

## Coexistence of Geographic Tongue and Palmoplantar Pustulosis: A Case Report

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### ABSTRACT

Palmoplantar pustulosis is strongly suggested the involvement of oral bacteria, but the cause of geographic tongue remains unknown. A 20-year-old female patient described a 1-2 year history of geographic tongue with irregular, smooth, red patches on parts of the tongue. She also presented several pustules, accompanied by delimited erythematous skin patches on both soles. One month after the first visit, when she returned for follow-up, the skin condition had progressed further, and pustules and scales became more prominent. Tongue rinses with commercial mouth washes were tried, but the condition of the lesions fluctuated between improvement and exacerbation. This report presents a rare case of the coexistence of geographic tongue and palmoplantar pustulosis in a young female patient.

Keywords: Geographic tongue, palmoplantar pustulosis, oral bacteria

### INTRODUCTION

Geographic tongue (G tongue) [1] or benign migratory glossitis is characterized by irregular, smooth, red patches with filiform papillae atrophy, producing a map-like aspect on different parts of the tongue. The lesions change in shape and size with time. The condition is harmless and affects approximately 1% to 3% of the people at any age [1]. Various factors [1], including hormonal disturbances and emotional stress, may be associated with the development of the disease, however, the precise cause remains unknown. No specific treatment for symptomatic benign migratory glossitis [2] has been found.

Palmoplantar pustulosis (PPP) [3] is a unique, chronic inflammatory skin disease that specifically affects the palms and soles, with prominent intraepidermal pustules accompanying with erythematous plaques. Lesions vary in severity and the symptoms may persist for many years. PPP is very difficult to treat, but topical steroids and psoralen plus ultraviolet A light (PUVA) [3] have long been used. Metal allergy and/or bacterial infections

have been strongly suspected as its causes, but until recently, the fact that dental metal allergy is not a cause of PPP has been reported [4]. There has been a recent report [5] that strongly suggests the involvement of oral bacteria in PPP.

This report presents the case of a 20-year-old female patient with the coexistence of G tongue and PPP. Whether G tongue and PPP exhibit coexistence or association, will be discussed.

### CASE PRESENTATION

A 20-year-old female patient described a 1-2 year history of G tongue (Figure 1A) with irregular, smooth, red patches on parts of the tongue. The patches had a fine white margin. She had no dental caries or gingivitis, and fungus was not detected on microscopic examination of a tongue scraping sample. She also presented several almost-symmetrically scattered pustules (Figure 1B (arrows)), accompanied by delimited erythematous

skin patches, forming plaque-like features on both soles (Figure 1B). One month after the first visit, when she returned for follow-up, the skin condition had progressed further, and pustules and scales became more prominent (Figure 1C (arrows)), which are the typical features of PPP [1]. So far, skin biopsy was not conducted without problems. Other than plantar lesions, no other skin lesions were detected. She is a non-smoker and reported no systemic symptoms, such as joint pain. The skin lesions were present for about 4 months and treated at another clinic using betamethasone ointment without improvement. Only zinc ointment was applied for the sensation of dryness on her soles.

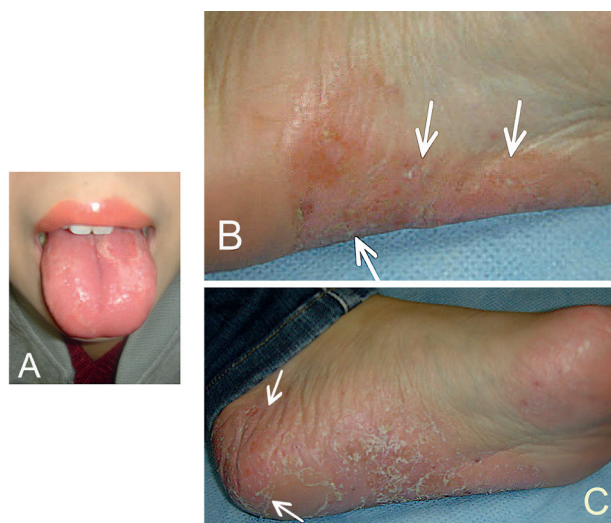
Although G tongue is thought to be caused by oral bacteria [6], there are no specific treatments. Tongue rinses with commercial mouth washes containing sterilization agent were tried and continued for several months. However, the condition of the lesions fluctuated between improvement and exacerbation, and, unfortunately, neither the G tongue nor PPP lesions were completely cured.

## DISCUSSION

Recent reports strongly attribute PPP to oral bacteria [5] such as periodontopathic bacteria. The involvement of oral bacteria in G tongue has also

been suggested [6], as certain specific bacteria may be present in the lingual microbiota of a patient. The pattern of G tongue changes over time, suggesting that moving microorganisms, which can penetrate the mucosa, may be involved. However, many different types of oral bacteria [6] are present in the oral cavity, and it would be difficult to determine the specific bacteria causing both G tongue and PPP. In the present circumstances, no particular micro-organism has been consistently found in association with G tongue. Identifying the precise cause of G tongue requires additional investigation, including whether oral bacteria are involved in this disease.

On the other hand, the association between G tongue and psoriasis, an inflammatory skin disease characterized by clinical features such as plaques, guttate, pustular, and erythrodermic lesions [7], has been reported in many studies [8]. There are many cases in which the features of psoriasis and G tongue do not overlap. Histopathological and other similarities also exist between G tongue and psoriasis [9]. Histological findings of G tongue [9] show inflammatory features including the occasional presence of small spongiform pustules and Munro's microabscesses due to inflammatory cell infiltration by the neutrophils. The histological appearance of G tongue closely resembles those of psoriasis [9]. G tongue has been suggested to



**Figure 1.** **A** Appearance of the geographic tongue at first visit. **B** At the first visit, several scattered pustules (points with arrows) accompanying erythematous and thickened patches forming plaques were noted on the soles. **C** At the time of consultation, from the mid-plantar surface of the foot to the plantar arch, there were many scales mixed with pustules and prominent disseminated tiny pustules (points with arrows) accompanying the erythema with scales on the heel, almost symmetrically on both soles, with typical PPP clinical features being noted. In addition, there was erythema on the hallux region.

be a psoriatic tongue lesion [9]. However, even if the tissue response resembles psoriasis, it can not explain the geographic patterns in many patients with G tongue and without psoriasis. Treatment with tacrolimus [10] (immunosuppressant FK506) has been sporadically attempted and the findings suggest that G tongue is a disease associated inflammatory immune responses. Based on these collected findings, the author believes that some bacteria may cause psoriasis-like local tissue reactions in the affected tissues. Overall, evidence supporting the possibility that G tongue is caused by oral bacteria is increasing. Also from the dental field, it has been reported that the indigenous bacteria of the tongue resemble those of the periodontal flora [11] and it has been pointed out that indigenous tongue bacteria are a source of periodontal bacteria [11]. It can not be ruled out that the G tongue may be the causative lesion in some cases of PPP and psoriasis; further verification is required.

The homology between PPP and psoriasis is still debatable [12], but the two should be considered separate entities owing to the specificity of the site of development of PPP. The specificity of the site of the lesion to the palms and soles indicates the unique pathomechanism of PPP [3] and its difference from that of psoriasis [7]. If PPP is a disease related to psoriasis [12], then an association with G tongue and PPP would also be likely, as G tongue is sometimes associated with psoriasis [8]. It has been pointed out that the cause of psoriasis is also oral bacteria [13].

In conclusion, to the best of my knowledge, cases of G tongue coexisting with PPP have not been previously reported. Determining the cause of this unexplained idiosyncratic disease, G tongue will open the way for treatment.

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### Author contribution

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### Ethical approval

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### Conflict of interest

The author declares that there is no conflict of interest.

### Patient's consent

Informed consent was obtained verbally from the patient for this publication and accompanying images.

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