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ORAL MANIFESTATIONS IN ENDOCRINE SYSTEM DISEASES

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Abstract

Endocrine system diseases significantly influence the condition of the oral cavity because hormones regulate metabolic activity, immune defense, tissue growth, and mineral metabolism. Disorders affecting endocrine glands often lead to pathological changes in oral tissues, including the gingiva, oral mucosa, salivary glands, teeth, and jaw bones. In many clinical situations, oral manifestations become early indicators of systemic endocrine abnormalities. Diabetes mellitus, thyroid dysfunctions, pituitary disorders, adrenal gland diseases, and parathyroid abnormalities are commonly associated with characteristic oral symptoms such as periodontal destruction, xerostomia, candidiasis, delayed wound healing, pigmentation, macroglossia, and bone resorption. Timely recognition of these manifestations is essential for early diagnosis, prevention of complications, and interdisciplinary management. The present article analyzes the pathogenesis, clinical features, diagnostic significance, and dental management of oral changes associated with endocrine diseases.

Keywords: endocrine diseases, oral cavity, diabetes mellitus, thyroid disorders, periodontal disease, xerostomia, oral manifestations.

ИЗМЕНЕНИЯ В СЛИЗИСТЫХ ОБОЛОЧКАХ ПОЛОСТИ РТА ПРИ ЗАБОЛЕВАНИЯХ ЭНДОКРИННОЙ СИСТЕМЫ

Аннотация

Заболевания эндокринной системы значительно влияют на состояние полости рта, поскольку гормоны регулируют метаболическую активность, иммунную защиту, рост тканей и минеральный обмен. Нарушения, затрагивающие эндокринные железы, часто приводят к патологическим изменениям тканей полости рта, включая десны, слизистую оболочку, слюнные железы, зубы и кости челюсти. Во многих клинических случаях оральные проявления становятся ранними признаками системных эндокринных нарушений. Сахарный диабет, дисфункции щитовидной железы, заболевания гипофиза, патологии надпочечников и нарушения функции паращитовидных желез часто сопровождаются характерными симптомами в полости рта, такими как разрушение тканей пародонта, ксеростомия, кандидоз, замедленное заживление ран, пигментация, макроглоссия и резорбция костной ткани. Своевременное распознавание данных проявлений имеет важное значение для ранней диагностики, профилактики осложнений и междисциплинарного подхода к лечению. В данной статье рассматриваются патогенез, клинические проявления, диагностическое значение и стоматологическое ведение изменений полости рта, связанных с эндокринными заболеваниями.

Ключевые слова

эндокринные заболевания, полость рта, сахарный диабет, заболевания щитовидной железы, заболевания пародонта, ксеростомия, оральные проявления.

Introduction

The endocrine system is composed of glands that synthesize and secrete hormones responsible for maintaining physiological homeostasis. Hormones regulate metabolism, calcium balance, immune function, tissue growth, and cellular differentiation. Because oral tissues are highly vascularized and metabolically active, endocrine disturbances frequently produce pathological changes within the oral cavity. The oral cavity often reflects systemic health conditions. Dentists may become the first healthcare professionals to identify signs of endocrine disorders due to visible oral manifestations. These manifestations can affect the teeth, periodontium, salivary glands, oral mucosa, tongue, and maxillofacial bones. Recognition of these changes contributes to early diagnosis and improves overall patient management. Endocrine disorders may alter salivary secretion, impair wound healing, increase susceptibility to infections, and disrupt bone metabolism. The severity of oral complications often correlates with the duration and control of the endocrine disease. This article discusses the most common endocrine diseases and their effects on the oral cavity.

Diabetes Mellitus and Oral Manifestations

Diabetes mellitus is one of the most prevalent endocrine disorders worldwide. It develops due to impaired insulin secretion, insulin resistance, or both, resulting in chronic hyperglycemia. Long-term elevation of blood glucose affects blood vessels, connective tissues, immune mechanisms, and salivary gland function. The oral cavity is highly sensitive to metabolic disturbances caused by diabetes mellitus.

Periodontal Disease

Periodontal disease is considered one of the major complications of diabetes mellitus. Hyperglycemia contributes to impaired neutrophil function, increased inflammatory cytokine production, reduced collagen synthesis, microvascular damage, and altered immune response. These factors accelerate destruction of periodontal tissues. Patients commonly present with gingival edema, bleeding during brushing, deep periodontal pockets, gingival recession, tooth mobility, and alveolar bone resorption. Several studies demonstrate a bidirectional relationship between diabetes mellitus and periodontitis. Severe periodontal inflammation may worsen glycemic control.

Xerostomia

Reduced salivary secretion is common among diabetic patients. Xerostomia may develop because of dehydration, salivary gland dysfunction, neuropathy, and drug therapy. Patients experience difficulty swallowing, impaired speech, increased caries risk, halitosis, and burning mouth sensation. Saliva plays an important protective role in maintaining oral homeostasis; therefore, salivary reduction significantly affects oral health.

Oral Infections

Patients with diabetes mellitus are predisposed to infections because of impaired immunity. Oral candidiasis is one of the most common fungal infections observed in diabetic individuals. Clinical forms include pseudomembranous candidiasis, angular cheilitis, and denture stomatitis. Poor healing and reduced resistance may contribute to periodontal abscesses and postoperative infections.

Delayed Wound Healing

Hyperglycemia impairs angiogenesis and collagen formation, resulting in delayed healing following tooth extraction or oral surgery.

Thyroid Disorders and Oral Manifestations

The thyroid gland regulates metabolic activity through the secretion of thyroid hormones.

Hyperthyroidism

Hyperthyroidism is characterized by excessive production of thyroid hormones. Children with hyperthyroidism frequently demonstrate early eruption of both primary and permanent teeth. Excessive thyroid hormones increase bone turnover, causing reduction of bone density in the jaws. Patients may complain of oral burning sensations and mucosal discomfort. Changes in salivary composition may increase the incidence of dental caries. Neuromuscular hyperactivity may produce tremors of the tongue.

Hypothyroidism

Hypothyroidism results from reduced production of thyroid hormones. Children often exhibit delayed eruption and impaired dental development. Enlargement of the tongue may interfere with mastication and speech. Myxedematous tissue changes contribute to swelling of facial soft tissues. Reduced metabolic activity slows regenerative processes. Abnormal craniofacial development may lead to orthodontic abnormalities.

Pituitary Disorders and Oral Changes

The pituitary gland controls the activity of many endocrine organs.

Acromegaly

Acromegaly develops because of excessive secretion of growth hormone after skeletal maturation. Progressive enlargement of the mandible causes prognathism. Increased spacing between teeth develops because of jaw expansion. The tongue becomes enlarged and thickened. Occlusal relationships become disturbed because of skeletal changes. Lips and oral mucosa may appear enlarged.

Growth Hormone Deficiency

Growth hormone deficiency in children may cause delayed eruption, underdeveloped jaws, crowding of teeth, and delayed craniofacial growth.

Parathyroid Disorders and Oral Manifestations

Parathyroid glands regulate calcium and phosphorus metabolism.

Hyperparathyroidism

Excessive secretion of parathyroid hormone stimulates bone resorption. Radiographic examination often reveals disappearance of the lamina dura around teeth. Bone destruction weakens periodontal support and increases tooth mobility. Giant-cell lesions known as brown tumors may occur within jaw bones. Bone remodeling changes occlusal relationships and may cause jaw pain.

Hypoparathyroidism

Hypocalcemia caused by reduced parathyroid hormone affects tooth development and mineralization. Patients may exhibit enamel hypoplasia, delayed eruption, short roots, increased caries susceptibility, and muscle spasms around the mouth.

Adrenal Gland Disorders and Oral Manifestations

Addison's Disease

Addison's disease is characterized by chronic adrenal insufficiency. Diffuse brown pigmentation may appear on the buccal mucosa, gingiva, tongue, and hard palate. Oral pigmentation is often among the earliest signs of the disease. Patients may experience adrenal crisis during stressful dental procedures if proper precautions are not taken.

Cushing's Syndrome

Cushing's syndrome develops because of excessive cortisol production. Patients often demonstrate delayed wound healing, osteoporosis, increased susceptibility to infections, oral candidiasis, and facial swelling. Long-term corticosteroid therapy may further increase oral complications.

Diagnostic Importance of Oral Manifestations

Oral changes associated with endocrine disorders possess important diagnostic value. In many cases, dentists identify suspicious lesions before systemic symptoms become obvious. Early diagnosis contributes to prevention of severe complications, improved disease control, better quality of life, reduction of oral infections, and preservation of teeth and periodontal tissues.

Comprehensive examination of oral tissues should therefore be included in the evaluation of patients with suspected endocrine abnormalities.

Dental Management of Patients with Endocrine Diseases

Successful dental treatment requires consideration of systemic status. The dentist should assess hormonal therapy, blood glucose levels, medication use, and history of endocrine surgery. Strict infection prevention is necessary because many endocrine diseases impair immunity. Stress management is essential, especially in patients with thyroid disease and adrenal insufficiency. Interdisciplinary cooperation between dentists and endocrinologists improves patient safety and treatment outcomes.

Prevention of Oral Complications

Patients with endocrine diseases should follow preventive oral care measures including regular dental examinations, proper oral hygiene, fluoride use, balanced diet, adequate hydration, smoking cessation, and control of systemic disease. Early intervention significantly reduces the risk of oral complications.

Conclusion

Endocrine diseases produce numerous pathological changes within the oral cavity. Diabetes mellitus, thyroid disorders, pituitary abnormalities, adrenal diseases, and parathyroid dysfunctions affect periodontal tissues, oral mucosa, salivary glands, and jaw bones. Oral manifestations may serve as early clinical indicators of systemic disease and therefore possess considerable diagnostic importance. Proper recognition of these changes allows timely referral, effective interdisciplinary treatment, and prevention of complications. Dentists play an essential role in the diagnosis and management of patients with endocrine disorders.

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