

Teeth in Systemic Disorders: Suggestion for a Classification

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Abstract

“Mouth Shows Many Things and Tooth Shows Tiny Things” vast systemic disorders manifest in the teeth in many ways that comprises of quantitative, qualitative and color changes. Many of the diseases which lead to developmental abnormalities of the teeth are unusual and some are now less momentous because of advances in the diagnosis and treatment of particular condition, and it is paramount important for the dental practitioners must be aware of that, a dental abnormality may be the first clinical sign of a previously undiagnosed systemic condition. The early recognition and treatment may lessen the severity of underlying disease, and that renders a profound service to the patient, so in this regards each one to know about various systems related conditions affecting the teeth. Here with presenting a first of its kind classification about “teeth in systemic disorders suggestion for a classification”.

Keywords: Systemic Disorders; Enamel; Teeth; Hypoplasia; Developmental Disorders

Introduction

Oral cavity is the window to the body and is more frequent where systemic disease first presents itself and it imitates the complete status of the body. Signs of systemic disease are often manifested in the oral cavity before the systemic disease itself is suspected [1]. Some variations appreciated in the oral cavity are disease specific while others may simply increase the clinician’s level of suspicion. These systemic disorders might demonstrations early changes in the teeth during developmental stages, and this will help us in early recognition and management [2].

Discussion

The developmental processes of teeth happens through several developmental stages like bud, cap, bell and advanced bell stages, So occurrence of any chronic systemic disorders during these developmental process leads to various anomalies in teeth size, teeth form and appearance. This article provides a guide for recognizing teeth in select systemic diseases and comprehensive classification provided in the table 1. The different systemic diseases results in structural disturbances and degree of this disturbance differs from microscopic abnormalities to more gross defects and frequently varies in extent in the calcified dental issues [3]. In case of prenatal syphilis there is conjecture about whether the dental malformations are the direct result of *T. pallidum* on the tooth bud, or whether they signify a more general interference resulting from endocrine or nutritional disturbances secondary to *T. pallidum* infection. Changes in the teeth associated with prenatal syphilis must be distinguished from those occurring as a result of rickets, tetracycline therapy or the exanthematous fever. The general morphology of the tooth is usually unaltered in the enamel hypoplasias associated with the latter condition [4,5].

	Systemic disorders	Conditions	Effect on teeth
1.	Infectious diseases	1. Leprosy	Odontodysplasia leprosy, Circumferential hypoplasia of enamel and cementum, "pinkish-red" discoloration of crown, Pulpitis and necrosis
		2. Prenatal syphilis	Screwdriver and Peg Shaped Incisors, Mulberry Molar, Dental Hypoplasia, Irregular Amelo-Dentinal Junction, necrosis and exfoliation of the developing tooth
		3. Congenital allergy	Enamel Hypoplasia,
		4. Exanthemas	Enamel pitting in the permanent teeth, Dental Hypoplasia, temporary upset in the developing teeth.
2.	Metabolic disorders	1. Diabetes mellitus	Hypocalcification of the developing dentition, Enamel Hypoplasia, Premature eruption.
		2. Endocrinopathies	
		a. Acromegaly	Longer roots, premature eruption, Cemental hyperplasia
		b. Hypopituitarism	Short roots, Delayed shedding of primary teeth, Delayed eruption of permanent teeth, Wide apices.
		c. Hyperthyroidism	Premature shedding of deciduous and premature eruption of permanent teeth,
		d. Hypothyroidism	Enlarged pulp chambers, Short roots, Root resorption, Thinning of lamina dura, Enamel Hypoplasia.
		e. Hyperparathyroidism	Complete or partial loss of lamina dura, Root resorption, Large pulp chambers, Tapered/pointed roots.
		f. Hypoparathyroidism	Short, blunted roots, Partial anodontia, Enamel/Dentine Hypoplasia, delayed eruption, or root dilacerations.
		g. Pseudohypoparathyroidism	Root resorption, Dagger shaped pulpal calcifications, Oligodontia, Enamel Hypoplasia, Delayed eruption.
		3. Hypophosphatasia	Cemento- genesis imperfect, Premature exfoliation of deciduous teeth, Enlarged pulp chambers and root canals, root resorption
3.	Skeletal disorders	4. Nutritional deficiency	Retarded eruption
		5. Phenylketonuria	Enamel Hypoplasia (grooving or pitting)
		1. Osteopetrosis (marble stone disease)	Enamel Hypoplasia, Osteodentine formed in the roots.
		2. Paget's disease	Hypercementosis, Mild root resorption, Ankylosing the tooth to the bone, Irregular cementum resorption and redeposition
		4.	Dermatological disorders
2. Cleroderma	Impaired development of the roots		
5.	Hematological disorders	1. Rh+ incompatibility	Bright green or bluish green discoloration of deciduous teeth.
		2. Thalassemias	Taurodontism, Spiky shaped and short roots.
		3. Sickle cell anemia's	Hypercementosis, Denticle like pulpal calcifications, Dentine Hypoplasia.
6.	Renal disorders	1. Nephrotic syndrome	Enamel Hypoplasia, Yellowish discoloration.
7.	CVS disorders	1. Congenital heart disease	Enamel Hypoplasia,
8.	Systemic diseases affecting number and size of teeth		
9.	Intrinsic stains	1. Blood born pigmentations	
		2. Administration of tetracycline	
		3. Decomposition of RBC within the pulp	
10.	Miscellaneous	1. Calcinosis	Short and bulbous roots, Obliterated pulp chambers and canals, Root resorption, Enamel pitting, Hypercementosis.
		2. Dental Fluorosis	Enamel Hypoplasia, pitting and brownish discoloration, White flecking, Corroded appearance.

Table 1

In exanthemas, although any condition accompanied by high fever (e.g. diphtheria, scarlet fever) seem to cause a metabolic disturbance adequate enough to produce a momentary upset in the developing teeth [6,7]. Ratners and Myers carried out a clinical and radiographic examination of the teeth aged between 3 and 9 years who suffered from a congenital allergy and shown enamel hypoplasia, which was situated at the incisal third of the canine and the occlusal third of the first molar. Transient interruptions of odontogenesis, invasion of pulp by granulomatous tissue in long standing lepromatous leprosy and Infiltration of pulpal tissue by leprae are the causes for dental abnormalities. Rushton (1938) suggests that the cementum is affected in the same way as the bone in this disease, such that there is irregular cementum resorption and redeposition in paget's disease. The dental changes in osteopetrosis probably result from local environmental factors adversely influencing the nutritional and spatial requirements of the growing tooth germs [8].

In 1968 Myers, Durmas and Ballhorn described their observations on the teeth of 35 patients with phenylketonuria and determined that the occurrence of enamel hypoplasia is significantly higher in patients with phenylketonuria [9]. There are reports in the dental literature (Brittain, Oldenburg and Burkes, 1976) indicating that hypophosphatasia can occur in a mild form, in which dental manifestations are the only clinical evidence of the disease and in these cases it is described as cemento-genesis imperfecta [10]. In various metabolic disorders like acromegaly, hypopituitarism, hypo and hyperthyroidism, hypo and hyperparathyroidism, diabetes mellitus and nutritional deficiency causes alterations in the eruption sequence and morphology of teeth. In case of congenital heart diseases as reported by Pindborg (1970), in which the teeth of 386 children with congenital heart disease were examined, 98 of them presented cyanosis and found that 16.9 per cent of the cyanotic children exhibited enamel hypoplasia [11].

In dermatological disorders like scleroderma, Foster and Fairburn (1968) reported that two lower permanent incisors showed impaired development of the roots and these teeth were in the region immediately associated with an area of morphea [12]. Browne and Byrne described in detail the clinical and histological features of the teeth of a female suffering from incontinentia pigmenti achromians and teeth were shown pale yellow to brown in color and on radiographic examination indicated a normal complement of permanent teeth without obvious structural defect [13].

Hematological disorders like in sickle cell anemia Soni suggest that 'Unusual inclusions', hypercementosis of the roots, 'denticle-like' calcified bodies in the pulp and their formation may be the result of sickling and thrombosis of the local blood vessels. In case of Rh incompatibility deciduous teeth may be pigmented bright green or bluish green in severe cases due to the circulating bile pigments [14]. In renal disorders like nephrotic syndrome, a survey by Oliver, *et al.* (1963), demonstrated enamel hypoplasia and the affected enamel showed depressions and in some patients appeared yellow in color; the authors suggest that this is because the enamel layer is thinned in the depressions, permitting the color of the underlying dentine to show through [15]. All the above systemic disorders can be diagnosed early based on the alteration and appearance in the teeth, for this one should know the following formulated classification.

Conclusion

Each and every systemic disorders of the body directly or indirectly manifests in the oral cavity and that gives hint for oral health care professional for early detection. Thus helps the general health care professional for early intervention, to lessen the occurrence and severity and maximize the response to treatment, so each one of us must know how to categorize the variations and appearance of teeth in various systemic disorders. All above means that the oral health care professionals can treat the whole body, but not just mouth.

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