Multimodal imaging for detection and segmentation of Barrett's esophagus-related neoplasia using artificial intelligence

The early diagnosis of cancer in Barrett's esophagus is crucial for improving the prognosis. However, identifying Barrett's esophagus-related neoplasia (BERN) is challenging, even for experts [1]. Four-quadrant biopsies may improve the detection of neoplasia, but they can be associated with sampling errors. The application of artificial intelligence (AI) to the assessment of Barrett's esophagus could improve the diagnosis of BERN, and this has been demonstrated in both preclinical and clinical studies [2, 3].

In this video demonstration, we show the accurate detection and delineation of BERN in two patients (▶ **Video 1**). In part 1, the AI system detects a mucosal cancer about 20 mm in size and accurately delineates the lesion in both white-light and narrow-band imaging. In part 2, a small island of BERN with high-grade dysplasia is detected and delineated in white-light, narrow-band, and texture and color enhancement imaging. The video shows the results using a transparent overlay of the mucosal cancer in real time as well as a full segmentation preview. Additionally, the optical flow allows for the assessment of endoscope movement, something which is inversely related to the reliability of the AI prediction. We demonstrate that multimodal imaging can be applied to the AI-assisted detection and segmentation of even small focal lesions in real time.

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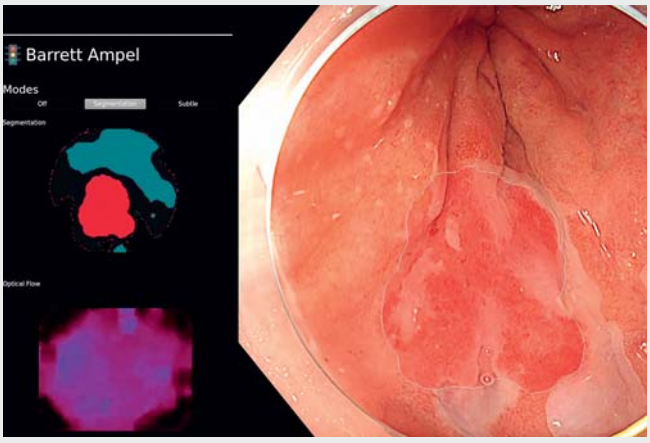

Video 1 Artificial intelligence (AI)-assisted detection and segmentation of Barrett's esophagus-related neoplasia. The AI system accurately detects and delineates even a small island of dysplasia in real-time multimodal imaging endoscopic examinations. NBI, narrow-band imaging; TXI, texture and color enhancement imaging.

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Competing interests

The authors declare that they have no conflict of interest.

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