



International Journal of Research Publication and Reviews

Journal Homepage: www.ijrpr.com ISSN 2582-7421

Oral Signs as Systemic Disease Sentinels: Common Medical Conditions Potentially Missed in Routine Dental Practice- A Review.

Dr. B. Lakshmana Rao ¹, Dr. V. Dal Singh², Dr. B. Krishnaveni ³, Dr. M. Vaishnavi Devi ⁴, Dr. K. Sridevi ⁵.

¹. Prof & HOD, Department of Prosthodontics, Lenora Institute of Dental Sciences, Rajahmundry, Andhra Pradesh, India,

². Prof & HOD, Department of Oral and Maxillofacial Surgery, Lenora Institute of Dental Sciences, Rajahmundry, Andhra Pradesh, India,

³. Professor, Department of Oral and Maxillofacial Surgery, Lenora Institute of Dental Sciences, Rajahmundry, Andhra Pradesh, India,

⁴. Professor, Department of Oral Medicine and Radiology, Lenora Institute of Dental Sciences, Rajahmundry, Andhra Pradesh, India,

⁵. Prof & HOD, Department of Oral Medicine and Radiology, GSL Dental College, Rajahmundry, Andhra Pradesh, India.

Mail: kushulubathala@gmail.com

ABSTRACT

The mouth is more than just a separate part of the body; it serves as a key link between oral health and overall health. Many systemic diseases can first show up as changes in the mouth, gums, saliva, oral tissues, teeth, or jaw. Regular dental check-ups can help spot medical conditions that have not yet been diagnosed. Still, small signs like pale mouth tissues, frequent mouth sores, swollen or bleeding gums, dry mouth, ongoing yeast infections, changes in color, problems with tooth enamel, unusual gum disease, slow healing, or loose teeth can be missed or mistaken for simple dental issues. This review examines common systemic diseases that can present with noticeable changes in the mouth, including anemia, nutritional deficiencies, diabetes, blood disorders, HIV, autoimmune diseases, Sjögren syndrome, digestive conditions such as Crohn disease and celiac disease, chronic kidney disease, and certain endocrine and skin disorders. It highlights patterns that should make dentists consider a possible underlying medical issue, explains why these signs matter, and describes when dentists should refer patients to a doctor. Noticing signs of systemic disease in the mouth is an important part of modern dental care. Careful oral exams, thorough medical histories, and timely referrals can help diagnose conditions sooner, make dental treatment safer, and lead to better patient outcomes.

Keywords: Oral manifestations; Systemic disease; Dental examination; Systemic disease detection; Oral-systemic health; Sentinel signs.

Introduction

In the past, the mouth was mostly seen as just the site of dental and gum problems. Today, we know it plays a much bigger role in our overall health. Many conditions—like infections, inflammation, autoimmune diseases, blood disorders, hormonal issues, digestive problems, kidney diseases, metabolic issues, and even cancers—can show early signs in the mouth and jaws. Sometimes, these changes in the mouth appear before any other symptoms, giving us a chance to spot diseases early. [1-3] Calling the mouth a “mirror” or “window” to your overall health is especially important in dentistry, since dentists often see patients who don’t regularly visit doctors. Research shows that dental professionals are sometimes the first to spot signs of underlying health problems that haven’t yet been diagnosed. Dentists aren’t expected to diagnose these systemic diseases on their own, but they should notice unusual patterns and refer patients for further checks when needed. [3]

Even with this potential, dentists sometimes miss signs of systemic diseases during regular check-ups. There are several reasons for this. Changes in the mouth caused by systemic diseases are often subtle and may resemble normal dental problems. Patients might not mention symptoms affecting the rest of their bodies, and dental exams often focus only on the teeth and gums, overlooking other important areas such as the tongue, oral mucosa, salivary glands, color changes, or swollen lymph nodes. [1,3]

For example, when someone has severe gum inflammation, it might be mistaken for regular gum disease, missing more serious issues like diabetes, leukemia, low platelet count, or immune problems. Similarly, recurring mouth ulcers might be treated only for the symptoms, without considering conditions such as inflammatory bowel disease, celiac disease, lupus, vitamin deficiencies, or certain autoimmune disorders. Ongoing dry mouth is often blamed on medications, which may lead doctors to overlook conditions like Sjögren’s syndrome or other metabolic diseases. [1,4-7]

The real value of noticing these changes isn’t that they always point to one specific disease, but that they serve as warning signs. When dentists spot unusual patterns, it’s a sign to revisit the diagnosis, review the patient’s history, check for related symptoms, and decide whether the patient needs to see a doctor for further tests. This article examines common oral changes that may signal systemic diseases and suggests ways to incorporate these checks into everyday dental exams, as well as when to refer patients to other healthcare providers.

Oral Signs That Should Raise Suspicion of Systemic Disease

A comprehensive oral examination should address more than caries, periodontal status, and restorations. The following findings require special attention:

- *unexplained mucosal pallor;
- * persistent or recurrent oral ulceration;
- *spontaneous gingival bleeding;
- *petechiae or ecchymoses;
- *disproportionate gingival enlargement;
- *severe periodontal inflammation that appears disproportionate to local plaque;
- *recurrent or persistent oral candidiasis;
- *unexplained xerostomia;
- *salivary-gland enlargement;
- *diffuse or unusual mucosal pigmentation;
- *atrophic or unusually smooth tongue;
- *angular cheilitis;
- *unexplained tooth mobility;
- *enamel developmental defects;
- *delayed eruption;
- *unexplained bone changes;
- *delayed post-extraction healing;
- *recurrent infections;
- *unexplained facial swelling or lymphadenopathy; and persistent oral lesions that do not resolve as expected.

When interpreting these findings, consider the patient's age, medical history, medications, lifestyle, family history, presenting symptoms, and clinical examination results.

Common Systemic Conditions Potentially Missed in Routine Dental Practice

1 Anemia and Nutritional Deficiencies

Anemia is among the systemic conditions that may produce relatively subtle oral findings. Oral manifestations may include mucosal pallor, atrophic glossitis, burning or soreness of the tongue, angular cheilitis, recurrent ulceration, and increased susceptibility to candidiasis. Iron, folate, and vitamin B12 deficiencies may present with overlapping clinical features. [4,8]

Iron-deficiency anemia may be particularly relevant in patients presenting with a pale oral mucosa, smooth or depapillated tongue, angular cheilitis, fatigue, or dysphagia. Vitamin B12 deficiency may produce a characteristic smooth, erythematous, and painful tongue, as well as oral burning. Severe hematological abnormalities may additionally influence periodontal and mucosal health.

Dentists should avoid attributing mucosal pallor or glossitis solely to local trauma or dietary habits. Persistent oral findings, or those accompanied by systemic symptoms such as fatigue, weakness, weight change, or a history suggestive of nutritional deficiency, warrant medical assessment and appropriate hematological investigation.

2 Diabetes Mellitus

Diabetes mellitus is particularly important because oral findings may be prominent while the systemic disease remains undiagnosed. Reported oral manifestations include periodontal disease, xerostomia, dental caries, periapical pathology, taste disturbance, candidiasis, burning mouth symptoms, and delayed wound healing. [9,10]

A systematic review found that periodontal disease, periapical lesions, xerostomia, and taste disturbance were more prevalent among diabetic patients. [9] Hyperglycemia can contribute to altered immune function, vascular changes, impaired wound healing, and increased susceptibility to infection, while periodontal inflammation may adversely influence glycemic control.

Dentists should be alert for periodontal destruction or inflammation that is disproportionate to the amount of local plaque and calculus, especially when accompanied by recurrent infections, xerostomia, delayed healing, or a history suggestive of hyperglycemia.

Periodontal disease alone should not be considered diagnostic of diabetes. However, an atypical combination of oral findings may warrant referral for medical assessment or blood glucose testing.

3 Leukemia and Other Hematological Disorders

Hematological disorders are among the most clinically important systemic conditions that may first become apparent in the oral cavity. Leukemia can produce gingival enlargement, spontaneous gingival bleeding, petechiae, mucosal pallor, oral ulceration, infections, and delayed healing. These findings may result from leukemic cell infiltration, thrombocytopenia, neutropenia, or impaired immune function. [4,11]

Rapidly developing gingival enlargement accompanied by spontaneous bleeding, pallor, petechiae, unexplained ulceration, or recurrent infection is particularly concerning. These findings should not be attributed solely to plaque-induced gingivitis or periodontal disease.

Thrombocytopenia and other disorders of hemostasis can similarly present as petechiae, ecchymoses, spontaneous gingival bleeding, prolonged bleeding after dental procedures, or mucosal hemorrhage. [8,12]

Unexplained bleeding should prompt a thorough history regarding previous bleeding episodes, bruising, medications, family history, systemic symptoms, and prior blood investigations. When clinically indicated, referral for hematological assessment is recommended before invasive dental treatment.

4 Human Immunodeficiency Virus Infection

Oral manifestations can provide important clues to HIV infection and immune suppression. Oral candidiasis, oral hairy leukoplakia, recurrent ulceration, unusual viral infections, parotid enlargement, xerostomia, and aggressive periodontal disease have been associated with HIV infection. [13,14]

Although antiretroviral therapy has substantially altered the prevalence and clinical presentation of HIV-associated oral disease, oral lesions remain clinically relevant. Certain lesions may occur early in infection or correlate with immune dysfunction.

A key clinical principle is that persistent or unusual opportunistic infections, especially when recurrent or lacking an obvious local cause, should prompt consideration of an underlying immunocompromised state.

Dentists should address this sensitively and without stigmatization. Medical referral and confidential testing through established healthcare pathways are preferable to assumptions based solely on oral findings.

5 Sjögren Syndrome and Other Causes of Xerostomia

Xerostomia is frequently encountered in dental practice and is commonly associated with medications, dehydration, anxiety, or systemic illness. However, persistent dry mouth accompanied by ocular dryness, salivary gland enlargement, rampant caries, oral candidiasis, difficulty swallowing dry foods, or altered taste should prompt consideration of Sjögren syndrome. [5,6]

Sjögren syndrome is an autoimmune disorder characterized predominantly by salivary and lacrimal gland dysfunction. Reduced salivary flow compromises lubrication, buffering, antimicrobial activity, and remineralization, thereby increasing the risk of caries, mucosal discomfort, candidiasis, and periodontal complications.

Patients presenting with unexplained severe xerostomia and extensive caries despite reasonable oral hygiene may warrant evaluation for underlying salivary gland dysfunction and possible systemic autoimmune disease.

6 Systemic Lupus Erythematosus

SLE may produce several oral manifestations, including recurrent oral ulcers, erythematous or keratotic mucosal lesions, xerostomia, cheilitis, glossodynia, pigmentation, and secondary Sjögren syndrome. [15,16]

Oral ulceration may occasionally be the first clinically recognizable manifestation of SLE. A systematic review and meta-analysis reported oral mucosal lesions in approximately one-third of patients with SLE, with oral ulcers being particularly common. [16]

Persistent or recurrent unexplained oral ulceration should be evaluated using established oral ulcer protocols. The presence of systemic symptoms such as arthralgia, unexplained fatigue, photosensitivity, skin manifestations, or other multisystem complaints should heighten clinical suspicion.

7 Pemphigus Vulgaris and Mucous Membrane Pemphigoid

Autoimmune vesicobullous disorders may initially manifest within the oral cavity. Pemphigus vulgaris frequently produces painful erosions and ulcers, while mucous membrane pemphigoid may present with desquamative gingivitis, erosions, and blistering. [17,18]

Persistent desquamative gingivitis unresponsive to conventional plaque-control therapy represents a significant clinical indicator.

The oral cavity may serve as the initial or predominant site of disease, positioning the dentist or oral medicine specialist as a key participant in the diagnostic process. Definitive diagnosis typically requires biopsy and immunopathological investigation rather than empirical treatment alone. [17,18]

8 Crohn Disease and Other Inflammatory Bowel Diseases

Crohn disease can produce characteristic oral manifestations, sometimes preceding gastrointestinal symptoms. These include mucosal swelling, lip enlargement, mucosal tags, cobblestoning, linear ulceration, mucogingivitis, aphthous ulceration, and, less commonly, pyostomatitis vegetans. [19,20]

The presence of recurrent oral ulceration, persistent mucosal swelling, cobblestone-like mucosa, lip swelling, or atypical mucogingival inflammation should prompt consideration of inflammatory bowel disease, particularly when accompanied by gastrointestinal symptoms, weight loss, anemia, or nutritional deficiencies.

Oral findings may also aid in monitoring disease activity, although their correlation with intestinal disease activity is inconsistent. [19]

9 Celiac Disease

Celiac disease is another gastrointestinal disorder that may present with dental findings. Dental enamel defects, recurrent aphthous stomatitis, atrophic glossitis, delayed eruption, xerostomia, and other mucosal abnormalities have been described. [21-23]

Developmental enamel defects are particularly significant because they may present symmetrically and follow a chronological distribution, indicating disruption during tooth development. Notably, enamel abnormalities may occur even without prominent gastrointestinal symptoms.

Therefore, a patient, especially a child or young adult, presenting with unexplained symmetrical enamel defects in combination with recurrent aphthous ulcers, nutritional deficiency, anemia, gastrointestinal complaints, or a relevant family history may warrant medical evaluation for celiac disease. [21,22]

10. Chronic Kidney Disease

Chronic kidney disease (CKD), particularly advanced disease, may be accompanied by xerostomia or hyposalivation, altered taste, periodontal disease, calculus accumulation, enamel abnormalities, mucosal changes, candidiasis, and, in severe cases, uremic manifestations. [24,25]

Oral findings alone are not sufficiently specific to diagnose CKD. However, unexplained alterations in taste, persistent dry mouth, significant periodontal disease, mucosal abnormalities, and a history of systemic symptoms may contribute to the overall clinical assessment.

Dental practitioners should recognize that established renal disease has significant implications for dental management, including medication selection, bleeding risk, infection risk, dialysis-related considerations, and transplantation status.

11 Endocrine Disorders and Abnormal Oral Pigmentation

Diffuse mucosal pigmentation may occasionally represent an important systemic clue. Addison disease, for example, may produce diffuse brown pigmentation involving the oral mucosa and may precede recognition of the systemic disorder. [1]

The differential diagnosis of oral pigmentation is extensive and includes physiologic pigmentation, smoking-associated pigmentation, medications, melanotic lesions, post-inflammatory pigmentation, and neoplastic disease. However, new-onset, diffuse, unexplained pigmentation, particularly when associated with weakness, weight loss, hypotension, gastrointestinal symptoms, or generalized hyperpigmentation, warrants further investigation. Disorders may similarly influence oral tissues, salivary function, periodontal status, bone metabolism, and tooth development.

12 Oral Malignancy and Systemic Neoplastic Disease

Although oral cancer typically presents as a localized disease, its detection remains a critical aspect of comprehensive systemic health surveillance. Clinical features such as persistent ulceration, unexplained induration, exophytic growth, unexplained red or white lesions, unexplained cervical lymphadenopathy, or progressive tissue destruction warrant prompt and thorough investigation.

A persistent lesion that does not heal within the anticipated timeframe should not undergo repeated empirical treatment without comprehensive reassessment. Lesions with suspicious characteristics may necessitate referral to oral medicine, oral and maxillofacial surgery, or head-and-neck oncology services for biopsy. Furthermore, systemic malignancies may occasionally metastasize to the oral cavity or jaws, resulting in unexplained swelling, pain, paresthesia, tooth mobility, or radiographic abnormalities [1,3].

Why Systemic Disease May Be Missed in Routine Dental Practice

Several clinical factors may contribute to the underdiagnosis of systemic disease.

1. Over-attribution to local dental disease

Common oral conditions, including gingivitis, periodontitis, aphthous ulceration, xerostomia, candidiasis, and tooth mobility, often have multiple local etiologies. Consequently, clinicians may prematurely attribute clinical findings to familiar dental diagnoses.

2. Nonspecific clinical presentation

Most systemic diseases lack pathognomonic oral manifestations. For instance, oral ulceration may arise from trauma, infection, nutritional deficiency, autoimmune disease, inflammatory bowel disease, or neoplasia. Therefore, clinical context is essential for accurate diagnosis.

3. Incomplete medical history

A medical history restricted to previous dental treatment and current medications may overlook systemic symptoms. Inquiring about fatigue, weight loss, bleeding, gastrointestinal symptoms, dry eyes, recurrent infections, unexplained bruising, and family history can yield critical diagnostic information.

4. Examination focused primarily on teeth

A comprehensive dental examination should encompass the lips, buccal mucosa, labial mucosa, gingiva, tongue, floor of mouth, hard and soft palate, oropharynx, salivary glands, cervical lymph nodes, and relevant extraoral structures, rather than focusing solely on the dentition.

5. Failure to reassess persistent lesions

An apparently benign lesion that persists, changes in character, enlarges, becomes indurated, bleeds unexpectedly, or fails to respond to appropriate treatment warrants reconsideration of the initial diagnosis.

A Practical “Systemic Sentinel” Approach for Dental Practice

An effective strategy involves incorporating the following five steps into standard clinical practice:

Step 1: Recognition

Oral findings that are unusual, disproportionate, persistent, recurrent, or unexplained should be identified.

Step 2: Reassessment

Determine whether the finding can reasonably be attributed to local dental factors.

Step 3: Review

The medical history should be expanded to include relevant systemic symptoms, medications, family history, and previous investigations.

Step 4: Referral

If systemic disease is suspected, the concern should be clearly communicated to the patient's physician or an appropriate specialist.

Step 5: Follow-up

Unexplained lesions should be reviewed, and recommended investigations or referrals should be completed when appropriate.

The objective is not for the dentist to serve as a substitute for the physician. Instead, the dentist acts as a sentinel clinician, identifying abnormalities that might otherwise remain undetected.

Clinically Important Oral–Systemic Associations

Oral finding	Systemic conditions that should be considered
Mucosal pallor	Anemia, nutritional deficiency, hematological disease
Atrophic/glossitic tongue	Iron, folate or vitamin B12 deficiency, anemia
Spontaneous gingival bleeding	Thrombocytopenia, leukemia, coagulation disorders
Petechiae/ecchymoses	Thrombocytopenia, platelet/coagulation disorders
Rapid gingival enlargement	Leukemia, drug-related enlargement, systemic disease
Severe disproportionate periodontal inflammation	Diabetes, immunodeficiency, hematological disease
Persistent candidiasis	Diabetes, HIV/immunodeficiency, immunosuppression
Persistent xerostomia	Sjögren syndrome, diabetes, medications, systemic disease
Recurrent oral ulcers	Nutritional deficiency, SLE, Crohn disease, celiac disease, immunodeficiency
Cobblestone mucosa/mucosal tags	Crohn disease
Symmetrical enamel defects	Celiac disease and developmental/systemic disturbances

Oral finding	Systemic conditions that should be considered
Diffuse oral pigmentation	Addison disease, physiologic/drug-related pigmentation, other endocrine or systemic disorders
Desquamative gingivitis	Pemphigus vulgaris, mucous membrane pemphigoid, lichen planus
Unexplained tooth mobility	Periodontal disease, hematological malignancy, metastatic disease, local bone pathology
Delayed wound healing	Diabetes, immunodeficiency, hematological disease, malnutrition
Persistent non-healing ulcer	Oral potentially malignant disorder/oral cancer, autoimmune disease, infection
Unexplained jaw swelling/paresthesia	Malignancy, hematological disease, metastatic disease, infection

Discussion

The significance of oral manifestations as indicators of systemic disease is rooted in their accessibility. Unlike many internal organs, the oral cavity is readily visualized and examined without specialized equipment. Consequently, dental professionals are well positioned to identify abnormalities that might otherwise go undetected. Recent literature highlights that oral healthcare providers are often among the first to observe clinical signs of previously undiagnosed systemic diseases [1-3].

However, the concept of oral findings as systemic “sentinels” should be interpreted carefully. Most oral manifestations are neither sufficiently sensitive nor sufficiently specific to establish a systemic diagnosis independently. For example, gingival bleeding is extremely common and most frequently has local periodontal causes. Similarly, xerostomia is commonly medication-related, and recurrent aphthous ulceration frequently occurs without an identifiable systemic disease. Therefore, the clinical value of these findings lies primarily in their ability to prompt a more comprehensive diagnostic process rather than in providing definitive diagnoses. Hematological disorders exemplify the potential value of this diagnostic approach. Pallor, spontaneous bleeding, petechiae, gingival enlargement, and recurrent infection may occur in disorders affecting red cells, white cells, or platelets [4,8,11,12]. When multiple findings present concurrently, especially if they are disproportionate to local dental disease, clinicians should maintain a low threshold for medical referral.

Diabetes provides another significant example. Periodontal disease, xerostomia, recurrent infection, taste alteration, and delayed healing may coexist in individuals with diabetes [9,10]. Although these manifestations are insufficient for an independent diagnosis, their recognition becomes clinically valuable when considered alongside symptoms such as polyuria, polydipsia, unexplained weight change, fatigue, or a relevant medical history. Autoimmune diseases present a distinct pattern. Oral ulcers in systemic lupus erythematosus (SLE), severe xerostomia in Sjögren syndrome, and persistent desquamative or erosive lesions in pemphigus or mucous membrane pemphigoid may serve as clinically significant manifestations of systemic or mucocutaneous disease [5,6,15-18]. In these cases, the dentist's role is critical, as the oral cavity may be the initial or most accessible site where the disease becomes clinically apparent.

Gastrointestinal diseases further underscore the necessity of considering systemic conditions during or present with symptoms. Crohn disease may present with mucosal swelling, cobblestoning, mucosal tags, and mucositis; celiac disease may present with developmental enamel defects and recurrent aphthous ulceration [19-23]. These findings may be overlooked if dental assessments focus solely on caries and periodontal disease.

A key practical implication is that the overall pattern of findings often provides more diagnostic value than any single lesion. For instance, the combination of severe periodontal inflammation, recurrent infections, and delayed healing is more clinically significant than periodontal inflammation alone. Similarly, the presence of xerostomia, rapidly progressive caries, ocular dryness, and salivary gland enlargement should prompt consideration of an underlying systemic condition rather than focusing solely on caries management. Effective communication is also essential. When referral is indicated, dentists should provide objective descriptions of clinical findings rather than offering unsupported diagnoses. For example, stating “persistent bilateral salivary gland enlargement with marked xerostomia and rapidly progressive caries” is preferable to simply noting “suspected Sjögren syndrome” without supporting evidence. Clear documentation supports effective interdisciplinary assessment.

The role of the dentist is evolving from a primarily tooth-centered provider to an oral-systemic health professional. Regular dental examinations offer repeated opportunities to identify systemic abnormalities, particularly in patients with limited access to other healthcare providers. Recent literature highlights the potential for routine oral healthcare encounters to facilitate earlier recognition of systemic disease [24]. However, this responsibility should not lead to unnecessary testing or the medicalization of common oral findings. A balanced approach involves recognizing red flags, evaluating relevant differential diagnoses, ensuring appropriate documentation, and making proportionate referrals.

Practical Red Flags Requiring Increased Vigilance

The following clinical findings warrant reconsideration of an apparently routine dental diagnosis:

1. Rapidly developing gingival enlargement or gingival enlargement without an identifiable local cause.
2. Spontaneous bleeding of the gingiva or oral mucosa.
3. Presence of multiple petechiae or ecchymoses in the absence of trauma.
4. Severe periodontal destruction disproportionate to the extent of local deposits.
5. Persistent or recurrent oral candidiasis without an identifiable cause.
6. Xerostomia accompanied by ocular dryness or enlargement of the salivary glands.
7. Recurrent oral ulcers in conjunction with gastrointestinal or systemic symptoms.
8. Cobblestone appearance of the mucosa, presence of mucosal tags, or persistent swelling of the lips.
9. Symmetrical developmental enamel defects in the absence of an identifiable local explanation.
10. New-onset diffuse mucosal pigmentation associated with systemic symptoms.
11. Persistent desquamative gingivitis or recurrent blistering of the oral mucosa. Tooth mobility or jaw radiographic abnormalities.
12. Delayed healing following dental treatment that appeared uncomplicated. Persistent oral lesions that do not respond to appropriate initial management.
13. Unexplained cervical lymphadenopathy or unexplained facial swelling.
14. Persistent oral ulceration, induration, or mixed red-white lesions suspicious for malignancy. [25,26]

Implications for Dental Education and Practice

Incorporating the recognition of systemic disease into undergraduate, postgraduate, and continuing dental education is essential. Clinical instruction should prioritize pattern recognition over rote memorization of isolated oral manifestations.

A standardized examination protocol should include the following components:

- * comprehensive medical history;
- * medication and allergy review;
- * assessment of general appearance where appropriate;
- * examination of oral mucosa and tongue;
- * periodontal assessment;
- * evaluation of salivary function and gland enlargement when indicated;
- * assessment of pigmentation;
- * cervical lymph-node examination when clinically indicated;
- * review of unexplained radiographic abnormalities;
- * documentation and photographic monitoring of suspicious lesions; and
- * appropriate referral and follow-up.

The use of digital photography, electronic health records, structured oral examination templates, and interdisciplinary referral systems may enhance recognition and continuity of care [27].

Limitations

The association between oral manifestations and systemic diseases is multifaceted. The majority of available evidence originates from observational studies, case series, narrative reviews, and selected systematic reviews. Numerous oral manifestations exhibit limited specificity, and their prevalence may vary with disease severity, treatment status, patient age, ethnicity, medication use, and comorbid conditions.

Consequently, the identification of an oral finding should not be regarded as definitive evidence of a systemic disorder. Similarly, the absence of oral manifestations does not preclude systemic disease. Future research should prioritize prospective studies that assess the diagnostic value, sensitivity, specificity, and predictive value of oral findings in identifying previously undiagnosed systemic disorders [28].

Conclusion

The oral cavity serves as a significant clinical indicator for systemic disease. Findings such as mucosal pallor, unexplained bleeding, gingival enlargement, severe periodontal inflammation, xerostomia, recurrent candidiasis, persistent ulceration, mucosal pigmentation, enamel defects, atypical mucosal lesions, delayed wound healing, and unexplained tooth mobility may indicate underlying systemic conditions rather than isolated dental pathology.

Dentists are not expected to independently diagnose systemic diseases based solely on oral findings. Instead, they should recognize patterns that are unusual, persistent, disproportionate, or unexplained. Conducting a thorough medical history, a comprehensive oral examination, an appropriate differential diagnosis, timely investigation, and an effective medical referral can transform a dental visit into a valuable opportunity for early detection of systemic disease.

Consequently, the contemporary dental examination should extend beyond the question of “What is wrong with the tooth?” and address the broader clinical consideration:

“Could this oral finding indicate a systemic condition occurring elsewhere in the body?”

Adopting this approach may facilitate earlier recognition of systemic disease, strengthen interdisciplinary healthcare collaboration, prevent inappropriate dental interventions, and ultimately improve patient outcomes.

References

- Islam NM, Bhattacharyya I, Cohen DM. Common oral manifestations of systemic disease. *Otolaryngol Clin North Am*. 2011;44(1):161-182. doi:10.1016/j.otc.2010.09.006.
- Gaddey HL. Oral manifestations of systemic disease. *Gen Dent*. 2017;65(6):23-29.
- Ukwas A, Porter SR. The potential of oral healthcare providers to recognise early systemic disease. *Br Dent J*. 2025;239(4):249-255. doi:10.1038/s41415-025-8814-0.
- Schlosser BJ, Pirigyi M, Mirowski GW. Oral manifestations of hematologic and nutritional diseases. *Otolaryngol Clin North Am*. 2011;44(1):183-203. doi:10.1016/j.otc.2010.09.007.
- Soto-Rojas AE, Kraus A. The oral side of Sjögren syndrome. Diagnosis and treatment. A review. *Arch Med Res*. 2002;33(2):95-106.
- Leung KC, McMillan AS, Leung WK, Wong MC, Lau CS, Mok TM. Oral manifestations of Sjögren's syndrome. *J Rheumatol*. 2005;32(2):227-234.
- Brennan MT, Elad S. Oral manifestations of systemic diseases. *Dent Clin North Am*. 2020;64(1):1-13.
- Javed F, Romanos GE. Systemic conditions associated with bleeding and oral manifestations. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 2011;112(1).
- Mauri-Obradors E, Estrugo-Devesa A, Jané-Salas E, Viñas M, López-López J. Oral manifestations of diabetes mellitus. A systematic review. *Med Oral Patol Oral Cir Bucal*. 2017;22(5). doi:10.4317/medoral.21655.
- Al-Maskari AY, Al-Maskari MY, Al-Sudairy S. Oral manifestations and complications of diabetes mellitus: a review. *Sultan Qaboos Univ Med J*. 2011;11(2):179-186.
- McCord C, Johnson L. Oral manifestations of hematologic disease. *Dent Clin North Am*. 2018;62(1):1-17.
- Nápoles-Gómez A, et al. Orofacial manifestations of hematological diseases: anemia and hemostatic disorders. *Med Oral Patol Oral Cir Bucal*. 2012;17(1).
- Patton LL, Hill C. Sensitivity, specificity, and positive predictive value of oral opportunistic infections in adults with HIV/AIDS as markers of immune suppression and viral burden. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 2001;90(2):182-188.
- Nokta M. Oral manifestations associated with HIV infection. *Curr HIV/AIDS Rep*. 2008;5(1):5-12. doi:10.1007/s11904-008-0002-8.
- Miziara ID, Weber R. Oral manifestations in lupus erythematosus. *Braz J Otorhinolaryngol*. 2009;75(1):116-121.
- Ruiz-Esquide V, et al. Prevalence of oral mucosal lesions in patients with systemic lupus erythematosus: a systematic review and meta-analysis. *BMC Oral Health*. 2023;23:913. doi:10.1186/s12903-023-03783-5.
- Ettlin DA. Pemphigus. *Dent Clin North Am*. 2005;49(1):107-125.

18. Carey B, Setterfield J. Mucous membrane pemphigoid and oral blistering diseases. *Clin Exp Dermatol*. 2019;44(7):732-739. doi:10.1111/ced.13996.
19. Lankarani KB, Sivandzadeh GR, Hassanpour S. Oral manifestation in inflammatory bowel disease: a review. *World J Gastroenterol*. 2013;19(46):8571-8579.
20. Vavricka SR, Rogler G, Gantenbein C, et al. Chronological order of appearance of extraintestinal manifestations relative to the time of IBD diagnosis in the Swiss IBD cohort. *Inflamm Bowel Dis*. 2015;21(8):1794-1800.
21. Pastore L, Carroccio A, Compilato D, Panzarella V, Serpico R, Muzio LL. Oral manifestations of celiac disease. *J Clin Gastroenterol*. 2008;42(3):224-232.
22. Rashid M, Zarkadas M, Anca A, Limeback H. Oral manifestations of celiac disease: a clinical guide for dentists. *J Can Dent Assoc*. 2011;77.
23. Nieri M, Tofani E, Defraia E, Giuntini V, Franchi L. Enamel defects and aphthous stomatitis in celiac and healthy subjects: systematic review and meta-analysis of controlled studies. *J Dent*. 2017;65:1-7. doi:10.1016/j.jdent.2017.07.001.
24. Dioguardi M, Caloro GA, Troiano G, Giannatempo G, Laino L, Petruzzi M, et al. Oral manifestations in chronic uremia patients. *Ren Fail*. 2016;38(1):1-6. doi:10.3109/0886022X.2015.1103639.
25. Summers SA, Tilakaratne WM. Renal disease and the mouth. *Am J Med*. 2007;120(7):568-572. doi:10.1016/j.amjmed.2006.12.007.
26. Capodiferro S, Limongelli L, Favia G. Oral and maxillo-facial manifestations of systemic diseases: an overview. *Medicina (Kaunas)*. 2021;57(3):271. doi:10.3390/medicina57030271.
27. Mirfarsi S, Stoopler ET, Sun HH, Elo JA. Common oral manifestations of select systemic diseases: anemia, diabetes mellitus and HIV. *J Calif Dent Assoc*. 2016;44(9):553-559.
28. Brennan MT, Elad S. Oral manifestations of systemic diseases. *Dent Clin North Am*. 2020;64(1):1-13.