

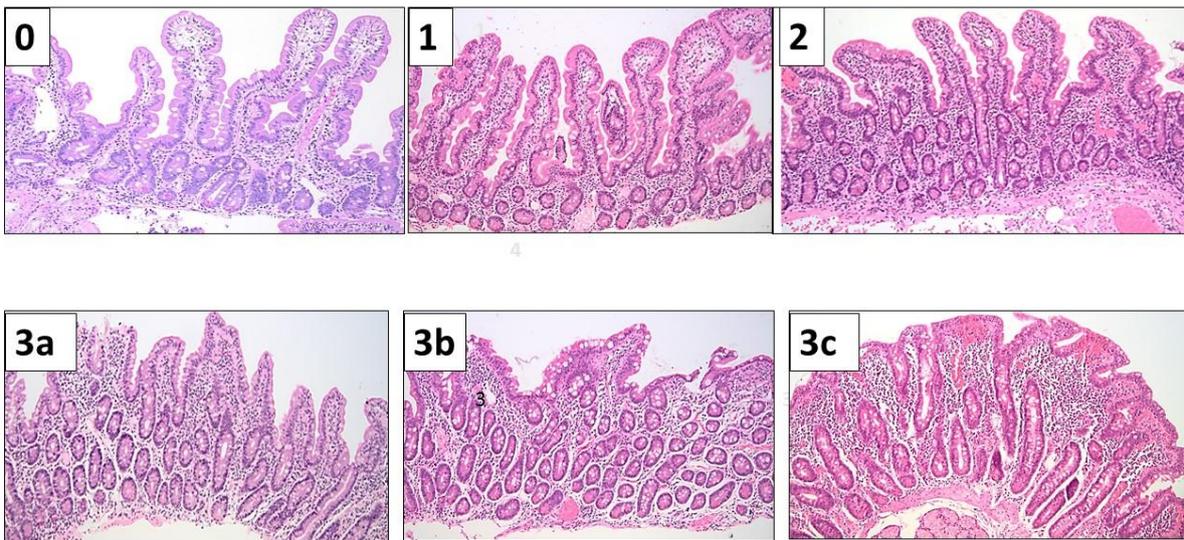
Histopathology of coeliac disease

Histopathology of proximal small intestinal biopsies remains the gold standard to confirm a diagnosis of coeliac disease. Typically, coeliac disease is characterised by the triad of histological features:

- 1) intraepithelial lymphocytosis (IEL>30/100 epithelial cells),
- 2) lamina propria inflammation, and
- 3) villous atrophy.

When all three features are present, there are only occasional circumstances where the patient does not prove to have coeliac disease. However, as recognised and staged originally by Marsh, villous atrophy may not always be encountered. In fact, duodenal biopsies for coeliac disease can show a spectrum of villous changes ranging from normal villi to complete atrophy.

MARSH STAGES



Marsh stage	0	1	2	3a	3b	3c
IEL (no./100 epithelial cells)	<30	≥30	≥30	≥30	≥30	≥30
Crypts	normal	normal	hypertrophic	hypertrophic	hypertrophic	hypertrophic
Villi	normal	normal	normal	atrophy +	atrophy ++	no villi
Histological designation	Normal	Intraepithelial lymphocytosis		Mild partial villous atrophy	Moderate partial or subtotal villous atrophy	Total villous atrophy

Comments and caveats

A number of issues with the biopsy diagnosis of coeliac disease are worth highlighting.

- Histological changes are variable in severity within the duodenum. In rare cases, the changes may be localised to the duodenal bulb. This means that at least 3 duodenal biopsies, including one from the bulb, should be taken to ensure the most significant area of disease activity is sampled.
- The duodenal bulb may be affected by peptic duodenitis with villus blunting. Conversely coeliac disease can have a neutrophil infiltrate that mimics peptic duodenitis. Most gastrointestinal pathologists can make this distinction based on the constellation of changes present.
- Staging the degree of villous atrophy is performed on the worst affected biopsy fragments.
- TTG levels reflect the degree of mucosal damage. Patients with low level or normal TTG levels and only minimal histological changes may still have coeliac disease.
- Results of histology and serological tests can be discordant. A raised TTG with normal biopsy findings can reflect sampling error (see above) or represent false positive serology (raised TTG can be seen in other autoimmune conditions).

Further reading

Brown I, Smith J, Rosty C. Gastrointestinal Pathology in Celiac Disease: A Case Series of 150 Consecutive Newly Diagnosed Patients. *Am J Clin Pathol.* 2012; 138(1): 42-9.

Yantiss RK, Odze RD. Optimal approach to obtaining mucosal biopsies for assessment of inflammatory disorders of the gastrointestinal tract. *Am J Gastroenterol.* 2009; 104(3): 774-83.