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Geographic tongue

Report of a case showing significant reduction in lingual tactile sensitivity

by

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Introduction

Geographic tongue (benign migratory glossitis, glossitis areata exfoliata, erythema migrans, wandering rash of the tongue) is a condition characterized by desquamation of the filiform papillae and swelling of the tongue (Tyldesley, 1974). Various red areas with white rims appear at certain points on the lingual surface. These areas shift location within the lingual surface daily in some cases (Fucci and Petrosino, 1981; Kullaa-Mikkonen *et al.*, 1982). The etiology of geographic tongue is still a mystery. There are some indications that it is related to hereditary factors, allergies, nutritional disturbances, emotional states of continued anxiety, and localized oral irritations (Boozer *et al.*, 1974; Merril and Kruger, 1973; Redman *et al.*, 1972). Geographic tongue is usually first noticed around age four, or earlier. It is slightly more common in women than in men, and it is basically symptom-free (Mescon *et al.*, 1970). The primary complaints from individuals with geographic tongue are irritation or pain resulting from eating spicy foods, smoking, or drinking alcoholic beverages (Kullaa-Mikkonen *et al.*, 1982). Treatments that have been applied to date consist of various types of vitamin therapy, and they have been relatively unsuccessful (Shafer *et al.*, 1974). The most important need expressed by most patients with geographic tongue is that of knowing that the condition is benign in nature. Cancerphobia is common among individuals with geographic tongue (Tyldesley, 1974).

Case Report

The case, a 25-year-old white female, was enrolled as a graduate student in speech and hearing sciences at Ohio University in the fall of 1981. She, like all students in the program, participated in a routine clinical speech screening procedure. The results of the screening revealed an articulation disorder characterized by sibilant distortions (/s/, /z/, /sh/). When questioned about the speech problem, she indicated that as a child she had been diagnosed by the family physician as having geographic tongue. More recently, her dentist made a similar diagnosis while she was having dental work done prior to leaving home for graduate school.

Upon oral examination, the patient's tongue showed deep fissures, especially down the middle and along the edges of the dorsum, and reddened areas varying in size surrounded by definitive white borders (Fig. 1). Overall, the tongue appeared to be swollen and somewhat tender to the touch. She expressed deep concern with respect to her lingual condition. She indicated that there was frequent pain accompanied by swelling of the tongue and that the swelling could reach a point where she would be chewing on the edges of the tongue without knowing it. She further indicated that her mouth was hypersensitive to spicy foods and alcohol. After having a meal including these items, she would experience a burning sensation on the tongue that could last until the following morning. The general condition of this individual was one of nervousness and hypertension. She was very concerned about the geographic tongue, the articulation disorder resulting from it, and the influence that these problems might have on her future aspirations of wanting to become a speech clinician. She had already been assured by her family physician and dentist that the condition was benign, but was

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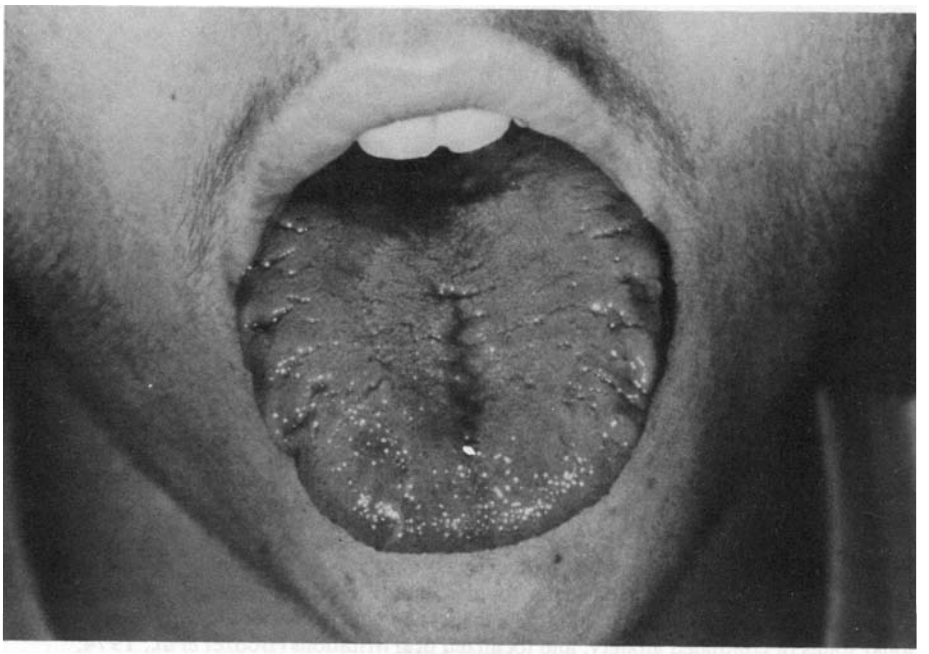


FIG. 1
Photograph of geographic tongue.

still bothered by the fact that it would not go away and that new sores would continue to appear at different points on the tongue as old ones disappeared. She was also upset by the fact that she could be chewing on the edges of the tongue without tactile awareness. Her first knowledge of the chewing activity was often a low level pain sensation or slight bleeding that could be eventually tasted.

In terms of treatment, the case was given instruction on how to reduce or possibly eliminate the articulation problem which consisted primarily of lateral distortions of the /s/ phoneme. Heavy instructional emphasis was placed on ear training and listening techniques for speech monitoring, in that there seemed to be a definite problem with tactile awareness of tongue location and contact with respect to the surrounding oral cavity structures. At the same time, further exploration of the reported tactile sensory deficit was accomplished through obtaining lingual thresholds through the use of mechanical vibration. This procedure was performed over an extended period of time.

Within the past decade, instrumentation has been developed at Ohio University which can be used to obtain tactile sensory thresholds from the tongue in a manner similar to that used by audiologists to determine thresholds of hearing. The apparatus itself consists of a frequency generator, an amplifier, and a vibrator which can be used to deliver pulses of vibration to the anterior midline of the dorsum of the tongue. The vibrator has a probe extension that makes actual contact with the tongue. Thresholds are determined by having the subject raise his hand when he just begins to feel the pulses on the lingual surface. The actual pulse amplitudes are recorded at that instant, and then converted to a linear measurement referred to as the micron (Fucci and Crary, 1979).

The lingual vibrotactile equipment has been used clinically in a number of different ways. Initially it was designed to help speech and hearing clinicians distinguish organic articulation cases (those with lingual sensory deficits) from functional articulation cases (those not showing lingual sensory deficits). Since then, it has been used to help clinicians monitor improvement of organically involved cases in therapy, to inform physicians of oral tactile sensory conditions of patients who have undergone oral surgery, to

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inform physicians of oral tactile sensory conditions of accident victims sustaining head injuries, and to explore the oral tactile sensory system in unusual cases such as the one presented above.

A basic procedure was instituted in which lingual vibrotactile thresholds were obtained from the geographic tongue case once a week for 10 weeks. Thresholds were also obtained in a similar manner from a graduate student of the same age and sex who had a normal appearing tongue (Fig. 2). In each instance, thresholds were obtained at three different frequencies which are known to be conducive to response by the lingual tactile sensory system. Threshold means (in microns) and standard deviations for both individuals are shown in the included table. It can be seen that the mean thresholds for the geographic tongue case are higher (indicating poorer threshold sensitivity) than those of the normal tongue case for all frequencies tested. The standard deviations are also higher for the geographic tongue case, indicating that her thresholds showed somewhat more variation from week to week than those of the normal tongue case.

Discussion

At the time of lingual threshold measurement, the geographic tongue case was making important strides toward self-control. The reassurances,

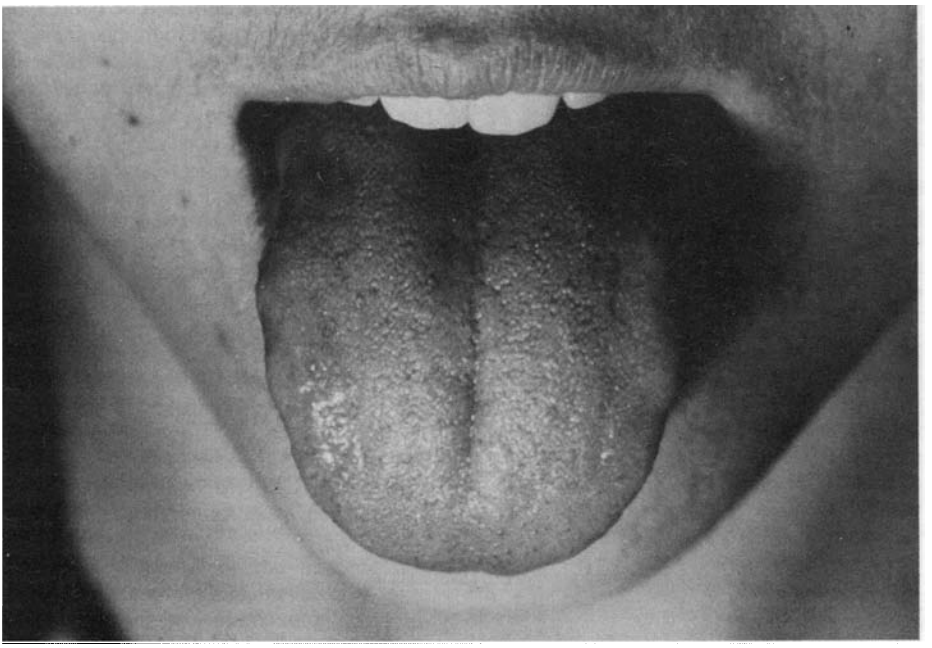


FIG. 2

Photograph of normal tongue.

TABLE I

LINGUAL VIBROTACTILE THRESHOLD MEANS (IN MICRONS) AND STANDARD DEVIATIONS FOR GEOGRAPHIC TONGUE AND NORMAL TONGUE

	125 Hz.		250 Hz.		400 Hz.	
	M	SD	M	SD	M	SD
Geographic tongue	9.25	1.18	5.19	0.86	10.42	1.09
Normal tongue	3.24	0.45	1.84	0.19	3.17	0.43

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success in reducing the articulation problem, and improved performance in school led to an overall healthier general outlook. She also began to watch her diet, participate in physical exercises, and maintain a schedule which would permit at least six hours of sleep every night. Even with this improved routine, however, the lingual vibrotactile thresholds were not altered significantly over the 10-week period. They were always higher than those of the normal tongue case. The tongue itself appeared to be more swollen some days than others. The number and size of the reddened areas changed weekly, and the general level of soreness increased and decreased on an irregular basis. These overt symptomatic changes also seemed to have little or no effect on the lingual vibrotactile thresholds obtained over the 10-week period.

The conclusion that can be drawn from the information collected is that the lingual tactile sensory deficit noted in this particular case of geographic tongue is a consistent condition. It appeared not to vary significantly over any given time-period or with any changes in the overt symptoms reported. Further study of the lingual vibrotactile thresholds of additional cases of geographic tongue is warranted in order to determine if this finding is unique to this particular case or something that is an integral part of the geographic tongue condition.

Summary

A case of a 25-year-old white adult female with geographic tongue is reported. A decrease in lingual tactile sensitivity was indicated to exist as measured through mechanical vibration. This decreased lingual sensitivity remained constant over a 10-week interval, even though the patient developed an overall healthier general outlook during this period. The overt symptoms accompanying this condition also changed from day to day, but appeared to have little or no effect on the overall decreased lingual tactile sensitivity.

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