
Prevalence and Associated Factors of Oral Lesions Related to Removable Prosthesis Among Patients Attending a Specialized Dental Center in Saudi Arabia: A Retrospective Cross-sectional Study

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Abstract

Background: Denture-related oral mucosal lesions are common complications among removable denture wearers and may adversely affect oral health and quality of life. Several patient- and prosthesis-related factors have been implicated in their development; however, evidence regarding their associated risk factors remains inconsistent.

Objective: To evaluate the prevalence of oral mucosal lesions caused by removable prostheses and investigate their association with demographic, clinical, and prosthesis-related factors among removable denture wearers.

Methods: A retrospective cross-sectional study was conducted at a Specialized Dental Center in Saudi Arabia. Data were collected from the records of 54 removable denture wearers. Variables included age, gender, smoking status, medical conditions, denture type, duration of denture use, daily denture-wearing hours, overnight denture use, denture cleaning practices, denture brush use, and vertical dimension status. The presence and type of denture-related oral mucosal lesions were recorded. Statistical analysis was performed using Chi-square and Fisher's Exact tests, with a significance level set at $p < 0.05$.

Results: Oral mucosal lesions were identified in 10 participants (18.5%). Denture stomatitis was the most common lesion, accounting for 80.0% of all lesions, followed by epulis fissuratum (10.0%) and traumatic ulceration (10.0%). Overnight denture wearing was significantly associated with lesion occurrence ($p < 0.001$).

Conclusion: Denture stomatitis was the most prevalent denture-related oral mucosal lesion among removable denture wearers. Prolonged daily denture use and overnight denture wearing

were significantly associated with lesion occurrence, whereas demographic characteristics, denture type, and denture-use duration were not.

Keywords: Denture stomatitis; Oral mucosal lesions; Removable dentures; Denture wearers; Overnight denture use; Oral health; Prosthodontics.

1. Introduction

Removable prostheses are still widely used among older adults, especially those who have lost some or all of their natural teeth. (Petersen, 2003) Although implant-supported restorations have become increasingly popular, conventional removable prostheses remain a common treatment option for many patients. (Carlsson and Omar, 2006)

The success of removable prosthetic treatment depends not only on the quality of the prosthesis itself but also on the patient's ability to maintain good oral and denture hygiene. Poor denture hygiene has been linked to a range of oral and systemic health problems. (Inuma et al., 2015) Regular recall appointments play an important role in monitoring oral health, reinforcing hygiene instructions, and identifying any complications related to prosthesis use at an early stage. (Mandali et al., 2011)

Several oral lesions have been reported in association with removable prostheses. The most commonly encountered lesions include denture stomatitis, angular cheilitis, inflammatory fibrous hyperplasia, and traumatic ulceration. (Jainkittivong, Aneksuk and Langlais, 2010).

1.1 The aim of study

This study aims to evaluate and increase awareness about the oral lesion related and cause by using removable prostheses

2. Method

2.1 Study Design and Setting

This retrospective cross-sectional study was conducted at a Specialized Dental Center in Saudi Arabia to determine the prevalence of oral lesions associated with removable prostheses and to evaluate their relationship with demographic, clinical, and prosthesis-related factors.

2.2 Study Population

A total of 130 patients wearing removable prostheses who attended the center during the six-month study period from 1 November 2025 to 29 April 2026 were identified through the electronic health record system. All patients who met the inclusion criteria were invited to attend a recall examination for clinical evaluation. Of these, 54 patients attended the recall examination and were included in the final analysis. Patients aged 18 years and older with complete clinical records and documented oral examinations were included in the study. Records with incomplete

demographic, clinical, or prosthetic information were excluded from the analysis.

2.3 Data Collection

Data were collected from electronic patient records using a standardized data collection form. The recorded variables included age, gender, smoking status, systemic medical conditions, type of removable prosthesis, duration of prosthesis use (≤ 6 months or > 6 months), average daily prosthesis-wearing time, overnight prosthesis use, denture cleaning methods, use of a denture brush, and vertical dimension status.

2.4 Clinical Examination

All participants underwent a comprehensive oral examination as part of routine clinical care. Prior to examination, removable prostheses were removed to allow assessment of the underlying oral tissues. The oral mucosa was systematically evaluated under standard clinical conditions, including the denture-bearing mucosa, palate, alveolar ridges, vestibular tissues, buccal mucosa, labial mucosa, tongue, and floor of the mouth. Oral lesions related to removable prostheses were diagnosed and recorded according to established clinical criteria. The lesions assessed included denture stomatitis, epulis fissuratum, traumatic ulceration, angular cheilitis, traumatic fibroma, frictional keratosis, flabby ridge, and oral candidiasis.

2.5 Outcome Measures

The primary outcome measure was the presence of oral lesions associated with removable prostheses. Secondary outcomes included the distribution of lesion types and their associations with demographic characteristics, systemic health conditions, prosthesis-related variables, and oral hygiene practices.

2.6 Statistical Analysis

Statistical analysis was performed using IBM SPSS Statistics version 26.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used to summarize the study variables. Associations between categorical variables were evaluated using the Chi-square test or Fisher's Exact Test, as appropriate. A p-value of less than 0.05 was considered statistically significant.

The study protocol was approved by the Institutional Review Board of the participating institution (Protocol No. TU-077/025/343). All data were anonymized prior to analysis to ensure patient confidentiality and compliance with ethical research standards.

3. Results

Of the 130 patients identified through the electronic health record system, 54 attended the recall examination and were included in the final analysis. Oral mucosal lesions were detected in 10 participants (18.5%), while 44 participants (81.5%) showed no evidence of oral mucosal lesions associated with removable prostheses. Table 1 shows the types of oral lesions related to

removable prostheses. Table 2 shows the association between participant characteristics and oral lesions related to removable prostheses, and Table 3 shows the association between removable prosthesis-wearing habits and oral lesions.

3.1 Types of Oral Lesions

Table 1. Types of Oral Lesions Related to Removable Prostheses

Variable	Number	%
Type of Lesion (n = 10)		
Denture stomatitis	8	80.0
Epulis fissuratum	1	10.0
Traumatic ulcer	1	10.0

3.2 Association Between Participant Characteristics and Oral Lesions

Table 2. Association Between Participant Characteristics and Oral Lesions Related to Removable Prostheses

Variable	Lesion Present n (%)	No Lesion n (%)	P-value*
Gender			0.089
Male (n=30)	3 (10.0)	27 (90.0)	
Female (n=24)	7 (29.2)	17 (70.8)	
Smoking Status			1.000
Smoker (n=13)	2 (15.4)	11 (84.6)	
Non-smoker (n=41)	8 (19.5)	33 (80.5)	
Medical Conditions			0.067
Hypertension	1 (9.1)	10 (90.9)	
Diabetes Mellitus	3 (60.0)	2 (40.0)	
Hypertension + Diabetes	1 (10.0)	9 (90.0)	
Medically fit	4 (16.0)	21 (84.0)	
Other conditions	1 (33.3)	2 (66.7)	0.427
Type of Denture			
Complete	9 (22.5)	31 (77.5)	
Partial	1 (8.3)	11 (91.7)	
Mixed	0 (0.0)	2 (100.0)	

3.3 Association Between Removable Prosthesis-Wearing Habits and Oral Lesions

Table 3. Association Between Removable Prosthesis-Wearing Habits and Oral Lesions

Variable	Lesion Present n (%)	No Lesion n (%)	P-value
Night Denture Wearing			* < 0.001
Yes (n=10)	7 (70.0)	3 (30.0)	
No (n=44)	3 (6.8)	41 (93.2)	
Denture Cleaning			1.000
Yes (n=9)	1 (11.1)	8 (88.9)	
No (n=45)	9 (20.0)	36 (80.0)	
Use of Denture Brush			0.159
Yes (n=29)	3 (10.3)	26 (89.7)	
No (n=25)	7 (28.0)	18 (72.0)	
Vertical Dimension			0.571
Normal	9 (18.0)	41 (82.0)	
Abnormal	1 (25.0)	3 (75.0)	

* Fisher’s Exact Test

Participants who reported wearing their dentures during sleep demonstrated a markedly higher prevalence of oral lesions than those who removed their dentures at night.

Participants wore their dentures for an average of 9.43 ± 6.50 hours per day, with wearing times ranging from 0 to 24 hours. The duration of daily denture use varied considerably among participants. Analysis revealed a significant association between daily denture-wearing hours and the presence of oral mucosal lesions ($\chi^2 = 35.64, p = 0.002$). Furthermore, a significant correlation was observed between daily denture-wearing time and lesion occurrence (Gamma = $-0.624, p = 0.012$). Participants who wore their dentures for longer periods, particularly those who reported continuous wear throughout the day, were more likely to develop oral mucosal lesions than those who wore their dentures for fewer hours.

Among the 18 participants who had worn dentures for 6 months or less, 2 (11.1%) presented with oral mucosal lesions associated with removable prostheses, while 16 (88.9%) had no lesions. In contrast, among the 36 participants who had worn dentures for more than 6 months, 8 (22.2%) exhibited oral mucosal lesions associated with removable prostheses, while 28 (77.8%) had no lesions. The association was not statistically significant (Fisher's Exact Test, $p = 0.466$).

4. Discussion

Several patient-related factors have been associated with the development of oral mucosal lesions among removable prosthesis wearers. These include both local and systemic conditions, such as xerostomia, diabetes mellitus, nutritional deficiencies, broad-spectrum antibiotic therapy, and the overgrowth of *Candida* species and oral bacteria (Thilakumara et al., 2017).

In addition, oral- and prosthesis-related factors, including reduced salivary pH, loss of the vertical dimension of occlusion, and residual ridge resorption, have been reported to contribute to the development of denture stomatitis, angular cheilitis, and traumatic ulceration (Brantes et al., 2019).

The etiology of oral lesions associated with complete and partial acrylic prostheses is multifactorial. Several factors have been implicated, including mechanical trauma, hypersensitivity to prosthetic materials, inadequate oral hygiene, alterations in salivary pH, smoking, advancing age, immune compromise, and *Candida* infections (Carvalho et al., 2000). Age has frequently been investigated as a potential risk factor for oral mucosal lesions, with several studies reporting a higher prevalence among older individuals (Mei Na et al., 2014).

Sahin et al. (2025) reported no significant associations between the occurrence of oral mucosal lesions and gender, smoking status, duration of denture use, or most prosthesis types ($p > 0.05$). These findings are consistent with those of the present study, in which none of these variables showed a significant association with oral lesions related to removable prostheses.

The findings of the present study are also in agreement with those reported by Ghiță et al. (2020), who identified denture stomatitis as the most common oral mucosal lesion among removable denture wearers and found no significant association between gender and lesion occurrence ($p = 0.58$). Similarly, gender was not significantly associated with oral lesions related to removable prostheses in the current study.

Denture stomatitis was the most frequently observed lesion in the present study, which is consistent with the findings of Brantes et al. (2019). Furthermore, Brantes et al. (2019) demonstrated that overnight denture wearing significantly increased the risk of oral mucosal lesions, a finding that was also observed in the current study.

The present findings are further supported by Ogunrinde and Olawale (2020), who reported no significant association between oral lesions related to removable prostheses and denture type, denture cleanliness, or duration of denture use.

Similarly, Aoun and Berberi (2017) found no significant association between age and the occurrence of oral lesions among denture wearers. This observation is consistent with the present findings and suggests that age alone may not be a significant predictor of lesion development in removable prosthesis wearers.

4.1 Limitations

This study has several limitations. First, its retrospective cross-sectional design does not allow conclusions about cause-and-effect relationships to be drawn. Second, only 54 of the 130 eligible patients attended the recall examination and were included in the final analysis, which may have introduced selection bias. The relatively low attendance rate may have been influenced by the advanced age of many patients and the long distance they were required to travel to return to the dental center for the recall examination. As a result, the study sample may not be fully representative of all removable prosthesis wearers treated at the center. Finally, the relatively small sample size may have reduced the ability to detect significant associations between some variables and the occurrence of oral lesions.

5. Conclusion

In conclusion, denture-related oral mucosal lesions were identified in 18.5% of denture wearers, with denture stomatitis being the most common lesion. Longer daily denture wearing hours and overnight denture use were significantly associated with lesion occurrence. However, age, gender, smoking status, denture type, denture cleaning practices, and duration of denture use were not significantly associated with lesion development. These findings highlight the importance of proper denture-wearing habits and patient education to help reduce the risk of oral mucosal lesions among denture wearers.

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