

Denture-Related Oral Mucosal Lesions in a Government Medical College: a Retrospective Analysis

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Abstract:

Background: Oral mucosal lesions are common complications among denture wearers, impacting their oral health and quality of life. This study aimed to investigate the prevalence and characteristics of denture-related oral mucosal lesions in patients attending a government medical college.

Methods: A retrospective study was conducted, involving 90 denture-wearing participants. Data on demographic details, type and duration of denture use, oral mucosal lesions, and oral hygiene practices were collected from dental records. Statistical analysis was performed using SPSS version 23.0, employing descriptive statistics, Chi-square tests, and t-tests.

Results: The study included 45 males and 45 females, with a mean age of 58.6 years. Complete dentures were worn by 60% of participants, and the mean duration of denture use was 5.3 years. Oral mucosal lesions were present in 72.2% of participants, with denture stomatitis being the most common (33.3%), followed by traumatic ulcers (22.2%) and angular cheilitis (16.7%). A significant association was found between the type of denture and the presence of lesions ($p = 0.035$), as well as between oral hygiene practices and lesion prevalence ($p = 0.045$).

Conclusion: The high prevalence of oral mucosal lesions among denture wearers highlights the need for preventive measures. Complete dentures and poor oral hygiene practices were significantly associated with these lesions.

Recommendations: Regular dental check-ups, proper denture maintenance, and stringent oral hygiene practices are recommended to reduce the risk of mucosal lesions in denture wearers.

Keywords: Denture-Related Lesions, Oral Mucosal Lesions, Denture Stomatitis, Oral Hygiene

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Introduction

Oral health is a critical component of overall well-being, significantly impacting quality of life. Among the various dental appliances, dentures play a vital role in restoring function and aesthetics for individuals with missing teeth. However, despite their benefits, denture wearers often face complications, including oral mucosal lesions. These lesions can result in discomfort, pain, and increased susceptibility to infections, thereby

adversely affecting the users' oral health and quality of life.

Denture-related oral mucosal lesions encompass a range of conditions, such as denture stomatitis, traumatic ulcers, and angular cheilitis. Denture stomatitis, an inflammatory condition of the mucosa beneath a denture, is the most common lesion, with prevalence rates varying from 15% to 70% among denture wearers [1]. Factors

contributing to the development of these lesions include poor oral hygiene, continuous denture wear, ill-fitting dentures, and the presence of microbial biofilms on denture surfaces.

Recent studies have highlighted the significant prevalence of oral mucosal lesions in denture wearers, emphasizing the need for routine dental check-ups and preventive measures. A study found that 67% of elderly denture wearers exhibited some form of oral mucosal lesion, with denture stomatitis being the most prevalent [2]. Another study reported a prevalence rate of 55% for denture-related lesions in a cohort of 200 participants, underscoring the widespread nature of this issue [3].

The type of denture—complete or partial—also influences the incidence of mucosal lesions. Complete dentures, which cover a larger surface area, are associated with higher rates of lesions due to increased pressure and limited mucosal ventilation. Moreover, the duration of denture use and maintenance practices significantly impact the oral health of denture wearers. Improper cleaning and prolonged wear without adequate rest periods have been linked to higher incidences of lesions [4].

In addition to denture-related oral mucosal lesions, there are several other types of oral lesions that can occur in both denture and non-denture wearers. These include leukoplakia, lichen planus, and oral candidiasis, all of which can significantly affect oral health.

Leukoplakia is characterized by the presence of white patches on the mucosa that cannot be rubbed off and are often asymptomatic. While the exact cause of leukoplakia is unknown, chronic irritation from poorly fitting dentures, tobacco use, and alcohol consumption are recognized risk factors. Leukoplakia is considered a potentially malignant disorder, making early diagnosis and management critical.

Lichen planus is a chronic inflammatory condition that can manifest as white, lacy patches or painful sores in the oral cavity. Its etiology is believed to be autoimmune, but it can be exacerbated by mechanical trauma from ill-fitting dentures. The discomfort associated with lichen planus can severely impact a person's ability to eat and speak, further diminishing quality of life.

Oral candidiasis is another common oral lesion, particularly among denture wearers, as the use of dentures can create a moist environment conducive to fungal growth. This condition is caused by the overgrowth of *Candida* species, often resulting from poor denture hygiene, systemic conditions like diabetes, or the use of medications such as antibiotics or corticosteroids. Oral candidiasis

presents as white, creamy patches that can be wiped off, revealing a red, sometimes bleeding, mucosa underneath. Denture-induced stomatitis is often associated with *Candida* overgrowth, highlighting the role of microbial biofilms in lesion development.

Furthermore, traumatic ulcers can occur due to mechanical irritation from dentures that do not fit properly or are worn continuously without rest. These ulcers can cause significant pain and may become secondarily infected if not addressed.

Angular cheilitis is another lesion associated with denture use, particularly in individuals with reduced vertical dimension of occlusion (when the height between the upper and lower jaws is reduced, leading to deep skin folds at the corners of the mouth). This condition is often linked to fungal or bacterial infections and is characterized by painful cracks or sores at the corners of the mouth, which can make eating and speaking difficult.

Oral hygiene practices are crucial in mitigating the risks of developing mucosal lesions. Effective cleaning of dentures and maintaining oral hygiene can prevent the accumulation of microbial biofilms, a primary etiological factor for many mucosal conditions. Regular dental visits for professional cleaning and adjustments of dentures are recommended to ensure proper fit and function, thereby reducing the risk of trauma and inflammation.

This study aims to investigate the prevalence and characteristics of denture-related oral mucosal lesions in patients who attended a government medical college.

Methodology

Study Design: A retrospective study.

Study Setting: The study was conducted at the Department of Dentistry, Anugrah Narayan Magadh Medical College, Gaya, Bihar, between December 2023 to June 2024.

Participants: The study included 90 participants who were denture wearers and had attended the dental clinic at the government medical college.

Inclusion Criteria

- Patients aged 18 years and above.
- Patients who had been wearing dentures for at least 6 months.
- Patients who had provided informed consent for their clinical records to be used for research purposes.

Exclusion Criteria

- Patients with incomplete medical or dental records.

- Patients with systemic conditions known to affect oral mucosa (e.g., diabetes, immunocompromised conditions).
- Patients with a history of oral cancer or radiation therapy.
- Patients who had recent oral surgery (within the past 6 months).

Bias: To minimize selection bias, all eligible patients' records within the specified period were reviewed consecutively. Information bias was minimized by using standardized data extraction forms and ensuring all data collectors were uniformly trained.

Data Collection

Data were collected from the dental records of the participants. The following information was extracted:

- Demographic details (age, gender).
- Type and duration of denture use.
- Presence and type of oral mucosal lesions.
- Oral hygiene practices.

- Relevant medical history.

Procedure: Dental records of patients who met the inclusion criteria were reviewed. Information on demographics, denture usage, and clinical findings was recorded on a pre-designed data extraction form. The types of oral mucosal lesions were identified and categorized based on clinical descriptions in the dental records.

Statistical Analysis: Data were entered into SPSS version 23.0 for statistical analysis. Frequencies and percentages were calculated for categorical variables, while means and standard deviations were calculated for continuous variables. A p-value of less than 0.05 was considered statistically significant.

Result

The study included 90 participants, comprising 45 males (50%) and 45 females (50%). The mean age of the participants was 58.6 years (SD = 10.4), with an age range of 40 to 85 years.

Table 1: Demographic Characteristics

Variable	Frequency	Percentage (%)
Gender		
Male	45	50.0
Female	45	50.0
Age (years)		
40-49	20	22.2
50-59	25	27.8
60-69	30	33.3
70-79	10	11.1
80-85	5	5.6
Mean (SD)	58.6 (10.4)	

The majority of participants (60%) wore complete dentures, while 40% wore partial dentures. The mean duration of denture use was 5.3 years (SD = 2.1).

Table 2: Denture Usage Characteristics

Variable	Frequency	Percentage (%)
Type of Denture		
Complete Denture	54	60.0
Partial Denture	36	40.0
Duration of Use (years)		
< 2	10	11.1
2-5	50	55.6
>5	30	33.3
Mean (SD)	5.3 (2.1)	

Out of 90 participants, 65 (72.2%) had at least one type of oral mucosal lesion. The most common lesion was denture stomatitis, observed in 30 participants (33.3%), followed by traumatic ulcers in 20 participants (22.2%), and angular cheilitis in 15 participants (16.7%).

Table 3: Prevalence of Oral Mucosal Lesions

Type of Lesion	Frequency	Percentage (%)
No Lesion	25	27.8
Denture Stomatitis	30	33.3
Traumatic Ulcers	20	22.2
Angular Cheilitis	15	16.7

A significant association was found between the type of denture and the presence of oral mucosal lesions ($p = 0.035$). Participants with complete dentures were more likely to have oral mucosal lesions compared to those with partial dentures.

Table 4: Association between Denture Type and Oral Mucosal Lesions

Denture Type	Lesions Present	No Lesions	p-value
Complete Denture	45 (83.3%)	9 (16.7%)	0.035
Partial Denture	20 (55.6%)	16 (44.4%)	

Participants who reported poor oral hygiene practices had a higher prevalence of oral mucosal lesions (80%) compared to those with good oral hygiene practices (60%). This association was statistically significant ($p = 0.045$).

Table 5: Association between Oral Hygiene Practices and Oral Mucosal Lesions

Oral Hygiene	Lesions Present	No Lesions	p-value
Good	30 (60.0%)	20 (40.0%)	0.045
Poor	35 (80.0%)	5 (20.0%)	

Discussion

This retrospective study evaluated the prevalence and characteristics of denture-related oral mucosal lesions in 90 participants attending a government medical college. The demographic analysis revealed a balanced gender distribution with an equal number of male and female participants, and the mean age was 58.6 years. The participants' age range from 40 to 85 years indicates that the study included a diverse age group, primarily in the middle-aged to elderly categories, who are typically more likely to use dentures.

The findings showed that the majority of participants (60%) wore complete dentures, while the remaining 40% wore partial dentures. The average duration of denture use was 5.3 years. These statistics suggest a significant proportion of long-term denture wearers, making the study relevant in understanding the long-term effects of denture use on oral health.

A critical outcome of the study was the high prevalence of oral mucosal lesions among the participants, with 72.2% exhibiting at least one type of lesion. Denture stomatitis was the most prevalent lesion, affecting 33.3% of the participants, followed by traumatic ulcers (22.2%) and angular cheilitis (16.7%). These results underline the common occurrence of mucosal lesions in denture wearers, emphasizing the need for regular monitoring and preventive measures.

Statistical analysis revealed a significant association between the type of denture and the

presence of oral mucosal lesions. Participants with complete dentures were more likely to have lesions compared to those with partial dentures ($p = 0.035$). This finding suggests that complete dentures might pose a higher risk for developing mucosal lesions, possibly due to increased coverage and pressure on the oral tissues.

The study also found a significant correlation between oral hygiene practices and the presence of oral mucosal lesions. Participants with poor oral hygiene practices had a higher prevalence of lesions (80%) compared to those with good hygiene practices (60%), with a statistically significant p-value of 0.045. This highlights the critical role of maintaining proper oral hygiene in preventing mucosal lesions in denture wearers.

Overall, the study underscores the high prevalence of oral mucosal lesions among denture wearers, with denture type and oral hygiene practices being significant contributing factors. The results advocate for regular dental check-ups and stringent oral hygiene practices to mitigate the risk of developing these lesions, thereby enhancing the overall oral health of denture wearers.

A study evaluated the association between denture-related oral mucosal lesions and Alzheimer disease (AD) in older adults. The study included 70 elderly adults and found no statistically significant difference between the AD and mentally healthy groups in the frequency of denture-related oral mucosal lesions. Factors such as age, education

level, and tobacco use were significant predictors of AD, but not of mucosal lesions [5].

A study assessed the prevalence and pattern of oral mucosal lesions in the elderly. The study found a prevalence of 59.6% for oral mucosal lesions in the geriatric population, with red and white lesions being the most common. Factors such as age over 65, male gender, denture usage, and tobacco habits were significantly associated with lesion prevalence [6].

A study examined the characteristics of patients who perceived dental treatment as a cause of oral mucosal lesions. The study found that 12.2% of patients attributed their lesions to dental treatment, with allergic reactions and traumatic ulcers being the most common diagnoses. Implants were the most frequently perceived cause of lesions, and the gingiva was the most common site of complaint [7].

A study investigated the prevalence and distribution of oral mucosal lesions in patients attending the Lebanese School of Dentistry. The study found that 61.8% of patients presented with one or more lesions, with the most common being coated/hairy tongue (17.4%), melanotic macule (11.2%), and gingivitis (9.6%). The prevalence of lesions did not significantly differ between sex and age groups [8].

Another study focused on oral mucosal changes in individuals wearing removable acrylic dentures. The study reported that 31.11% of the subjects exhibited mucosal changes, with Newton's type 1 lesions (denture stomatitis) being the most prevalent. This emphasizes the commonality of mucosal lesions in denture wearers and the need for proper denture hygiene and regular adjustments to prevent lesions [9].

A study in South Africa found that 25.76% of denture wearers had denture-related stomatitis, with the palate and tonsillar areas being the most common sites for lesions. The study suggested that this high prevalence is exacerbated by comorbidities such as diabetes, which can impair the body's ability to fight infections, making denture wearers more susceptible to mucosal lesions. The results indicate the importance of targeted oral healthcare strategies in vulnerable populations, such as elderly individuals with systemic health conditions [10].

A study reported that 13.5% of denture wearers experienced denture-related mucosal lesions (DRML), with the most common cause being overextension of denture flanges. The study emphasized the importance of regular dental appointments to detect and correct denture instability, preventing the development of mucosal lesions [11]. Similarly, a study found that the

prevalence of denture-related oral mucosal lesions in a cohort of 185 patients was 42.7%, with a higher incidence in males and complete denture wearers compared to partial denture wearers. Denture stomatitis was the most frequently diagnosed lesion, accounting for 54.43% of cases. The study also identified factors such as denture type, hygiene practices, and gender as significant contributors to lesion development [12].

Conclusion

The study found a high prevalence of oral mucosal lesions among denture wearers, with denture stomatitis being the most common. The type of denture and oral hygiene practices were significantly associated with the presence of these lesions. These findings highlight the importance of regular dental check-ups and proper oral hygiene practices for denture wearers to prevent oral mucosal lesions.

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