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## Correspondence

# Differential diagnosis between leukoedema and white spongy nevus



## KEYWORDS

Leukoedema;  
White spongy nevus;  
Oral mucosal disease

Leukoedema and white spongy nevus are two conditions with a similar histologic feature showing hyperparakeratosis, acanthosis, and intracellular edema of the epithelial cells in the spinous layer.<sup>1–4</sup> Although the clinical features of the two conditions are different for the experienced oral pathologists, they may be difficult to distinguish from each other by the general dentists.

Leukoedema is a common oral condition of unknown cause. It occurs more frequently in blacks than in whites, suggesting that the condition has an ethnic predilection. Because leukoedema is so common, it is reasonably considered to be a variation of normal rather than a disease. Although leukoedema appears to be developmental in nature, some studies indicated that it is more common and more severe in smokers than in non-smokers.<sup>1,2</sup> According to our clinical experience, leukoedema is also more frequently observed in betel quid chewers than in non-chewers. A 45-year-old man with the betel quid chewing and smoking habits for 3 years. He was referred to our oral mucosal disease clinic for evaluation of white lesions on the bilateral buccal mucosae. Oral examination revealed a diffuse, milky-white, and opalescent appearance on the bilateral buccal mucosae (Fig. 1A and B). The buccal mucosal surface was smooth without significant wrinkles. Moreover, the white appearance on the bilateral buccal mucosae disappeared when the buccal mucosa was stretched. Thus, a clinical diagnosis of leukoedema was made.<sup>1</sup>

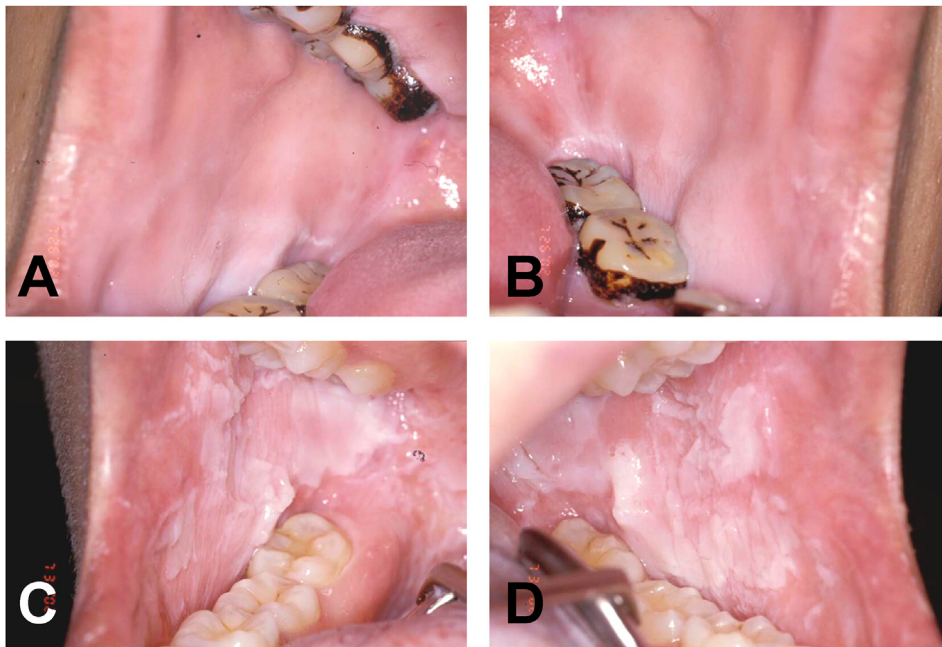
White spongy nevus is a rare genetically-determined skin disorder that is inherited as an autosomal dominant

trait with a high degree of penetrance and variable expressivity. The condition is due to mutations in either of *keratin 4* or *keratin 13* genes, resulting in a defect in the normal keratinization of the oral mucosa.<sup>3,4</sup> A 26-year-old woman was referred to our oral mucosal disease clinic for evaluation of large and elevated white lesions on the bilateral buccal mucosae. Oral examination showed diffuse, symmetrical, thickened, corrugated, and white plaques on the bilateral buccal mucosae (Fig. 1C and D). The patient said that she had neither smoking nor betel quid chewing habit and the white lesions had been present on the bilateral buccal mucosae since her early childhood. In addition, these white lesions were asymptomatic. Thus, the clinical diagnosis of white spongy nevus was confirmed.

Leukoedema and white spongy nevus can be easily diagnosed by looking the characteristic clinical features of the two conditions. Buccal mucosa stretching test is very helpful for the diagnosis of leukoedema.<sup>1,2</sup> For the diagnosis of white spongy nevus, querying whether the white plaque lesions are present since early childhood is an important information for the clinical diagnosis.<sup>3,4</sup> If the diagnosis of white spongy nevus is still in doubt, exfoliative cytologic study can provide more definitive diagnostic information because the cytologic preparation of the lesional epithelial cells stained with the Papanicolaou method often exhibits the characteristic feature of presence of eosinophilic perinuclear condensation of the epithelial cell cytoplasm.<sup>1</sup>

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**Figure 1** Clinical photographs of leukoedema and white spongy nevus. (A and B) Leukoedema in a 45-year-old man with the betel quid chewing and smoking habits for 3 years showing a diffuse, milky-white, and opalescent appearance on the bilateral buccal mucosae. (C and D) White spongy nevus lesions in a 26-year-old woman demonstrating diffuse, symmetrical, thickened, corrugated, and white plaques on the bilateral buccal mucosae.

## Declaration of Competing Interest

The authors have no conflicts of interest relevant to this article.

## References

1. Neville BW, Damm DD, Allen CM, Chi AC. Developmental defects of the oral and maxillofacial region and dermatologic diseases. In: Neville BW, Damm DD, Allen CM, Chi AC, eds. *Oral and maxillofacial pathology*. 4th ed., vols. 7–8. St Louis: Elsevier, 2016:691–2.
2. Martin JL. Leukoedema: a review of the literature. *J Natl Med Assoc* 1992;84:938–40.
3. Westin M, Rekabdar E, Blomstrand L, Klintberg P, Jontell M, Robledo-Sierra J. Mutations in the genes for keratin-4 and keratin-13 in Swedish patients with white sponge nevus. *J Oral Pathol Med* 2018;47:152–7.
4. Cai W, Jiang B, Yu F, et al. Current approaches to the diagnosis and treatment of white sponge nevus. *Expert Rev Mol Med* 2015; 17:e9.

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