

Celiac Disease: Oral and Dental Manifestations

Background

Celiac disease is a permanent intolerance to certain proteins (collectively called “gluten”) that are present in wheat, rye and barley and related grains. Ingestion of gluten causes damage to the small intestine through an autoimmune mechanism in genetically susceptible individuals. It can develop at any age when gluten is present in the diet, but if it develops in children while the permanent teeth are developing, abnormalities in the structure of the dental enamel can occur. The mechanism of the development of these defects is not clear but immune-mediated damage is suspected to be the primary cause. Calcium deficiency due to malabsorption may also play a role.

Typical symptoms of celiac disease include abdominal pain, diarrhea and weight loss. However, many individuals present with atypical or non-gastrointestinal symptoms including anemia (iron or folate deficiency), extreme weakness, short stature, migraine, osteoporosis, menstrual irregularities and infertility. Additional symptoms in children include delayed growth and puberty, vomiting and irritability. Celiac disease affects between 0.5 to 1% of the population, but because of the wide variation in symptoms and their severity in this disease, diagnosis is often delayed and many individuals remain undiagnosed.

Serological tests are useful to screen for celiac disease. The definitive diagnosis is established with a small intestinal biopsy. At present, the only treatment for celiac disease is a strict gluten-free diet for life. Early diagnosis and treatment of this hidden and dangerous disease can reduce the risk of serious complications like osteoporosis, reproductive disorders and lymphoma in both men and women.

Facts

- Common oral and dental manifestations of celiac disease include the following:
 - Enamel defects
 - Delayed eruption
 - Recurrent aphthous ulcers
 - The dental enamel defects most commonly occur in the permanent dentition.
 - Dental enamel defects that develop in celiac disease, and the number of teeth affected, are strongly associated with the time of onset of the symptoms, and the age at which a gluten-free diet is initiated.
 - Dental enamel defects tend to occur symmetrically and chronologically in all four sections of dentition, with more defects seen in the maxillary and mandibular incisors and molars.
 - Such defects usually develop before 7 years of age.
 - Both hypoplasia and hypomineralization of the enamel can occur. A band of hypoplastic enamel is common, often with intact cusps. A break

in the enamel and dentine formation can occur at a developmental stage which corresponds with the onset of gastrointestinal symptoms.

- Specific enamel defects can include pitting and grooving. Sometimes there is complete loss of enamel.
- Prevalence of dental caries in children with celiac disease is variable. It was found to be no different than the general population in one study but higher in another study.
- Dental enamel defects are often found in first degree relatives of individuals with celiac disease, even though they may have no gastrointestinal symptoms (silent celiac disease).
- Recurrent aphthous ulcers are common in celiac disease, which could provide another clue to the possible presence of this disorder.

As celiac disease is only one of many conditions that cause bilateral symmetrical multiquadrant enamel defects, the diagnosis of celiac disease based on enamel defects alone is not possible. However, by referring patients with unexplained dental enamel defects to their physicians for screening and follow-up, dental professionals can play a key role in increasing awareness about celiac disease and preventing some of the serious complications of this disorder in their patients.



Grade I Enamel Defects: Multiple white and cream opacities with clearly defined margins.
(By permission: Drs. Ted Malahias & Peter Green)



Grade II Enamel Defects: Rough enamel surface with patchy symmetric opacities and discolouration.
(By permission: Drs. Ted Malahias and Peter Green)



Grade III Enamel Defects: Deep horizontal grooves with large pits and linear discolouration.
(By permission: Children's Digestive Health and Nutrition Foundation)



Aphthous ulcers in the buccal mucosa (By permission: Children's Digestive Health and Nutrition Foundation)

Classification of Systemic Dental Enamel Defects in Celiac Disease *

Grade 1

Defects in colour of enamel: single or multiple cream, yellow or brown opacities.

Grade II

Slight structural defects: rough enamel surface, horizontal grooves, shallow pits.

Grade III

Evident structural defects: deep horizontal grooves, large vertical pits.

Grade IV

Severe structural defects: shape of the tooth may be changed.

* Adapted from Aine et al.

Suggested Readings:

1. Dental enamel defects in celiac disease. Aine L, Mäki M, Collin P, Keyriläinen O. J Oral Pathol Med. 1990;19(6):241-5.
2. Oral manifestations of celiac disease. Pastore L, Carroccio A, Compilato D, Panzarella V, Serpico R, Lo Muzio L. J Clin Gastroenterol. 2008;42(3):224-32.
3. Orally based diagnosis of celiac disease: Current perspectives. Pastore L, Campisi G, Compilato D, Lo Muzio L. J Dent Res. 2008;87(12):1100-7.
4. The association between celiac disease, dental enamel defects, and aphthous ulcers in a United States cohort. Cheng J, Malahias T, Brar P, Minaya MT, Green PH. J Clin Gastroenterol. 2010;44(3):191-4.
5. Oral manifestations of celiac disease: A clinical guide for dentists. Rashid M, Zarkadas M, Anca A, Limeback H. J Can Dent Assoc 2011;77:b39



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