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Case report

THE RELATIONSHIP BETWEEN SMOKING AND ORAL HAIRY TONGUE LESIONS

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ABSTRACT

Background: Oral hairy tongue is a benign condition characterized by elongation and hyperkeratinization of the filiform papillae on the dorsum of the tongue, resulting in a hairy appearance. The discoloration may be brown or black due to the accumulation of keratin, pigments, and microorganisms. Poor oral hygiene and smoking are the main predisposing factors, while the use of antihypertensive medications may also contribute. **Case report:** A 63-year-old man presented with blackish discoloration of the tongue and discomfort while eating, which had persisted for three months. He reported poor oral hygiene, smoking two packs of cigarettes daily for the past 50 years, and taking amlodipine for hypertension. Intraoral examination revealed a solitary, soft, blackish-brown plaque on the dorsum of the tongue, measuring approximately 3 × 4 cm, with diffuse borders and asymptomatic. **Case Management:** The treatment plan included providing information and education to the patient that the oral condition was related to the patient's habits and manifestations of systemic disease. The patient was also given a tongue scraper and instructed to use it twice daily after tooth brushing. In addition, nystatin oral drops and benzydamine hydrochloride mouthwash were prescribed. **Conclusion:** Oral hairy tongue is a multifactorial condition caused by poor oral hygiene, smoking, and medications inducing xerostomia. The management focuses on eliminating predisposing factors, improving oral hygiene, mechanically cleaning the tongue, and educating the patient to prevent recurrence.

Keywords: Oral hairy tongue, Cigarettes, Hypertension

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INTRODUCTION

Oral Hairy Tongue is a benign condition of the tongue in which the filiform papillae on the dorsal surface of the tongue become elongated and hyperkeratinized, giving it a "hairy" or rough appearance. This appearance can range from yellowish-white, brown, to black, depending on the accumulation of keratin, food/drink pigments, and microorganisms.[1,2] This condition is usually harmless, but can cause discomfort, bad breath (halitosis), changes in taste, and can cause aesthetic anxiety for patients.[1,2] Diagnosis of hairy tongue is usually confirmed clinically based on the typical appearance on intraoral examination without requiring additional supporting examinations.[3]

Hairy tongue occurs due to desquamation defects in epithelial cells in the filiform papillae of the tongue. Normally, these papillae always renew their cells through desquamation, but in hairy tongue, this process does not run optimally, so that the papillae thicken, lengthen, and accumulate keratin and debris.[4] These elongated filiform papillae trap cell debris, food, bacteria and fungi, thereby increasing the likelihood of microbial colonization and staining that produces a hairy tongue appearance with a dark or abnormal colour.[4,1]

One major factor is inadequate oral hygiene, where the filiform papillae, which trap food debris and bacteria, are not properly cleaned. Smoking, alcohol consumption, and dark-colored drinks like coffee and tea can worsen this condition by adding additional pigment to the elongated papillae.[3,5,19] In addition, the use of medications such as broad-spectrum antibiotics, proton pump inhibitors (PPIs), and drugs that reduce salivary secretion are also significant risk factors. Systemic factors, such as diabetes mellitus and dry mouth (xerostomia), have also been associated with an increased incidence of hairy tongue. The presence of this condition can worsen oral microbiome dysbiosis, which can worsen symptoms and affect the balance of microorganisms in the oral cavity.[5,6,15]

Hypertension is a chronic condition characterized by persistent increases in blood pressure due to impaired hemodynamic regulation and peripheral vascular resistance, thus requiring long-term management by consuming antihypertensive drugs such as Amlodipine to lower blood pressure through the mechanism of calcium channel inhibition in smooth muscle.[6,7] The use of the drug

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Amlodipine can reduce the rate of saliva and trigger the occurrence of xerostomia, a dry mouth condition that results in disruption of the protective function of saliva on oral cavity tissue.[6,7,15] Decreased salivary flow causes xerostomia, which minimizes the self-cleaning effect of saliva on the surface of the dorsum of the tongue, thereby facilitating the accumulation of keratin, debris and microorganisms that can trigger the elongation of the filiform papillae and the formation of hairy tongue.[7,8,14]

Hairy tongue is generally treated conservatively with a primary focus on improving oral hygiene, including regular use of a soft brush or tongue scraper, as well as eliminating risk factors such as smoking, excessive coffee or tea consumption, and trigger medications. In cases accompanied by dry mouth due to decreased salivary flow, adequate hydration and mechanical stimulation through consumption of fibrous foods can help desquamation of the filiform papillae. If there is a fungal infection, topical antifungal therapy can be given. For cases that do not respond to conservative treatment, minimally invasive procedures such as lasers are reported to be effective in restoring the condition of the tongue without causing serious complications.[9,13,14]

CASE REPORT

A 63-year-old man came to the Soelastri Dental and Oral Hospital at Muhammadiyah University of Surakarta. He complained of a blackened tongue and discomfort when eating. The patient had been complaining of a burning sensation on his tongue for the past three months. He had been a heavy smoker since young adulthood, with an average consumption of two packs of cigarettes per day. He has also been regularly taking *amlodipine* for approximately 17 years to manage his hypertension.

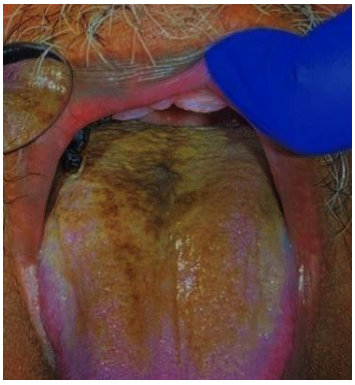

Figure 1. Intraoral patient

On intraoral examination, the patient had poor oral hygiene with a score of 6,2. A blackish-brown plaque was observed on the dorsum of the tongue, measuring 3 × 4 cm, with diffuse borders, solitary presentation, soft consistency, and asymptomatic. Based on the subjective and objective examinations, the diagnosis was oral hairy tongue.

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CASE MANAGEMENT

Based on the anamnesis and supporting clinical examinations carried out, this patient was diagnosed with Hairy tongue, which arises due to excessive cigarette consumption, the influence of hypertension medication, and poor oral hygiene. The treatment plan for the patient includes providing information and education that the conditions in the oral cavity are due to the patient's habits and manifestations of systemic diseases. The patient is also educated to reduce smoking and maintain oral hygiene. In addition, the patient is also given a tongue scraper, which is instructed to be used twice a day after brushing their teeth and prescribed medication in the form of *nystatin drops* and also mouthwash in the form of *benzydamine hydrochloride*.

DISCUSSION

In this case, the patient has oral hairy tongue, which arises as a manifestation of the bad habit of smoking. Oral hairy tongue begins with a disruption in the epithelial turnover process of the filiform papillae. Under normal conditions, the filiform papillae undergo continuous regeneration and keratin shedding due to mechanical stimulation from food, tongue friction, and mechanical cleaning of the oral cavity. When this desquamation process is disrupted, keratin accumulates, causing the papillae to elongate and thicken. These elongated papillae then become a site for retention of food debris, bacteria, fungi, and external pigments, resulting in the characteristic tongue discoloration.[3,9,10]

The disease progression in this case began with heavy smoking, systemic medication use, and possibly inadequate oral hygiene. In the early phase, changes in the oral microenvironment occurred, including changes in the microbiota and a decrease in the oral cavity's natural cleansing mechanism. Over time, filiform papillae that don't desquamate will lengthen and accumulate keratin. In advanced stages, the elongated papillae will trap pigments from cigarettes, food, and microorganisms, resulting in a blackish-brown appearance, as in this patient's case.[10,11]

Smoking is a major risk factor that plays a role in the progression of hairy tongue. The chemicals in cigarettes can cause chronic irritation of the oral mucosa and increase the process of epithelial keratinization. Furthermore, cigarettes can alter the composition of the oral mucosa bacteria and reduce saliva production, increasing the retention of debris and microorganisms on the filiform papillae. Cigarette tar can also adhere to the surface

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of the papillae, increasing tongue discoloration.[9,13,14]

Poor oral hygiene also plays a significant role in promoting the development of hairy tongue. Inadequate oral hygiene leads to the accumulation of plaque, food debris, and microorganisms on the tongue surface. This condition increases the risk of oral microbial dysbiosis, which further accelerates biofilm formation on the elongated filiform papillae. Furthermore, the lack of mechanical tongue cleaning further impedes epithelial desquamation, leading to further keratin accumulation. Clinically, this condition accelerates the transition from the initial keratin thickening phase to the pronounced papilla elongation phase. [2,4]

Consumption of antihypertensive drugs such as Amlodipine in patients can also act as an indirect predisposing factor through the mechanism of xerostomia.[15,17,20] Decreased saliva production causes disruption of salivary function, self-cleansing of the oral cavity and reduces saliva's ability to control the growth of microorganisms. Dry mouth also facilitates the accumulation of keratin and debris on the filiform papillae. [10,15,18]

Medications that cause xerostomia, including antihypertensives, have been reported to increase the risk of oral hairy tongue. Besides that, xerostomia can also cause changes in the balance of the oral microbiota, increasing the colonization of bacteria and fungi, such as Candida, on the surface of the papillae. This microorganism colonization plays a role in biofilm formation and pigment production, which exacerbates tongue discoloration. In some cases, hairy tongue is sometimes found together with fungal colonization on the surface of elongated filiform papillae.[3,10,15]

Management must be in accordance with the principles of hairy tongue therapy, namely eliminating predisposing factors, improving oral hygiene, and mechanically cleaning the tongue papillae. Education to reduce smoking and maintain oral hygiene is the main therapy because hairy tongue is generally a benign and reversible condition that shows significant improvement or complete resolution when the underlying etiologic factors are effectively eliminated, and good oral hygiene is maintained.[12,16]

Tongue cleaning using a tongue scraper has been shown to help remove accumulated keratin and debris on the tongue surface, thus accelerating healing. Nystatin may be considered as an adjunct therapy when fungal colonization is suspected. Furthermore, benzydamine hydrochloride mouthwash may help reduce local inflammation and discomfort

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experienced by patients during the healing process.[3,12]

CONCLUSION

The development of oral hairy tongue is multifactorial, with poor oral hygiene, smoking, and certain medications contributing synergistically to its formation. Poor oral hygiene allows for the accumulation of debris and microorganisms on the filiform papillae, creating an environment conducive to keratin build up. Smoking exacerbates the condition by increasing keratinization and adding extrinsic pigmentation, while drugs that induce xerostomia reduce the natural cleansing mechanism of the oral cavity, further promoting plaque accumulation. The interaction of these factors leads to elongation of the filiform papillae, increased colonization by microorganisms, and the characteristic discoloration observed in hairy tongue.

Effective management of oral hairy tongue requires a comprehensive approach targeting these predisposing factors. This includes eliminating habits that contribute to the condition, improving oral hygiene, and performing mechanical cleaning of the tongue using tools such as tongue scrapers. In addition, patient education and counseling are essential to ensure adherence to preventive measures and maintenance of oral health. By addressing both the underlying causes and the clinical manifestations, the condition can be effectively controlled and its recurrence minimized.

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