



CASE REPORT:

Lifestyle Intervention Based on the 8S Model in a Patient with Benign Migratory Glossitis: A Case Report

Intervención de estilo de vida basada en el modelo 8S en un paciente con glositis migratoria benigna:
Reporte de caso

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ABSTRACT: Benign migratory glossitis (BMG) is widely regarded as a harmless anatomical variant, which historically accounts for the absence of a standardized management protocol. However, given that multiple associated factors have been described in the literature, a broader clinical assessment and an individualized management approach may be warranted in symptomatic cases. This case report describes the management of a 21-year-old female patient with BMG, who presented with multiple irregular, well-demarcated areas of papillary atrophy on the dorsal tongue. Initial assessment identified potentially relevant lifestyle factors, including inadequate nutrition, physical inactivity, and suboptimal stress management. Further clinical evaluation revealed protein-energy malnutrition, intestinal parasitosis, vitamin D deficiency, and gastrointestinal dysfunction. Although these findings suggest a potential orogastrointestinal dysbiosis, causal relationships cannot be definitively established. A comprehensive, personalized therapeutic plan was implemented, based on the principles of Lifestyle Medicine and the 8S framework. Over the follow-up period, the patient exhibited progressive clinical improvement, along with a marked reduction in depapillated areas. While the simultaneous application of multiple lifestyle modifications precludes the isolation of individual therapeutic effects, this single case suggests that BMG may be associated with broader systemic findings in certain individuals. The 8S model offers a supportive framework for addressing underlying chronic inflammatory conditions, highlighting the potential value of integrative diagnostic approaches in oral medicine.

KEYWORDS: Glossitis, Benign Migratory; Dysbiosis; Healthy Lifestyle; Oral Medicine; Vitamin D Deficiency; Case Reports.

RESUMEN: La glositis migratoria benigna (GMB) es considerada ampliamente como una variante anatómica benigna, lo que históricamente explica la ausencia de un protocolo de manejo estandarizado. Sin embargo, dado que en la literatura se han descrito múltiples factores asociados, una evaluación clínica más amplia y un enfoque de manejo individualizado pueden estar justificados en casos sintomáticos. Este reporte de caso describe el manejo de una paciente de 21 años con GMB, quien se presentó con múltiples áreas irregulares y bien delimitadas de atrofia papilar en el dorso de la lengua. La evaluación inicial identificó factores del estilo de vida potencialmente relevantes, que incluían una nutrición inadecuada, inactividad física y un manejo subóptimo del estrés. La evaluación clínica adicional reveló malnutrición proteico-energética, parasitosis intestinal, deficiencia de vitamina D y disfunción gastrointestinal. Aunque estos hallazgos sugieren una posible disbiosis oro-gastrointestinal, no es posible establecer relaciones causales de manera definitiva. Se implementó un plan terapéutico integral y personalizado, fundamentado en los principios de la Medicina del Estilo de Vida y el modelo 8S. Durante el período de seguimiento, la paciente mostró una mejoría clínica progresiva, junto con una marcada reducción de las áreas depapiladas. Si bien la aplicación simultánea de múltiples modificaciones del estilo de vida impide aislar los efectos terapéuticos individuales, este caso único sugiere que la GMB puede estar asociada con hallazgos sistémicos generalizados en ciertos individuos. El modelo 8S ofrece un modelo de soporte para el abordaje de afecciones inflamatorias crónicas subyacentes, destacando el valor potencial de los enfoques diagnósticos integrativos en medicina oral.

PALABRAS CLAVE: Glositis Migratoria Benigna; Disbiosis; Estilo de Vida Saludable; Medicina Oral; Deficiencia de Vitamina D; Informes de Casos.

INTRODUCTION

Benign migratory glossitis (BMG), commonly referred to as geographic tongue, is a chronic, recurrent, and benign inflammatory disorder of the oral mucosa with an incompletely understood etiology and pathogenesis. Proposed contributing factors include genetic predisposition, psychosomatic influences, chronic psychological stress, hormonal imbalances, atopy (such as asthma, allergic rhinitis, and eczema), and nutritional deficiencies (B-complex vitamins, iron, zinc, and vitamin D), as well as immunogenetic associations with psoriasis and specific HLA haplotypes (1,2). Recent studies suggest that the microbiota present on the dorsal tongue and within affected lesions diverges notably from that of healthy mucosa, indicating a possible role for oral microbiome dysbio-

sis in triggering local inflammatory responses. This dysregulated environment may manifest as burning sensations, pain, or discomfort. Although BMG is frequently asymptomatic and conservatively managed, symptomatic cases often present a significant clinical challenge (3).

Emerging evidence positions Lifestyle Medicine as a scientifically grounded therapeutic approach, emphasizing the modification of daily behaviors as a primary means to manage and prevent non-communicable chronic diseases (NCDs) (4). The six foundational pillars—nutrition, physical activity, stress regulation, restorative sleep, healthy interpersonal relationships, and avoidance of toxic substances have demonstrated broad systemic benefits, including potential enhancements in oral health outcomes (4,5).

Building on these tenets, the 8S Oral Medicine Model proposes a comprehensive framework that extends Lifestyle Medicine principles to address multifactorial oral disorders. This model encompasses eight core domains: nutrition, physical activity, sleep, stress management, social interactions, skin and mucosal care, movement and exposure to nature, and minimization of toxic exposures. Integration of these elements aims to support systemic balance, which is closely linked to microbial homeostasis and immunoregulation (4).

This article presents the case of a young female patient diagnosed with BMG, in whom significant nutritional and immunological alterations were identified. A favorable clinical course was observed during follow-up under a personalized, integrative intervention guided by the 8S Model. While generalized conclusions or causal relationships cannot be drawn from a single case, this report supports considering BMG as a condition that may warrant broader clinical assessment in selected patients, particularly when accompanied by findings suggestive of systemic imbalances (2,6).

CASE REPORT

Patient Information and Clinical Findings. A 21-year-old female with no previously relevant medical history presented to the Diagnostic Clinic of the Faculty of Dentistry (Autonomous University of San Luis Potosí) seeking care for the appearance of her tongue. She reported an ongoing burning sensation and discomfort, which were particularly exacerbated by the consumption of acidic or spicy foods.

Intraoral clinical examination revealed multiple irregular, well-demarcated areas of filiform papillary atrophy on the dorsal surface of the tongue, primarily affecting the mid and posterior thirds (Figure 1). The lesions exhibited a migratory pattern characterized by central erythematous

zones bordered by prominent whitish peripheries. The patient reported sensitivity strictly localized to the tongue; no lesions were observed on the buccal mucosa, palate, or gingiva. Furthermore, no lymphadenopathy or systemic signs of infection were present, and the remainder of the physical examination was unremarkable. These dynamic morphological features specifically the classic migratory pattern of well-demarcated atrophic erythematous patches surrounded by slightly elevated, white-to-yellow circinate margins fulfilled the established clinical diagnostic criteria for BMG. Given the highly pathognomonic clinical presentation and the absence of induration, ulceration, or atypical localized persistence, a mucosal biopsy was not indicated, aligning with current oral pathology consensus that relies on clinical evaluation for classic BMG to avoid unnecessary invasive procedures (2). However, because the patient presented with symptomatic burning and underlying psychosocial distress, the localized lingual inflammation was interpreted not merely as an isolated anatomical anomaly, but as a potential mucosal indicator of an underlying systemic imbalance. Consequently, a comprehensive systemic evaluation was prioritized to investigate potential nutritional, immunological, or metabolic co-factors that could be exacerbating the oral presentation (1).

Diagnostic Assessment. Given the patient's persistent symptoms and clinical findings, we expanded the diagnostic protocol to investigate potential systemic contributing factors. Laboratories included hematology and clinical chemistry panels, immunological screening, urinalysis, stool analysis, serum 25-hydroxyvitamin D (calciferol), glycated hemoglobin (HbA1c), erythrocyte sedimentation rate (ESR), and standardized anxiety and perceived stress questionnaires.

Key findings ruled out clinical anxiety or stress (DASS-21 Depression, anxiety and stress scale) but revealed protein-energy malnutrition, vitamin D deficiency, systemic inflammation, intes-

tinal parasitosis, and gastrointestinal dysfunction. These systemic and gastrointestinal findings are cautiously interpreted as potential exacerbating co-factors rather than primary etiologic drivers of the lingual lesions.

One notable diagnostic challenge was the traditional assumption that BMG represents solely an anatomic variant, which can potentially mask systemic associations.

Therapeutic Intervention and Timeline. Following the diagnosis, a non-pharmacological, lifestyle-oriented therapeutic approach was implemented, centered on the core principles of the 8S Model. The interdisciplinary management timeline was structured as follows:

- **Baseline:** Baseline dietary recall documented a markedly insufficient intake of 808 kcal and 35 g of protein per day, well below the estimated physiological needs of 1,554 kcal and 78 g of protein.
- **Intervention Phase:** Nutrition served as the leading therapeutic component. A personalized diet plan was instituted, emphasizing high-quality proteins, dietary fiber, hydration, and healthy fats (omega-3). Targeted supplementation included oral probiotics, vitamin D, and omega-3 to address specific laboratory deficiencies (Suppl. Figure 1). Additional interventions focused on gastrointestinal optimization using pre-meal

bitter herbs and tailored dietary modifications. Concurrently, stress-reduction practices (such as mindful breathing), sleep hygiene improvements, and regular movement breaks were integrated to limit sedentary behavior.

- **Follow-Up Phase:** Long-term adherence was facilitated by a flexible food guide grounded in nutritional equivalency and continuous clinical monitoring.

Outcomes and Follow-up. Over the course of the intervention, progressive clinical gains were observed in gastrointestinal symptoms, hydration status, appetite, food tolerance, and total energy intake. These clinical improvements were supported by biochemical parameters: serum vitamin D increased from 17.6 ng/mL to an optimal 57.7 ng/mL, and the ESR decreased from 12 mm/h to a normal range of 6 mm/h.

Collectively, these time-sequenced systemic improvements coincided with a visible restoration of the lingual surface and a pronounced decline in papillary atrophy (Figure 2, Figure 3, Figure 4). The patient's care remained exclusively non-pharmacological and non-invasive. While the clinical course was highly favorable (Figure 5), the concurrent application of multiple lifestyle and nutritional adjustments precludes the establishment of a direct causal relationship or the isolation of individual therapeutic effects based on this single case report.



Figure 1. Initial clinical presentation diagnosed. Multiple irregular, well-demarcated areas of papillary atrophy on the dorsal surface of the tongue, primarily involving the mid and posterior thirds.



Figure 2. Clinical findings following an initial phase of the non-pharmacological, lifestyle-oriented therapeutic approach based on the 8S Model and Lifestyle Medicine principles. Shows partial recovery of the lingual surface, with a reduction in the size and extent of the areas of papillary atrophy.



Figure 3. Clinical follow-up showing continued progressive improvement of the lingual surface. The image demonstrates a marked reduction in the depapillated areas and greater integrity of the filiform papillae, reflecting the positive response to the comprehensive, personalized therapeutic plan. Only a small, less-defined patch remains centrally.



Figure 4. Sustained clinical improvement of the dorsal tongue surface. Significant recovery of the lingual papillae and the resolution of most of the characteristic lesions of BMG.

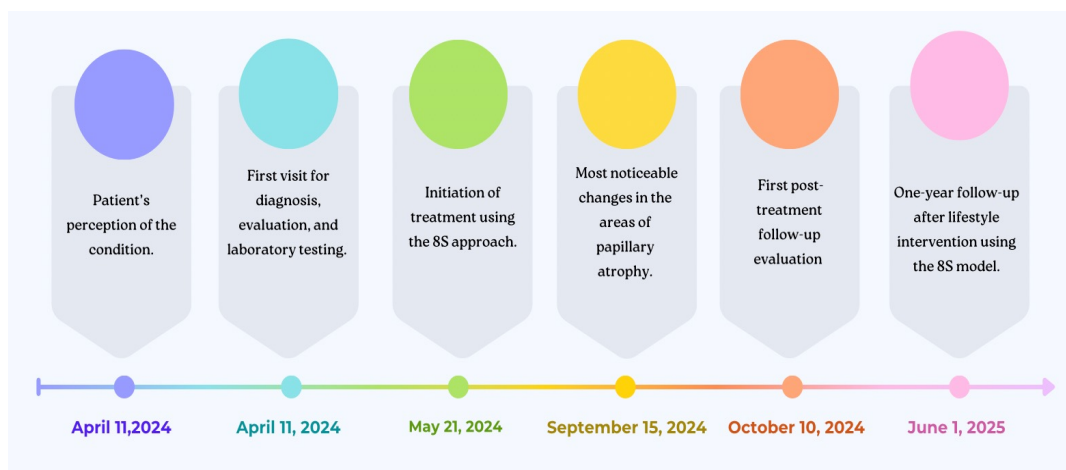


Figure 5. Timeline of clinical changes during follow-up. The graph illustrates the temporal relationship between the implementation of the lifestyle-oriented intervention and the observed improvements in lingual symptoms.

DISCUSSION

Based on the available evidence, this case contributes to the ongoing discussion that benign migratory glossitis (BMG) may, in specific clinical contexts, warrant an evaluation that extends beyond a strictly localized mucosal variant. BMG remains a complex oral inflammatory condition with an understood etiology. While traditionally characterized as a benign and self-limiting anatomical anomaly, recent evidence underscores its potential interaction with systemic health, thereby necessitating a thorough review of existing diagnostic paradigms (7).

In the present case, a clinical follow-up under an integrative intervention guided by the 8S model coincided with the remission of lingual symptoms and favorable shifts in nutritional, gastrointestinal, and immunological parameters (4). These observations suggest that a non-pharmacological, multidisciplinary approach may be beneficial in selected symptomatic patients. It also highlights the potential utility of an integrative framework that incorporates the patient's environment, behaviors, and lifestyle into the diagnostic and therapeutic process (4,5).

Systemic Associations and Multifactorial Etiology. Classically, BMG displays a predilection for young adults and females, manifesting as migratory erythematous patches on the dorsum of the tongue (7). Emerging research supports a multifactorial etiology involving genetic, immunological, psychosomatic, and nutritional determinants. Associations with immunogenetic profiles particularly those shared with psoriasis underscore its potential relevance as an external indicator of systemic immune dysregulation (6,9). Furthermore, environmental and lifestyle factors, such as psychological stress and tobacco use, have been recognized as exacerbating variables in mucocutaneous pathologies, including BMG (9,10). These findings justify a holistic, patient-centered diagnostic approach rather than a strictly lesion-centered view.

Diagnostic Complexity and the Dysbiosis Hypothesis. The clinical challenge of BMG stems from its variable presentation and morphological overlap with distinct systemic disorders. Given the patient's persistent burning symptoms, an expanded laboratory panel was performed, revealing concurrent protein-energy malnutrition, hypovitaminosis D, and gastrointestinal dysfunction

(7,11). Concurrently, emerging literature links oro-gastrointestinal dysbiosis as a contributing factor to mucosal immune dysregulation and chronic glossitis (7). Although a clear temporal correlation was observed between the regeneration of the lingual papillae and the correction of nutritional and gastrointestinal deficits, establishing a definitive etiological link remains complex. Current evidence documents associations between BMG and systemic metabolic or gastrointestinal shifts, yet a causal relationship cannot be inferred from a single clinical scenario. Consequently, the simultaneous improvement of the oral mucosa and gastrointestinal function suggests a potential link via the oro-gastrointestinal axis, but this clinical observation does not prove a definitive cause-and-effect mechanism.

Therapeutic Perspectives: Lifestyle Medicine and the 8S Model. Contemporary management of BMG is challenged by the lack of standardized guidelines and the limited efficacy of local pharmacological therapies, which often overlook broader systemic contributors (12). Lifestyle Medicine and integrative models, such as the 8S Oral Medicine framework, focus on supporting systemic homeostasis through nutrition, physical activity, sleep hygiene, and stress regulation (4). Deficiencies in critical micronutrients, particularly vitamin D and zinc, have been independently associated with the persistence of BMG lesions (13). In this patient, a structured nutritional intervention, alongside stress-reduction practices, was temporally associated with an improvement in inflammatory markers and mucosal integrity (9,14).

Patient Perspective. The patient reported high satisfaction with the intervention, noting: "I knew I was about to make a significant lifestyle change, but I never anticipated that nutrition and supplementation could so profoundly enhance my overall health." This subjective patient-reported outcome (PRO) highlights the psychological and perceived systemic benefits of adopting a compre-

hensive lifestyle intervention, even when specific physiological mechanisms remain under investigation (4).

Study Limitations. A crucial limitation of this report is its design as a single case observation, which inherently precludes the establishment of causal relationships. Furthermore, the implemented 8S Model involved multiple, simultaneous therapeutic measures including dietary restructuring, targeted supplementation (vitamin D, probiotics, omega-3), and stress management techniques. Consequently, it is methodologically unfeasible to isolate the specific efficacy of any individual component on the resolution of the lingual lesions. The clear differentiation between a clinical hypothesis (e.g., dysbiosis as an etiologic factor) and evidence-based conclusions must be maintained; the improvements documented herein represent an observational correlation rather than proven therapeutic efficacy.

Broader Clinical Implications. This case indicates that persistent, symptomatic BMG may justify a deeper investigation into potential nutritional or immunological imbalances. It also underscores the value of interdisciplinary cooperation among dental professionals, primary care physicians, and nutritionists (5). Rigorous, controlled, and prospective studies are necessary to validate the dysbiosis hypothesis and to consolidate the evidence base for lifestyle-oriented management protocols in oral mucosal disorders.

CONCLUSION

The management of symptomatic BMG may benefit from a comprehensive, individualized assessment of nutritional, psychological, and immunological domains rather than relying solely on localized symptomatic relief. While the integration of Lifestyle Medicine principles and the 8S Oral Medicine model provided a structured framework that coincided with clinical improvement in this

patient, the multifactorial nature of the intervention and the single-case design preclude any definitive assertions of causality. The hypothesis that systemic imbalances and dysbiosis drive BMG requires rigorous validation through controlled clinical trials. Nevertheless, this case illustrates the potential value of holistic clinical assessments in recognizing oral lesions as possible indicators of broader systemic health.

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