

# ORAL MUCOSAL LESIONS ASSOCIATED WITH THE USE OF DENTURES: CASE SERIES

## LESÕES DA MUCOSA ORAL ASSOCIADAS AO USO DE PRÓTESES: UMA SÉRIE DE CASOS

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**ABSTRACT:** The World Health Organization recognizes tooth loss as a social and public health problem. The edentulism can be defined as total or partial loss of permanent dentition. It occurs as a consequence of several deleterious effects that take place throughout an individual's lifetime. Thus, the use of denture, for the restoration of masticatory function, is necessary. The poor hygiene and fit of these denture as well as other local and systemic factors may contribute for the appearance of buccal lesions, such as denture stomatitis, traumatic ulcers, angular cheilitis and fibrous hyperplasia. Therefore, this article aims to report a series of three clinical cases of oral mucosa lesions associated with the use of dental prosthesis, in elderly patients. The reported cases are of female patients aged between 54

and 66 years who were diagnosed and adequately treated for denture stomatitis, angular cheilitis and inflammatory fibrous hyperplasia. Therefore, this study highlights the importance of the dentist in the prevention, diagnosis and treatment of these oral diseases prevalent in dentistry.

**Keywords:** Geriatric Dentistry. Dental Prosthesis. Aged. Mouth Diseases.

**RESUMO:** A Organização Mundial da Saúde reconhece a perda dentária como um problema social e de saúde pública. O edentulismo pode ser definido como a perda total ou parcial da dentição permanente e ocorre como consequência de vários efeitos deletérios que se sucedem durante a vida do indivíduo. Desta forma, a utilização de próteses dentárias, para o restabelecimento da função mastigatória, torna-se necessária. A falta de higienização e adaptação dessas próteses dentárias bem como outros fatores locais e sistêmicos podem contribuir para o aparecimento de lesões bucais como a estomatite protética, úlcera traumática, queilite angular e hiperplasias fibrosas. Portanto, esse artigo tem como objetivo relatar uma série de 3 casos clínicos de lesões bucais associadas ao uso de prótese dentária, em pacientes idosos atendidos no ambulatório de Estomatologia da Clínica Odontológica da UEL. Os relatos apresentados são de pacientes do sexo feminino com a idade entre 54 e 66 anos que receberam diagnósticos e adequados tratamento para estomatite protética, queilite angular e hiperplasia fibrosa inflamatória. Portanto, esse trabalho realça a importância do cirurgião-dentista, na prevenção, diagnóstico e tratamento dessas prevalentes doenças bucais na odontologia.

**Descritores:** Odontogeriatrics. Prótese Dentária. Idoso. Doenças da Boca.

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## 1. INTRODUCTION

The world population has been quickly aging in various regions of the planet, due to the decreased fertility rate and increased life expectancy<sup>1</sup>. The World Health Organization (WHO) established that 60-year-old people or over are considered elderly in developing countries<sup>2</sup>. In the last 200 years, people in all countries of the world achieved an impressive

health-related progress, which leads to an increased life expectancy. Globally, life expectancy increased to an average of 73 years in 2019<sup>3</sup>.

The elderly are those who most uses dental prostheses, with values of tooth loss that reach 92.4%<sup>4</sup>. During aging, there is a decrease in the protective function of the oral mucosa, such as the reduction of oral epithelium proliferation and collagen synthesis

in the connective tissue. Therefore, a decreased tissue regeneration is expected, as well as less resistance to injuries. Alterations in the oral mucosa of these patients can be explained by the interaction of many factors, such as systemic condition, aging, metabolic alterations, nutritional factors, medication use, psychobiological habits, prosthesis use, alcohol and tobacco consumption<sup>5-8</sup>. The main mucosal lesions associated to removable prosthesis are denture stomatitis, angular cheilitis, inflammatory fibrous hyperplasia and traumatic ulcers. The presence of candida infection, poor oral hygiene, mechanical trauma, low salivary pH and reduced occlusion vertical dimension (OVD), have been associated with the development of these lesions<sup>6,9</sup>.

The oral rehabilitation does not eliminate the possibility of new problems arising regarding the biological and prosthetic elements involved<sup>10</sup>. The maintaining of proper hygiene of the prostheses has an essential role in preventing lesions related to its use<sup>11</sup>. Dentists play an important role in guiding patients on the proper hygiene of their prostheses<sup>12</sup>.

Constant exposure to various harmful agents predisposes the oral mucosa to various oral diseases<sup>13</sup>. The use of inadequate removable prosthesis must be considered an important factor influencing the presence of oral diseases<sup>14</sup>. Thus, this article reports a series of three cases of oral mucosa lesions associated with dentures in elderly patients, as well as discusses the etiopathogenesis, prognosis and current treatment for these conditions.

## 2. CASE REPORT

### 2.1. Case Report 1

A 54-year-old woman was referred to the Stomatology Service, School of Dentistry, Londrina State University, complaining of "gum pain". Her medical history included schizophrenia that currently was being managed with chlorpromazine and olanzapine. Extraoral examination revealed a reddish erosion in the labial commissure, bilaterally (Figure 1). On the intraoral examination, a sessile nodule was noted in the right posterior maxillary vestibule, with a smooth surface, with color similar to normal oral mucosa, occasionally symptomatic, measuring about 3.5 cm in diameter (Figure 2). Besides, a diffuse erythematous asymptomatic area in the hard palate and upper alveolar ridge was also observed. Moreover, oral mucosa dryness was verified. According to the clinical features, a diagnosis of angular cheilitis was established for the lesions in the labial commissure; and denture stomatitis for the lesions on the hard palate and upper alveolar ridge. The clinical diagnostic hypothesis for the nodule associated with the border of maxillary denture was inflammatory fibrous hyperplasia (IFH). The proposed treatment to the denture stomatitis consisted in using antifungal for seven days, to which a nystatin oral suspension solution of 100,000 IU/mL was prescribed, recommending the patient to do mouthwash with the medication three times a day, and then swallow it. Regarding the sessile nodule, the proposed treatment was to

discontinue the use of the denture, and a total regression of lesion was noted after 21 days. In addition, the patient received instructions on oral and prosthetic hygiene and she was encouraged to replace her dentures.



**Figure 1** – Clinical aspect of angular cheilitis characterized by maceration, erythema, and crust formation of corners of mouth.



**Figure 2** - Discrete sessile nodule in the right posterior in alveolar mucosa that had a smooth surface.

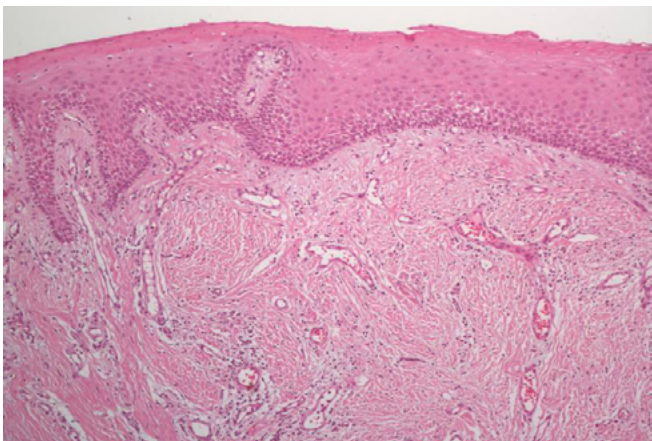
## 2.2. Case Report 2

A 59-year-old woman sought our ser-

vice, complaining that “a fleshy tissue had appeared in mouth”. During anamnesis, she reported to be in treatment for depression with clonazepam, venlafaxine and carbamazepine. The patient was a former smoker, having had stopped 10 years before, and reported consumption of alcoholic beverages twice a week. Extraoral examination did not show remarkable features. Upon the intraoral examination, we observed multiple sessile nodules with normochromic colored, irregular surface and shape with distinct borders, located on the anterior maxillary vestibule. The lesion had flaccid consistency and measured about 3 cm (Figure 3). On the basis of these clinical features, the presumptive clinical diagnosis was of IFH, and excisional biopsy under local anesthesia was performed. Histopathological examination revealed a fragment of mucosa lined by a stratified squamous parakeratinized epithelium, showing areas of hyperplasia. In the submucosa, there was a hyperplastic dense fibrous connective tissue with chronic inflammatory infiltrate, confirming the diagnosis of IFH (Figure 4). One week after the biopsy, an optimal tissue repair was observed. Adjustments were performed in the upper denture and instructions concerning the need for replacement by new dentures were given.



**Figure 3** – Multiple erythematous nodules with irregular surface and shape located on the anterior maxillary vestibule.



**Figure 4** – Photomicrograph of biopsy specimen showing a fragment of mucosa lined by a stratified squamous parakeratinized epithelium, with areas of hyperplasia. Submucosally, hyperplastic dense fibrous connective tissue showed discreet chronic inflammatory infiltrate. (HE, 100x).

### 2.3. Case Report 3

A 60-year-old woman sought our service, complaining of “bleeding gum”. In the anamnesis, she reported having stopped using

the prosthesis due to the discomfort and pain that caused it. Her medical history included hypertension and hypothyroidism that currently was being managed with spironolactone, levothyroxine and omeprazole. Extraoral examination found no abnormalities. Intraoral inspection, revealed areas with diffuse erythematous spots, smooth-surfaced and asymptomatic in the hard palate and upper alveolar ridge (Figure 5). Poor oral hygiene as also observed with presence of coated tongue and intense halitosis. Based on the clinical aspects observed, the clinical diagnosis was of denture stomatitis. Thus, the patient received instructions on oral and prosthetic hygiene and to remove the dentures, especially during sleep. The therapy established was of nystatin oral suspension of 100,000 IU/mL, with similar recommendations to case 1. After one week, there were regression of lesions in hard palate and oral and prosthetic hygiene significantly improved. The patient was advised of the need to replace her prostheses.



**Figure 5** – Areas with diffuse erythematous spots, smooth-surfaced in the hard palate and upper alveolar ridge.

### 3. DISCUSSION

The poor hygiene of the dentures associated with trauma act as predisposing factor to the appearance of oral mucosal lesions, its development depending on the patient's health conditions<sup>15</sup>. In this case series, all patients presenting oral mucosa lesions associated with the use of prosthesis and were female with aged from 54 to 60 years. It is known that women seek dental treatment more often than men, allowing lesions to be detected, besides postmenopausal hormonal changes that make the mucosa more susceptible to hyperplastic reactions<sup>16</sup>.

Denture stomatitis (DS) is a widely prevalent inflammatory disease among prosthesis wearers. It affects mostly the palatal mucosa and is strongly associated with poor denture hygiene<sup>17</sup>. Multiple etiological factors contribute to denture stomatitis, such as microorganisms *Candida* sp. and Gram-negative anaerobes bacteria; impaired salivary flow and salivary gland function; trauma from ill-fitting dentures; poor denture and oral hygiene; and impaired immune response secondary to systemic conditions. Certain strains of *Candida*, specifically hyphal-forming *Candida albicans*, are more commonly found in candidal infections in DS patients. These virulent strains are capable of epithelial binding, disruption of epithelial integrity, and invasion<sup>18-19</sup>. The progression of DS without an adequate treatment can lead to a systemic infection, especially in immunocompromised patients<sup>20</sup>. Most red oral lesions are of inflammatory nature, but some are potentially malignant, especially oral eryth-

roplakia<sup>21</sup>. This lesion has a high probability of showing signs of dysplasia or malignancy at the time of diagnosis. Thus, the biopsy is mandatory in cases of doubt. Other rare lesions, that must be excluded during the diagnosis are: Kaposi's sarcoma, erosive lichen planus, and discoid and systemic lupus erythematosus<sup>22-23</sup>.

Studies have demonstrated that many denture wearers attempt to maintain denture hygiene only by brushing, as one would brush natural dentition; however, this is inadequate for maintaining proper denture hygiene, and other methods, such as use of commercial disinfectant solutions, or immersion of dentures in dilute sodium hypochlorite, are required as part of daily and routine denture maintenance, as well as removing it during the night<sup>24-25</sup> in order to give rest to the supporting tissues<sup>26</sup>. Sodium hypochlorite 1%, has been accepted by the American Dental Association as a prosthesis cleaning and disinfection agent; its advantages include a wide antimicrobial spectrum<sup>27</sup>. The oil from the seeds of *Ricinus communis* (castor bean) has detergent properties and is able to damage the fungal cell wall, leading to cytoplasm extravasation and consequent cell death<sup>28</sup>. Mechanical brushing with mild soap associated with the disinfection with sodium hypochlorite is still one of the most efficient ways to proceed with the hygiene, due to its simplicity, low cost and efficiency in removing the biofilm. However, in older adults who depend on others, it is advised that such cleaning procedure should be done by a family member or caregiver<sup>29</sup>. With the purpose of improving hygiene through adequate cleaning of the prosthesis, some recommendations are

included, as the regular and frequent use of soft brushes, antifungal therapy, mouthwash with anticandidal activity, including triclosan, chlorhexidine and gluconate, as well as the hygiene of the soft tissues that are in contact with the prosthesis<sup>30</sup>.

In the cases here presented, all the dentures were in unfavorable hygiene conditions. Thus appropriated instructions about oral and denture hygiene were given by the dentists. In addition, it was prescribed antifungal for seven days (nystatin oral suspension solution of 100,000 IU/mL). After one week, it was possible to observe regressions in lesions on the hard palate and a significant improvement in oral and denture hygiene. Patients were also advised to remove their dentures during sleep and to replace them with new dentures. Brantes et al. demonstrated that the habit of night use of the denture is considered an independent risk factor for the development of oral lesions. Furthermore, they also found that the longest period of use of the same denture and biofilm had statistically significant relationship to oral lesions<sup>9</sup>.

Another disease reported in our cases was angular cheilitis. Clinically, it is a frequent condition characterized by erythema, cracking, fissuring, and maceration of the lip corners and the adjacent skin, either in one commissure or both.<sup>31</sup> The angular cheilitis is usually related to one or more factors, including: infectious agents (*Staphylococcus aureus*, Streptococci and *Candida*), dermatological diseases, nutritional deficiency, immunodeficiency, hypersalivation and mechanical factors, leading to the loss of the OVD<sup>32</sup>. Some systemic disorders as the Down syndrome, in-

flammatory bowel diseases (such as Crohn's disease or ulcerative colitis) can be associated with angular cheilitis<sup>33-35</sup>.

In our case, the presence of angular cheilitis was related to loss of OVD caused by edentulism and wearing the same denture for a long time. Occasionally, this type of cheilitis can be miss diagnosed for other less frequent lesions, which can have a similar clinical appearance, such as herpes simplex, impetigo, and pemphigus vulgaris. The treatment often requires a multidisciplinary approach. The main factor for a successful treatment is identifying each case's correct etiological factors. The most common treatment is based on antifungals. However, local antibiotics and corticoids, vitamin complexes, hygiene of the prostheses, and allergen prevention has also been used<sup>36-37</sup>. In our case, due to the large time using the same denture, the treatment established was the replacement of the prosthesis to reestablish the OVD and reduce the formation of prominent folds at the corners of the mouth, which provides accumulation of saliva and the skin may become cracked and infected secondarily. Moreover, it was prescribed topical antifungals and oriented about the correct oral and prosthetic hygiene.

Acute and chronic irritation from defective or ill-fitting dentures may injure the oral mucosa, resulting in the formation of traumatic ulcers or hyperplastic tissues folds. IFH is the most frequent lesion among inflammatory/reactive lesions, and its development correlates directly to denture use<sup>38</sup>. The prevalence rate of IFH ranges from 5% to 20% of all the oral biopsies and is observed in 65% of the lesions in denture users<sup>39</sup>. The IFH is a non-neoplas-

tic proliferative lesion resulting from a hyperplastic reaction of the fibrous connective tissue, and it develops in association with the borders of poorly fixed total or partial removable prosthesis<sup>40</sup>. In our cases of IFH, the patients were wearing poorly adapted dentures for more than 19 years. In addition, dentures also showed deterioration, irregular edges, rough and cracked surfaces. Clinically, IFH is asymptomatic with multiple folds that can be detected on the alveolar mucosa. Ulcerations are occasionally observed in the bottom of fissures of the lesion. This lesion usually occurs in middle-aged and older adults who wear removable dentures for a long time, with a higher prevalence rate in women<sup>41</sup>. Histologically, it is a dense fibrous connective tissue with variable chronic inflammatory infiltrate<sup>42</sup>.

This lesion presents excessive collagen deposition, being responsible for the increased volume<sup>43</sup>. The treatment consists in surgical removal of the hyperplastic tissue, and adjustment or replacement of the prosthesis to prevent recurrences. The red and small lesions, which are mostly inflamed lesions, completely disappear when the denture is removed or its flanges are shortened. In one of our cases the proposed treatment was to discontinue the use of the denture for a certain period of time and in the other case excisional biopsy. It is now known that other lesions

of appearance nodule may mimic the IFH, such as benign mesenchymal neoplasms, as well as non-neoplastic proliferative processes, being of is important the correlation of clinical and microscopic aspects.

The prevalence of lesions in oral mucosa related to the use of dentures can be reduced through adequately instructing the patients; the preservation of oral hygiene; and cares by dentist in the various stages of making the prostheses, resulting in stable occlusion, good fixation of its basis to the mucosa, and adequate peripheral sealing, within the limits of the basal area<sup>44</sup>. In addition, the patient must also understand the maintenance requirements, and need to alter personal behaviours which compromise oral health<sup>45</sup>.

#### **4. CONCLUSIONS**

Based on this serie of cases, the oral lesions found were associated to poor oral and denture hygiene, in addition to several years of using the same prosthesis and their deficiency of adaptation. Considering the systemic and oral consequences of these factors and the great number of patients wearing dentures, a special attention should be given by clinicians and public health officials to these denture related problems.



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