

In Vivo Characterization of DALM in Ulcerative Colitis with Probe-Based Confocal Laserendomicroscopy: The Expert's Approach



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Abstract

The term dysplasia-associated lesional mass (DALM) refers to a heterogeneous population of endoscopically visible lesions within the colitic colon, in the course of inflammatory bowel diseases, which has an associated dysplasia in the surrounding mucosa at histology. The presence of DALM is an indication for colectomy. Here the technique of probe-based confocal laser endomicroscopy is demonstrated for *in vivo* characterization of DALM in a patient with chronic ulcerative colitis. This article is part of an expert video encyclopedia.

Keywords

Dysplasia-associated lesional mass; Endomicroscopy; Inflammatory bowel diseases; Probe-based confocal laserendomicroscopy; Standard endoscopy; Video.

Video Related to this Article

Video available to view or download at doi:[10.1016/S2212-0971\(13\)70165-1](https://doi.org/10.1016/S2212-0971(13)70165-1)

Materials

- Endoscope: CF-160M video-colonoscopy; Olympus Europe, Hamburg, Germany.
- Confocal laserendomicroscopy (CLE) system: Cellvizio[®] Endomicroscopy System; Mauna Kea Technologies, Paris, France.
- Accessories: Coloflex UHD-type probe; Mauna Kea Technologies, Paris, France; Spay catheter, CN-23Q; Medi-Globe Corporation, Düsseldorf, Germany; Biopsy forceps PB-23Q; Medi-Globe Corporation, Düsseldorf, Germany.
- Contrast agent: 10% sodium fluorescein; ALFA INTES, Casoria, Italy.
- Staining: 1% methylene blue; Bioindustria L.I.M., Novi Ligure, Italy.

Background and Endoscopic Procedures

The term dysplasia-associated lesional mass (DALM) refers to a heterogeneous population of endoscopically visible lesions within the colitic colon, in the course of ulcerative colitis, which has an associated dysplasia in the surrounding mucosa at the histology. These lesions demonstrate plaque-like, mass, stricture, sessile, or pedunculated morphology. DALM have to be differentiated from inflammatory lesions and adenomatous polyps because the management of each of these lesions

differs radically, involving, medical therapy, endoscopic resection, or proctocolectomy, respectively.

Accurate diagnosis of DALM historically has required multiple biopsies of the circumscribed lesion followed by multiple biopsies of the adjacent mucosa.

CLE is a new technology that has enabled endoscopists to collect real-time *in-vivo* histological images or 'virtual biopsies' of the gastrointestinal mucosa during endoscopy.

The ability to target biopsies to areas suggestive of dysplasia *in vivo* allows rapid, highly accurate diagnosis 'on table', reducing inappropriate, nonsignificant histopathology.

Here the technique of probe-based CLE (p-CLE) is demonstrated for *in vivo* characterization of DALM in a patient with chronic ulcerative colitis.

A 52-year-old man underwent surveillance colonoscopy for a long-standing ulcerative colitis. He had undergone total colectomy and ileorectal anastomosis 18 years before for refractory disease, but had ceased all medical examinations and treatment for approximately 8 years.

Colonoscopy revealed many inflammatory polyps in the rectal stump and a sessile polypoid mass at the level of the anastomotic ring.

A morphological characterization of the lesion with p-CLE was undertaken. Five milliliters of 10% sodium fluorescein were injected as a contrast agent intravenously before CLE image acquisition. Confocal imaging of both the mass and surrounding rectal mucosa was performed by placing the tip of the probe in direct contact with the target tissue site.

p-CLE images of both the mass and surrounding rectal mucosa showed typical features of dysplastic mucosa according to Miami classification criteria for p-CLE,¹ suggesting the *in vivo* diagnosis of DALM.

Mucosal biopsy specimens were collected from the observation sites using biopsy forceps. Histology demonstrated low-grade dysplasia in all biopsy specimens, confirming the final diagnosis of DALM.

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Key Learning Points/Tips and Tricks

- Endoscopically visible lesions, in the course of long-standing ulcerative colitis, should be carefully inspected together with the surrounding mucosa.
- p-CLE has an important role in targeting biopsies, reducing the number of useless biopsies and improving the early detection of dysplasia.
- Carefully wash the mucosa prior to p-CLE.
- Use a cap to stabilize the probe.
- The best imaging quality can be achieved within 8 min of the fluorescein injection.

Complications and Risk Factors

- Short-term minor side effects of intravenous injection of sodium fluorescein: yellowish skin discoloration and bright yellow-colored urine.
- Safe procedure but there is a need to take into account patient allergies.

Scripted Voiceover

<i>Time (min:sec)</i>	<i>Voiceover text</i>
00:00 → 00:33	A 52-year-old man, affected by ulcerative colitis, was admitted for surveillance colonoscopy. He had undergone total colectomy and ileorectal anastomosis 18 years previously, for refractory disease. Colonoscopy reveals many inflammatory polyps in the rectal stump and a polypoid mass at the level of the anastomotic ring.
00:34 → 00:50	The lesion is stained with 1% methylene blue and carefully inspected together with the surrounding mucosa.

00:52 → 01:10

Five milliliters of 10% sodium fluorescein are injected intravenously.

The tip of the probe is placed in direct contact with the target tissue site of both the mass, and surrounding rectal mucosa.

01:13 → 02:08

Probe-based confocal laser endomicroscopy (p-CLE) imaging of the polypoid mass are highly suggestive for dysplasia, showing an irregular architectural pattern, characterized by irregularly sized and disrupted crypts, tubular shaped crypt, with goblet cells density attenuation, and dark epithelial borders with villiform structures.

02:10 → 02:36

The blood vessels are dilated and irregularly branching, with poor orientation to adjunct tissue, and fluorescein extravasation.

02:37 → 03:18

p-CLE imaging of rectal mucosa surrounding the lesion shows similar neoplastic criteria, suggesting the diagnosis of dysplasia-associated lesional mass (DALM).

Mucosal biopsy specimens are collected from the observation sites using biopsy forceps. Histology demonstrated low-grade dysplasia in all biopsy specimens, confirming the final diagnosis of DALM.

Reference

1. Wallace, M.; Lauwers, G. Y.; Chen, Y.; *et al.* Miami Classification for Probe-based Confocal Laser Endomicroscopy. *Endoscopy* **2011**, *43*(10), 882–891.