

## Case Report

### **Treatment of Geographic Tongue Superimposing Fissured Tongue: A literature review with case report**

**Jalaleddin H Hamissi<sup>1</sup>, Mahsa EsFehani<sup>2</sup>, Zahra Hamissi<sup>3</sup>**

<sup>1</sup>Associate Professor in periodontics and Dental Caries Prevention Research Center, Qazvin University Medical Sciences, Qazvin, Iran.

<sup>2</sup>Assistant Professor, Department of Oral Medicine & Diagnosis, college dentistry, Qazvin University Medical Sciences, Qazvin, Iran.

<sup>3</sup>Dental Student, College of Dentistry, Shahied Behesti University of Medical Sciences, Teheran, Iran

#### **\*Corresponding author**

Dr Jalaleddin H Hamissi

Email: [jhamissi@qums.ac.ir](mailto:jhamissi@qums.ac.ir) ; [jhamissi@gmail.com](mailto:jhamissi@gmail.com)

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**Abstract:** Tongue is a most sensitive part of the oral cavity. It is responsible for many functions in the mouth like swallowing, speech, mastication, speaking and breathing. Geographic tongue (Benign migratory glossitis, erythema migrans) is an asymptomatic inflammatory disorder of tongue with controversial etiology. This disease is characterized by erythematous areas showing raised greyish or white circinate lines or bands with irregular pattern on the dorsal surface of the tongue and depapillation. The objective in presenting the case report and literature review is to discuss the clinical presentation, associated causative factors and management strategies of geographic tongue.

**Keywords:** Asymptomatic; Characteristics; Fissured tongue; Geographic tongue; Migratory

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#### **INTRODUCTION**

Geographic tongue is an asymptomatic inflammatory condition of the dorsum of tongue occasionally extending towards the lateral borders. The appearance of geographic tongue is variable from one person to the next and changes over time. It is also recognized as erythema migrans, annulus migrans and wandering rash. It was first described by Rayer in year 1831. This lesion is known by various terminologies such as wandering rash of tongue, geographic tongue, lingua geographical, exfoliation areata lingua, pityriasis linguae, erythema migrans, and transitory benign plaques of the tongue. Although its common presentation, but many of times this lesion is undiagnosed, either due to improper examination of tongue or asymptomatic nature of the lesion. It is also interesting to know that the exact cause of this disorder is unidentified [1-5].

The appearance is multifocal, circinate, irregular erythematous patches bounded by a slightly elevated, white or cream colored keratotic band or line. The central erythematous patch represents atrophy of the filiform papillae. The white border is composed of regenerating filiform papillae and a mixture of keratin and neutrophils [1, 6-8]. Benign migratory glossitis is a common disorder of the tongue, frequently presenting as an asymptomatic disorder, even though some patients may have burning sensation. The condition is observed

in approximately three percent (3%) majority of female population [9]. On other aspects of oral mucosa, such as on commissure of lip, floor of mouth, cheek etc., which has been described as ectopic geographic tongue [10]. This lesion is quite common, and has also been associated with patients suffering from Acquired Immune Deficiency Syndrome (AIDS) [11-12].

The prevalence rate varies in different geographical regions: in United States of America geographic tongue prevalence range is from 1-14% [13]. It's reported to be 0.6% in South Africa, 27.7% in Brazil [14], 5.71% in southern India [15]. It occurs worldwide with no predilection for any particular race. Benavidez [16] supported a difference in prevalence between the sexes, and reported a higher frequency among males. Motallebnejad also reported a higher prevalence in males in an epidemiological study in Iranian patients [17] while Benczy [18-19] reported higher frequency in women. In India its prevalence is 0.89% and overall prevalence is 1 to 2.5% in general population. In school children its prevalence was observed to be 1 % by Redman. High prevalence in children was found in Japan (8%), Israel (14%). Females are more commonly affected. Etiology of geographic tongue is not clear but in children it can be associated with environmental allergies [1, 20-22]. The purpose of this study was to determine the clinical

presentation of geographic tongue, associated etiological factors and treatment modalities.

### CASE REPORT

A 38-year-old woman came to private clinic in Qazvin, Iran. She has history of six years with mild to moderate continuous nature pain and burning sensation on the tongue which serious on intake of citrus and spicy foods and relieved by medication. She also complained of discomfort during chewing. No history of allergy, antibiotic use and there was no family history of geographic tongue and psoriasis. The patient gave a negative history in relation to any symptoms of the tongue or any similar lesions in the immediate family members. Based on patient's history and clinical examination, provisional diagnosis of fissured tongue was observed. The dorsal aspect of the patient's tongue showed an appearance of well-defined grooves having a branching appearance associated with a presence of local denuded erythematous zones are surrounded by a slightly elevated, yellowish-white, serpentine border.

Past medical history is indifferent to various medications, such as vitamin B12, itraconazole and no steroidal anti-inflammatory drugs (NSAIDs). General clinical examination demonstrated the patient was normal. Routine blood investigation revealed mild anemia. Extra-oral examination exposed normal facial morphology, no skin lesions were seen. Intra-oral examination revealed good oral hygiene, mild halitosis and deeply grooved lesions on the dorsal surface of the tongue with entrapped food debris.



Fig 1: Showing fissured tongue

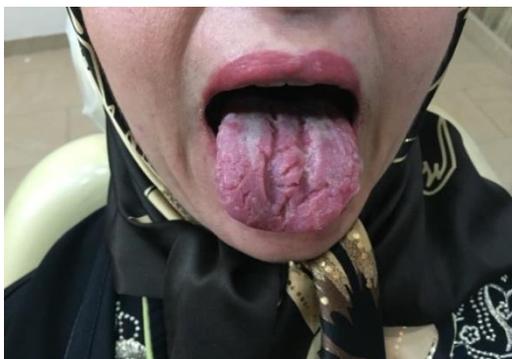


Fig-2: Geographic Tongue Superimposing Fissured Tongue

### Clinical Examination

On examination of tongue, groups of smooth, reddish-pink, atrophic, or depapillated patches on the dorsum or lateral borders of the tongue were noted. These patches frequently have a slightly elevated, thin, yellow border (Fig 1 &2). Just to differentiate it from other similar oral lesion such as psoriasis, Reiter syndrome, glossitis, lichen planus and lupus erythematosus his scalp, hair, palms, nails, soles and eye were examined but no abnormalities were observed.

### Causes

The etiology and causes of geographic tongue is not well known till date and the literature reports varied predisposing factors [23-26]. Geographic tongue does not usually cause any symptoms, and in those cases where there are symptoms, an oral Para-functional habit may be a related factor [27]. Persons may have geographic tongue show scalloping on the sides of the tongue (crenated tongue). Some studies propose that hormonal factors may be involved [28], because one reported case in a female appeared to vary in severity in correlation with oral contraceptive use [29]. People with geographic tongue frequently claim that their condition worsens during periods of psychological stress [27]. It may have inversely associated with smoking and tobacco use [30]. Sometimes it's run in families [28]; it is reported to be associated with several different genes, though studies show family association may also be caused by similar diets. Some have reported links with various human leukocyte antigens, such as increased incidence of HLA-DR5, HLA-DRW6 and HLA-Cw6 and decreased incidence in HLA-B51 [25].

Vitamin B2 deficiency (ariboflavinosis) can cause several signs in the mouth, possibly including geographic tongue [31], although other sources stated that is not related to nutritional deficiency [28]. Fissured tongue often occurs concurrently with geographic tongue [24], and some studies consider fissured tongue to be end stage of geographic tongue [29]. In the past some research suggested that geographic tongue was associated with diabetes, seborrhea dermatitis and atrophy, however newer research does not corroborate these findings [30]. Some studies have reported a link between geographic tongue and psoriasis [32], although 90% of children who are diagnosed with geographic tongue do not develop psoriasis [33]. Again however, modern research studies do not support any link between psoriasis and geographic tongue [30].

Lesions that are histologically indistinguishable from geographic tongue may also be diagnosed in reactive arthritis (arthritis, uveitis/conjunctivitis and urethritis [27]. It is reported an association between stress and geographic tongue. Furthermore, the occurrence of a similar condition in both the monozygotic twins might indicate the possible role of genetic factors and this warrants further investigation [34]. There are many risk factors have

been reported for geographic tongue such as: Hormonal disturbances [35]; Oral contraceptive use [36]; Juvenile diabetes mellitus [37]; Pustular psoriasis [38,39]; Allergic conditions such as atop hay fever and rhinitis [40,41]; Fissured tongue [20,42]; Robinow's syndrome [43]; Reiter's syndrome [44]; Down syndrome [45,46]; Psychological factors [47]; Nutritional deficiencies [48]; Lithium therapy [39,49]; Familial predisposition [50-52]; Fetal hydantoin syndrome [53]; Aarskog's syndrome [54].

## DISCUSSION

Geographic tongue is defined as a benign inflammatory condition. It is characterized as erythematous lesion with atrophy of filiform papillae and thinning of the epithelium, the white border around this lesion is suggestive of regenerating filiform papillae. In general, fissure tongue has been associated with Down syndrome, acromegaly, psoriasis, and Sjögren's syndrome [55]. Burning tongue also has an unknown etiology and seems to affect women seven times more often than men [56].

Synonyms of geographic tongue include benign migratory glossitis, erythema migrans, annulus migrans or wandering rash of the tongue. The occurrence of geographic tongue in general population ranges from 1.0 to 2.5% and it is more prominent in adults than in children [57]. No conclusive gender predilection has been reported [47, 58]. Specific cause of geographic tongue remains unknown. Various etiological factors which have been recommended in the literature include allergy [58], emotional stress [47], and systemic conditions like diabetes and psoriasis [7, 59]. None of the proposed etiological factors provide a definitive evidence of a causal relationship.

Other situations associated with this pathology are Vitamin B deficiency, a trigger from certain foods such as cheese, congenital anomaly, asthma, rhinitis, systemic diseases like psoriasis, anemia, gastrointestinal disturbances, candidiasis, lichen planus, hormonal imbalance, psychological conditions, etc. [6, 22]. Many geographic tongue literatures are available. One case is discussed here. The prevalence of the appearance of this disease is important and it varies from region to region and studies conducted in those regions. According to the study by Go swami the prevalence of geographic tongue ranged from 1.0-2.5% in the study population [7]. In another studies reported the prevalence which was 4.8% in Jordanian population [59].

Investigations proved that there was no specific racial predilection or gender difference observed in their studies. The most normally affected site is the tongue; however, other oral mucosal soft tissue sites may be affected. The majority of affected patients are asymptomatic. However, discomfort ranging from foreign body sensation to minimal itching to a severe burning sensation, which may occasionally

interfere with eating or sleeping. Moreover, some patients associate smoking and seasoned or spicy foods as aggravating factors [60]. Geographic tongue has been reported with increased incidence in patients with psoriasis and in patients with fissured tongue [39]. On rare occasions, where significant pain develops and/or persists, the use of systemic Cyclosporine [61] or topical application of 0.1% tacrolimus ointment [62] for relieving symptoms, has been reported. Anti-fungal medication is introduced if secondary candidiasis is suspected. In the present case, symptomatic treatment with topical lignocaine and reduction in the intake of acidic or spicy foods was advised.

## Treatment

Patients do not usually require treatment apart from comfort. Various symptomatic treatments have been tried and include fluids, acetaminophen, mouth rinsing with topical anesthetic agent, antihistaminic, anxiolytics and steroids [63]. Nutrition education and diet modification was advised. The patient was put on oral iron zinc therapy. Patient was advised to maintain the lingual hygiene by 10 times stroking the tongue with either soft tooth brush or tongue scrappers after meals scrappers to avoid food accumulation on the tongue. In bedtime supplemented with mouthwash (0.2% solution of Chlorhexidine gluconate) prescribed to swish and spit with 10 ml twice daily for one minute and to strictly adhere to the oral hygiene instructions. Patient had symptomatic improvement with the treatment. Vitamin A therapy resulted in partial improvement in some patients [64]. The topical factors that exacerbate patient's symptoms such as very hot, spicy or acidic food, and dried salty nuts should be avoided [63].

Patient was prescribed benzydamine hydrochloride mouth wash for symptomatic relief. On second visit there was improvement in her symptoms.

## CONCLUSION

Geographic tongue is usually asymptomatic and it produces the characteristic migratory pattern on the dorsum of tongue. It is a benign condition that not ever turns into malignancy. Although the etiology of geographic tongue remains unknown till date, the condition is not preventable, psychosomatic and genetic factors appear to play a significant role in the etiology. The only complication is the discomfort due to the persistent clinical appearance and frequent recurrence after healing. However it is advisable to promote optimal oral hygiene and avoid contact with local factors that could precipitate symptoms, such as spicy and acidic foods, alcohol, irritants in toothpastes and mouth rinses. Careful examination and investigations are recommended to rule out probable etiological factor. Reassurance and follow-up of both young and adult patients is mandatory, so that unnecessary treatment protocol is not undertaken. Also long-term follow-up studies should be initiated to know the course, duration

of the disease and probable outcome of different treatment modalities in future.

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