



EVALUATING THE ORAL MUCOSA AND NON-CARIOUS DENTAL LESIONS IN PATIENTS WITH TYPE 2 DIABETES MELLITUS: A DIAGNOSTIC CHALLENGE

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Abstract:

Type 2 diabetes mellitus (T2DM) is a chronic systemic condition that predisposes individuals to a variety of oral health problems. This article explores the range of mucosal and non-carious dental lesions observed in patients with T2DM and emphasizes the diagnostic complexity posed by overlapping symptoms and comorbidities. Special focus is given to xerostomia, candidiasis, burning mouth syndrome, wedge-shaped defects, erosions, and hypersensitivity. The paper advocates for improved interdisciplinary care and outlines diagnostic approaches tailored to this patient population.

Keywords: Type 2 diabetes, xerostomia, burning mouth syndrome, oral candidiasis, non-carious lesions, diagnostic criteria.

Introduction:

Type 2 diabetes mellitus (T2DM) affects millions of individuals worldwide and has well-established links with systemic and local health complications. Among the local manifestations, the oral cavity is frequently affected, leading to mucosal pathologies and non-carious damage to dental tissues. These lesions often remain undiagnosed or misattributed due to their nonspecific presentation and overlap with



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age-related or behavioral factors. Understanding the specific characteristics of these lesions and their association with glycemic control is vital for timely diagnosis and management.

Xerostomia and Salivary Hypofunction: Xerostomia, or dry mouth, is one of the most prevalent complaints among diabetic individuals. It results from autonomic neuropathy affecting salivary gland function and dehydration caused by osmotic diuresis. Studies show that nearly half of all patients with T2DM report symptoms of dry mouth. Objective findings often reveal hyposalivation, with stimulated salivary flow rates significantly lower than in non-diabetic controls.

Xerostomia contributes to increased dental plaque accumulation, impaired taste perception, difficulty in chewing and swallowing, and higher susceptibility to opportunistic infections such as candidiasis. Salivary changes also influence pH and buffering capacity, predisposing the individual to enamel demineralization and erosion.

Oral Candidiasis: Due to immunosuppression and altered salivary composition, patients with T2DM are at elevated risk for fungal infections, particularly oral candidiasis. *Candida albicans*, the most common fungal pathogen, thrives in the glucose-rich and hypoimmune environment typical of diabetic patients. Candidiasis presents clinically in various forms—pseudomembranous, erythematous, and angular cheilitis—each requiring distinct treatment strategies.

Wearing removable prostheses further increases the risk, as poor prosthetic hygiene combined with xerostomia creates an ideal environment for fungal colonization. Early diagnosis through exfoliative cytology and culture tests is crucial to prevent chronic and relapsing forms of infection.

Burning Mouth Syndrome (BMS): Burning mouth syndrome (BMS) is a neuropathic pain disorder characterized by burning sensations on the tongue, lips, and palate, often without visible mucosal changes. BMS is particularly common among postmenopausal women and individuals with T2DM, likely due to diabetic neuropathy and microvascular dysfunction.

Patients with BMS frequently report persistent pain, tingling, altered taste perception (dysgeusia), and a metallic or bitter taste. These symptoms are often worsened by stress and fatigue. Accurate diagnosis of BMS requires exclusion of differential



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diagnoses such as oral candidiasis, iron or B-vitamin deficiency, and allergy to dental materials.

Non-Carious Dental Lesions: T2DM patients exhibit a high prevalence of non-carious dental lesions, including wedge-shaped defects, erosion, abrasion, and tooth hypersensitivity. These lesions reflect cumulative mechanical, chemical, and metabolic influences on the dental hard tissues.

Wedge-shaped defects, commonly found at the cervical margin of teeth, are often associated with gingival recession due to periodontitis, aggressive brushing habits, and impaired enamel structure. Erosion, or loss of dental hard tissue due to acidic dissolution, is exacerbated by xerostomia and frequent consumption of sugary or acidic beverages, a common dietary preference among diabetic individuals.

Abrasion and attrition may be intensified by parafunctional habits such as bruxism, which is more prevalent in individuals experiencing diabetic stress or neuropathic discomfort. In addition, dental hypersensitivity often arises due to exposed dentin from erosion or recession, and it can severely impact patients' quality of life.

Diagnostic Challenges: Differentiating diabetic-related oral manifestations from those arising due to aging, lifestyle, or unrelated systemic conditions is a major challenge for clinicians. Comprehensive diagnostic workup must include:

- Detailed medical and dental history with emphasis on glycemic control (HbA1c levels)
- Salivary flow rate tests and biochemical analysis
- Oral microbiological swab and fungal cultures
- Visual analog scale (VAS) for pain assessment in BMS
- Clinical evaluation of non-carious lesions using tactile and light microscopy

Interprofessional collaboration between endocrinologists and dental professionals is essential to accurately identify these oral manifestations and design appropriate treatment plans.

Therapeutic Considerations: Managing oral mucosal and non-carious lesions in T2DM patients requires both symptomatic treatment and systemic control of diabetes. For xerostomia, interventions may include saliva substitutes, pilocarpine, and increased fluid intake. Patients should also be advised to avoid caffeine, alcohol, and tobacco, all of which exacerbate dryness.



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Oral candidiasis necessitates antifungal therapy—topical agents such as nystatin or miconazole are usually effective, but systemic antifungals may be required for recurrent cases. For BMS, treatment remains largely symptomatic, often involving topical clonazepam, alpha-lipoic acid, and cognitive-behavioral therapy.

In the case of non-carious lesions, addressing the etiological factor is paramount. For example, dietary counseling and use of remineralizing agents (fluoride varnishes, calcium phosphate pastes) are effective in managing dental erosion. Desensitizing toothpaste and bonding agents help alleviate hypersensitivity, while occlusal guards can mitigate damage from bruxism.

Conclusion:

Patients with T2DM are prone to a spectrum of oral mucosal and non-carious dental conditions that complicate their overall health and well-being. These manifestations are often multifactorial, reflecting the interplay between metabolic, immunological, and behavioral factors. Improved diagnostic awareness and interdisciplinary care are crucial to managing these conditions effectively and enhancing the quality of life in diabetic patients.

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