Annals of Clinical Case Reports

Case Report
Published: Jan 20, 2026

Geographic Tongue in a 5-year-old Child

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Abstract

Geographic tongue (GT) is a benign mucosal condition characterized by areas of tongue depapillation surrounded by keratotic borders. Other mucosal surfaces may also be affected where the condition is termed erythema migrans. There is no known etiology and it usually affects adults. GT is usually an asymptomatic, transient, and self-limiting condition, with periods of recurrence and remission, and many patients are unaware of their presence. Although GT is harmless, correct diagnosis is essential to prevent unnecessary concern, invasive investigations, and inappropriate treatment, as it may resemble other oral lesions, making accurate differentiation important. We report a rare case of geographic tongue presenting in a 5-year-old child.

Introduction

Erythema migrans (EM), is a benign inflammatory mucosal condition characterized by transient erythematous areas surrounded by irregular whitish borders that change in shape and location over time. When this presentation is confined to the tongue, it is termed geographic tongue (GT) or benign migratory glossitis.

The condition can occur at any age, including in pediatric patients. It is usually asymptomatic, although some patients may experience mild discomfort or sensitivity to spicy or acidic foods. The exact etiology remains unclear, with proposed contributing factors including genetic predisposition, stress, allergic conditions, and nutritional deficiencies [1].

Although EM is a harmless and self-limiting condition, correct diagnosis is essential to differentiate it from other oral lesions and to reassure parents and caregivers. This case report describes the clinical presentation of geographic tongue in a 5-year-old child.

Clinical Presentations

GT presents as irregular erythematous, map-like patches on the tongue due to loss of filiform papillae, surrounded by slightly elevated white keratotic borders. The lesions change in size, shape, and location giving the migratory pattern mainly affecting the dorsal and lateral surfaces of the tongue. The condition may present as single or multifocal lesions and is transient, with periods of recurrence and remission. Lesions are generally asymptomatic; however, some patients might experience pain or increased sensitivity especially when consuming spicy or acidic foods [1].

Discussion

GT is described as a relatively common, benign mucosal condition that presents with irregular, erythematous patches on the dorsum of the tongue surrounded by slightly raised, whitish borders. Population based studies estimate that GT affects roughly 2–3% of adults worldwide [2], though individual reports vary widely depending on study design, diagnostic criteria, and geographic region. Because the lesions can resolve and reappear in different areas of the tongue, prevalence may be underestimated in single time point examinations. In most individuals, the condition is asymptomatic and discovered incidentally during routine oral examinations. However, a subset of patients may experience burning, sensitivity, or discomfort, often triggered by spicy or acidic foods as well as pain in the ears and ipsilateral submandibular lymphadenopathy [3]. The natural course tends to be chronic and fluctuating, with periods of remission and recurrence. Despite decades of reporting, the exact cause of GT remains unclear. 'The literature suggests a multifactorial background with possible contributions from genetic predisposition and psychosomatic stressors representing modifiable risk factors that contribute to the recurrence of GT

OPEN ACCESS

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Received Date: *08 Jan 2026*
Accepted Date: *19 Jan 2026*
Published Date: *20 Jan 2026*

Citation:
Alsarraf A, Almahmeed F, Abdulredah B, Alfadalah Q. Geographic Tongue in a 5-year-old Child. Ann Clin Case Rep. 2026; 11: 2815.

ISSN: 2474-1655.

Figure 1: Multiple areas of tongue depapillation surrounded by keratotic borders involving the left lateral tongue.

Figure 2: Multiple areas of tongue depapillation surrounded by keratotic borders involving the right lateral tongue.

Figure 3: Geographic tongue involving the tip extending to the ventral surface.

such as psoriasis, Research has shown that geographic tongue occurs more frequently in patients with psoriasis, indicating a potential overlap in their underlying mechanisms [4]. The two conditions share comparable histopathological features and may be linked through a mutual genetic association, particularly the genetic marker Human Leukocyte Antigen (HLA)-Cw6 [5]. These remain correlations rather than proven causal relationships. Other proposed links including nutritional deficiencies of vitamin B6, B12, folic acid, iron and zinc have been introduced to be contributing factors as well, hormonal influence, gastrointestinal conditions, and environmental irritation are inconsistently documented. Clinical reviews emphasize that the condition is harmless and does not progress to malignancy [6].

Although well recognized in adults, a wide range of studies show that GT also occurs in children, with prevalence differing significantly between populations. Reported rates among pediatric groups vary markedly, ranging from less than 1% in some clinical samples to over 10–14% in school-aged cohorts in certain regions [1]. These differences likely reflect variations in diagnostic criteria, study methods, and geographic influences. The condition is often asymptomatic in children and discovered incidentally during routine oral exams, though some cases present with burning, stinging, or sensitivity to acidic or spicy foods. Only two pediatric cases were reported of environmental allergies who presented with symptoms in adult patients. Reported symptoms include oral discomfort, excessive salivation, altered taste, and pain during eating and drinking [7].

Most literature agrees that pediatric GT follows a benign, fluctuating course in which lesions change location, appear, and resolve over time. As in adult populations, the precise cause remains uncertain. Proposed contributors as in adults include genetic predisposition. Studies have shown that siblings of a parent with GT have a significantly higher prevalence of the condition compared with siblings of unaffected parents, supporting a possible familial or hereditary link [8]. Analyses of histocompatibility antigens in individuals with geographic tongue also demonstrated notably elevated levels of DR5 and DRW6 antigens, along with a relative decrease in DR2, compared with healthy controls [9]. In addition, a recent report describing five-year-old monozygotic twins who experienced mild discomfort when consuming spicy foods further reinforces the likelihood of a genetic component in the development of this condition [10]. Also, allergic or atopic tendencies, psychological stress relations with systemic or dermatologic conditions as well as associations with syndromes such as Reiter's syndrome, Down syndrome, Aarskog syndrome, Fetal Hydantoin syndrome, and Robinow syndrome. Despite these associations, no definitive cause-and-effect relationship has been established. Recent research has explored oral microbiome differences between healthy children and those with GT, suggesting potential microbial influence, though findings remain preliminary [11]. GT is generally benign and non-progressive; it does not appear to carry a risk of malignant transformation. None of these associations are definitive, and many children with GT have no apparent systemic disease, allergy, or other risk factors.

Recognizing GT is essential for general dental and medical practitioners because it prevents unnecessary concern, invasive investigations, and incorrect treatments. Although the condition appears erythematous and migratory, its benign and self-limiting nature means that reassurance and simple symptomatic management are usually sufficient. Failure to correctly identify this lesion may lead to misdiagnosis as candidiasis, lichen planus, lupus erythematosus, glossitis, or even early malignant change, resulting in avoidable antifungal therapy, corticosteroids, biopsies, or patient anxiety. Additionally, some patients, especially children, may present with burning discomfort, sensitivity to spicy foods, or with fissured tongue as some suggested a genetic linkage between these two conditions, therefore appropriate counselling improves quality of life and avoids unnecessary dietary restrictions [12]. Awareness is also important because geographic tongue can coexist with systemic conditions such as atopy, psoriasis, reactive arthritis, or nutritional deficiencies; therefore, accurate recognition allows practitioners to distinguish benign variants from lesions that warrant further medical evaluation. Overall, familiarity with the presentation and behaviour of geographic tongue supports accurate diagnosis, patient education, and cost-effective care.

Conclusion

Geographic tongue is a benign, self-limiting oral mucosal condition that may present in childhood and can cause concern for parents and caregivers due to its striking clinical appearance. This case highlights the occurrence of GT in a 5 years old child, reinforcing that the condition is not limited to adults and may be encountered during routine pediatric dental examinations. Although the exact etiology remains uncertain, current evidence supports a

multifactorial background involving genetic, immunologic, and environmental factors. Awareness of its characteristic migratory pattern and benign nature is essential for clinicians to establish an accurate diagnosis, avoid unnecessary investigations or treatments, and provide appropriate reassurance. Early recognition and patient-parent education play a key role in reducing anxiety and ensuring optimal, conservative management, with treatment reserved only for symptomatic relief when required.

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