Diagnostic value of confocal endomicroscopy in celiac disease.

BACKGROUND: Improved endoscopic screening with targeted biopsies might enhance diagnostic yield in celiac disease. Confocal endomicroscopy (CEM) allows high-resolution in vivo histological analysis. We compared the endomicroscopic findings during ongoing endoscopy with the histological findings graded according to the Marsh classification.

METHODS: Twenty-four patients with celiac disease and six patients with celiac disease that was refractory on a gluten-free diet were examined using CEM. The duodenal mucosa was evaluated by CEM and by conventional histological analysis in respect of villous atrophy, crypt hyperplasia, and increased numbers of intraepithelial lymphocytes (IELs> 40 / 100 enterocytes). The CEM results were assessed as to sensitivity, specificity, and interobserver variability. A Marsh classification score determined by CEM was compared to that obtained by histology. Thirty patients undergoing routine upper gastrointestinal endoscopy were used as controls.

RESULTS: Conventional histology showed villous atrophy and crypt hyperplasia in 23 and increased numbers of IELs in 27 of the 30 patients with celiac disease. With CEM, villous atrophy, crypt hyperplasia, and increased IELs were respectively identified in 17, 12, and 22 of the 30 patients. The agreement of the findings on CEM with those of conventional histology was good in
relation to villous atrophy (sensitivity 74 \%) and increased numbers of IELs (sensitivity 81 \%), but inadequate in relation to crypt hyperplasia (sensitivity 52 \%). The kappa values for determination of interobserver variability were 0.90 for villous atrophy, 1.00 for crypt hyperplasia, and 0.84 for IEL detection. In the 30 control patients, normal duodenal architecture was found by both histology and endomicroscopy, indicating an overall specificity of 100 \%. CONCLUSION: The assessment of duodenal histology by CEM in patients with celiac disease is sensitive and specific in determining increased numbers of IELs and villous atrophy, but insufficient in respect of crypt hyperplasia. For routine use of CEM in patients with celiac disease, the technique would need to be improved.