

## FACTORS INFLUENCING SUCCESSFUL MANAGEMENT OF DENTURE-RELATED LESIONS IN ELDERLY PATIENTS

### *(FAKTOR-FAKTOR YANG MEMENGARUHI KEBERHASILAN PENATALAKSANAAN LESI TERKAIT GIGI TIRUAN PADA PASIEN LANJUT USIA)*

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### ABSTRACT

The denture-related oral mucosal lesion is a heterogeneous clinical and histopathological tissue alteration commonly found among older people. Dental management requires understanding dental and medical aspects and paying attention to many other factors. A 62-year-old male came to Universitas Indonesia Dental Hospital complaining of painful soreness and redness at the corner of his mouth. The patient had hypertension and had not routinely taken Amlodipine in the last three years. A blood count examination revealed normal results, except for a slightly low MCV. Diagnosis of angular cheilitis was established along with denture stomatitis and median rhomboid glossitis. Angular cheilitis was healed after administration of 0.2% Miconazole cream. Unfortunately, the patient could not use the drug correctly, so denture stomatitis and median rhomboid glossitis have not entirely resolved yet. The predisposing factors of denture-related oral mucosal lesions might be

local or systemic. Proper pharmacological treatment and appropriate dental health education will make a good prognosis. However, the patient's compliance and cooperation will determine the success of dental treatment. It is essential to enhance patient compliance and overcome the treatment challenges to achieve optimal results in managing denture-related oral mucosal lesions of elderly patients.

**Keywords:** denture; elderly; lesion; management

### **ABSTRAK**

*Lesi mukosa oral terkait gigi tiruan menunjukkan tampilan klinis heterogen dan perubahan jaringan secara histopatologis yang umum ditemukan pada populasi lansia. Manajemen dental tidak hanya membutuhkan pemahaman aspek medis dan kedokteran gigi saja, namun perlu memperhatikan banyak faktor lainnya. Laki-laki berusia 62 tahun datang ke RSKGM FKG UI dengan keluhan luka dan kemerahan yang terasa sakit pada sudut mulutnya. Pasien memiliki hipertensi dan mengonsumsi Amlodipine secara tidak rutin sejak 3 tahun terakhir. Hasil pemeriksaan darah lengkap menunjukkan hasil normal, kecuali nilai MCV yang sedikit rendah. Diagnosis angular cheilitis ditegakkan bersama dengan denture stomatitis dan median rhomboid glossitis. Angular cheilitis sembuh setelah penggunaan Miconazole krim 0,2%. Namun, disayangkan pasien tidak dapat menggunakan obat secara tepat, sehingga denture stomatitis dan median rhomboid glossitis belum sembuh secara total. Faktor predisposisi dari lesi mukosa oral terkait gigi tiruan dapat berupa faktor lokal dan sistemik. Terapi farmakologi yang tepat dikombinasikan dengan edukasi kesehatan gigi dan mulut yang baik akan memberikan prognosis yang baik pula. Namun, kepatuhan dan sikap kooperatif pasien akan menentukan keberhasilan perawatan dental. Merupakan suatu hal yang penting untuk meningkatkan kepatuhan pasien dan mengatasi tantangan dalam perawatan untuk memperoleh hasil optimal dalam penatalaksanaan lesi mukosa oral terkait gigi tiruan pada pasien*

*lansia.*

***Kata kunci:*** *gigi tiruan; lansia; lesi; tata laksana*

## **INTRODUCTION**

The denture-related oral mucosal lesion presents as a clinical and histopathological alteration of tissue in the oral cavity. The prevalence increases with age, so older adults are more likely to get this condition.<sup>1</sup> Different countries showed varying ranges of denture-related oral lesions. Feng et al. reported a prevalence of 10,8% among the Chinese population. Meanwhile, 59,5% of induced oral lesions were in dental hospitals in India.<sup>2,3</sup> Impaired DNA repair capacity, reduced immunologic activity, and oral epithelium atrophy will increase the vulnerability of denture-induced oral lesions among elderly patients.<sup>4</sup> Angular cheilitis, denture stomatitis, and traumatic ulcer are mentioned as the three most common lesions related to denture wearing.<sup>5</sup> When lesions develop in denture wearers, especially elderly patients, it can negatively impact their quality of life.<sup>6</sup> To prevent this problem, dentists should increase awareness and provide proper management for patients experiencing denture-related lesions. This case report will discuss the

case of an elderly patient who presents with some lesions related to a removable complete denture.

## **CASE REPORT**

A 62-year-old male patient came to Integration Clinic, Universitas Indonesia Dental Hospital, with a complaint of sores (VAS = 2) and redness at the corner of the mouth for the last six months. The pain was getting worse on mouth opening. The sores recurred weekly without prodromal symptoms and healed in 2 days with no treatment. He used a complete denture daily, made by a traditional dental technician five years ago, but never removed it while sleeping, although he cleaned it 2-3 times after eating with a toothbrush under water flow. He admitted that the denture was uncomfortable due to its unfitness for the past year.

The patient had a history of hypertension with no routine medication for the last three years. He ate 2-3 times daily with a balanced diet consisting of rice, some proteins (eggs, tofu, tempeh), and vegetables (carrot, beans, squash) but took

red meat once or twice a month. He preferred dry meals and never complained of difficulties when eating or swallowing. Water intake is approximately 1,5 L/day with a cup of black coffee daily. The patient has smoked two packs of cigarettes daily for 45 years and has been unemployed since the COVID-19 pandemic, which made him feel stressed due to financial problems. He rarely did any physical exercises. The patient denied any harmful oral habits, but he sometimes unconsciously licked the corner of his mouth during the examination.

The extraoral examination revealed that the upper and lower lips were dry, with erosion, erythema, and multiple fissures bilaterally at the corner of the mouth (figure 1). Intra-oral examination showed painless erythema on the hard palate below the denture-bearing area (figure 2). There was a rhomboid-shaped atrophic papillary area, size 20 x 15 mm, on the dorsum of the tongue with fissure and tongue coating (figure 3). Irregular white plaque with a diffuse border was found on the lower ridge area.

The patient was diagnosed with angular cheilitis, type II denture stomatitis, and median rhomboid glossitis. At the same time, the irregular plaque was considered as frictional keratosis. He was treated with 0.2% miconazole cream to be applied on the corner of the mouth, nystatin oral

suspension 100.000 IU for intraoral lesion, and instructed to remove the denture when he slept and soaked it with chlorhexidine solution. The patient was educated about his oral hygiene, to replace his old denture, to stop his smoking habit, and referred for a Complete Blood Count examination.



**Figure 1.** Painful erythema and multiple fissures at the commissures.



**Figure 2.** Diffuse erythematous area found on the underneath mucosa covered by denture.



**Figure 3.** Median rhomboid glossitis presents as localized atrophy of the lingual papilla in the posterior portion of the dorsum tongue.

On a follow-up visit, a week after the first visit, the patient admitted that the lesion on the corner of the mouth had healed. On drug usage evaluation, the patient confessed to applying the miconazole cream correctly but only used Nystatin twice to thrice a day without removing his denture. He also stated that he rarely opened the denture and didn't even soak it in an antiseptic solution, and still smoked two packs of cigarettes daily. The complete blood count results revealed slightly low MCV (79,3 fL), while the other components were within the normal range.

Extraoral examination showed no lesion on the corner of the mouth. Intraoral examination revealed reduced erythematous on the denture-bearing area and a slight improvement on the atrophic area of the tongue. The miconazole cream

treatment was stopped. The patient was re-educated on the importance of proper usage of Nystatin oral suspension and denture removal during nighttime; we even asked him to repeat the usage instructions and gave him notes to be taken home. He was scheduled to perform another follow-up visit in one week, but the patient failed to perform the visit.



**Figure 4.** Entirely resolved angular cheilitis.



**Figure 5.** Diminished area of diffuse erythema on the palatum.



**Figure 6.** Reduced papillary atrophic area (Posterior dorsum of the tongue).

## DISCUSSION

Aging is a natural process in almost all organ systems, including the nervous, musculoskeletal, cardiovascular, and other systems.<sup>7</sup> This process led to degenerative systemic changes, negatively affecting oral health. Physiological aging of the oral mucous membrane, tooth, periodontal tissue, salivary gland, and secretion contribute to edentulism in elderly patients.<sup>8</sup> In developing countries, most patients with complete edentulous will receive conventional removable denture treatment, which requires regular follow-up and maintenance to prevent complications like soft tissue trauma, chronic soreness, and alveolar ridge resorption.<sup>9</sup>

In this case, the patient had multiple lesions caused by an ill-fitting removable denture with inappropriate maintenance. Removable dentures can alter the oral environment and, consequently, oral flora. The role of dentures as predisposing factors

for oral mucosal lesions can be related to inadequate maintenance by the patient, operator's error, or the fabrication of the denture itself.<sup>10</sup> Dentures made from synthetic polymers (polymethyl methacrylate), which are micro-porous, providing a favorable environment for *Candida* to adhere readily. In addition, host factors such as the immune system, diet, hormonal imbalance, and production of saliva also contribute to the colonization of *Candida*.<sup>11</sup>

The patient's chief complaint was the soreness and redness in the corner of the mouth, later diagnosed as angular cheilitis or perlèche, an inflammatory condition at the corner of the mouth that begins at the mucocutaneous junction and extends to the skin. Clinically, it was characterized by erythema, moist maceration, ulceration, and crusting at the mouth commissures.<sup>12</sup> Multifactorial conditions, ranging from local to systemic that either act alone or in combination can contribute to the process of angular cheilitis. Anatomical, mechanical, allergic, chemical, and infectious agents were classified as local etiologic factors, while nutritional deficiencies, drug-related side effects, and systemic diseases were the systemic ones.<sup>12</sup> The predisposing factors of angular cheilitis in this patient were local. The first factor is reduced vertical dimension due to complete edentulous

causes of stasis and pooling of saliva. Due to unfitness and improperly made old dentures, the vertical dimension could not be restored. Moreover, chronic lip licking of the patient leads to saliva accumulation at the mouth commissures. Although the patient didn't show any signs of anemia, due to the history of poor nutritional intake, a suspicion of hematinic deficiency could not be administered until a complete blood count examination. The result revealed that most components were within the normal range with a slight decrease in MCV, so anemia was ruled out as a predisposing factor of angular cheilitis.

The second lesion found in this patient was denture stomatitis, which commonly affects denture wearers. It is chronic erythematous mucosal inflammation of oral tissues underneath removable prosthesis. According to the clinical aspects of the lesion, it belongs to type II, generalized diffuse erythematous area extended the bearing area of the complete denture.<sup>13</sup> Denture stomatitis has multiple causes for its initiation and progression. The main etiological factors were trauma, nocturnal denture wearing, surface texture, poor denture hygiene, denture lining materials, saliva, and systemic conditions. Smoking leads to reduced salivary flow and contributes to denture stomatitis development.<sup>14</sup> The

diminished function of the salivary gland commonly associated with aging will impact salivary production in elderly patients. With advancing age, there is atrophy of acinar tissue, proliferation of ductal elements, and another degenerative change in the major salivary glands.<sup>8</sup> Based on subjective examination, denture hygiene, nocturnal denture wearing, and trauma due to ill-fitting dentures were this patient's leading causes of denture stomatitis. The denture insertion alters normal oral microflora. The tissue contact surface of the denture is less disturbed and enhances the colonization of microbes, especially *Candida* and acidogenic bacteria.<sup>11</sup>

Another condition found in the patient was an erythematous area related to papillary atrophic on the tongue's dorsum, which refers to median rhomboid glossitis. The etiology is not fully understood, but biopsies yield candida hyphae in more than 85% of the lesions.<sup>15</sup> The risk factors include smokers and denture wearers as well as patients using inhalation steroids. A concurrent erythematous lesion, known as a contact lesion, can sometimes be observed in the palatal mucosa.

Denture wearers are prone to develop oral mucosal lesions. Based on previous data, at least one denture-related oral mucosal lesion was in nearly half of denture wearers.<sup>9</sup> Denture stomatitis, epulis

fissuratum, angular cheilitis, frictional keratosis, papillary hyperplasia, traumatic ulcer, and squamous cell carcinoma were mentioned as some of the lesions induced by denture. Considering age groups, the lesions were more commonly seen in elderly patients as the prevalence of edentulism was reported to be higher among them.<sup>3</sup> In some studies, Males presented more oral mucosal lesions induced by dentures than females.<sup>4</sup> Epithelial atrophy and reduced salivary flow rate during the aging process contribute to changes in the oral cavity and overgrowth of oral microflora.<sup>7</sup> In this patient, the lesions were mainly caused by candida infection.

Management of angular cheilitis began with the identification of the predisposing factors.<sup>12</sup> In this patient, reduced vertical dimension and lip-licking habit acted as the prominent causes of salivary accumulation, leading to the potency of *Candida* infection, so miconazole cream 0.2% was prescribed. In addition, dental health education for new denture fabrication and eliminating lip-licking habits is also delivered to the patient. At the follow-up visit, the lesion at the commissures was completely gone following the administration of topical antifungal as instructed. Miconazole is effective against both *Candida albicans* and non-*albicans* species due to its ability to

induce reactive oxygen species, making it a potent fungicidal azole.<sup>16</sup>

Denture stomatitis and median rhomboid glossitis in this patient were treated with Nystatin and encouragement to perform denture hygiene by removing the denture during sleep and soaking it in chlorhexidine gluconate 0.2% before the old denture replacement. Topical antifungal medications, such as Nystatin in some preparations (dry powders, lozenges, and suspensions), are effective against most *Candida* species and its oral manifestations, such as denture stomatitis and median rhomboid glossitis.<sup>17</sup> Antifungal (polyenes or azoles) prescription, along with denture hygiene, was one of the treatment modalities in denture stomatitis.<sup>18</sup> Meticulous oral hygiene, including denture hygiene and care, is vital in achieving resolution in denture stomatitis.<sup>19</sup> Mechanical cleaning is the standard method for controlling plaque, but somehow, it can result in denture wear and surface defects, which lead to the pigmentation and reservoir of *Candida*. Several options include chemical cleansers (peroxide, hypochlorite, enzymes) chosen as preferable agents. Some common impediments to complete recovery of denture stomatitis include reduced patient compliance, immunodeficiency, and drug resistance.<sup>20</sup> Due to this patient's absence of



systemic issues, the lesion should have been entirely resolved. Unfortunately, the lack of patient compliance contributes a lot to the incomplete resolution of denture stomatitis and median rhomboid glossitis.

Therapeutic adherence is defined as the degree to which a person's behavior corresponds with the accepted recommendations of the health professional. This phenomenon is considered more prevalent in developing countries. Non-adherence behaviors have shown a wide range of possibilities, from irregular taking of drugs, short periods of rejection of the medicines, and premature abandonment of treatment.<sup>21</sup> To proffer solutions, it is essential to understand some of the influencing factors. Provider factors, including physicians, pharmacists, and nurses, play a role in determining whether patients comply with prescriptions. Some providers may only focus on the diseases and treatment, neglecting the patient's acceptance of treatment modalities. It leads to inadequate education of the dosage, timing, formulation, and side effects of the prescribed medicines.<sup>22</sup> The patient's factors need to be considered while dealing with non-adherence to medications. Factors including illiteracy, multiple medications, alcohol use, cultural use, religious beliefs, and lack of knowledge about the treatment itself can adversely influence medication

adherence. Medication factors such as pharmaceutical formulation, size, dosage, frequency, and drug preparations can also affect patient adherence. Some potential barriers to medication include cost, timing, and adverse effects of the drug.<sup>22</sup>

Older people arise as an essential group developing this issue due to the complexity of multimorbidity, polypharmacy, the high rates of drug-drug interactions and adverse drug reactions, the alteration of senses, and cognitive deterioration.<sup>21</sup> In this case, the three influencing factors above contributed to the patient's compliance. Besides that, the patient also complained about the time Nystatin was used, which felt too frequent (every 6 hours), so he didn't follow the instructions well. Possessing communication and interpersonal skills with acknowledgment of the patient's challenge of using prescribed medications can improve their compliance. Increased patient satisfaction with care can be achieved by establishing clear information through open communication between patient/caregiver and healthcare provider. Effective communication requires the provision of clear, accurate, and comprehensive information. The health provider can also show simple gestures of kindness and compassion, unhurried approach, and empathy when talking to

elderly patients. Proactive communication was highlighted as crucial to patient involvement in every decision-making process.<sup>23</sup> It can often be difficult for elderly patients to remember everything discussed during a dental visit. It can be helpful to write down or print out takeaway points so they have information to review later about their health issues, treatment given, and other significant points discussed. Compensating for visual/hearing deficits due to the aging process should be performed to support better communication.

## CONCLUSION

Successful treatment of denture-related lesions in elderly patients requires many factors to be considered. The patient should be assessed comprehensively, both dental and medical conditions that probably contribute to developing diseases. The other essential things are patient compliance and therapeutic adherence due to the provider, the patient, and the medication factors. Effective communication should be performed to support optimal results.

## CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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