Anemia-induced complex oral conditions

ABSTRACT

Although early diagnosis of hematological diseases may remarkably improve the prognosis and quality of life of patients, anemia is often unrecognized by physicians for lack of specific systemic symptom. This article describes a 60-year-old male with a chief complaint of tongue pain without any other symptoms. Full oral examination and hematological tests revealed a megaloblastic anemia resulting in complex oral conditions. The association of anemia and abnormal oral conditions is of importance to dental clinicians, as they may be able to diagnose hematological disease at an early stage.

Key words: Anemia; Diagnosis, oral; Glossodynia

Introduction

Deficiencies of folate and/or cobalamin are common causes of megaloblastic anemia, which may lead to dizziness, fatigue, shortness of breath, and palpitations\(^1\). Some of these deficiencies or the anemia they can give rise to may remain unrecognized owing to lack of systemic symptoms.

Anemia may result in various oral abnormalities including atrophic glossitis, pallor, Candida infection, glossodynia (burning/tingling tongue and/or mouth), recurrent ulceration, lingual paresthesia, burning sensation, dysgeusia (disturbed taste), pruritus, intolerance of dental prosthesis, and xerostomia\(^2\). These abnormal oral manifestations could be the first features of anemia.

Herein we describe a patient with several months of tongue pain, especially during eating cold, hot, or spicy food. A general medical practitioner initially diagnosed glossodynia and referred the patient to our oral medicine clinic for further investigation. Intraoral examination and hematological tests revealed megaloblastic anemia, which was presumed to have resulted in glossodynia, atrophic glossitis, and mucosal erythema of the hard palate.

Case report

A 60-year-old male was referred to the Oral Medicine Consultation Clinic at the Prince Philip Dental Hospital, The University of Hong Kong by a general medical practitioner for the management of glossodynia in June 2011. For several months, whilst eating cold, hot or spicy food, the patient had been experiencing tongue pain, particularly at its tip and lateral
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Borders. There were no other oral or systemic symptoms. The patient had no history of hypertension, diabetes, gastro-intestinal diseases, or other systemic diseases. Nor was he taking any medications. Moreover, he had no habit of drinking and was a non-smoker. Oral examination revealed atrophic glossitis (Fig 1a) and an erythematous lesion on the hard palate (Fig 1b) beneath the maxillary denture. Based on the medical history and clinical findings, differential diagnosis was anemia-induced stomatitis and/or oral candidiasis. Complete blood picture (CBP), serum vitamin B12, red cell folate levels, and blood iron status were investigated. The patient received 2-week empiric treatment (nystatin suspension, 500,000 units, mouth rinse 4 times daily) for presumed denture-induced atrophic candidiasis, which failed to alleviate the tongue pain and erythematous lesion on the hard palate. The CBP showed a white cell count of $2.61 \times 10^9/L$, red blood cell count of $2.91 \times 10^{12}/L$, hemoglobin level of 121 g/L, platelet count of $46 \times 10^9/L$, merkel cell polyomavirus of 123.6 fl, melanin-concentrating hormone of 41.5 pg, and mean corpuscular hemoglobin concentration of 336 g/L. These features were characteristic of megaloblastic anemia. Serum vitamin B12 and red cell folate levels were remarkably lower at < 50 ng/L and 137.55 µg/L, respectively. Iron status studies yielded nil abnormal. These results indicated that the patient had megaloblastic anemia due to combined vitamin B12 and folate deficiencies. The patient was then referred to a hematologist for further management. The patient was reviewed again after 3-month treatment with vitamin B12 and folate acid, whereupon all the hematological parameters became normalised and no intraoral lesions were noted (Fig 2). The patient stated that the tongue pain had ceased 1 month after initiation of vitamin B12 and folate therapy.

![Figure 1](image1.png) **Figure 1**  (a) Depapillation of the tongue and (b) erythematous lesion at the hard palate before treatment

![Figure 2](image2.png) **Figure 2**  After 3-month treatment to correct the anemia, the structure and color of the (a) tongue and (b) hard palate became normal
Discussion

Deficiencies of vitamin B12 and folate may be caused by inadequate dietary intake or impaired absorption. Vitamin B12 and folate are critical for DNA synthesis. Deficiencies may cause abnormalities of red blood cells, leukocytes, platelets, as well as epithelial changes, particularly in the rapidly dividing epithelium in the oral cavity resulting in abnormal oral conditions. Glossodynia and mucosal erythema may result from various etiologies including trauma, oral candidiasis, Sjögren's syndrome, burning mouth syndrome or anemia, while atrophic glossitis is a common manifestation of anemia. The patient was a 60-year-old wearing a maxillary denture and presented with glossodynia and mucosal erythema of the hard palate suggesting a working diagnosis of denture-induced atrophic candidiasis, while the atrophic glossitis indicated that the patient might have anemia. The CBP, serum vitamin B12, and red cell folate levels indicated the presence of hematological disease. Two-week topical nystatin treatment was of no avail, while the blood tests revealed megaloblastic anemia. After 3 months of supplementation with vitamin B12 and folate, the patient's hematological abnormalities and oral symptoms had resolved.

The tongue pain (a feature of glossodynia or burning mouth syndrome) does not follow anatomic pathways and may not be associated with mucosal lesions, neurologic/systemic disorder, or characteristic laboratory abnormalities. Psychological or psychiatric factors play an important role in this syndrome. In this patient, the oral lesions and laboratory abnormalities were significantly ameliorated by successful correction of the underlying disease.

Our patient demonstrates that it is necessary to screen for correctable causes when there are complex oral conditions, even in the absence of systemic symptoms. Early detection and correction can prevent future medical complications, improve the prognosis, and enhance quality of life.

For dental patients with severe anemia, physician consultation prior to surgical treatment is necessary. If the hemoglobin level is lower than 80 g/L, it is recommended that general anesthesia be avoided, and the additional risks of bleeding and/or delayed wound healing should be recognized. Patients should maintain good oral hygiene to prevent oral and periodontal infection. Prompt and aggressive treatment of oral infections, once diagnosed, is also important.

This case highlights the importance of early diagnosis by dental clinicians, since recognition of such anemias in patients lacking systemic symptoms can significantly improve the prognosis and quality of life.

References