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Short Communication

The Carbuncled Conduit-Geographic Tongue

Anubha Bajaji*

Histopathologist in A.B. Diagnostics, New Delhi, India

***Corresponding Author**: Anubha Bajaji, Histopathologist in A.B. Diagnostics, New Delhi, India.

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Preface

Geographic tongue is denominated as a benign, inflammatory condition arising within the lingual mucosa which typically displays migrating areas of smooth, reddish discoloration of mucosal surface within anterior tongue associated with asymptomatic, erythematous patches with a serpiginous perimeter. Reddish zones are circumscribed by a whitish perimeter composed of desquamated epithelial cells. Initially chronicled by Rayer in 1831, geographic tongue is additionally designated as benign migratory glossitis, erythema migrans, glossitis migrans, annulus migrans or wandering rash of tongue.

Geographic tongue can be appropriately discerned with concurrence of characteristic history and clinical features whereas histological correlation is exceptionally required.

Disease characteristics

Generally, geographic tongue commences in childhood although majority of instances emerge within the third decade. No age of disease emergence is exempt and the condition may be discerned in young children. A mild female predominance is observed. Geographic tongue demonstrates an estimated prevalence of ~1%.

Of obscure aetiology, predisposing factors engendering geographic tongue emerge as common cold, fissures in the tongue, stress or psoriasis which histologically simulates the condition. Psychosomatic, familial and hereditary factors are posited to contribute to emergence of geographic tongue. Psychiatric subjects depict an enhance prevalence of geographic tongue [1,2].

Decimation of mental stress assists in alleviation of geographic tongue. Geographic tongue is prevalent within first degree relatives and parents and siblings of incriminated individuals, in contrast to the general population. A polygenetic mode of disease inheritance may be observed.

Geographic tongue is associated with conditions such as asthma, atopy, eczema, hay fever, allergic rhinitis or elevated levels of immunoglobulin Allergy to drugs, food or associated antigens appear concurrent to geographic tongue [1,2].

Geographic tongue may be contemplated as an oral manifestation of psoriasis on account of identical histological features and immunohistochemistry. Although debatable, association with human leukocyte antigen (HLA)-Cw6 and HLA-B13 may be observed. Nevertheless, a significant proportion of healthy subjects depict geographic tongue [1,2].

Besides, geographic tongue exemplifies an enhanced incidence in individuals with diabetes mellitus and is associated with diverse hormonal factors wherein oral contraceptive pills engender hormonal fluctuation. Inhibitors of angiogenesis possibly induce geographic tongue. Deficiency of vitamin D, vitamin B6, vitamin B12, folic acid, iron and zinc contribute to development of geographic tongue [3,4].

Consumption of tobacco decimates pathogenesis of geographic tongue, possibly due to enhanced keratinization and declining levels of macrophage induced tumour necrosis factor alpha (TNF-α), interleukin 1 (IL-1) and interleukin 6 (IL-6) through the activation of nicotinic receptors [3,4].

Clinical elucidation

The benign, chronic, relapsing, inflammatory condition arising within the oral cavity usually manifests as asymptomatic, erythematous, migratory circinate patches which demonstrate a typical countenance resembling a map. Lesions may persist for weeks, dissipate and re-emerge at diverse sites. Geographic tongue commonly appear upon lateral and dorsal aspects of the tongue although extra-lingual lesions arise upon lips, labial mucosa, buccal mucosa or floor of the mouth [3,4].

Of variable clinical representation, geographic tongue usually manifests as an asymptomatic, erythematous, migratory, atrophic, circinate patch associated with reduced lingual filiform papillae and circumscribing whitish, circinate perimeter confined to lateral and dorsal aspects of the tongue. Lesions occurring in diverse locations are designated as ectopic geographic tongue [5,6].

Infrequently discerned extra-lingual lesions are generally situated upon the labial mucosa, buccal mucosa, lips, hard palate, uvula or floor of the mouth. Exceptionally, regions beyond the tongue are implicated, thereby engendering nomenclature of "geographic stomatitis" or "ectopic geographic tongue" [5,6].

Geographic tongue enunciates periods of remission and exacerbation. Lesions vary in magnitude and configuration with consequent emergence of a migrating, map like pattern [5,6].

Lesions are asymptomatic or may manifest pain, burning sensation, stomatodynia, dysgeusia and sensitivity to hot, spicy or sour food. Clinical symptoms such as burning with ingestion of spicy food or juices may appear which are associated with fissured tongue [5,6].

Geographic tongue demonstrates a smooth, reddish dorsal surface and peripheral margin circumscribed by whitish slough. Reddish zones devoid of papillae undergo spontaneous regeneration within weeks or months although alternative areas of the tongue may be incriminated [5,6].

Histological elucidation

Upon gross examination, an erythematous, flattened zone is discerned upon dorsum of the tongue on account of declining filiform papillae. Localized decimation of filiform papillae is associated with ulcer-like lesions upon the lingual mucosa with rapidly altering magnitude and hue [7,8].

Upon microscopy, acanthosis of superimposed stratified squamous epithelium is associated with epithelial infiltration of neutrophils along with configuration of surface micro-abscesses. Additionally, an inflammatory infiltrate appears confined within the lamina propria. The lesions may morphologically simulate psoriasis [7,8].

A characteristic infiltration of innumerable neutrophilic leukocytes migrates through superimposed stratified squamous epithelium. Spongiform pustules or miniature abscess thus engendered appear confined to upper epithelial layers and are designated as "Munro's micro-abscess". Stratum spinosum is thickened and oedematous. Connective tissue papillae confined to smooth, reddish zones may extend to superimposed surface epithelium, akin to psoriasis [7,8].

Whitish areas demonstrate sub-epithelial inflammatory infiltrate composed preponderantly of neutrophils which configure micro-abscesses. Additionally, acanthosis of superimposed stratified squamous epithelium, elongation of rete ridges, acantholysis, parakeratosis, accumulation of glycogen within epithelial cells and exfoliated necrotic cells within the surface layer are observed [7,8].

Erythematous area exhibits mononuclear inflammatory infiltrate within the sub-epithelium, predominantly of CD4+ T-lymphocytes. Besides, hypertrophy of supra-papillary zone and vascular ectasia may occur [7,8].

Ultrastructural examination delineates a dual morphology such as absence of filiform papillae within the erythematous zone and accumulated necrotic cells within the whitish zone [7,8].

Differential diagnosis

Atypical lesions of geographic tongue require a segregation from conditions such as erythroplakia, lichen planus, candidiasis, contact stomatitis, leukoplakia, trauma, aphthous ulcer, squamous cell carcinoma or plaque psoriasis [1,2].

Investigative assay

Geographic tongue is generally discerned by characteristic history and clinical features. Histological confirmation of the lesion is necessitated in atypical instances. Additional evaluation is mandated for assessing conditions associated with geographic tongue [8,9].

Geographic tongue may be concurrent to chronic inflammatory bowel disease, psoriasis, celiac disease, human immune deficiency virus (HIV) infection, atopic dermatitis, lichen planus, diabetes mellitus, lupus erythematosus, Down syndrome, reactive arthritis, Aarskog syndrome, foetal hydantoin syndrome or Robinow syndrome [8,9].

Therapeutic options

Therapy is unnecessary for asymptomatic instances of geographic tongue. Counselling and reassurance to subjects is recommended on account of benign, self limiting nature of the condition. Symptomatic lesions are efficaciously treated with topical corticosteroids, antihistamines, cyclosporine, vitamin A, zinc, acetaminophen or topical tacrolimus. Circumvented consumption of alcohol, acidic fruits, acidic beverages and hot, spicy or sour foods is recommended along with preservation of adequate oral hygiene in order to meliorate pertinent clinical symptoms [8,9].

The benign, asymptomatic geographic tongue is devoid of complications and is associated with a superior prognosis [8,9].

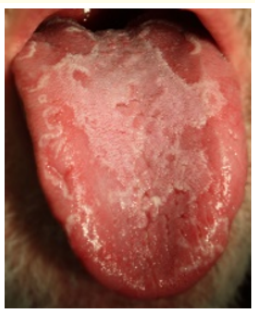

Figure 1: *Geographic tongue demonstrating reddish zones admixed and whitish zones surface with a serpiginous border upon the lingual surface [10].*

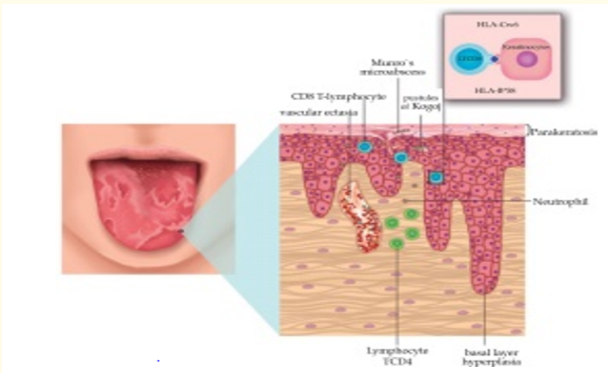

Figure 2: *Geographic tongue exhibiting zones with decimated filiformpapillae and cytokine induced intraepithelial neutrophilic exudate configuring micro-abscess [11].*

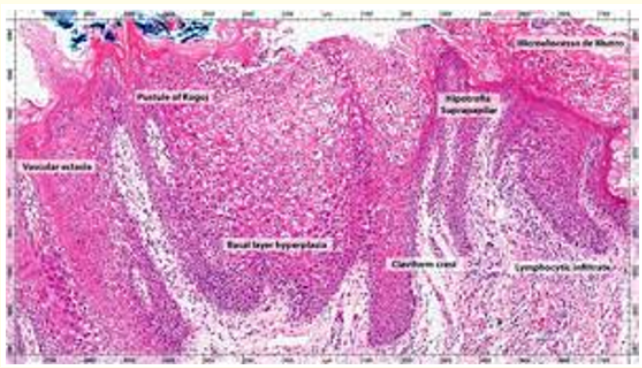

Figure 3: *Geographic tongue displaying morphological alterations such as neutrophilic and lymphocytic infiltration, vascular ectasia, basal cell hyperplasia and micro-abscess [11].*

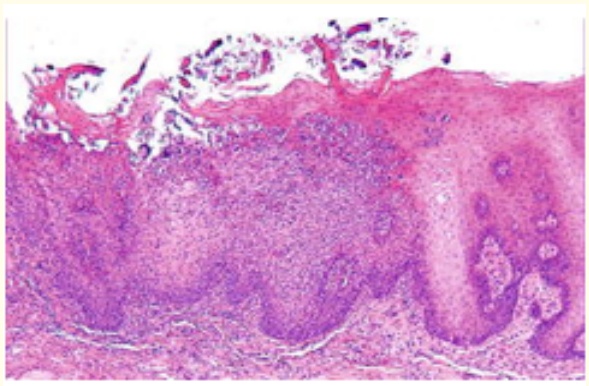

Figure 4: *Geographic tongue exhibiting acanthotic, parakeratotic stratified squamous epithelium with focal neutrophilic and lymphocytic infiltration along with basal cell hyperplasia and vascular ectasia [12].*

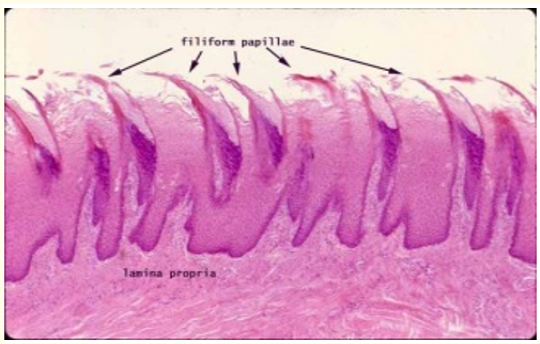

Figure 5: *Geographic tongue enunciating reddish zones with decimated filiform papillae and an inflamed lamina propria [13].*

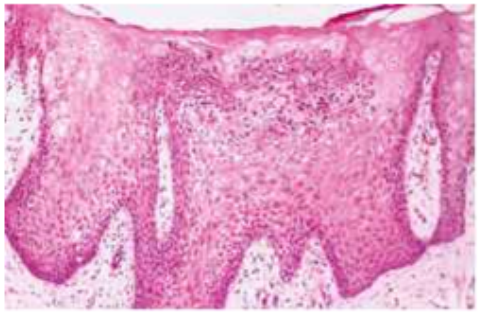

Figure 6: *Geographic tongue exemplifying an acanthotic, hyperkeratotic stratified squamous epithelium with neutrophilic exudate and configuration of micro-abscess [14].*

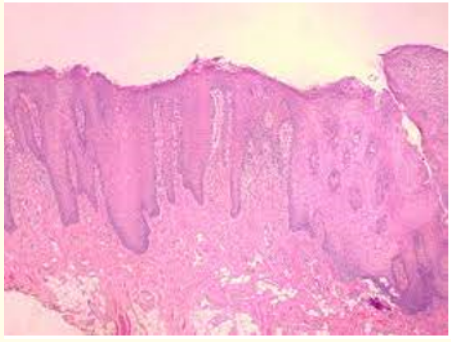

Figure 7: *Geographic tongue demonstrating an acanthotic, hyperkeratotic epithelium with neutrophilic infiltration and configuration of micro-abscess along with an inflamed lamina propria [15].*

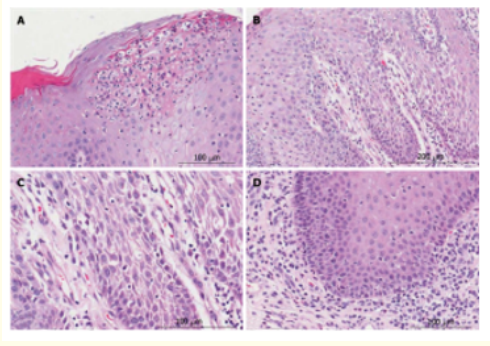

Figure 8: *Geographic tongue exhibiting reddish zones with loss of filiform papillae and extensions of acanthotic stratified squamous epithelium into the subjacent inflamed lamina propria [16].*

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10. Image 1 Courtesy: Wikipedia.

11. Image 2 and 3 Courtesy: Scielo Bro.

12. Image 4 Courtesy: Pocket Dentistry.

13. Image 5 Courtesy: Pinterest.

14. Image 6 Courtesy: ALPF Medical Research.

15. Image 7 Courtesy: Dermamin.com.

16. Image 8 Courtesy: Research Gate.

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