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RESEARCH ARTICLE

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Management of Geographic Tongue in a Patient with Mango Allergy Accompanied with Fissure Tongue, Oral Candidiasis and Cheilitis

Sri Hernawati^{1(CA)}

^{1(CA)}Oral Medicine Department, Faculty of Dentistry, Universitas Jember, Indonesia;
srihernawati.drg@yahoo.com (Corresponding Author)

ABSTRACT

The tongue is a solid organ formed by skeletal muscles that has an important function as the sense of taste, mastication, swallowing, and speaking. There are several physiological conditions on the tongue which can be pathological conditions e.g. Geographic tongue and Fissured tongue. This situation may occur due to trigger factors e.g. allergic reactions. Allergies of certain fruits e.g. mangoes are very rare. However, in some patients those cases may cause immediate or delayed hypersensitivity reactions. A 40-year-old male patient complained that his tongue felt sore after eating a lot of mango salad, after clinical examination the results showed clinical appearance were: 1) island-shaped atrophy, surrounded by white edges, pain; 2) fissure, multiple, redness, pain; 3) yellowish white plaque, can be scraped, no clear boundary, no pain in the dorsum of the tongue. In addition to the extraoral examination there were abnormalities in the upper and lower lips of the patient in the form of fissure, vertical, multiple, accompanied by desquamation. The final diagnosis the patient was geographic tongue with fissured tongue, oral candidiasis in the dorsum of the tongue, and cheilitis on the upper and lower lips. Therapy provided to patient was topical benzidamine HCl oral anti-inflammatory medicine, oral suspension topical nystatin antifungal, OM ointment, Becomzet multivitamin (Vitamin B complex, A, C, E, and Zinc) as multivitamin and tongue cleaner. Two weeks after treatment with benzydamine HCL which acts to inhibit TNF α and prostaglandin, administration of ointments that are analgesic and help the healing process (for geographic tongue and fissure tongue), and administration of nystatin for oral candidiasis, nystatin a macrolide polyene whose toxicity low and specific for candida albicans, accompanied by multivitamins that help the healing process, tongue geography, tongue fissure and oral candidiasis heal.

Keywords: fissure tongue; oral candidiasis; cheilitis; mango

INTRODUCTION

Tongue is a solid organ that is formed on the skeletal muscle which has an important function as a sense of taste, mastication, swallowing (deglusion) and speaking. The dorsum of the tongue is covered by a protective layer of flat-coated epithelium and several mucous protrusions that form the papillae. Papillae contained in the dorsum of the tongue consist of papillary filiform, papilla fungiformis, papum circumvalata and papilla foliata. Filiform papillae are the smallest but most numerous papillae with a normal length of 1 mm. This papilla is a conical or cylindrical slim rod-like hair which has a layer of keratin which serves to protect the tongue. Filiform papillae appear pink in patients with good oral hygiene, but will be white or red when irritated or inflamed. Papillary filiform has an abrasive function during mastication and the number increases with age.^(1,2)

Geographic tongue (GT) or benign migratory geographic tongue or benign migratory glossitis or erythema migrans is an inflammatory lesion on the tongue that is benign and has no tendency to turn malignant. This disorder, as the name suggests, occurs on the tongue, especially on the dorsum or on the lateral part of the tongue. Lesions in GT are asymptomatic because there is papilla atrophy or depapilation of the filiform papillae which is able to change sensations.⁽³⁾

The etiology of this lesion is still unknown, although many studies have examined the geographic

tongue. Some researchers mention that genetic or hereditary factors play a major role in this lesion⁴. Predisposing factors also support the occurrence of these disorders e.g. nutritional deficiencies, stress, and others.

Geographic tongue lesions clinically appear yellow, white or gray at the edges with irregular shapes⁵ these lesions also look like red circles with irregular white edges on the sides, or the middle of the tongue. Red spot is a condition in which there is atrophy of the filiform papillae and the white border of the red spot is the filiform papillae which is generative and mixed with keratin and neutrophils. These lesions usually appear for a week or two and then disappear and reappear in a different place from the tongue.

Geographic tongue is an asymptomatic lesion and this lesion is not a condition where the patient always feels pain due to the appearance of the lesion, but only when there are trigger factors for pain, e.g. spicy, hot and acidic food and carbonated or alcoholic drinks. Geographic tongue lesions also sometimes appear during menstrual periods or when the patient's condition is stressed, other compared to that this disorder can heal itself and then reappear in different places⁽⁶⁾.

Oral candidiasis (oral candidiasis) is an opportunistic infection in the oral cavity. Candida is a commensal microorganism or normal flora in the mouth and 20 -75% are found in the general population without causing symptoms (Candida carriers). *C. albicans* is the primary causative agent in oral candidiasis. *C. albicans* mainly settles in the dorsum of the posterior tongue⁽⁷⁾. Predisposing factors that play a role are local factors (bad OH, xerostomia, mucosal damage, artificial teeth, antibiotic mouthwash) and systemic factors (broad spectrum antibiotics, steroids, immunosuppressive drugs, radiation, HIV infection, hematological malignancies, neutropenia, deficiency anemia) Fe, cellular immunodeficiency, and endocrine abnormalities⁽⁸⁾. Clinically found 4 kinds of candidiasis in the oral cavity which are superficial infections that are usually caused by *Candida albicans* namely pseudomembranous candidiasis, acute atrophic candidiasis, hyperplastic candidiasis, chronic atrophic candidiasis⁽⁹⁾.

The pathogenesis mechanism of this infection starts with adhesions of candida in epithelial cells due to glycoprotein on the surface of candida and epithelial cells. Then candida will produce enzymes proteinase, hyaluronidase, chondroitin sulfatase and phospholipase. Phospholipase functions to hydrolyze epithelial cell membrane phospholipids while proteases and other enzymes are keratolic thus it can facilitate the penetration of candida into the epidermis. In candida cell walls that contain mannan (a component of protein) function to activate complement and stimulate antibody formation. The antigen-antibody complex on the surface of candida cells will protect candida from host immunity.⁽¹⁰⁾

Fissured tongue is often also known as "scrotal tongue or plicated tongue" is a condition of the normal variant which is marked by the presence of a gap in the dorsum of the tongue, and generally there are no symptoms of pain, but if there is food scraps stuck in these gaps, the patient can complain of pain or burning sensation on his tongue⁽¹¹⁾.

Fissured tongue is a benign condition in the form of cracks with a depth of 2-6 mm on the dorsal surface of the tongue but this situation becomes more apparent with age. Fissured tongue is usually found in healthy people (congenital fissured tongue) and more often found in older people. Fissured tongue is also a manifestation from Melkersson-Rosenthal syndrome, Down syndrome, psoriasis and often occur together with benign migratory glossitis (geographic tongue).

The etiology of this variant is unknown, but hereditary plays an important role. This condition is hereditary, seen at birth, or may become clearer at increased age. Age and local environmental factors can influence its development. Fissured tongue can also be a manifestation of Melkersson-Rosenthal syndrome, Down syndrome, Sjogren's syndrome and psoriasis.

In an animal experiment, B complex deficiencies may be related to cleavage of the retepeg in the cleft of the tongue⁴. According to Rathee, the prevalence of a fissured tongue "is a normal variant condition characterized by the presence of a deep gap in the dorsum of the tongue, and generally there are no symptoms of pain. on his tongue. Fissured tongue is a benign condition in the form of cracks with a depth of 2-6 mm on the dorsal surface of the tongue but this situation becomes more apparent with age. Fissured tongue is usually found in healthy people (congenital fissured tongue) and more often found in older people. Fissured tongue is also a manifestation of Melkersson-Rosenthal syndrome, Down syndrome, psoriasis and often occurs together with benign migratory glossitis (geographic tongue).

Clinical figures can vary both in the shape, number, depth and length and pattern of the cracks in the tongue. However, there is usually more than one gap in the fissure tongue 2-6mm deep. The usual pattern is that there is the largest central gap in the middle of the tongue with a small branching gap around it. Based on the pattern of the gap in the tongue is divided into 3 directions i.e. vertical, transverse and oblique.

Filiform papillae are spread in the mucosa on the dorsal surface of the tongue, where they protect the epithelial surface from mechanical stress. Mechanical protection of the mucosa of the tongue becomes lower in the fissured tongue without the presence of papilla and keratin which can cause inflammation. Fissured tongue is usually asymptomatic and is discovered by chance, but the accumulation of food trapped in the gaps can cause halitosis and focal glossitis.⁽¹¹⁾

The most common appearance of oral candidiasis is the presence of white patch plaque lesions, slightly protruding and easily scraped off. The differential diagnosis of oral candidiasis includes leukoplakia, lichen planus and white sponge nevus. Management of oral candidiasis is by administering topical antifungals (nystatin, azole derivatives, amphotericin B) and systemic azoles (ketoconazole, fluconazole, itraconazole).⁽⁸⁾

Cheilitis is a general term to refer to inflammation of the vermilion border of the lips. The vermilion area is the boundary between the skin and the mucosa. The area has many capillaries as a result it is redder compared to other areas and is covered by a thick squamous epithelium¹³. Inflammation of the lips e.g. angular cheilitis, granulomatous cheilitis, allergic cheilitis, actinic cheilitis, exfoliative cheilitis, cheilocandidosis, factitious cheilitis, and glandular cheilitis. Lip lesions can appear as a manifestation of systemic disease or skin disease or as a local condition of the lip itself¹⁴.

Hypersensitivity reactions to mangoes are very rare. Allergy to mangoes can manifest in two forms i.e. direct hypersensitivity reactions which are presented as anaphylaxis, angioedema, erythema, urticaria, shortness of breath, and hypersensitivity reactions appear late as contact dermatitis and periorbital swelling. Direct hypersensitivity reactions to mangoes are mediated through the pathophysiological mechanism of classical IgE and are thought to occur in individuals who were previously sensitive to antigens in the mango, sensitization usually occurs on prior consumption. This type of hypersensitivity reaction is expected to occur within minutes of a combination of mango antigens with corresponding IgE antibodies, which in turn are bound to mast cells. This immediately leads to mast cell degranulation, with primary (histamine, protease and acid hydrolase) and secondary (leukotriene, prostaglandin, and platelet activation) inflammatory mediators. This results in vasodilation, eosinophil recruitment and leukocyte infiltration as an intermediary for the inflammatory response. This is followed by bronchoconstriction. Type I hypersensitivity reactions are also more frequently seen in individual atopics.

Delayed hypersensitivity to mangoes is mediated by cells, and Th-1 type CD-4 cells are considered the main mediators of this reaction. Triggers (uroshiol, cardol, limonene and B-pinene) present in mangoes are stored in the epidermal layer of the skin and are sensitive to CD-4 cells. In repeated exposure, sensitive CD-4 cells first accumulate in the dermis and then migrate to the epidermis where they release cytokines that damage keratinocytes, causing separation from these cells and leading to epidermal spongiosis. Erythema and site induration occur within 8-12 hours after exposure, reach a peak in 24-72 hours, and then slowly recede¹⁵.

Please write introduction section here. If needed, this section can be separate to some sub sections such as background, purpose, etc⁽⁵⁾. Please write the title of sub sections correctly like as the examples⁽⁶⁾. The Methods, Results and Discussion also can be separated to some sub sections. Please write citation correctly as this example.

METHODS

This case report was conducted on a Dental Hospital Jember University patient. It's about management The final diagnosis the patient was geographic tongue with fissured tongue, oral candidiasis in the dorsum of the tongue, and cheilitis on the upper and lower lips.

A male patient aged 40 years, Javanese with body weight of 45 kg and height of 165 cm. He came to the Oral Medicine Department, Dental Hospital, of Jember University on October 14, 2019 complaining about having had sore tongue for a week. Previously, he had eaten a lot of unripe mango salad as a result he felt itchy and sore on his tongue. Previously, when eating unripe the patient only felt itchy on his tongue without sore, and he had never treated this pain. He revealed that he rarely ate and drank water. He only ate once and drank 2 glasses of water in a day.

RESULTS

Case Description

Extraoral examination results showed abnormalities in the upper and lower lips of the patient in the form of fissure, vertical, multiple, accompanied by desquamation. Examination On intraoral clinical examination on the dorsum of the tongue showed the presence of: 1) island-shaped atrophy, surrounded by white edges, painful; 2) fissure, multiple, redness, pain; 3) yellowish white plaque, could be scraped, no clear boundary, no pain. The condition of the tongue of the patient when he first visited RSGM Unej on October 14, 2019 can be seen in Figure 1 and Figure 2.

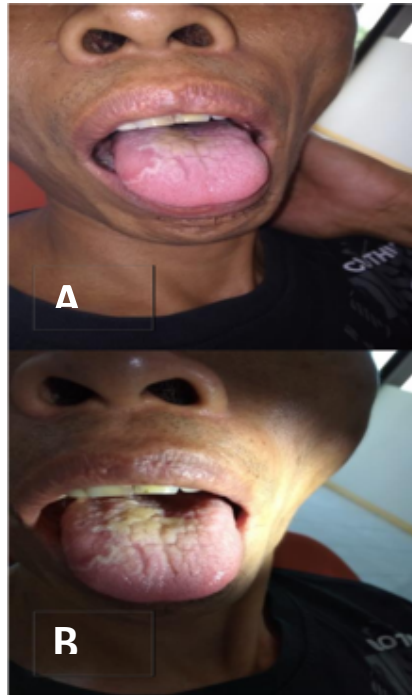


Figure 1. The condition of the tongue of the patient when he first visited the Dental Hospital of Universitas Jember on October 14, 2019. A. Without lighting the lamp; B. By lighting the lamp



Figure 2. Condition of lips of the patient when first visiting the Dental Hospital of Universitas Jember on October 14, 2019

Diagnosis in patients was Geographic tongue, fissured tongue, oral candidiasis on the dorsum of the tongue and cheilitis on the upper and lower lips. Supporting examination was carried out to establish the diagnosis in the form of oral swab examination in the Laboratory of Microbiology of Dentistry Faculty, Jember University with the result that there was the formation of spores +1 (positive 1) and hyphal form 0, thus the diagnosis can be established in the form of oral candidiasis on the tongue.

Therapy provided to the patient was by using topical anti-inflammatory benzidamine HCl oral rinse, topical anti fungal nystatin oral suspension, OM ointment, tongue cleaner for tongue cleaners, and administration of multivitamin becomzet containing B complex, vitamins A, C, E, and Zinc and giving instructions to patients to apply at home. The therapies carried out at UNGM Hospital during the first visit are as follows:

1. The patient is instructed to gargle
2. solate the work area with a cotton roll
3. Oral swab was performed by:
 - Glass objects were sterilized by using a tissue that had been moistened with alcohol
 - Fixation of glass objects above the Bunsen flame
 - Clean debris with a cement spatula
 - Take a sample with a cement spatula and then fix it on a Bunsen flame
 - Samples are put on a glass object

- preparations closed with glass decks
 - Create a referral letter for microbiological examination of fungi
 - Immediately sent to the Microbiology Laboratory
4. The patient was instructed to gargle with 15 ml of benzidamine HCl for 1-2 minutes. After that it was discarded.
 5. Topical treatment was conducted using antifungal (nystatin oral suspension), dripped onto the tongue with 0.5 ml cotton palate and flattened. Then wait 2-3 minutes, after that may be swallowed, might not be thrown away.
 6. Apply the ointment OM on the patient's upper and lower lips
 7. Wait 20-30 minutes, might not eat, drink or gargle.

After the therapy, the patient was instructed to use topical anti-inflammatory drugs, benzidamine HCl oral rinse, topical nystatin oral suspense antifungal, OM ointment, and multivitamin becomzet as prescribed, maintain oral hygiene, especially the tongue using tongue cleaner, reduce smoking, consumption of food, oral suspense nystatin suspense, OM ointment, and multivitamin becomzet as prescribed, maintain oral hygiene especially the tongue using tongue cleaner, reduce smoking, consumption of food nutritious and balanced nutrition, and adequate rest and control 1 week later.

Management on Control

On October 21, 2019, patients returned to the Dental Hospital for Control 1 (Figure 3). The patient said that his tongue did not feel as painful as before. On extra oral examination no abnormalities were found, upper and lower lips were not dry. On intraoral examination there were still a few white plaques, could be scraped and not painfull. The patient said that he had used topical anti-inflammatory benzidamine HCl as mouthwash prescribed, topical nystatin antifungal drops twice daily which was not as recommended, applied OM ointment as prescribed, used tongue cleanser as recommended and took multivitamin obtzet once a day.

In control 1, therapy was performed using oral nystatin suspension and instructions on patients to use oral nystatin suspension medication routinely, cleaning the tongue with a tongue cleaner as recommended, improving oral hygiene, consumption of nutritious food and balanced nutrition, and adequate rest and 4-day control then. The patient was provided a prescription of multivitamin becomzet again.



Figure 3. On October 21, 2019, the patient returned to the Dental Hospital of Universitas Jember for control 1.

DISCUSSION

Final diagnosis based on subjective examination results in the form of anamnesa, extra oral and intra oral clinical examination, and supporting examination in the form of a swab test at the Microbiology Laboratory of Universitas Jember can be established in the form of geographic tongue with fissured tongue, oral candidiasis, cheilitis. The causative factor in this patient's case is an allergy to unripe manga which causes geographic tongue and fissured tongue which are actually normal lesions in the oral cavity to become pathological conditions.

Case management in this patient is by topical anti-inflammatory treatment in the form of benzidamine HCl mouthwash. Benzidamine HCl is an anti-inflammatory medicine that is widely used for the treatment of the oral region which is classified as a topical nonsteroidal anti-inflammatory drug (NSAID) class. Benzidamine HCl will inhibit the stimulation of TNF- α in the production of PGE₂ and PGE₁ prostaglandins in the gingival fibroblasts thus they will indirectly inhibit prostaglandin production. Aside from being an anti-inflammatory, benzidamine HCl also has analgesia as a local anesthetic that does not change the function of the oral mucosa, may even act as a mucosal protector as a result it will reduce pain due to mucosal damage⁽¹⁶⁾.

Topical antifungal therapy in the form of oral nystatin suspension. Nystatin is a macrolide polyene of

which toxicity is low if used as a topical drug although it has an unpleasant taste. It is effective against most *Candida* species and most often used to suppress local *Candida* infections. Antifungal polyene binds to ergosterol in the fungi cell membrane thus there is a disturbance in the structure of the cell membrane that causes intracellular leakage which ends with cell death.

Ointment OM contains hydrocortisone, lanolin, vitamin E and vaselin. Hydrocortisone is a corticosteroid medicine that may act as an anti-inflammatory and anti-allergic agent. Lanolin works to moisturize the lips. Vitamin E as a nutrient to increase skin elasticity. Vaseline is used to protect lips from heat evaporation.

Mechanical tongue cleaning using a tongue cleaner regularly can eliminate the causative factor, i.e. *C. albicans* on the patient's tongue. Consumption of multivitamin B complex, A, C, E, and zinc helps the formation of collagen in healing process. In addition, instructing and educating the patient can be given by instructing the use of routine medicines, cleaning the tongue with a tongue cleaner, reducing smoking habits, eating balanced nutritious food and adequate rest.

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