



# Dental Enamel Defects in Celiac Disease

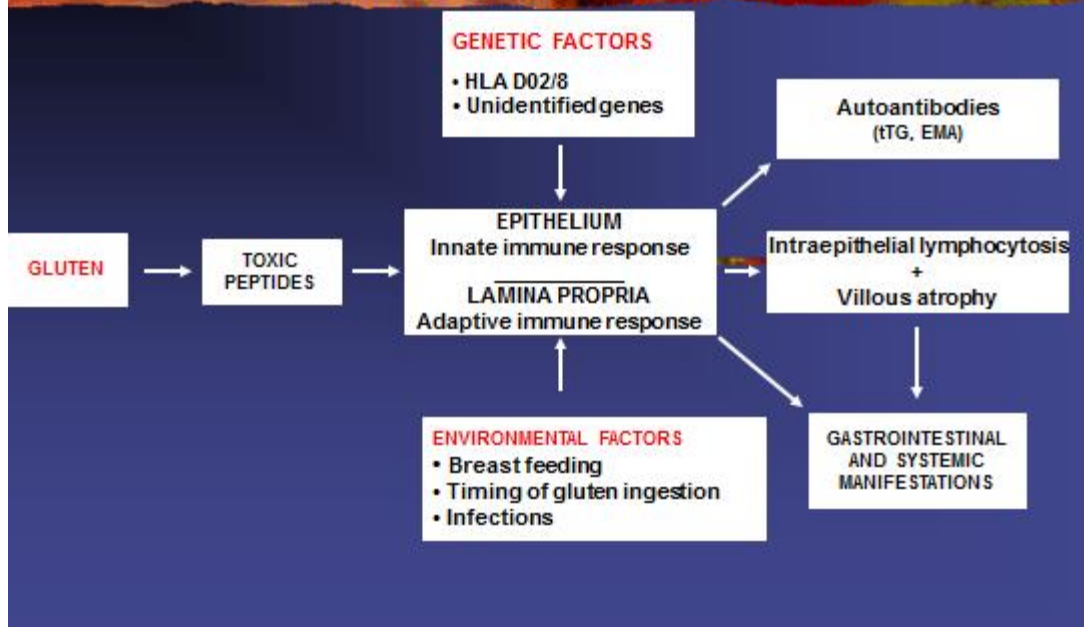
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Another piece of the puzzle  
Theologos Malahias D.D.S

## Celiac disease

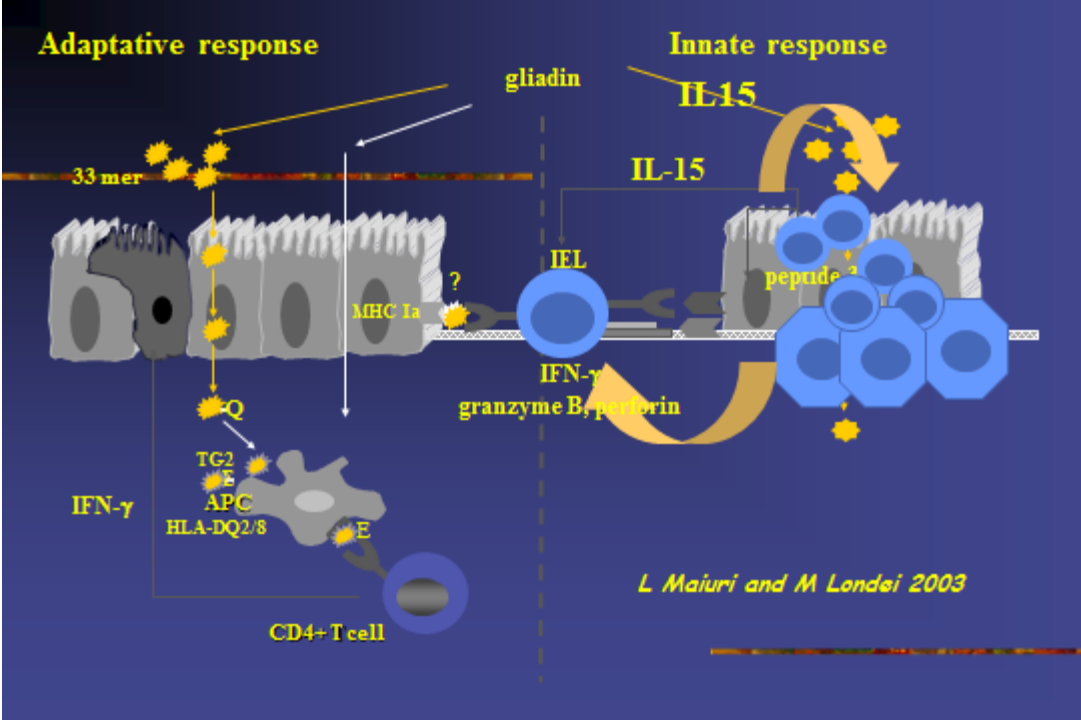
- A genetically –determined chronic inflammatory intestinal disease induced by an environmental precipitant, gluten.
- Gluten is the storage protein found in wheat, rye and barley.
- Incidence as high as 1:133 not at risk patients and 1:22 in first degree relatives of celiac patients.

## PATHOGENESIS OF CELIAC DISEASE



## PATHOPHYSIOLOGY OF CELIAC DISEASE

- Gliadin is incompletely digested by gastric, duodenal and pancreatic secretions in humans
- leaving toxic epitopes, especially a 33 mer
- Enters lamina propria probably during infections



# Histologic changes seen in celiac patients



## Damaged villi

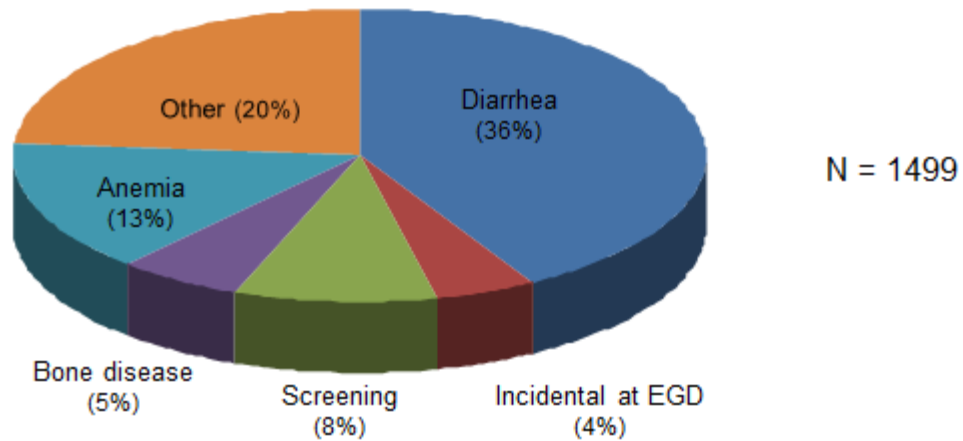
Celiac disease (CD) is characterized by damage to the absorptive villi and hyperplasia of the crypts in the small intestine.



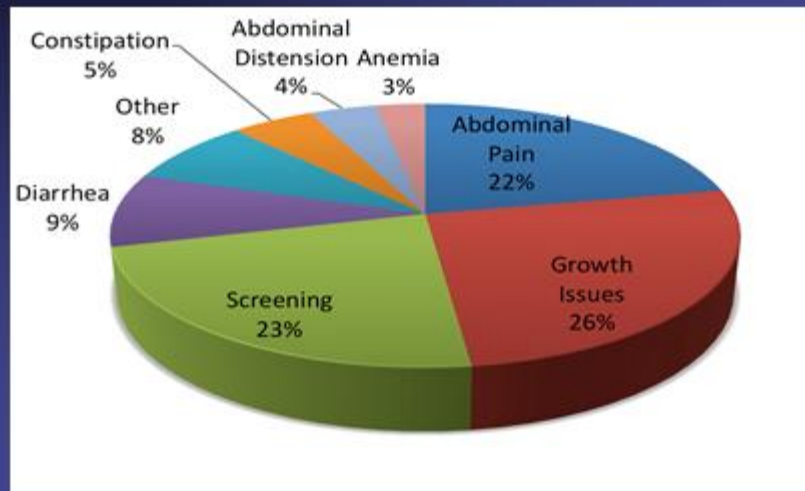
## Normal villi

Adhering to a gluten-free diet enables villi to recover.

## PRESENTATION OF CELIAC DISEASE (ADULTS)



**PEDIATRIC CELIAC DISEASE (CHONY)**  
**Modes of Presentation**  
**N=224 (2000-2008)**





8-10% of the 2.1 million people with Type I diabetes have celiac disease.

Patients with Down syndrome, Turner syndrome and Williams syndrome have a higher rate of celiac disease than the general population.

## DIAGNOSIS OF CELIAC DISEASE

Clinical  
Suspicion

Positive  
Serologies

**BIOPSY**

Endoscopy for any Reason

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graph TD; A[Clinical Suspicion] --> B[BIOPSY]; C[Positive Serologies] --> B; D[Endoscopy for any Reason] --> B; A --> C;
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## SEROLOGIC TESTS IN CELIAC DISEASE

- Antigliadin antibodies IgA, IgG NOT USED ANYMORE
- Deamidated gliadin peptide (DGP) antibodies
- Endomysial antibodies (EMA) IgA
- Tissue transglutaminase antibody (tTG) IgA
- Total serum IgA
  
- BEST COMBO – tTG IgA + DGP

## Oral presentation of celiac disease

- Permanent dentition may have bilateral , symmetrical and chronologic white or yellow opacities with or without rough horizontal lines or grooves. Enamel is without glaze and enamel structural defects may be present.
- Delayed eruption of teeth.
- Aphthous ulcers which lessen in severity when a gluten free diet is started.

## Classification of Enamel Defects specific to celiac disease

- Grade 0 No defect
- Grade1 Defect in color of the enamel. A part or the entire surface of enamel is without glaze.
- Grade2 Slight Structural defects. Enamel surface rough, filled with horizontal grooves or shallow pits.

## Classification of Enamel Defects specific to celiac disease

- Grade 3 Evident Structural defects. The enamel has deep horizontal grooves and is rough.
- Grade 4 Severe structural defects. The shape of the tooth is changed.







## The Association Between Celiac Disease, and Aphthous Ulcers in a United States Cohort.

- Overall those with Celiac Disease had a higher rate of enamel defects. 51% vs. 30%
- Children had a significantly higher rate of dental enamel defects than adults. 87% vs. 33%.
- There was a significant association of aphthous ulcers with celiac patients 42.4% vs. 23.2% in controls  $p=0.02$
- Patients with enamel defects have a significantly higher rate of aphthous ulceration than patients without enamel defects 41.5% vs. 25.3%  $p=0.05$
- Malahias, Cheng, Brar, Minaya , Green J Clin Gastroenterol 2009

## Oral mucosal changes

Intraepithelial T-cells were significantly more frequent in gluten free diet –treated Celiac disease patients than in controls.

Eur J oral Sci 1998; 106 899-906

# Saliva

- Celiac disease did not alter salivary flow rate
- The relative amounts of secreted proteins e.g amylase, IgA, and IgM were significantly lower in Celiac patients than in healthy controls.
- Gluten challenge resulted in a decrease in myeloperoxidase activity, IgA, and IgM concentrations and the relative amount of secreted IgA
- Studies show an increased rate of celiac disease in patients with Sjogren's syndrome.

(Changes in whole saliva in patients with coeliac disease Archives oral biology 45(2000)347-354

- Salivary test are not sensitive enough to be reliable in diagnosing celiac disease. (Green, Jones Celiac disease a hidden epidemic)

Celiac patients who have taken a gluten free diet for five years or more do not have an increased risk of developing cancer over all sites when compared with the general population. The risk is increased, in those taking a reduced gluten or a normal diet. This population has an excess of cancers of the mouth, pharynx and esophagus.(20).

## Dental Examination

- The Dentist should be alert for delayed eruption of permanent teeth, aphthous ulcers (canker sores).
- Take notice of Enamel defects which are bilateral and chronologically distributed.
- The Dentist should review medical history, paying close attention to **unresolved anemia, Juvenile diabetes, Autoimmune thyroid conditions**, chronic gastrointestinal complaints, and make appropriate referral to the physician for serologic testing based on collaborative oral findings.

## Dental Products

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- Major dental product manufacturers of dental adhesives, impression materials, restorative materials tooth pastes. do not include gluten in their formulations.
  - Due to the multitude of companies and the fact that some companies market products made by other companies it is best to call the manufacturer when in doubt.
-

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Calcium Release in Prophylaxis Paste\*

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ACP	~20
Novamin + ACP	~90

\*Data on file

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## Gluten free dental products

- Aquafresh toothpaste
- Crest products
- Colgate products
- Sensodyne and Sensodyne pro-enamel
- Biotene products for dry mouth
- Oraqix (topical anesthetic)
- Toms of maine oral care products
- If in doubt call the company consumer help line