

# Benign Migratory Glossitis or Geographic Tongue: An Enigmatic Oral Lesion

Dimitrios Assimakopoulos, MD, George Patrikakos, MD, Christina Fotika, MD,  
Moses Elisaf, MD

Benign migratory glossitis, or geographic tongue, is usually an asymptomatic inflammatory disorder of unknown etiology that affects the epithelium of the tongue. Local loss of filiform papillae leads to ulcer-like lesions that rapidly change the color and size. Histopathologic findings parallel the clinical appearance,

and may have a psoriasiform pattern. The disorder is characterized by exacerbations and remissions. In most cases, patients do not require treatment other than reassurance about the benign nature of the disorder. *Am J Med.* 2002;113:751–755. ©2002 by Excerpta Medica Inc.

**B**enign migratory glossitis, which was first described by Rayer in 1831 (1), is usually an asymptomatic inflammatory disorder of the tongue mucosa that is characterized by circinate, erythematous, ulcer-like lesions of the dorsum and lateral border of the tongue due to loss of filiform papillae of the tongue epithelium (Figure 1). The lesions have been referred to as wandering rash, lingua geographica, erythema migrans, exfoliatio areata linguae, superficial migratory glossitis, lingual dystrophy, pityriases linguae, transitory benign plaques of the tongue, marginal exfoliative glossitis, ectopic geographic tongue, and glossitis areata migrans (2), but the condition is now most commonly called geographic tongue or benign migratory glossitis.

## EPIDEMIOLOGY

The prevalence of geographic tongue has been reported to vary between 0.28% and 14.4% (3–13), but most surveys show a range between 1.0% and 2.5% (14–21). Differences in sampling, diagnosis, and type of examination may explain the wide range in reported rates (4). It appears to occur more commonly in children, and its frequency diminishes with age (22). Some studies have shown that it is about twice as common in women (3,14), whereas others reported similar rates by sex (15,16,23).

## ETIOLOGY

The cause of the disease remains obscure. It has been associated with several conditions (Table), such as pustular

psoriasis (15,24–37), allergy (2,16,38–42), hormonal disturbances (3,43,44), juvenile diabetes (45), Reiter syndrome (4,46,47), Down syndrome (48), nutritional deficiencies (3,23), psychological upsets (3,38,49–52), fissured tongue (3,16,23,28,53,54) (Figure 2), and lichen planus (17). A possible genetic predisposition has also been suggested (24,27,38,53,55–57). A geographic tongue in an otherwise healthy person may indicate a propensity to develop generalized pustular psoriasis (35).

Geographic tongue can also be a manifestation of pustular psoriasis (25,33,58). Histologic findings, and the parallel improvement of psoriatic skin lesions and tongue lesions with systemic retinoid treatment, support the hypothesis that the disorder is a form of psoriasis (26,28). The infiltrate in oral psoriatic lesions consists mainly of T cells and macrophages, particularly CD4-positive cells (36), and immunohistochemical studies of geographic tongue show a similar abundance of CD4-positive cells in the subepithelial cell infiltrate (34). In a study of patients who had geographic tongues with or without cutaneous psoriasis, the histologic findings were similar in the majority of biopsy samples (37). However, other researchers have reported that geographic tongue is uncommon in patients with psoriasis (29–31).

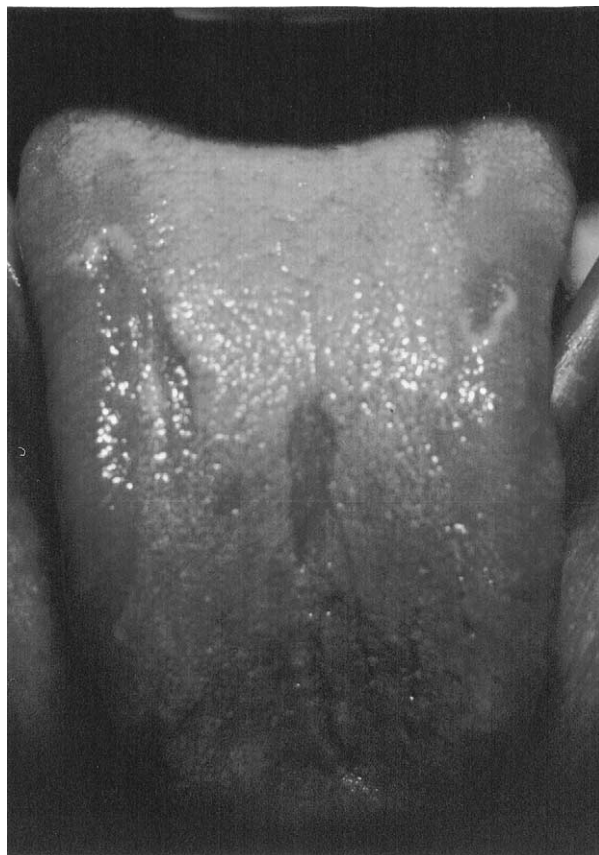
Patients with an allergic background—such as a personal or family history of asthma, eczema, and hay fever, or an elevated total serum immunoglobulin E level—may be more likely to have a geographic tongue (2,42). Geographic tongue is common in patients who develop recurrent acute inflammatory conditions on surfaces that are in contact with the external environment (40). Psychosomatic factors, which probably contribute to both geographic tongue and atopy, may explain the high prevalence of this tongue disorder in atopic patients (39).

Hormonal associations have also been reported. Waltimeo reported that phase of the oral contraceptive cycle affected the initiation and duration of circinate lesions in women with geographic tongues; the changes were most severe on the 17th day of the cycle (44). About 8% of patients with juvenile diabetes mellitus have a geographic

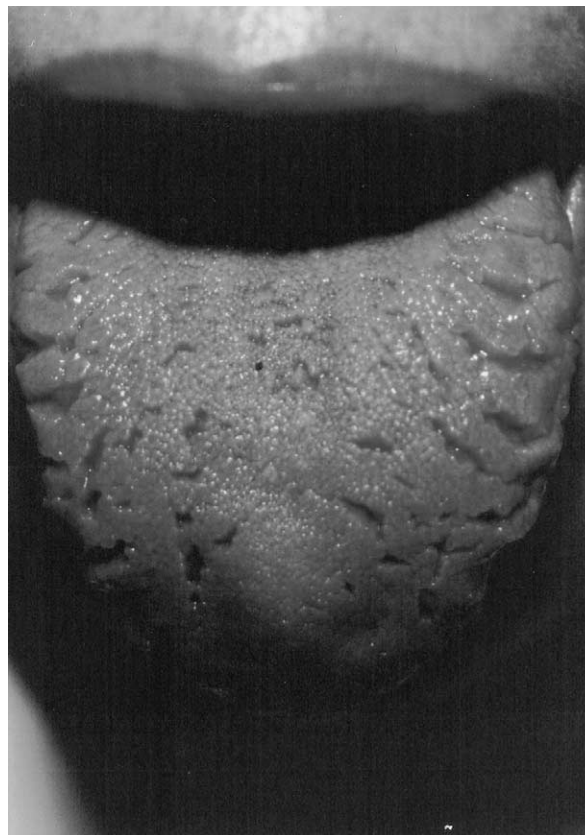
From the Departments of Otorhinolaryngology (DA, GP), Dermatology (CF), and Internal Medicine (ME), Medical School, University of Ioannina, Ioannina, Greece.

Requests for reprints should be addressed to Dimitrios Assimakopoulos, MD, Department of Otorhinolaryngology, Medical School, University of Ioannina, 45110 Ioannina, Greece, or [dassimak@cc.uoi.gr](mailto:dassimak@cc.uoi.gr).

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**Figure 1.** Geographic tongue in a man.



**Figure 2.** Fissured tongue in a woman.

tongue (45). When they occur on the tongue, the oral lesions of Reiter syndrome may resemble geographic tongue (4,46,47). It has been reported in about 1 in 9 children with Down syndrome (48). The disease may also be considered part of Aarskog syndrome (along with Hirschsprung disease, midgut malrotation, renal cyst, cartilaginous projection of the pinna, and dental anomalies) (59), as well as the fetal hydantoin syndrome (60).

**Table.** Diseases Reported To Be Associated with Geographic Tongue

Disease	Reported Prevalence (Reference)
Pustular psoriasis	1% (29), 5% (31,33), 10.3% (28)
Allergy	35.7% (39), 40.5% (2)
Stress	20% (3)
Hormonal disturbances	
Nutritional deficiencies	
Juvenile diabetes	8% (45)
Reiter syndrome	
Down syndrome	11.2% (48)
Oral contraceptives	
Fetal hydantoin syndrome	
Aarskog syndrome	
Lithium treatment	

Geographic tongue is not related to infection with human immunodeficiency virus (61,62) or use of tobacco (63), but has been reported as a relatively rare side effect of lithium treatment (64–66).

Geographic tongue occurs in association with fissured tongue in 50% of patients (53), and transformation from fissured tongue has occurred (54). A family history is reported in most patients, suggesting the presence of hereditary factors. The prevalence of the disease in parents and siblings is significantly higher than in controls (53). A simple dominant transmission with variable penetrance, as well as a polygenic mode of inheritance, have been proposed (38,53,67). Geographic tongue, fissured tongue, and generalized pustular psoriasis have polygenic inheritance patterns, and affected patients may share genes (24,56). No clear associations with HLA antigens have been demonstrated (45,55,68,69), with the possible exception of those associated with juvenile diabetes or psoriasis.

## SIGNS AND SYMPTOMS

Although the majority of patients are asymptomatic, they often develop serious anxiety and fear of cancer (22). During exacerbations, the lesions may be accompanied



**Figure 3.** Leukoplakia in a man.

by oral discomfort, burning, foreign body sensations, or paroxysmal pain in the ears or ipsilateral submandibular lymph nodes (23,70). Lesions appear as multifocal, circinate or irregular erythematous patches that represent loss of filiform papillae. There is often a slightly elevated white or yellow border (71) (Figure 1). Lesions tend to change location, pattern, and size within minutes to hours, like shifting sand. Any location on the dorsum or the lateral borders of the tongue epithelium may be affected. The disease is characterized by periods of exacerbation and remission, during which lesions heal without residual scar formation. These may last days, months, or years. When lesions recur, they tend to appear in a new location, thus producing the migration effect (70). Geographic tongue must be distinguished from other similar conditions, such as fissured tongue (Figure 2) and leukoplakia (Figure 3).

## HISTOPATHOLOGY

Histologic lesions parallel the clinical appearance of the epithelium of the tongue (28,72,73). Histologic examination may reveal an acute and chronic inflammatory infiltrate in the submucosa, with epithelial edema and with neutrophils forming microabscesses (74). The white elevated areas of the lesions include subepithelial neutrophil infiltrates and microabscesses, leukocyte invasion into the epithelial layer, interepithelial edema, rupture of cell junctions, glycogen deposits in epithelial cells, and exfoliation of necrotic cells in the surface layer. The erythematous areas have mononuclear infiltrates in sub- and in-

terepithelial positions, two types of basal cells (either typical epidermal basal cells or immature basal cells), filament and filament bundle formation in the spinous layer, lack of a stratum granulosum, and incomplete keratinization or parakeratinization in the surface layer. Differentiation into filiform papillae is lacking in the erythematous areas (72). Scanning electron microscopy has revealed that the surface of geographic tongue contains two types of abnormal mucosa: an atrophic area, on which the hair of filiform papillae are absent but the bodies appear typical, and a white margin of desquamating cells. Microfissures are located between atrophic and normal mucosa (73).

## DIAGNOSIS

Diagnosis is based on the history and clinical examination (3,75), consistent with chronic, migratory, macroscopic lesions on the tongue epithelium that change in size, color, and position. Routine laboratory tests, including complete blood count, sedimentation rate, and levels of C-reactive protein and glucose, are usually normal. Biopsy and histologic examination of the lesions may assist in reassuring patients of the benign nature of the disorder.

The differential diagnosis includes candidiasis, psoriasis, Reiter syndrome, lichen planus, leukoplakia (Figure 3), systemic lupus erythematosus, herpes simplex virus, and drug reaction. In children, the differential diagnosis should include atrophic candidiasis, local trauma, and severe neutropenia.

## TREATMENT

Patients suffering from geographic tongue do not usually require treatment apart from reassurance (22,76). Symptomatic treatments, all of which are unproven, include fluids, acetaminophen, mouth rinsing with a topical anesthetic agent, antihistamines, anxiolytics, and steroids (3,23,70,75).

Specific treatments have not been evaluated rigorously. Helfman reported satisfactory results after treating 3 patients with topical tretinoin (77). Systemic antipsoriatic therapy (with etretinate or acitretin) was reported to be effective in 3 patients with concurrent pustular psoriasis and geographic tongue (25,26). Vitamin A acid therapy resulted in partial improvement in some patients (78), whereas cytotoxic therapy has also been tried (79).

We believe that it is often helpful to treat stress and allergy in patients with geographic tongue. In our experience, most patients respond to topical antihistamine solution mouth rinses during exacerbations, accompanied by detailed explanation of the benign and recurrent course. We also tell patients to avoid topical factors that exacerbate their symptoms, such as very hot, spicy, or acidic foods, and dried, salty nuts.

## CONCLUSION

Migratory glossitis or geographic tongue is a benign, chronic, recurrent disease. It resembles pustular psoriasis histopathologically. The disease may cause anxiety and fear of cancer, and should be treated with reassurance and local measures.

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