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Original Research

Study of Prevalence of Oral Lesions in Complete Denture Wearers

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Abstract:

Background: Complete denture wearing patients are often associated with the presence of various denture-related oral mucosal lesions. The purpose of this study is to evaluate the prevalence of denture-related oral mucosal lesions in complete denture patients.

Materials and Methods: The study was consisted of 362 patients having various denture-induced oral mucosal lesions from the outpatient department of the department out of the 608 complete denture patients examined. Data related to gender, age, length of denture use, hygiene care were obtained. All the data were tabulated and analyzed.

Results: In 362 complete denture patients, 378 oral mucosal lesions were found as 16 (4.2%) patients were having two types of lesions. Denture stomatitis (59.25%) was the most common lesion present, followed by epulis fissuratum (18.51%) and angular cheilitis (8.9%). The denture-induced oral mucosal lesions were found more common in age >40 years (60.78%) and in female (54.70%) complete denture wearer patients.

Conclusion: This study highlights the prevalence of the various denture-induced oral mucosal lesions in complete denture patients and more importance should be given to these patients as their oral health needs increases due to change in the oral environment conditions.

Key Words: Complete denture, denture stomatitis, edentulism, oral mucosal lesions

Introduction

Edentulism may be last sequel of dental caries and periodontal diseases. In case of older adults, edentulism is essential as a correlate of self-esteem and quality of life.[1] Furthermore, the oral health of the completely edentulous patient is an important factor in relation to the nutrition, social interactions, and general systemic health of the patients.[2]

The use of complete dentures in older patients has been known to act as a potential risk factor for the development of various oral lesions such as, denture stomatitis, epulis fissuratum, angular cheilitis, papillary hyperplasia, and traumatic ulcer as well as development of squamous cell carcinoma.[1,3]

Besides complete dentures rehabilitative function, it is common to see the presence of oral mucosal lesions caused by poorly adapted dentures, improper use, improper cleaning, denture plaque, mechanical trauma, etc.[1]

The present study was done to evaluate and analyze the prevalence of oral mucosal lesions in complete denture wearing patients.

Materials and Methods

The study was carried out on the complete denture wearing patients came to the Department of Prosthodontics over a period of 1-year. A total of 608 patients were examined and in that 362 patients were found to have various types of oral mucosal lesions. Data of gender, age, length of denture wearing, denture cleaning methods, and the presence of oral mucosal lesions were recorded.

Approval from the Ethical Committee was taken before start of the study and informed consent was taken from all the patients.

Inclusion criteria

1. Patients wearing complete denture
2. Patients wearing both maxillary and mandibular complete denture.

Exclusion criteria

1. Newly coming patients for the preparation of complete denture
2. Patients not ready to give informed consent.

Statistical analysis

All data were collected, tabulated and percentage analysis was done.

Results

A total of 608 patients were examined and in that 362 patients were found to have 378 various types of oral mucosal lesions. In 16 patients two types of oral mucosal lesions were present.

Denture stomatitis (59.25%) was the most prevalent lesion present, followed by the presence of the epulis fissuratum

(18.51%) and angular cheilitis (8.9%). Papillary hyperplasia was found to be present in 7.4% of the complete denture wearing patients. About 5.8% patients shown presence of traumatic ulcer and occurrence of the denture-induced or chronic irritation induced squamous cell carcinoma was found in 2 patients (Table 1 and Graph 1).

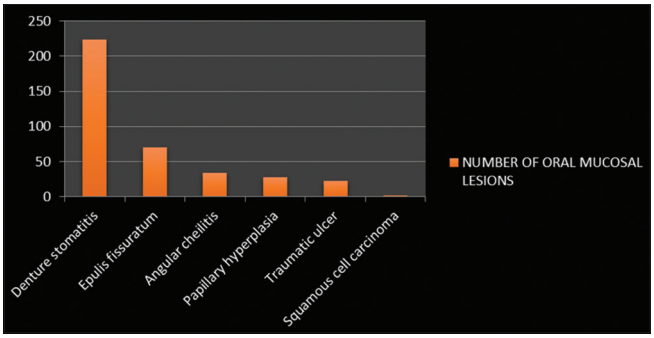
The study patients were divided into two age groups of <40 years and >40 years. The denture-induced oral mucosal lesions were more common seen in the elderly patient's, i.e., age group of >40 years (60.78%). Females (54.70%) were shown to have more oral mucosal lesions as compared to males (45.30%). Different time period of contact of the dentures were studied and it is found that patients wearing dentures for more time period (>5 years) were having more chances of development of the oral mucosal lesions (66.30%). The cleaning method of combination of mechanical and chemical aids leads to less chances of oral mucosal lesions than mechanical cleaning alone (72.37%) (Table 2 and Graph 2).

Table 1: Number of denture induced oral mucosal lesions.

Oral mucosal lesion	Number of denture induced oral mucosal lesions (%)
Denture stomatitis	224 (59.25)
Epulis fissuratum	70 (18.51)
Angular cheilitis	34 (8.9)
Papillary hyperplasia	28 (7.4)
Traumatic ulcer	22 (5.8)
Squamous cell carcinoma	02 (0.5)
Total	378

Table 2: Prevalence of the oral mucosal lesions in complete denture wearing patients according to age, gender, length of denture use and cleaning method.

Variable	Number of patients having oral mucosal lesions
Age (years)	
<40	142 (39.22)
>40	220 (60.78)
Gender	
Male	164 (45.30)
Female	198 (54.70)
Length of denture wearing (years)	
<5	122 (33.70)
>5	240 (66.30)
Method of denture cleaning	
Mechanical	262 (72.37)
Mechanical and chemical	100 (27.63)



Graph 1: The prevalence of different denture induced oral mucosal lesions.

Discussion

Oral mucosal inflammation in case of denture wearers occurs in local, generalized, or papillomatous forms.[4] Acute and chronic inflammatory lesions of the oral mucosa can be caused by various etiological factors including traumatic injuries due to traumatic occlusion, neuromuscular traumatic injuries due to improper balanced occlusion, complete dentures mere presence or acting as a foreign body, poor ventilation or oxidation of the oral mucosa covered by complete denture, improper retention of the denture, neurological and endocrinological systemic conditions of the patient, poor nutrition, chemicotoxic injuries by denture base material, infectious material accumulation on undersurface of the denture.[4]

In the present study, denture stomatitis (59.25%) was found to be commonest lesion in complete denture wearing patients, which is in accordance to the study done by Shah and Ahmad[4] and in contrast to the study by Patil *et al.*,[3] in which traumatic lesions (232 patients) were found more common than the denture stomatitis (142 patients).

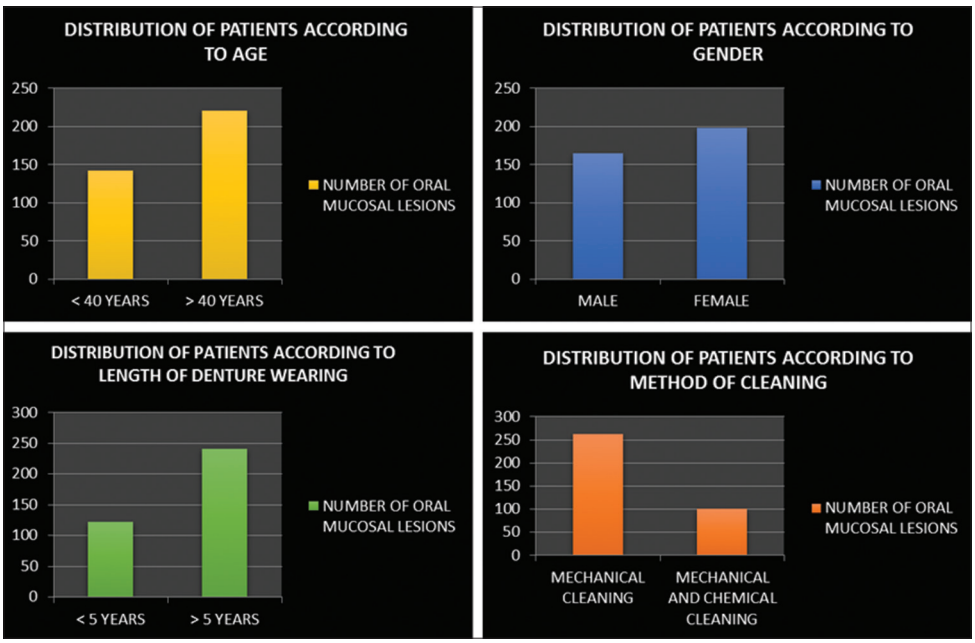
The impact due to overnight wearing of the denture is an important factor in the pathogenesis of the denture stomatitis.[5] pH value of the palatal mucosa decreases due to continuous wearing of the denture, due to acid products of the yeasts, lactobacilli and streptococci. Furthermore, acidic environment between denture base and oral mucosa is caused by the reduced salivation at night.[5]

Other factors such as denture cleaning methods, integrity of the denture (presence of crack, fracture or holes), poor oral hygiene, smoking, and quality and quantity of saliva can influence the presence of denture-induced stomatitis.[6]

The *Candida albicans* role in the pathogenesis of the denture stomatitis is well investigated, and various strains of the *Candida* have been shown to populate the denture base and the oral mucosa.[2]

Aging has been related to cause progressive increase in the *Candida* in the oral cavity. However, various studies showed that sole factor of complete denture wearing affected the number of *Candida* species; independent of the age of the complete denture wearer.[7] The poor oral hygiene maintenance in denture patient increases the frequency of positive cultures for *Candida* in the dentures.[1]

Angular cheilitis is a mucocutaneous lesion with presence of deep fissures and ulcerated appearance affects the angles of the mouth. It is associated with a variety of factors such as nutritional, systemic and drug related factors in combination



Graph 2: Distribution of denture associated oral mucosal lesions according to age, gender, length of use, and method of cleaning.

with the local factors like wearing of complete denture, as it is common in edentulous patients.[8]

In our study, we reported two cases of denture trauma induced oral squamous cell carcinoma. Panat *et al.*[9] and Shah and Ahmad *et al.*[4] also reported a case of oral squamous cell carcinoma induced by ill-fitting dentures.[10]

The most common location for the denture irritation induced oral squamous cell carcinoma is floor of the mouth. The reason for development of lesion at this site is due to flange extensions of the mandibular denture.[9]

The denture irritation hyperplasia or papillary hyperplasia and traumatic ulcer is caused by chronic injury of the tissue in contact with the ill-fitting denture border.[1]

In this study, we found that denture-related oral mucosal lesions were more common in age group of >40 years (60.78%), this was also seen in study by da Silva *et al.*,[1] in which 70% patients were above age of 40 years.

In recent studies, it was shown that aged and denture stomatitis patients show a decreased number of salivary neutrophils than controls and also had dysfunctions in the phagocytosis and killing of the *C. albicans*.[1]

Age is also associated with the development of the various nutritional deficiencies, systemic diseases, changes in the quality and quantity of saliva. These factors in accompany with the denture use can facilitate changes in the oral environment and enhances the development of oral mucosal lesiosn.[1]

In addition, age is also associated with systemic diseases, nutritional deficiencies, polypharmacy, and changes in the quantity and quality of saliva. These factors, along with denture use, may facilitate changes in the oral environment and enhance the development of *C. albicans*.[1-3]

The increased frequency of denture induced lesions among female is not much understood, but in can be explained by age-related and hormonal reasons. In case of perimenopausal and postmenopausal females, the decrease of the estrogen and progesterone and the atrophy of the oral mucosa can contribute to the exacerbation of the inflammatory response for chronic irritation caused by the use of complete dentures, leading to increasing the incidence of oral mucosal lesions in female patients.[11]

The female prevalence (54.70%) was also high in the present study. It is in accordance to the study done by Patil *et al.*,[3] Shah and Ahmad[4] and da Silva *et al.*[1]

The mechanical cleaning along with chemical aids found to be more effective, as chemical agents like silicone polymer provides protective cover for dentures as a final step in the cleaning process. Furthermore, chemical aids such as sodium and coconut soap seems shown to be more effective.[1] Our study shown similar results of the presence of less number of lesions in patients using both mechanical and chemical aids for the denture cleaning, as that of study by Shah and Ahmad.[4]

Use of chemical agents as an adjuvant, such as a new denture cleaner that contains silicone polymer and that provides a protective coating for dentures as a final step in the cleaning process. However, in poor communities, some of the proposed methods are inaccessible. Thus, the mechanical cleaning combined with effective and inexpensive chemical aids, such

as sodium hypochlorite and coconut soap, seems to be more appropriate.[1,12]

In the present study, patients using denture for long-term (>5 years) were seen to be more associated with the presence of the development of the oral mucosal lesions, which was also seen in study by da Silva *et al.*[1]

Therefore, wearing of dentures can reduce the protective effect of saliva, decreased cleaning by tongue and ultimately reduced oxygenation of the oral mucosa and leads to the increased tendency for the development of the oral mucosal lesions. This study therefore reinforces the importance of the dental services for the edentulous adults.

Conclusion

The complete denture wearers should be educated about the importance of periodic examination due to changes of supporting tissues and early detection of mucosal lesions to maintain their oral and denture hygiene in optimum level.

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