

## White Plaque of the Lateral Tongue

Parish P. Sedghizadeh, DDS; Carl M. Allen, DDS, MSD



The following Case Challenge is provided in conjunction with the American Academy of Oral and Maxillofacial Pathology.

### **Case Summary**

A healthy 48-year old white woman presented with a chief complaint of an 'irritated' sensation involving her tongue. The problem seemed to be limited to her left lateral tongue and had been noticed for at least six months by the patient. She also indicated the condition varied in severity.

After you have finished reviewing the available diagnostic information, make the diagnosis.

## Diagnostic Information

### History of Present Illness

Despite being present on the left lateral tongue for six months, the lesion was not painful as described by the patient but rather sore or irritating at times. She was unaware of any bleeding or ulceration at the site. She denied chewing on her tongue, and she was certain the lesion was not factitial in nature. She had never sought treatment for the lesion, nor did she take any medications to try to resolve the lesion.

### Past Medical History

The patient's past medical history was unremarkable. She had no contributing history of hospitalizations or surgeries, and she was taking no medications. She also stated she had no known drug or food allergies. Her social history revealed she had been in a monogamous relationship for many years. She also had no history of smoking, alcohol, injecting drug use, or immunosuppression.

### Clinical Examination Findings

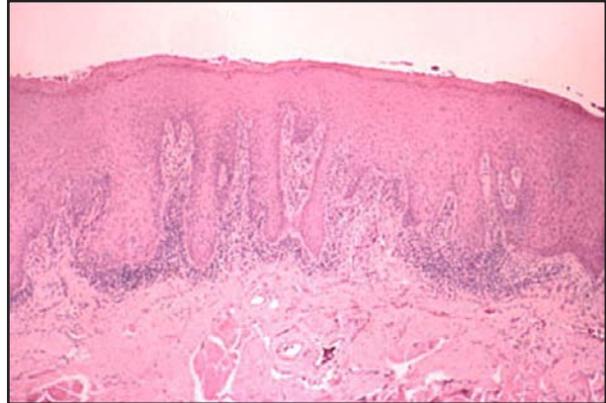
Clinical examination showed a ragged, somewhat patchy, white plaque involving the left lateral tongue that could not be wiped off. (Figure 1) No bleeding or ulceration was seen, and no evidence of induration could be detected on palpation. The patient had her natural dentition, and there were no fractured teeth or sharp restorations adjacent to the lesion. No other oral mucosal lesions were observed and salivary output appeared to be sufficient upon visual inspection.



**Figure 1.** Adherent white plaque with a ragged surface on the lateral tongue

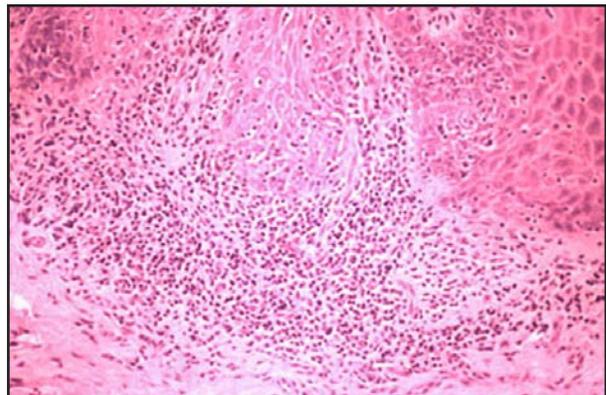
### Incisional Biopsy and Photomicrographs

Histologically, the epithelium demonstrated variable amounts of hyperkeratosis, atrophy of the spinous layer, leukocytic exocytosis, and basilar crowding and atypia. (Figure 2)



**Figure 2.**

Subjacent to the epithelium was a band of chronic inflammatory cells, which in some areas effaced the rete ridge architecture. (Figure 3) A perivascular infiltrate comprised mostly of lymphocytes, with occasional plasma cells, was seen in association with the vascular channels in the connective tissue. Upon staining with the periodic acid-Schiff (PAS) method, no evidence of fungal forms was identified in the superficial epithelium.



**Figure 3.**

### Can you make the diagnosis?

A healthy 48-year old white woman presented with a chief complaint of an 'irritated' sensation involving her tongue.



### Select the Correct Diagnosis

- A. Candidiasis
- B. Oral Hairy Leukoplakia
- C. Mucosal Cinnamon Reaction
- D. Lichen Planus
- E. Leukoplakia

## Candidiasis

**Choice A. Sorry, this is not the correct diagnosis.**

Although pseudomembranous candidiasis can appear as white lesions, these are usually more creamy-white and flat and can be wiped off to reveal subjacent normal or erythematous

mucosa.<sup>1</sup> Hyperplastic candidiasis could present in this fashion, although the anterior buccal mucosa would be a more common site for this process. In addition, remember that the PAS stain showed no evidence of fungal infection upon microscopic evaluation.

Please re-evaluate the information about this case.

## Oral Hairy Leukoplakia

**Choice B. Sorry, this is not the correct diagnosis.**

OHL is a lesion of the lateral tongue that may appear clinically similar to this lesion. However, OHL, which is caused by Epstein-Barr virus infection, is found in patients with HIV infection or other immunosuppressive disorders.<sup>2</sup> For a monogamous, healthy 48-year old woman with no identifiable risk factors for HIV infection, OHL would be a distinct rarity.

Please re-evaluate the information about this case.

## Mucosal Cinnamon Reaction

### Choice C. Congratulations! You are correct.

#### Discussion

Contact stomatitis from artificial cinnamon flavoring has also been referred to as oral mucosal cinnamon reaction or contact lichenoid reaction. Numerous materials come into contact with the mouth on a daily basis, so it is not surprising that many of these agents may elicit an inflammatory host reaction. Certain foods, artificial flavorings, food additives, and materials used in dentistry have been implicated as etiologic agents of contact stomatitis. The actual frequency of true allergic reactions due to contact with antigenic substances probably is not very high. The lesser reactivity of the oral mucosa, as compared to the skin, has been attributed to many factors including the brief contact period of agents with the mucosa, the more rapid dispersal and absorption of antigens, and the diluting and neutralizing properties of saliva.<sup>1</sup> Nonetheless, it may be seen with some frequency in both sexes at any age.

The clinical features of contact stomatitis due to cinnamon flavoring can vary, although most lesions appear white, red, or a mixture of the two. Sometimes only an isolated lesion of the buccal mucosa or lateral border of the tongue is detected, while other patients may exhibit two or more sites of involvement.<sup>1</sup> The buccal lesions may resemble oral lichen planus or morsicatio buccarum clinically, while the tongue lesions may resemble oral hairy leukoplakia or carcinoma. Focal areas of erosion and ulceration may be associated with this lesion. Most patients admit to using artificially flavored cinnamon products such as chewing gum, candy, breath freshener, mouth rinse, or flavored dental floss. Of interest, the natural spice form is identified infrequently as the responsible agent. The prolonged tissue contact and high concentration of the cinnamon oil are the suspected reasons for more problems associated with artificially flavored agents.

The histopathologic features of contact stomatitis from cinnamon flavoring demonstrate a psoriasiform pattern of acanthosis and atrophy of the epithelium with increased parakeratin production.

Neutrophilic microabscesses are also observed in the spinous layer. Subjacent to the epithelium, a moderately dense population of chronic inflammatory cells comprised mainly of lymphocytes is observed. The inflammatory infiltrate may efface the epithelium-connective tissue interface. In addition, a perivascular lymphocytic response is noted in the connective tissue.<sup>6</sup>

With mucosal cinnamon reactions, the lesions typically resolve significantly within a week of discontinuing the offending product, which was chewing gum in this patient. (Figure 4) The diagnosis is best confirmed by challenging the oral mucosa with the presumed cinnamon-containing offending agent. Usually, the lesion will be induced within a period of a few minutes to an hour following the reintroduction of the product. (Figure 5)



**Figure 4.** Reversal of the tongue lesion when the allergen was eliminated.



**Figure 5.** Recurrence of the white plaque when the offending agent was reintroduced into the mouth.

Since this oil is commonly used in a variety of oral hygiene products and food substances, the sensitized individual should be advised to read the package labels to prevent recurrences.

## Lichen Planus

**Choice D. Sorry, this is not the correct diagnosis.**

Lichen planus is a chronic, immune-mediated disease process involving damage to basal keratinocytes.<sup>3</sup> Although clinically, lichen planus may appear white, it would be unusual for lichen

planus to occur unilaterally and only on a single area of the tongue. Lack of symmetrical and bilateral lesion involvement and no suggestion of striae formation associated with the white patch would exclude this mucocutaneous disease from consideration.

Please re-evaluate the information about this case.

## Leukoplakia

**Choice E. Sorry, this is not the correct diagnosis.**

Leukoplakia, or white plaque, is a precancerous lesion.<sup>4</sup> Although the latero-ventral tongue is a high-risk site for this lesion, it would be unusual for it to wax and wane over time as in this case.<sup>5</sup> In addition, the borders of this lesion tend to blend into the adjacent normal mucosa, while leukoplakia usually has sharply defined margins.

Please re-evaluate the information about this case.

## References

1. Neville BW, Damm DD, Allen CM, et. al. Oral and Maxillofacial Pathology, 2nd edition. W.B. Saunders Company. 2002:305-306.
2. Walling DM, Flaitz CM, Nichols CM, et al. Persistent productive Epstein-Barr virus replication in normal epithelial cells in vivo. J Infect Dis. 2001 Dec 15;184(12):1499-507.
3. Thornhill MH. Immune mechanisms in oral lichen planus. Acta Odontol Scand 2001 Jun;59(3):174-7.
4. Van der Waal I, Schepman KP, Van der Meij EH, et. al. Oral leukoplakia: a clinicopathological review. Oral Oncol. 1997 Sep;33(5):291-301.
5. Prince S, Bailey BMW. Squamous carcinoma of the tongue: review. Br J Oral Maxillofac Surg. 1999 Jun;37(3):164-74.
6. Daley TD, Nartey NO, Wysocki GP. Pregnancy tumor: an analysis. Oral Surg Oral Med Oral Pathol. 1991 Aug;72(2):196-9.
7. Allen CM, Blozis GG. Oral mucosal reactions to cinnamon-flavored chewing gum. J Am Dent Assoc. 1988 May;116(6):664-7.

## About the Authors

*Note: Bio information was provided at the time the case challenge was developed.*

### Parish P. Sedghizadeh, DDS



Dr. Sedghizadeh is an Oral and Maxillofacial Pathology Resident in the Department of Oral and Maxillofacial Pathology in the College of Dentistry at Ohio State University in Columbus, OH.

E-mail: [sedghizadeh.1@osu.edu](mailto:sedghizadeh.1@osu.edu)

### Carl M. Allen, DMD, MSD



Dr. Allen is a Professor and serves as the Director of Oral and Maxillofacial Pathology in the College of Dentistry at Ohio State University in Columbus, OH.

E-mail: [allen.12@osu.edu](mailto:allen.12@osu.edu)