BJCR
Brazilian Journal of Case Reports

PCAA
Publicações Científicas de Acesso Aberto

Case Report

Full Spectrum Cannabidiol Oil as a Symptomatic Management Strategy in Geographic Tongue: Case Report with Literature Review

Guilherme Klein Parise [1,*], Ana Caroline Silvestre [2], Laura Gabriela de Oliveira First [2], Larissa Rodrigues Gasparini [1], Juliana Lucena Schussel [1]

[1] Post Graduate Program in Dentistry, Department of Stomatology, Federal University of Paraná, Curtiba, Paraná, Brazil.
[2] Faculty of Dentistry, Federal University of Paraná, Curtiba, Paraná, Brazil.

* Correspondence: guiparise@gmail.com.

Abstract: To report a case of symptomatic geographic tongue (GT) successfully managed with full-spectrum cannabidiol (CBD) oil, highlighting dose–response dynamics, individualized titration, and clinical outcomes. A 60-year-old female presented with a five-month history of oral burning sympton. Clinical examination revealed multiple atrophic areas with whitish borders on the dorsal tongue. Laboratory investigations were within normal limits except for mildly reduced vitamin D. Prior use of topical corticosteroids provided transient symptom relief. CBD oil (3000 mg/30 mL) was administered sublingually, starting at 5 mg twice daily and titrated weekly according to pain intensity measured by Visual Analog Scale (VAS). The patient experienced significant improvement (VAS reduced from 8 to 2) at 4 drops twice daily. No adverse effects were reported during a three-month follow-up. Although GT generally does not require treatment, symptomatic cases may significantly impact quality of life. The analgesic, anti-inflammatory, and emotion-modulating properties of cannabidiol (CBD) may explain the observed clinical improvement. The non-linear clinical response reinforces the importance of individualized dose titration and careful monitoring. Full-spectrum CBD oil may represent a potential therapeutic approach for patients with persistent GT. Careful titration is essential to optimize outcomes. Further controlled studies are needed to confirm efficacy and establish evidence-based dosing protocols.

Keywords: Glossitis Benign Migratory; Cannabidiol; Cannabinoids.

Citation: Parise GK, Silvestre AC, First LGO, Gasparini LR, Schussel JL. Full Spectrum Cannabidiol Oil as a Symptomatic Management Strategy in Geographic Tongue: Case Report with Literature Review. Brazilian Journal of Case Reports. 2026 Jan-Dec;06(1):bjcr179.

https://doi.org/10.52600/2163-583X.bjcr.2026.6.1.bjcr179

Received: 16 March 2026
Accepted: 28 March 2026
Published: 30 March 2026

Copyright: This work is licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0).

1. Introduction

Geographic tongue (GT) also known as migratory glossitis, erythema migrans, benign migratory glossitis, or stomatitis areata, is a benign inflammatory condition of uncertain etiology, most frequently affecting the dorsal surface of the tongue and occasionally extending to the lateral borders [1]. Symptoms are uncommon, occurring in approximately 9% of patients, and fissured tongue is present concomitantly in nearly half of cases [2]. Clinically, GT is characterized by well-demarcated erythematous areas with central atrophy, surrounded by a white keratotic border and adjacent regions of normal mucosa. Lesions are dynamic, often healing spontaneously and reappearing in the same or different locations [3]. Diagnosis is typically clinical, with biopsy reserved for atypical presentations [4].

Histopathologically, GT displays mixed but relatively nonspecific features, including parakeratosis, loss of the granular layer, epithelial atrophy, acanthosis, and suprapapil-

lary thinning. The whitish borders may result from marked neutrophilic exocytosis forming Kogoj spongiotic pustules in the spinous layer and Munro microabscesses within the stratum corneum. A subepithelial inflammatory infiltrate, predominantly composed of T lymphocytes, macrophages, and neutrophils, is commonly observed [5].

Although most cases are asymptomatic and require only reassurance regarding the benign and self-limiting nature of the condition, symptomatic cases can significantly affect quality of life. However, no universally accepted treatment exists [6,7]. Management strategies include topical corticosteroids, anesthetic rinses, antihistamines, anxiolytics, nutritional supplementation, and avoidance of dietary triggers such as spicy or acidic foods [6].

Cannabis sativa has recently received increasing attention for its pharmacological potential. The plant produces more than 100 cannabinoids, secondary metabolites synthesized by glandular trichomes, that interact with specific cannabinoid receptors in human tissues. Cannabidiol (CBD), a non-psychoactive cannabinoid, has shown promising anti-inflammatory and analgesic properties [8]. Cannabis-based products may offer therapeutic alternatives for conditions that are refractory to conventional therapy or where standard treatments produce unacceptable adverse effects [9].

This case report describes the use of full-spectrum CBD oil to manage oral burning in a patient with symptomatic GT, aiming to explore its feasibility, clinical effects, and potential role as an adjunctive therapy for inflammatory oral conditions with atypical presentations.

2. Case Report

A 60-year-old woman presented to the Stomatology Clinic of the Federal University of Paraná with a five-month history of persistent burning tongue pain. She denied systemic diseases, smoking cessation occurred five years prior, and no regular medications were reported. Clinical examination revealed atrophic areas with well-defined white borders on the dorsal tongue (Figure 1). No other oral lesions were present. Laboratory tests (CBC, serum iron, folate, vitamin B12, zinc) were normal, except for mildly decreased vitamin D. No vitamin D supplementation was initiated during the follow-up period, minimizing its potential influence on symptom improvement. The diagnosis of symptomatic GT was established. The patient reported previous temporary relief with topical corticosteroids but declined prolonged use due to concerns about side effects.

Figure 1. Clinical aspect. A. Lateral view showing erythematous areas delineated by whitish borders. B. Frontal view revealing multiple atrophic regions on the dorsal surface of the tongue.

The treatment protocol proposed was Full-spectrum CBD oil (3000 mg/30 mL, CR Wellness®) prescribed at 5 mg (2 drops) sublingually twice daily after meals. Pain intensity was measured weekly with the Visual Analog Scale (VAS), and the dosage was titrated according to clinical response (Table 1).

Table 1. Evolution of Pain Intensity (VAS) with CBD Dose Adjustment.

Week	Dose (drops BID)	VAS Score	Clinical Notes
0 (baseline)	-	8	Severe burning
1	2	7	Mild improvement
2	3	2	Significant relief
6	4	2	Stable response
7	8	8	Symptom exacerbation
8	4	2	Symptom control restored

Treatment outcome showed that significant pain reduction was achieved at 4 drops twice daily (VAS 2). As the patient still reported mild residual burning, a cautious dose escalation to 8 drops was performed to achieve complete symptom resolution. However, this resulted in worsening symptoms (VAS 8), prompting a return to 4 drops, with subsequent stabilization. No adverse effects were reported.

The patient remains under clinical follow-up with sustained symptom control and no adverse effects. Considering the typical duration of cannabidiol studies (3–14 weeks in randomized controlled trials, up to 26–47 weeks in observational studies), therapy continuation, tapering, or discontinuation will be individualized based on periodic reassessment of efficacy, tolerability, and overall risk–benefit.

3. Discussion

A broad spectrum of inflammatory disorders, originating from either local or systemic factors, may involve the oral mucosa. While certain conditions present substantial challenges for definitive diagnosis, others can be accurately recognized through clinical assessment alone. Geographic Tongue (GT) is considered to belong to the latter category [10–12]. Geographic tongue does not typically require medical intervention [13–15]. Symptomatic management of geographic tongue involves the use of oral rinses containing anesthetics, topical corticosteroids, vitamin A, antihistamines, and zinc supplements. Dietary guidance should be provided, recommending the avoidance of acidic and spicy foods. In severe and persistent cases, systemic oral cyclosporine treatment can result in an excellent therapeutic response. Additionally, topical tacrolimus and the use of pregabalin have also been reported as successful treatment options, supporting its potential role in managing this condition [4,16,17].

Recent clinical trials have explored the therapeutic efficacy and safety of cannabinoids in a wide range of medical conditions [18]. Cannabidiol (CBD), the major non-psychoactive phytocannabinoid, exhibits multiple pharmacological properties, including anxiolytic, antipsychotic, sleep-modulating, antidepressant, antiepileptic, anti-inflammatory, and analgesic effects [19–21]. Beyond its potential analgesic and anti-inflammatory effects, cannabidiol (CBD) has been increasingly investigated for its role in emotional regulation, anxiety reduction, and sleep improvement. Neurocognitive and imaging studies suggest that CBD may influence emotional processing and modulate stress-related neural circuits, although findings on its acute effects remain mixed.

Evidence from systematic reviews and clinical studies indicates that longer-term administration may yield more consistent anxiolytic outcomes, reinforcing the therapeutic relevance of dosing strategies and treatment duration. Furthermore, observational data support that CBD use is often associated with improved sleep quality, reductions in psychological distress, and better overall well-being [22–24], which is particularly relevant in

symptomatic geographic tongue, where emotional imbalance and stress are recognized as aggravating factors for burning symptoms. Taken together, these findings highlight the potential of CBD not only for symptom modulation but also for addressing the emotional and psychological dimensions that exacerbate oral discomfort.

In Dentistry, growing evidence suggests a broad spectrum of potential applications, such as the management of orofacial pain and temporomandibular disorders, control of dental anxiety, treatment of periodontal diseases, enhancement of tissue regeneration, and prevention or mitigation of xerostomia and oral mucositis induced by cancer therapy [25]. Experimental and clinical studies further indicate that CBD may benefit oral mucosal lesions, including mucositis, ulcers, and burning mouth syndrome, through its anti-inflammatory and analgesic actions, with histological analyses showing reduced inflammatory infiltrate and improved tissue healing compared with placebo [26].

Nevertheless, the current evidence base remains limited. Most available studies are case reports, small case series, or preclinical investigations, with few randomized controlled trials assessing efficacy, safety, and optimal dosing in oral disorders. Variability in CBD formulations and concentrations further complicates reproducibility. Additionally, regulatory restrictions, high cost, and insufficient training of dental professionals represent significant barriers to widespread adoption.

A critical pharmacological aspect of CBD is its inverted U-shaped dose–response curve, where intermediate doses provide maximal analgesic and anxiolytic effects, whereas both lower and higher doses may lead to diminished efficacy. This narrow therapeutic window reinforces the need for individualized titration and close monitoring to achieve optimal symptom control [19,27]. In the present case, the symptom fluctuation observed during dose escalation appears consistent with this non-linear response, highlighting the clinical relevance of precise dose adjustment in cannabinoid-based therapy for conditions characterized by subjective and variable symptomatology, such as oral burning.

One of the major barriers to the appropriate therapeutic use of cannabinoids is the limited training of healthcare professionals in this area. In the United States, 89.5% of medical residents and fellows report feeling unprepared to prescribe medical cannabis, and only 35.3% feel confident answering cannabis-related questions. Additionally, less than 10% of U.S. medical schools incorporate formal education on clinical cannabis into their curricula [9].

In Brazil, dentists registered with the Regional Council of Dentistry are legally authorized to prescribe cannabis-derived products when clinically indicated. However, despite the growing body of research and expanding therapeutic applications, significant barriers persist in dental practice. These include limited formal education on cannabinoid therapeutics, the absence of standardized clinical protocols, and a shortage of high-quality evidence specific to oral conditions. The lack of robust data on optimal dosing, long-term safety, and adverse effect profiles further contributes to professional hesitation, often compounded by concerns about social stigma and patient acceptance [28, 29]. Collectively, these factors underscore the urgent need for structured education and training programs, as well as the development of evidence-based clinical guidelines, to enable dental professionals to prescribe cannabinoids safely and effectively.

4. Conclusion

This case report highlights the potential role of full-spectrum cannabidiol (CBD) oil as an adjunctive therapy for the symptomatic management of geographic tongue–associated oral burning. Careful titration and individualized dosing resulted in a marked reduction in pain intensity, as measured by the Visual Analog Scale (VAS). The observed clinical response may suggest a possible inverted U-shaped dose–response pattern, reinforcing the importance of dose optimization to prevent symptom exacerbation. Treatment was well tolerated, with no adverse effects during follow-up.

These findings suggest that CBD oil may be considered a potential therapeutic approach for patients with persistent symptoms unresponsive to conventional treatments, such as topical corticosteroids. Importantly, this case reinforces the need for enhanced education and training of dental professionals regarding cannabinoid-based therapies to ensure safe, evidence-based prescribing. Well-designed controlled studies are warranted to establish standardized protocols, determine long-term safety, and confirm the clinical efficacy of cannabinoids in oral mucosal disorders.

Funding: None.

Research Ethics Committee Approval: The patient provided written informed consent for participation, and the study was conducted in accordance with the ethical guidelines outlined in the Declaration of Helsinki.

Acknowledgments: None.

Conflicts of Interest: All other authors declare no conflicts of interest.

References

1. Sarruf MBJM, Quinelato V, Sarruf GJM, Oliveira HE, Calasans-Maia JA, Quinelato H, et al. Stress as worsening of the signs and symptoms of the geographic tongue during the COVID-19 pandemic: a pilot study. BMC Oral Health. 2022 Dec 3;22(1):565.
2. Dafar A, Bankvall M, Garsjö V, Jontell M, Çevik-Aras H. Salivary levels of interleukin-8 and growth factors are modulated in patients with geographic tongue. Oral Dis. 2017 Sept;23(6):757–62.
3. Su N, Poon R, Liu C, Dewan C, Darling M, Grushka M. Taste and Pain Response in Burning Mouth Syndrome With and Without Geographic Tongue. J Oral Facial Pain Headache. 2020 July;34(3):217–21.
4. Picciani BLS, Santos LR, Teixeira-Souza T, Dick TNA, Carneiro S, Pinto JMN, et al. Geographic tongue severity index: A new and clinical scoring system. Oral Surg Oral Med Oral Pathol Oral Radiol. 2020 Apr;129(4):330–8.
5. Dick TNA, Santos LR, Cunha KS, Silva-Junior GO, Dziedzic A, Aredes MM, et al. Correlation between extent and clinical severity, and histopathological characteristics of geographic tongue. Folia Morphol. 2025 July 9;84(2):398–405.
6. De Campos WG, Esteves CV, Fernandes LG, Domaneschi C, Júnior CAL. Treatment of symptomatic benign migratory glossitis: a systematic review. Clin Oral Investig. 2018 Sept;22(7):2487–93.
7. Ślebioda Z, Drożdżyńska J, Karpińska A, Krzyżaniak A, Kasperczak M, Tomoń N, et al. Clinical Characteristics and Risk Factors of Geographic Tongue: A Retrospective Analysis of 100 Polish Patients.
8. Stahl V, Vasudevan K. Comparison of Efficacy of Cannabinoids versus Commercial Oral Care Products in Reducing Bacterial Content from Dental Plaque: A Preliminary Observation. Cureus [Internet]. 2020 Jan 29 [cited 2025 Sept 24]; Available from: https://www.cureus.com/articles/25300-comparison-of-efficacy-of-cannabinoids-versus-commercial-oral-care-products-in-reducing-bacterial-content-from-dental-plaque-a-preliminary-observation
9. MacCallum CA, Russo EB. Practical considerations in medical cannabis administration and dosing. Eur J Intern Med. 2018 Mar;49:12–9.
10. Bernaola-Paredes WE, Filho VB, Vilela Dias EM, Sugaya NN. A case of migratory stomatitis in a young male patient: Management and differential diagnosis. J Oral Maxillofac Pathol. 2022 Feb;26(Suppl 1):S17–21.
11. Núñez Amin Dick T, Rocha Santos L, Carneiro S, Moore D, Pestana S, Laerte Boechat J, et al. Investigation of oral atopic diseases: Correlation between geographic tongue and fungiform papillary glossitis. J Stomatol Oral Maxillofac Surg. 2021 June;122(3):283–8.
12. Garsjö V, Dafar A, Jontell M, Çevik-Aras H, Bratel J. Increased levels of calprotectin in the saliva of patients with geographic tongue. Oral Dis. 2020 Apr;26(3):558–65.
13. Panda B and Ghosh D. Pathophysiology & Treatment of Geographic Tongue: A Mini Review. Acta Neurophysiol 2023, 4(6): 180037.
14. Stoopler ET, France K, Ojeda D, Sollecito TP. Benign Migratory Glossitis. J Emerg Med. 2018 Jan;54(1):e9–10.
15. Horiuchi Y. Geographic tongue: What is this disease? JDDG J Dtsch Dermatol Ges. 2023 Dec;21(12):1465–7.
16. S Kurtipek G, Sarı N, T Akyürek F. Geographic tongue that responds to the treatment of pregabalin: Can it be a new treatment choice? Dermatol Ther. 2019 Jan;32(1):e12776. doi: 10.1111/dth.12776. Epub 2018 Nov 18. PMID: 30365234.
17. Amasyalı SY, Gürses AA, Aydın ON, Akyol A. Effectiveness of Pregabalin for Treatment of Burning Mouth Syndrome. Clin Psychopharmacol Neurosci. 2019 Feb 28;17(1):139–42.
18. Hossain MK, Chae HJ. Medical cannabis: From research breakthroughs to shifting public perceptions and ensuring safe use. Integr Med Res. 2024 Dec;13(4):101094.
19. Zuardi AW, Rodrigues NP, Silva AL, Bernardo SA, Hallak JEC, Guimarães FS, et al. Inverted U-Shaped Dose-Response Curve of the Anxiolytic Effect of Cannabidiol during Public Speaking in Real Life. Front Pharmacol. 2017 May 11;8:259.
20. Lafaye G, Karila L, Blecha L, Benyamina A. Cannabis, cannabinoids, and health. Dialogues Clin Neurosci. 2017 Sept 30;19(3):309–16.

21. Campana MD, De Paolis G, Sammartino G, Bucci P, Aliberti A, Gasparro R. Cannabinoids: Therapeutic Perspectives for Management of Orofacial Pain, Oral Inflammation and Bone Healing—A Systematic Review. Int J Mol Sci. 2025 Apr 16;26(8):3766.
22. Bloomfield MAP, Yamamori Y, Hindocha C, Jones APM, Yim JLL, Walker HR, et al. The acute effects of cannabidiol on emotional processing and anxiety: a neurocognitive imaging study. Psychopharmacology (Berl). 2022 May;239(5):1539–49.
23. Han K, Wang JY, Wang PY, Peng YCH. Therapeutic potential of cannabidiol (CBD) in anxiety disorders: A systematic review and meta-analysis. Psychiatry Res. 2024 Sept;339:116049.
24. Henson J, Vitetta L, Quezada M, Hall S. Enhancing Endocannabinoid Control of Stress with Cannabidiol. J Clin Med. 2021 Dec 14;10(24):5852.
25. Neves LBM, Lima BC, Marques FV, Baldessarini BL, Machado RCM. Cannabinology in Dentistry: Therapeutic Applications and Future Directions. Int J Oral Dent Health. 2025 Aug 19;12(2):1–4.
26. Mederos M, Salvi LC, Chisini LA. The therapeutic effect of cannabidiol in oral mucosa lesions: a scoping review of in vivo and clinical studies. Braz J Oral Sci. 2025 Mar 28;24:e255518.
27. Linares IM, Zuardi AW, Pereira LC, Queiroz RH, Mechoulam R, Guimarães FS, et al. Cannabidiol presents an inverted U-shaped dose-response curve in a simulated public speaking test. Braz J Psychiatry. 2019 Feb;41(1):9–14.
28. Batista MM. Primeiras orientações ao prescritor de cannabis medicinal: uma revisão narrativa baseada na literatura científica e na atual regulamentação brasileira. Ufopbr [Internet]. 2024 [cited 2025 Sep 24]; Available from: https://www.monografias.ufop.br/handle/35400000/8072.
29. Xavier Viana TR, De Paula Venute L, Teixeira Coelho A, Ribeiro De Souza D, Xavier De Deus R, Crivoi Cesar A, et al. Cannabis Medicinal: Uma Revisão sobre as Perspectivas Atuais e Desafios Futuros na Prática Clínica. J Res Med Health. 2024 Apr 15;2:e202401.