White Plaques on the Tongue of a Patient with Advanced CKD

Orlando Vieira Gomes,1 Marília Rodrigues de Oliveira Campos,1 and Gyl Eanes B. Silva2

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Case Description
An 18-year-old man had recently discovered systemic arterial hypertension, whose etiology was being investigated. He was admitted to the emergency department with adherent white lesions on the tongue and dysgeusia. He had no other known comorbidities, although he complained of nausea, dyspnea at rest, and generalized edema for the previous month. A physical examination revealed adherent and well-demarcated white plaque-like lesions on the tongue surface predominantly under the tongue (Figure 1A), tachycardia (140 bpm), skin pallor, 160/80 mm Hg arterial pressure, signs of pulmonary congestion, and loud pericardial friction rub. Laboratory examinations detected a hemoglobin level of 3.7 g/dl, a total white blood cell count of 12,130/mm3, a platelet count of 228,000/mm3, a creatinine level of 32.9 mg/dl, a urea level of 479.7 mg/dl, and a potassium level of 6.8 mmol/L. Arterial blood gas analysis showed a pH of 7.23, HCO3 of 5.3 mmol/L, pCO2 of 13.1 mm Hg, and lactate of 0.5 mmol/L. Uremia raised suspicion that the oral lesions had been caused by uremic stomatitis.

The patient was stabilized and submitted to emergency hemodialysis. As blood urea concentration was reduced with dialysis therapy and oral hygiene was practiced with antiseptic mouthwashes, the oral lesions completely healed (Figure 1B). He was discharged from the hospital 19 days after admission.

Discussion
CKD, which is usually silent in its early stages, may have striking clinical consequences as the condition progresses. The reduced capacity to eliminate metabolic excretions and toxins because of the progressive loss of renal function is responsible for multiple systemic complications (1). Uremic stomatitis is a rare manifestation of uremia that suggests long-lasting CKD. Due to its low incidence, few cases have been reported in the literature over the years. Although its etiology has not been well established, it is believed to be directly related to high levels of urea because it is usually found in patients with rather high levels of this solute (>300 mg/dl) (2). In this case, urea present

Figure 1. | Patient's tongue before and after the treatment. (A) Intraoral examination revealed the presence of white plaques predominantly involving the lateral borders and undersurface of the tongue. (B) Significant improvement of the tongue lesions was seen after four hemodialysis sessions.
in the saliva is transformed into ammonia by bacterial ureases, causing chemical oral mucosa lesions. Another theory relates oral mucosa lesions to hemostatic disorders often present in uremic patients—in which case, fragile tissues are associated with bacterial infections (2,3).

Uremic stomatitis is characterized by a usually whitish pseudomembrane covering the oral mucosa. Four forms of the lesions, which appear mainly on the ventral surface of the tongue and the floor of the mouth, have been described in the literature: ulcerative, hemorrhagic, hyperkeratotic, and pseudomembranous (4). The lesions are normally quite painful, and other manifestations also occur, e.g., odynophagia, xerostomia, halitosis (uremic breath), burning sensation of the oral mucosa, and taste changes. The diagnosis is based on the clinical history, lesion characteristics, and serum levels of urea (3).

As in the case of our patient, the condition is solved by treating uremia (after beginning dialytic therapy) and oral hygiene (2,5). Therefore, the advent of RRT and its worldwide growth have made this manifestation of CKD even rarer (2).

Teaching Points
- Uremic stomatitis is a rare manifestation of CKD, characterized by a usually whitish pseudomembrane covering the oral mucosa.
- Diagnosis is based on the clinical history, lesion characteristics, and serum levels of urea.
- The treatment consists in improving blood urea levels and oral hygiene.

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Author Contributions
O.V. Gomes was responsible for conceptualization; O.V. Gomes and M.R.O. Campos wrote the original draft of the manuscript; and O.V. Gomes and G.E.B. Silva reviewed and edited the manuscript.

References

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