ease the interpretation of clinicopathological spectrum, and histopathological correlation of lesions of oral cavity.

Results

Table 1 presents the demographics of the 110 patients recruited for use in this experiment. The majority of patients was observed to be aged between 41–60 years old (42.7%), followed by those who were aged 21–40 years old (29.1%), above 60 years old (18.2%) and below 20 years old (10.0%). The gender composition consisted of males (70.0%) and females (30.0%). It is evident from the results that oral lesions are common in older and middle-aged males.

Table 1: Characteristics of Patients Suffering from Oral Lesions (n = 110)

Parameter	Frequency (n)	Percentage (%)
Age Group (Years)		
≤20	11	10.0
21–40	32	29.1
41–60	47	42.7
>60	20	18.2
Gender		
Male	77	70.0
Female	33	30.0

The distribution of oral lesions is described in Table 2 below. The buccal mucosa was observed to be the most common site of development (30.0%), followed by tongue (25.5%), gingiva (15.5%), palate (11.8%), lip (10.0%), and floor of the mouth (7.2%). From the above findings, one can deduce that the lesions developed in areas that had easy access to carcinogenic agents.

Table 2: Anatomical Distribution of Oral Cavity Lesions (n = 110)

Site of Lesion	Frequency (n)	Percentage (%)
Buccal mucosa	33	30.0
Tongue	28	25.5
Gingiva	17	15.5
Palate	13	11.8
Lips	11	10.0
Floor of mouth	8	7.2
Total	**110**	**100.0**

The 110 patients included in the study were distributed according to location of oral cavity lesions as seen in figure 1. The most affected place was buccal mucosa (30.0%), followed by tongue (25.5%) and gingiva (15.5%). Lesser common lesions were those affecting the palate, lips and floor of the mouth. Increased buccal mucosa and tongue involvement of lesions could be related to the increased exposure to local irritants and the established risk factors of tobacco and betel nut use.

Figure 1: Graphical Representation of Anatomical Distribution of Oral Cavity Lesions (n = 110)

The types of histopathological lesions that occurred in the oral cavity were listed in Table 3. Out of all the malignant lesions, the most frequently occurring one was (35.5%), followed by inflammatory lesions (23.6%), premalignant lesions (18.2%), benign neoplasms (13.6%), reactive lesions (5.5%), and cystic lesions (3.6%). Oral squamous cell carcinoma was the most frequently occurring malignant lesion in this study.

Table 3: Classification of Histopathology of Oral Cavity Lesions (n=110)

Histopathological Diagnosis	Frequency (n)	Percentage (%)
Inflammatory lesions	26	23.6
Reactive lesions	6	5.5
Cystic lesions	4	3.6
Premalignant lesions	20	18.2
Benign neoplasms	15	13.6
Malignant neoplasms	39	35.5
Total	**110**	**100.0**

The histopathology of lesions in the oral cavity was observed as illustrated in Figure 2 among 110 individuals. It should be noted that the majority of lesions observed are malignant neoplasms with 35.5% followed by inflammatory lesions (23.6%), pre-malignant lesions (18.2%), and benign neoplasms (13.6%). Reactive lesions and cystic lesions comprised the remaining few percentages. Therefore, it can be concluded that there are several lesions in the oral cavity with various histopathology.

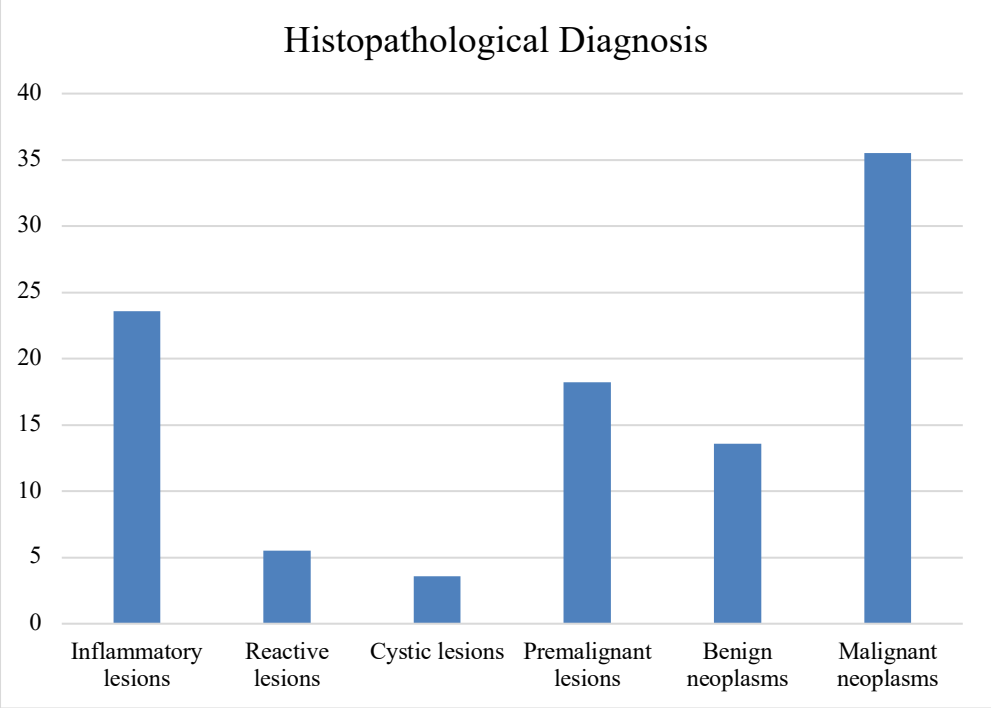

Figure 2: Graphical Representation of Histopathological Classification of Oral Cavity Lesions (n = 110)

Correlation of clinical diagnosis with histopathological diagnosis is shown in Table 4. A total number of 110 cases were selected for the study, out of which 92 cases were found with matching clinical diagnosis and histopathological diagnosis (83.6%), while in 18 cases (16.4%), there was a difference between clinical diagnosis and histopathological diagnosis.

Table 4: Clinicopathological Correlation of Oral Cavity Lesions (n = 110)

Correlation Status	Frequency (n)	Percentage (%)
Clinical diagnosis correlated with histopathology	92	83.6
Clinical diagnosis not correlated with histopathology	18	16.4
Total	**110**	**100.0**

The clinicopathological correlation observed in the 110 cases of lesions of the oral cavity included in the study is shown in figure 3. Diagnostic discrepancies occurred in 16.4% of cases while there was an agreement between the provisional clinical diagnosis and the final histopathological diagnosis in majority of cases (83.6%). The results highlight the importance of histopathological diagnosis in confirming clinical diagnosis and achieving correct management of lesions of the oral cavity.

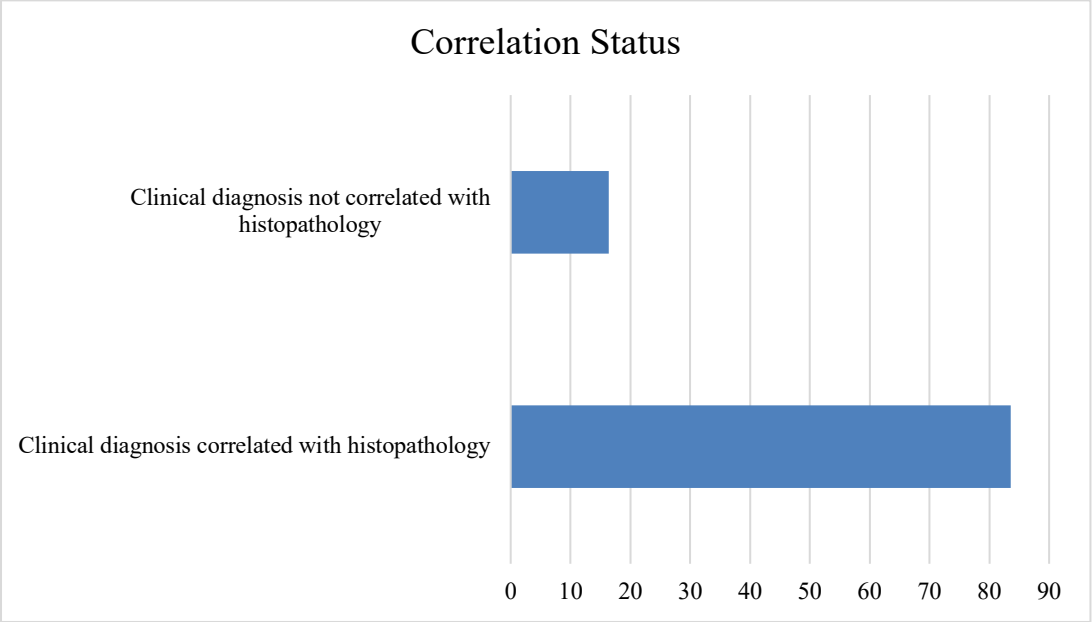

Figure 3: Graphical Representation of Clinicopathological Correlation of Oral Cavity Lesions (n = 110)

In the present study, the oral cavity lesions were more common in males and mostly occurred among people in the fourth to sixth decade of life. The mouth (buccal mucosa) and tongue were the most common sites of involvement. Histopathological analysis showed that the majority of the cases had been diagnosed as malignant lesions, followed by inflammatory and premalignant lesions. High correlation was observed clinically and pathologically; however, in some instances, a discrepancy was observed in relation to the clinical and pathological diagnoses. This emphasizes the significance of histopathological evaluation in confirming and managing lesions present in the mouth.

Discussion

The current retrospective study was carried out with an aim to determine the demographic distribution, location of the lesions, histopathological spectrum, and clinicopathological correlation among oral cavity lesions referred to a teaching hospital for tertiary care Lubek et al. (2013) [11]. Oral cavity diseases range from inflammatory diseases to malignant neoplasm disease and histopathological study is critical in the management of such diseases. Oral cavity lesions documented in the current study act as a reference for lesion pattern in the oral cavity and highlighted the importance of clinicopathological correlation in oral pathology Maturana-Ramírez et al. (2015) [12].

Demographic analysis showed that the age with the highest incidence of oral cavity lesions was 41–60 years (42.7%) followed

by 21–40 years. This is similar to what has been observed in multiple studies of middle-aged and elderly people who showed a higher incidence of oral lesions from chronic exposure to environmental and behavior risk factors Modi et al. (2013) [13]. This age group shows more lesions than other age groups, which could be due to the cumulative effect of smoking tobacco products, chewing betel nut, drinking alcohol, the chronic irritation or changes in the tissue caused by age.

In addition, the present study revealed a significant sex ratio of males (70.0%) to females Nikitakis et al. (2014) [14]. This is in keeping with the previous reports from India and developing countries where the prevalence of tobacco related habits in general is more among males and hence, they would be more prone to oral pathological conditions Peker et al. (2016) [15]. Anatomical distribution analysis revealed the buccal mucosa as the most frequently involved site followed by the tongue and gingiva. Buccal mucosal lesions are common and could be related to the habit of placing smokeless tobacco and betel quid in the buccal vestibule, thereby exposing mucosa to the carcinogenic chemicals for an extended period Rahaman and Mujib (2014) [16]. Likewise, the tongue because of its blood supply and high prevalence of chronic irritation is a common site for both premalignant and malignant lesions. This confirms findings from previous clinicopathological reports where the most frequently involved locations were the buccal mucosa and tongue Rahman (2014) [17].

On histopathological analysis, it was seen that the largest proportion of lesions involved malignant tumors (35.5%). It further emphasizes that oral cancers constitute a major burden among Indians. Squamous cell carcinoma was found to be the most commonly occurring type of malignant lesions, which coincides with the findings in global and national epidemiological literature that indicates the predominance of squamous cell carcinomas among all oral cancers Sengüven et al. (2015) [18]. The large number of malignant lesions observed in this study can be attributed to the nature of tertiary care facility and referrals of suspect cases to this center.

The second most common category was inflammatory lesions followed by the premalignant lesions. High prevalence of inflammatory lesions is due to the persistent contact of the oral cavity with microbial agents, trauma, poor oral hygiene and local irritants. There was a substantial number of cases of potentially malignant disorders of oral cavity (premalignant condition) including leukoplakia, oral submucous fibrosis and lichen planus. Due to the risk of malignant transformation these lesions should be diagnosed early and follow up histopathological studies are necessary. A significant number of patients have premalignant lesions, which highlights the importance of public health measures to decrease tobacco and areca nut use, and regular oral examination.

The most important results of the present study were the level of clinicopathological concordance between the provisional clinical diagnoses and final histopathological diagnoses. Overall, the level of diagnostic accuracy was satisfactory, as in 83.6% of cases clinical and microscopic diagnosis were in agreement. However, there was still 16.4% discrepancy between the clinical impression and histopathology. Many oral lesions can have similar clinical features with different histological features, which can lead to discrepancies Song et al. (2015) [19]. These results do support the notion that clinical examination is not always enough to make diagnosis and that histopathological examination is the “gold standard” for the correct disease diagnosis.

The discrepancies observed in the clinicopathological aspects also emphasize

the need for routine biopsy in the assessment of oral lesions which may be suspected. Besides confirmation of diagnosis, histopathological examination also gives valuable information about the degree of dysplasia, the extent of differentiation, inflammatory activity, and malignant change etc. which is vital to prognosis and the choice of therapy Yakin et al. (2016) [20]. Thus, the combination of clinical assessment and histopathological analysis further improves the accuracy of diagnosis and has a remarkable impact on patient outcome.

Conclusion

The current retrospective study indicated the prevalence of lesions of the oral cavity amongst middle aged men, with the buccal mucosa and tongue as the commonest areas affected. Histological analysis confirmed that there were lesions of a diverse nature, where the most prevalent lesions were malignant tumors, followed by inflammatory lesions and precancerous lesions.

There was an excellent correlation between clinical and pathological findings, indicating that clinical assessment is reliable, but the importance of histological diagnosis cannot be overlooked.

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