



## Case Report

# A Patient with a “Strawberry Tongue”

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## Abstract

The primary constituents of saliva are water and mucins that keep the oral mucous membranes moist and lubricated. When salivary gland secretions are diminished or lost, patients may develop symptoms of oral dryness (xerostomia), burning, soreness, and difficulty with eating, taste, and swallowing. The use of xerogenic medications is one of the major causes of reduced salivary gland function. This case report describes a patient with mood disorders and fibromyalgia for which he was taking five medications that are associated with xerostomia and hyposalivation. In order to alleviate his oral dryness, he began to use a homemade beverage that discolored his tongue and masked a median rhomboid glossitis. This lesion is a manifestation of infection by *Candida albicans* that can develop as a consequence of a loss of saliva and its constituent protective antimicrobial proteins.

## Keywords

Saliva, Hyposalivation, Drug effects, Adverse effects, Oral candidiasis, Salivary proteins and peptides

## Case Presentation

A 54-year-old man presented to the dental clinic complaining of pain in his maxillary left canine. The tooth had been restored two years previously but had now developed secondary caries, fractured, and was determined to be non-restorable. The patient’s medical history included depression, chronic fatigue syndrome, fibromyalgia, gastro-esophageal reflux, and elevated cholesterol. He denied smoking. His current medications included venlafaxine HCl (Effexor®), bupropion HCl (Wellbutrin®), and aripiprazole (Abilify®) for depression, esomeprazole (Nexium®) for gastro-esophageal reflux, fenofibrate (Tricor®) for elevated cholesterol and

naproxen sodium (Aleve®) for chronic muscle and joint pain. The oral examination revealed a fiery red, fissured, and atrophic dorsal surface of the center of the tongue (Figure 1). The labial and buccal mucosa felt dry to palpation. At this point, the patient reported that he had symptoms of dry mouth for which he was drinking a homemade, sweetened, red colored beverage that he had brought with him (Figure 2). The patient was advised to substitute water and to suck on ice chips for his symptoms instead of drinking the sweetened beverage, and the maxillary canine was extracted. At his follow-up visit two weeks later, the dorsal surface of the tongue now revealed a fissured, atrophic, erythematous region along the midline (Figure 3). This appearance was consistent with central papillary atrophy (median rhomboid glossitis) that is one of the manifestations of erythematous candidiasis [1]. A 10-day regimen of 10 mg clotrimazole (Mycelex®) troches to be held in the mouth 4-5 times a day was prescribed, but the patient failed to return for his next follow-up visit.

Our final assessment was central papillary atrophy of the tongue that had been stained by a red, food-coloring additive in a homemade beverage that the patient was using to relieve his symptoms of xerostomia.



**Figure 1:** Initial appearance of the atrophic and fissured tongue with the intense, red coloration.

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Figure 2: The patient's homemade beverage.



Figure 3: Appearance of the tongue two weeks after discontinuing use of the homemade beverage.

## Discussion

A reduction in or loss of salivary gland function is primarily caused by the use of medications [2]. A number of drugs have been associated with this side effect, particularly if they have anticholinergic or parasympatholytic effects or modify neurotransmission such as psychotherapeutic agents or anticonvulsants [2,3]. Other commonly used prescription or over-the-counter medications that have been associated with loss of saliva or symptoms of xerostomia include antihistamines, diuretics, nonsteroidal anti-inflammatory agents, and drugs for gastrointestinal and respiratory diseases [2-4]. The use of multiple medications also increases the likelihood of hyposalivation, particularly in the elderly population [5]. This is particularly relevant to data from U.S. surveys collected between 2011-2014 which found that 91% of patients 65 years and older had used at least one prescription drug, 67% had taken three or more, and 41% had taken five or more in the past 30 days [6].

A reduction in or loss of salivary gland function has also been associated with a number of systemic conditions that include autoimmune diseases such as fibromyalgia in this patient, diabetes, cirrhosis, and primary and secondary Sjögren's syndrome. Radiation therapy to the head and neck or treatment with radioactive iodine for cancer of the thyroid are additional risk factors for loss of salivary gland function

[1,2].

Saliva is essential for the maintenance of oral health based on its fluid content that bathes and irrigates the oral cavity, and a large number of proteins and peptides that have antimicrobial properties for maintaining a normal balance of oral flora [7]. When there is a disruption in this balance, an overgrowth of *Candida albicans* can result as a consequence of loss of saliva as well as other risk factors such as cigarette smoking, use of dentures, recent use of an antibiotic, diabetes, or immunosuppression [1-3,8]. The only risk factor for candidiasis in this patient, however, was medication-induced hyposalivation from the xerogenic side effects of the five medications that he was taking. It is also of interest that all of the medications that he was taking were among the 200 most frequently prescribed drugs in the United States in 2014 [9].

Central papillary atrophy of the tongue (median rhomboid glossitis) is a manifestation of erythematous candidiasis that develops in the midline of the dorsal surface of the tongue [1]. It is characterized by a well-circumscribed erythematous oval or rhomboid-shaped patch that is typically located at the junction of the anterior two-thirds and posterior third of the tongue [1]. “Strawberry tongue”, on the other hand, is the term used to describe the appearance of the dorsal surface of the tongue four or five days after the onset of scarlet fever (scarlatina). This was first recognized in 1842 [10,11] and the descriptive term “strawberry” was based on the development of erythema and hyperplasia of the fungiform papillae [1]. The development of a strawberry tongue is considered to be pathognomonic of scarlet fever [1], an infection caused by group A,  $\beta$ -hemolytic streptococci that primarily affects children between the ages of 3 and 12 [1]. Other manifestations of scarlet fever include sore throat, pharyngitis, fever, and a skin rash [1], none of which were apparent in our patient.

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