Beyond Standard Image-enhanced Endoscopy Confocal Endomicroscopy

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KEYWORDS

• IBD • Confocal endomicroscopy • Chromoendoscopy

KEY POINTS

- Endomicroscopy is a new imaging tool for gastrointestinal endoscopy.
- Panchromoendoscopy with targeted biopsies has become the method of choice for surveillance of patients with inflammatory bowel disease.
- Endomicroscopy can be added after chromoendoscopy to clarify whether standard biopsies are still needed.
- This smart biopsy concept can increase the diagnostic yield of intraepithelial neoplasia and substantially reduce the need for biopsies.
- Endomicroscopy is still mainly used for research but clinical acceptance is increasing because of a multitude of positive studies about the diagnostic value of endomicroscopy.

INTRODUCTION

Patients with long-standing extensive chronic inflammatory bowel disease (IBD) have an increased risk to develop intraepithelial neoplasia and colitis-associated cancer compared with the average population risk. Triggers to neoplasia are chronic inflammation and sporadic adenoma.[1] Thus, colonoscopic surveillance is recommended in patients with long-lasting ulcerative colitis (left side and pancolitis) as well as Crohn's colitis.[2] Guidelines recommend performing targeted (visible lesions) and random biopsies. Here, 2 to 4 random biopsies every 10 cm within the colon should be performed.[2] Dysplastic lesions are often multifocal, flat, and difficult to detect with white light endoscopy.[2]

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In 2003, the first randomized controlled trial[3] was published evaluating lesions in the colon according to a modified pit pattern classification after panchromoendoscopy with methylene blue (0.1%) (pit pattern I–II, endoscopic prediction of nonneoplastic lesions; pit pattern III–V, endoscopic prediction of neoplastic lesions). Chromoendoscopy made it possible to identify dysplastic lesions and to clarify the borders between neoplastic and normal tissue. This development has led to the smart biopsy concept, in which more targeted biopsies become possible after enhanced endoscopy (chromoendoscopy) (**Figs. 1–3**). Panchromoendoscopy has become the method of choice for endoscopic surveillance of patients with IBD (European consensus guidelines).[2]

Confocal laser endomicroscopy (CLE) is a research and clinical tool that promises to improve diagnostics and therapeutic algorithms in patients with IBD. Endomicroscopy has been shown to be useful in dysplasia detection and differentiation of lesions to optimize their management (differentiation between colitis-associated neoplasia, sporadic neoplasia, and nonneoplastic lesions) and to reduce the number of unnecessary biopsies.[4] Confocal endomicroscopy has for the first time revealed in vivo tissue microscopy to gastroenterologists.[4] Using this technology, changes in vessel, connective tissue, and cellular-subcellular structures can be graduated during ongoing colonoscopy at subcellular resolution.[5,6]

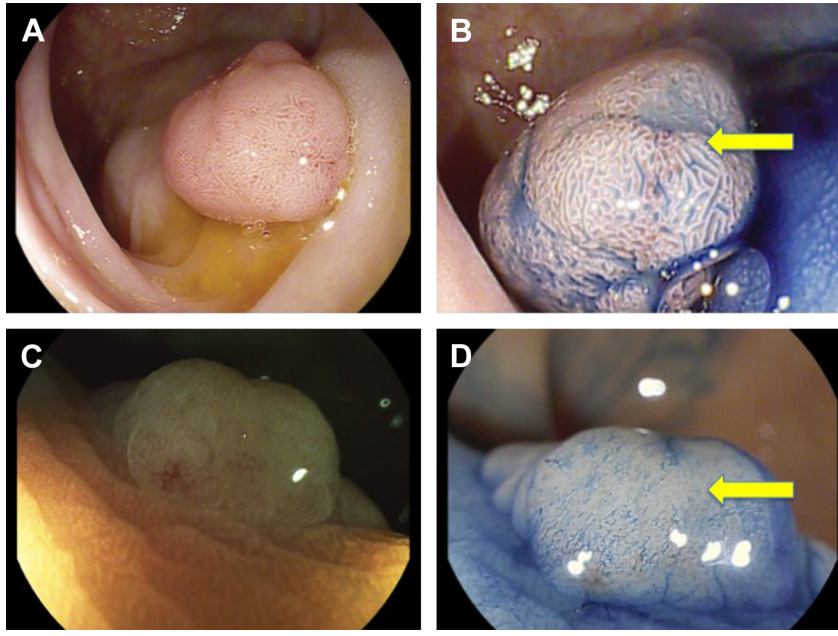

Fig. 1. Chromoendoscopy of colorectal lesions. (*A*) A polypoid lesion can be identified in the ascending colon of a 64-year-old patient who has had ulcerative colitis for 34 years. (*B*) Chromoendoscopy with methylene blue (0.1%) clarifies the mucosal pattern (pit pattern IIIL, *arrow*), which predicts tubular adenoma. Endoscopic resection was performed and final histology confirmed adenoma with low-grade intraepithelial neoplasia. (*C*) A sessile lesion can also be identified. A wide cryptal opening is seen (pit pattern II) using magnification and chromoendoscopy (*D*). Hyperplastic changes (nonneoplastic) could be confirmed histologically.