

## **Geographic tongue in children: two clinical cases**

**Claudia Norma Haydee Zini–Carbone<sup>1</sup> ORCID: 0000-0002-8027-5527**

**María de las Mercedes Medina<sup>2</sup> ORCID: 0000-0002-9891-2408**

**María Mercedes González<sup>3</sup> ORCID: 0000-0002-7235-4612**

**10.22592/ode2019n34a8**

### **Abstract**

Pediatric dentists play a significant role in the early detection of oral pathologies at a young age because they are usually the first to have contact with the child. This enables them to detect mouth lesions, such as geographic tongue, which is a reddish lesion that appears and disappears and leads parents to seek professional help as they are alarmed. It is essential to reassure parents that it is a benign lesion, which generally does not require treatment <sup>(1)</sup>.

This article aims to present two clinical cases, with different signs and symptoms, for which it is important to know the specific clinical characteristics of the geographic tongue and clinical management.

Keywords: children, geographic tongue, migratory, benign.

## **Resumen**

El Odontopediatra juega un rol importante en la detección precoz de patologías orales en edades tempranas, debido que casi siempre es el primero que tiene contacto con el niño y cabe la posibilidad de ser el detector de lesiones en boca, como la lengua geográfica. Pero también es motivo de consulta de los padres, una lesión de color rojizo que aparece y desaparece, que los alarma. Es de suma importancia transmitir y tranquilizar a los padres de que se trata de una lesión benigna, que generalmente no requiere tratamiento <sup>(1)</sup>.

Este artículo tiene como objetivo la presentación de dos casos clínicos, con signos y síntomas diferentes para lo cual es de importancia conocer las características clínicas específicas de la lengua geográfica y el manejo clínico.

Palabras Claves: Niños, Lengua Geográfica, Migratoria, Benigna.

## **Resumo**

O Odontopediatra desempenha um papel importante na detecção precoce de patologias bucais em uma idade precoce, pois é quase sempre o primeiro a ter contato com a criança e é possível detectar lesões na boca, como a linguagem geográfica. Mas também é um motivo de consulta dos pais, uma lesão avermelhada que aparece e desaparece, o que os alarma. É muito importante transmitir e tranquilizar os pais de que é uma lesão benigna, que geralmente não requer tratamento <sup>(1)</sup>.

Este artigo tem como objetivo apresentar dois casos clínicos, com diferentes sinais e sintomas, para os quais é importante conhecer as características clínicas específicas da linguagem geográfica e do manejo clínico.

Palavras-chave: Crianças, Linguagem Geográfica, Migratório, Benigno.

1 School of Dentistry, Universidad Nacional del Nordeste, Corrientes, Argentina. 2 School of Dentistry, Universidad Nacional del Nordeste, Corrientes, Argentina.

3 Stomatology Department, School of Dentistry, Universidad Nacional del Nordeste, Corrientes, Argentina.

Received on: 25 Sep 2019 – Accepted on: 31 Jul 2019

### **Authorship contribution**

1. Conception and design of study
2. Acquisition of data
3. Data analysis
4. Discussion of results
5. Drafting of the manuscript
6. Approval of the final version of the manuscript

• CZ has contributed in: 1, 2, 3, 4, 5 and 6.

• MM has contributed in: 2, 3, 4 and 5.

• MG has contributed in: 3, 4 and 5.

### **Introduction**

A geographic tongue is a benign migratory lesion found at the back of the tongue, usually in the middle and sides, although it can coexist in both areas and, with a lower incidence and frequency, at the tongue base <sup>(9,16)</sup>.

Geographic tongue is also known as marginal exfoliative glossitis, marginalized and aberrant desquamation by areas; exfoliation in areas of the tongue and lingual pityriasis, among others. These names illustrate the most salient clinical aspects.

This lesion is not essentially limited to children <sup>(2)</sup>, as it is also frequent in young adults and middle-aged patients, and can be observed from a very early age, from 2 to 40 years of age.

Pediatric dentists play a significant role: as they are the first to have contact with the child, they will make an early detection and diagnosis of the lesions in the mouth.

The etiology of geographic tongue is unknown, although different factors that may be related to this lesion have been proposed. However, the causes suggested in the literature provide clear evidence of a causal relationship <sup>(3-4)</sup>. It is believed that these patients may present a possible psychosomatic background. It was already demonstrated in 1966 that emotional stress was an etiological factor for the geographic tongue <sup>(5)</sup>, and it has been associated with allergies and avitaminosis deficiencies in children as well.

Other authors such as Reyes Velázquez et al. (2009) point out that this alteration may also be associated with infectious, emotional and irritant factors and the use of alcohol and tobacco, which trigger the loss of filiform papillae, forming patch-like macules <sup>(17)</sup>.

Geographic tongue does not have a specific etiology (Redman et al., 1972; Goregen et al., 2010). However, authors such as Redman et al. (1972), Goregen et al., Ferreria et al. (2013), Hubiche et al. (2013), Ching et al. (2012) and Costa et al. (2009) have linked it to emotional stress, fungal or bacterial infections, drug use, chronic trauma, vitamin and zinc deficiency, family history, psoriasis, atopy, Reiter's syndrome, Diabetes Mellitus, seborrheic dermatitis and burning mouth syndrome, among others; but none of them has been able to prove their hypothesis and consequently, the etiology remains controversial <sup>(18)</sup>.

In studies conducted in Viña del Mar, Chile, by Marshall Baburizza et al., of 436 children, 23 presented geographic tongue, accounting for a prevalence of 5.28%, with a 95% CI of 3.37% to 7.81%. There were no differences regarding sex, age or type of

educational center. No factors associated with geographic tongue were identified. The prevalence of geographic tongue observed is similar to other studies covering the same age range population.

Just as in other studies, it could not be demonstrated that emotional stress, chronic irritation, fissured tongue and type of educational center were factors linked to the presence of geographic tongue. In studies conducted in Mexico by Celia Linares-Vieyra et al. <sup>(19)</sup>, geographic tongue had a prevalence of 8.9%, similar to that observed by Reynoso <sup>(20)</sup> et al. (7.76 %) in the Mexican population and the one reported by Bessa <sup>(21)</sup> et al. (9.08 %) in Brazilian children <sup>(19)</sup>.

According to César Rivera (2017) and based on a systematic literature review, geographic tongue lesions are among the five most frequent oral mucosa pathologies in children and adolescents. The studies were conducted in the United States, Italy, India, Turkey and Chile. The range of samples in the systematic review ranges from 10,030 to 1,041 subjects, with an age range from 0 to 18 <sup>(22)</sup>.

**Table 1. Most frequent oral mucosa lesions in children and adolescents. Systematic literature review with data from five countries.**

Gs	First authors/country (city)	N° subjects/age	Diagnosis ranking
1	Shulman (2005) /USA (Nationwide)	10,030/2-17	1. Traumatic lesions 2. Recurrent oral ulcers 3. Nevus 4. Recurrent herpes 5. Geographic tongue
2	Majorana (2010) / Italy (Brescia)	10,128/0-12	1. Candidiasis 2. Traumatic lesions 3. Recurrent oral ulcers 4. Geographic tongue 5. Recurrent herpes
6	Ambika (2011) / India (Malkapur)	1,003/4-14	1. Linea alba 2. Pigmented lesions 3. Fordyce spots 4. Fissured tongue

			5. Abscess
15	Kose (2013) / Turkey (Ankara)	1,034/0-12	<ol style="list-style-type: none"> <li>1. Recurrent oral ulcers</li> <li>2. Geographic tongue</li> <li>3. Mucocele</li> <li>4. Candidiasis</li> <li>5. Primary herpetic gingivostomatitis</li> </ol>
18	Bardellini (2015) / Italy (Brescia)	4,073/13718	<ol style="list-style-type: none"> <li>1. Linea alba</li> <li>2. Recurrent oral ulcers</li> <li>3. Recurrent herpes</li> <li>4. Candidiasis</li> <li>5. Traumatic lesions</li> <li>5. Geographic tongue</li> </ol>
24	Ünür (2015) / Turkey (Istanbul)	1041/0-13	<ol style="list-style-type: none"> <li>1. Traumatic lesions</li> <li>2. Fissured tongue</li> <li>3. Recurrent oral ulcers</li> <li>4. Abscesses</li> <li>5. Geographic tongue</li> <li>5. Recurrent herpes</li> </ol>
-	Zúñiga (2013)/Chile (Valdivia)	542/<6-16	<ol style="list-style-type: none"> <li>1. Mucocele</li> <li>2. Pyogenic granuloma</li> <li>3. Irritation pseudofibroma</li> <li>4. Ranula</li> <li>5. Sialadenitis</li> </ol>
-	Rivera(2017)/Chile (Talca)	99/4-18	<ol style="list-style-type: none"> <li>1. Mucoceles</li> <li>2. Pyogenic granuloma</li> <li>3. Irritation pseudofibroma</li> <li>4. Geographic tongue</li> <li>5. Nevus</li> </ol>

## Background

Geographic tongue is initially characterized by the presence of small, round or irregular areas of dekeratinized and desquamated filiform papillae. Such shedding areas are red, have little sensitivity and thick, white or white-yellowish edges <sup>(3-4)</sup>. Generally the lesion begins as a smooth, shiny, well-defined patch that tends to become larger with adjacent lesions, so we may find single or multiple lesions <sup>(8)</sup>. The geographic tongue has remission and exacerbation periods of varying length <sup>(7)</sup>. When the lesion is

observed for days or weeks, it changes its pattern and seems to move across the back of the tongue, since once an area heals, it progresses towards the adjacent area <sup>(4)</sup>.

Geographic tongue may occur in two forms:

1) As white, annular lesions, with a red atrophic center, which present a migratory pattern over the back of the tongue, varying in intensity and which may disappear instantaneously and is sometimes painful.

2) As a red lesion, when atrophic papillae predominate over keratosis edges <sup>(4)</sup>. The lesions are usually asymptomatic <sup>(7)</sup> but occasionally painful, reportedly ranging from mild itching to an intense burning sensation. Discomfort sometimes increases with spicy foods or acidic fruits.

Discomfort occurs immediately after the patient's discovery of the tongue lesions. The pain is genuine, even though the affected area is small <sup>(6)</sup>. Histopathologically, geographic tongue lesions show a loss of filiform papillae and variable thinning of the mucosa. There is epithelial hyperplasia in some areas. The epithelium shows spongiosis (epidermal intercellular edema with increased spaces between cells and greater visualization of intercellular bridges) and acute and chronic inflammatory infiltrate <sup>(8)</sup>. The white-yellowish edges of these lesions are well defined by a slightly elevated accumulation of degenerated and polymorphonuclear epithelial cells <sup>(6)</sup>. In the middle part and round erythematous area there is usually a loss of surface parakeratin and a significant migration of polymorphonuclear leukocytes and lymphocytes inside the epithelium; these leukocytes are located in micro-abscesses close to the surface. In addition, there is infiltration of neutrophils, lymphocytes and plasma cells within the underlying lamina propria <sup>(4)</sup>.

### **Description of clinical cases**

Both males, 6 years old (Case 1) and 7 years old (Case 2), sought emergency care treatment at the Pediatric Dentistry Department of the School of Dentistry of Universidad Nacional del Nordeste in 2017-2018. The parents reported the children had toothache.

In both cases they had geographic tongue lesions. Their clinical records were prepared and their informed consent obtained, in compliance with the institution's bioethics committee.

### **Clinical case Nº 1**

Male patient, 6 years old, lives in Corrientes Capital, in San Antonio Oeste neighborhood. They sought care because of toothache, which was due to the eruption of the first permanent molars.

The following information was collected in the clinical records: allergic rhinitis as a base systemic disease, but not taking any medication and no hereditary history of the pathology in the family.

The patient was shy, introverted but very collaborative and responded favorably to behavioral management techniques.

The extraoral exam showed hypertonic lips. In the intraoral clinical exam, early mixed dentition with normal soft tissue was observed.

During the clinical examination of the tongue, multiple lesions in the shape of incomplete rings were found on the dorsal surface (tip of the tongue and sides), progressing to the ventral surface, with areas of dekeratinized and desquamated filiform papillae. The scaling patches are red, have little sensitivity and thick, white or yellowish white edges.

The lesions were usually asymptomatic but sometimes painful. The symptoms increased when he ate spicy or acidic foods.

The lesions on the child's tongue presented periods of remission and exacerbation of varying length, as can be seen in Figures 4 and 5. By the 15-day checkup, they had disappeared almost completely on their own.

The lesions move across the dorsal surface of the tongue. Once one area heals, it progresses to the adjacent area.



**Figure 1: Dorsal surface geographic tongue: sides and tip of the tongue**



**Figure 2: Floor of the mouth with no lesions**



**Figure 3: The lesion on the left side of the dorsal surface progresses towards the ventral surface of the tongue**



**Figure 4: Checkup after 15 days, exacerbation period**

**Figure 5: Checkup after 15 days, exacerbation period, with no lesions on the ventral surface**

The patient comes in for a checkup after 30 days. Tongue lesions have changed shape and intensity, moving from the center of the dorsal surface outwards, with irregular edges, showing continuity from the side of the dorsal surface to the ventral surface (Figures 6 and 7).



**Figura Nº 6: 30-day control, change of the pattern of the lesion.**



**Figure Nº 7: continuity of the lesion of the side area of the back to the ventral face of the tongue**

## **Clinical case Nº 2**

Male patient, 7 years old, lives in Corrientes Capital, in San Gerónimo area who attends the dental service consultation presenting multiple caries. The following information could be collected: no basic systemic diseases, no medication, and no hereditary history of pathology in the family. The patient presents himself very collaboratively, responded favorably to behavioral management techniques.

The extraoral examination shows hypotonic lips, early mixed dentition with normal soft tissues and polycaries were observed in the intraoral clinical examination. The reason for the consultation was pain in the tooth 6.5. The clinical examination was observed in the lingual organ, lesions of multiple elements in oval form, on the dorsal face, in the lateral areas, without extension to the ventral face of the same. Well-defined areas of dekeratinization and flaking of filii papillae. Flaking areas have a red lesion, thick edges when atrophic papillae predominate over keratotic edges. The lesions in the lingual organ in this child are asymptomatic and have periods of remission and exacerbation of varying duration as can be seen in Figure 11, which at 15 days of control disappeared almost completely these lesions, spontaneously.



**Figure 8: Geographic tongue with dorsal surface lesions on the sides**



**Figure 9: Geographic tongue with oval-shaped lesions**



**Figure 10: Ventral surface of the tongue with no lesions**



**Figure 11: 15-day checkup, no lesions**

### **Treatment**

In both cases, parents were reassured and informed about the disease. They were told that it has periods of remission and exacerbation and it is self-limited and asymptomatic in nature. Nonetheless, when there are symptoms, the treatment is empirical and symptomatic such as good oral hygiene, a soft and cold diet, avoiding acidic, spicy and salty foods.

It is important for parents to rest assured and know that it is harmless. It is a benign disorder and it does not foreshadow a more serious disease. The tongue is expected to go back to its normal appearance over the years.

### **Discussion**

Marshall Baburizza et al. claim in their study that the children with geographic tongue had a very different behavior to that of the children who were not affected: they were

more restless, untidy and anxious. This differs from what Redman et al. (1966) had proposed that emotional stress would not act as a risk factor for geographic tongue.

Nevertheless, it is worth noting that, based on our clinical experience, we agree with Redman et al. The patients observed in this article suffered emotional stress due to changes or new experiences; this could stimulate the remission of lesions in the tongue. On the other hand, stress would be a predisposing factor, and it cannot be said to be the only cause, as Marshall Baburizza et al. indicate. They state that it is not possible to prove that emotional stress, chronic irritation, a fissured tongue and avitaminosis are factors associated with the presence of geographic tongue.

Bascones-Martinez et al. link geographic tongue to plicated or scrotal tongue, as 40% of the patients with geographic tongue evolve towards a scrotal tongue. Some authors consider it to be the same process in different evolutionary periods.

## **Conclusions**

Early detection of stomatological lesions, such as geographic tongue in children is important mainly to inform and reassure parents. It is a benign lesion with a migratory pattern and unknown etiology. The most important risk factor is the psychosomatic component, such as stress, without disregarding others such as avitaminosis, anemia and respiratory problems. This lesion has remission and exacerbation periods. It does not require treatment in general and if necessary, it is palliative care. Otherwise, it is asymptomatic, which occurs in most cases.

## **References**

1. Villalón G, Cardozo C, Maroto Edo M, Silva, Barbería Leache E. Lengua geográfica en Odontopediatría. Revisión. Gaceta dental: Industria y profesiones. 2007; 179: 128-140. Available from: <https://www.researchgate.net/publication/39312645/download>
2. Bordoni N, Escobar A, Castillo Mercado R. Odontología Pediátrica. La salud bucal del niño y el adolescente en el mundo actual. 1st ed. Buenos Aires: Médica Panamericana; 2010 1200.
3. Dean J. Higiene Oral mecánica y química en el hogar. Consideraciones nutricionales para el paciente dental pediátrico. Dean J. McDonald y Avery Odontología Pediátrica y del Adolescente. 5th ed. Barcelona: Elsevier, 1992. p120-180.
4. Regezi J, Sciubba J. Patología bucal: correlaciones clínico patológicas. 2nd ed. México: MacGraw-Hill Interamericana, 2000.
5. Redman R, Vance F, Gorlin R; Peagler F, Meskin L. Psychological component in the Etiology of geographic tongue. J Dent Res. 1996; 45 (5): 1403-8.17.
6. Sanders B. Cirugía bucal y maxilofacial pediátrica. Buenos Aires: Mundi. 1984.5.
7. Jainkittivong A, Langlis RP. Geographic tongue: clinical characteristics of 188 cases. J Contemp Dent Pract. 2005; 1 (6): 123-35.
8. Wood N, Goaz P. Diagnóstico diferencial de las lesiones orales y maxilofaciales. 5th ed. Madrid: Harcourt Brace; 1998.
9. Grispan D. Semiología, Patología, Clínica y Terapéutica de la Mucosa Bucal, Tomo III. Patología Clínica y Terapéutica de la Mucosa Bucal. 1st ed. Editorial Mundi S.A., Buenos Aires, 1970; pg.1683-1691.
10. Hernández G. Guías de manejo en estomatología pediátrica. México: ECOE,1998. pg. 41-58, 102-107.

11. Bezerra S, Costa I. Oral conditions in childrens from birth to 5 years: the findings of a children's dental program. J Clin Pediatr Dent. 2000; 25: 79-81.

12. García Pola MJ, García JM, González M. Estudio epidemiológico de la patología de la mucosa oral en la población infantil de 6 años de Oviedo (España). Med Pathol. 2002; 7 (3): 24-31.

13. Marshall Baburizza M, Feldstedt González M, Fernández Moraga J, Fernández Moraga A, Esguep Sarah A. Prevalencia de Lengua Geográfica en Niños Chilenos de 7 a 10 Años de Edad. Int. J. Odontostomat. 2014; 8 (2): 235-240.

Available from: [https://scielo.conicyt.cl/scielo.php?script=sci\\_arttext&pid=S0718-381X2014000200015&lng=es](https://scielo.conicyt.cl/scielo.php?script=sci_arttext&pid=S0718-381X2014000200015&lng=es). <http://dx.doi.org/10.4067/S0718-381X2014000200015>.

14. Toscano Varandas E, Da Silva Viana, H. Prevalencia De Lengua Geográfica, Lengua Fisura Da y Glositis Rómbica Mediana En Escolares Del Municipio De Joao Pessoa-Pb, Brasil. CES Odontología, Norteamérica 2011; 8.

Available from: <http://revistas.ces.edu.co/index.php/odontologia/article/view/1520>.

15. Jankittivong A, Langlis RP. Geographic tongue: clinical characteristics of 188 cases. J Contemp Dent Pract; 2005; 1 (6): 123-35.

16. Barberia Leache E, Cardozo C, Maroto Edo M. Lengua geográfica en Odontopediatría. Revisión. Gaceta Dental. 2011; 179: 128-140.

Available from: <https://www.gacetadental.com/2011/09/lengua-geografica-en-odontopediatra-revisin-25437/>

17. Reyes Velázquez OJ, Jiménez Cruz N, Bello Hernández C. La lengua y sus múltiples patologías. Artículo de revisión mayor. C. D Med Oral. 2009; 11 (3): 101-105.

18. Marshall Baburizza M, Feldstedt González M, Fernández Moraga J, Fernández Moraga A, Esguep Sarah A. Prevalencia de Lengua Geográfica en Niños Chilenos de 7 a 10 Años de Edad. Int. J. Odontostomat. 2014; 8 (2): 235-240.

Available from: [https://scielo.conicyt.cl/scielo.php?script=sci\\_arttext&pid=S0718-381X2014000200015&lng=es](https://scielo.conicyt.cl/scielo.php?script=sci_arttext&pid=S0718-381X2014000200015&lng=es). <http://dx.doi.org/10.4067/S0718-381X2014000200015>.

19. Linares-Vieyra C. Lesiones de mucosa bucal. Factores asociados en población infantil. Rev Méd Inst Mex Seg Soc. 2013; 51 (3): 320-325.

20. Reynoso-Licon A, Mendoza-Núñez VM. Magnitud de lesiones bucales de tejidos blandos en niños de 1 a 6 años de edad de la ciudad de México. Rev ADM. 2004; 61 (2): 65 - 69.

21. Bessa CF, Santos PJ, Aguiar MC, do Carmo MA. Prevalence of oral mucosal alterations in children from 0 to 12 years old. J Oral Pathol Med. 2004; 33 (1):17-22.

22. Rivera C. Enfermedades de la mucosa oral más frecuentes en niños y adolescentes. Mouth. 2017; 2 (1): e11052017es.

Available from: [file:///C:/Users/lenovo/Downloads/mouth11052017es%20\(3\).pdf](file:///C:/Users/lenovo/Downloads/mouth11052017es%20(3).pdf)

23. Bascones Martínez MA, Valero Marugán A, Encinas Bascones A, Carrillo de Albornoz A, Bascones Martínez A. Geographic tongue and atopic dermatitis: A frequently association. Av Odontoestomatol [Internet]. 2006; 22 (2): 111-118. Available from: [http://scielo.isciii.es/scielo.php?script=sci\\_arttext&pid=S0213-12852006000200002&lng=es](http://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S0213-12852006000200002&lng=es).

Claudia Zini: [claudiazini74@hotmail.com](mailto:claudiazini74@hotmail.com)