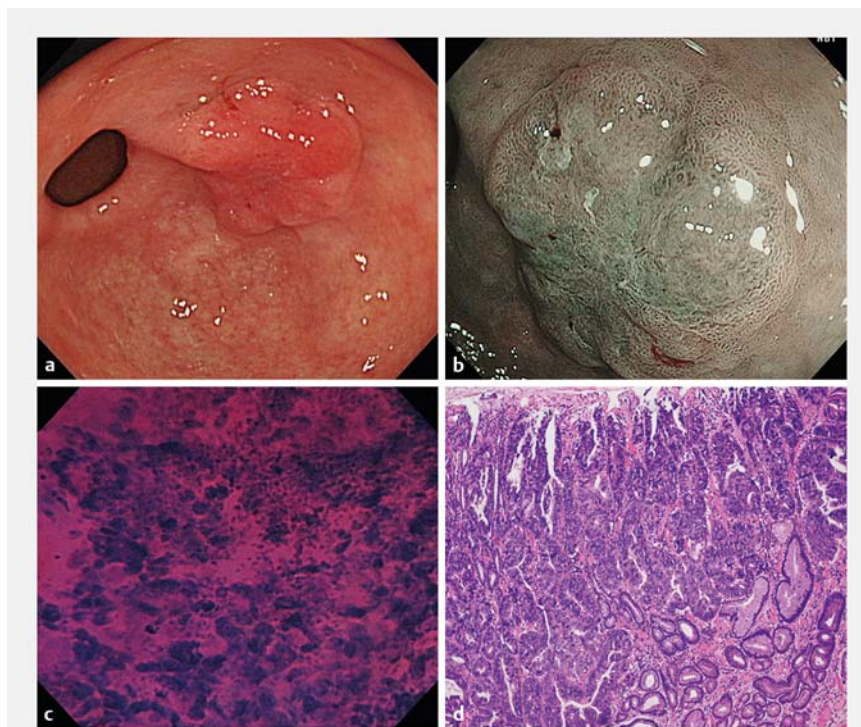


New-generation endocytoscopy for optical characterization of elevated-type early gastric cancer

Narrow-band imaging with magnification is a tool often used to predict the histology of early depressed-type gastric cancer on the basis of the observation of the vascular and surface structure [1]. However, it can be relatively difficult to characterize elevated-type lesions because the alert signs, such as microvascular pattern or demarcation line, are sometimes obscure [2]. New-generation endocytoscopy (single lens, continuous zoom) enables in vivo ultrahigh magnification ($\times 520$) for direct visualization at the cellular level and allows a precise pathological prediction of gastrointestinal neoplasia [3]. Herein, we report two patients with gastric elevated lesions that were characterized accurately by endocytoscopy (► Video 1).

Patient 1 An 80-year-old man was referred for endoscopic examination because of intermittent epigastralgia. One 2-cm elevated lesion was found on the posterior wall of gastric antrum using conventional white-light endoscopy (► Fig. 1 a) and narrow-band imaging (► Fig. 1 b). Prior to endocytoscopic observation, a mixture of 1% methylene blue and 0.05% crystal violet (CM double staining) was sprayed over the lesion to stain the nuclei and cytoplasm. Endocytoscopy showed some enlarged, disarranged, hyperchromatic nuclei (“enlarged nuclear sign”), with complete distortion of the glandular structure, features which are consistent with gastric cancer (► Fig. 1 c) [4]. Endoscopic submucosal dissection (ESD) was performed, with histopathology revealing a well-differentiated adenocarcinoma with invasion of the muscularis mucosa (► Fig. 1 d).

Patient 2 A 52-year-old man underwent endoscopic examination for longstanding acid regurgitation. A 2-cm elevated lesion was found accidentally on the posterior wall of the prepyloric antrum on endoscopy (► Fig. 2 a, b). Endocytoscopy



► Fig. 1 Images from patient 1 showing: a a 2-cm elevated lesion on the posterior wall of the gastric antrum on conventional white-light endoscopy; b the same lesion on narrow-band imaging; c some enlarged, disarranged, hyperchromatic nuclei (enlarged nuclear sign), with complete distortion of the glandular structure on endocytoscopy; d a well-differentiated adenocarcinoma with invasion of the muscularis mucosa on histopathology of the endoscopic submucosal dissection specimen.

was performed after CM double staining and showed a regularly arranged glandular structure, with sparse small round nuclei, which was recognized as being a benign lesion (► Fig. 2 c). ESD was performed, and the histopathology revealed a hyperplastic polyp (► Fig. 2 d). Endocytoscopy is therefore useful for real-time optical biopsy to distinguish early gastric cancer from non-cancerous lesions.

Endoscopy_UCTN_Code_CCL_1AB_2AD_3AB

Competing interests

The authors declare that they have no conflict of interest.

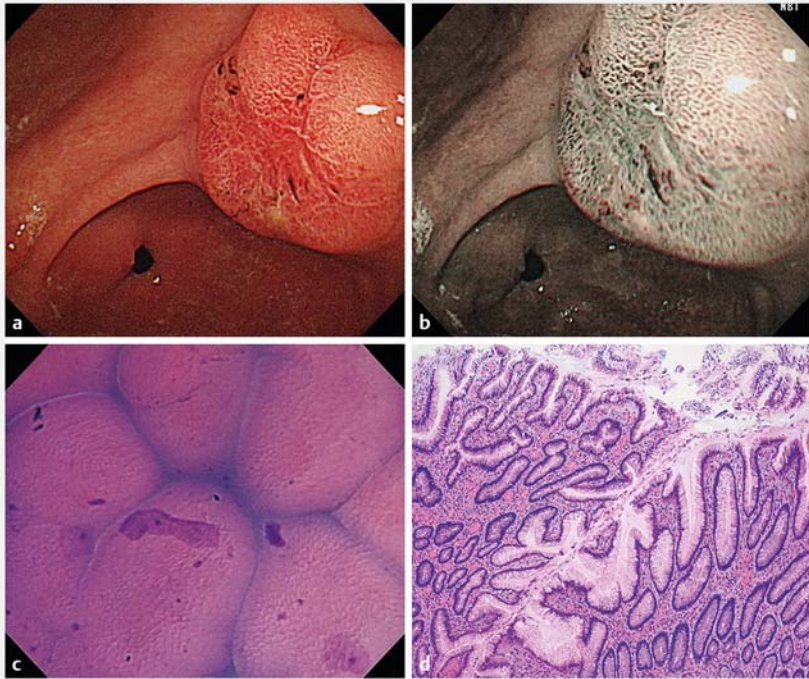
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Wen-Lun Wang^{1,2}, Hsiu-Po Wang³, Ming-Lun Han³, Ching-Tai Lee¹

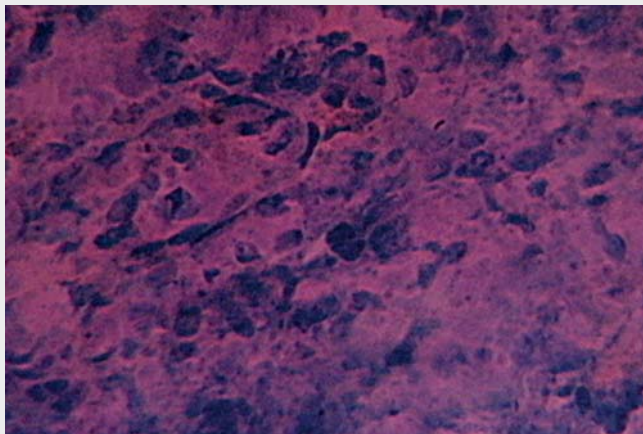
1 Department of Internal Medicine, E-Da Hospital/I-Shou University, Kaohsiung, Taiwan

2 School of Medicine, College of Medicine, I-Shou University, Kaohsiung, Taiwan

3 Department of Internal Medicine, National Taiwan University Hospital, Taipei, Taiwan



► **Fig. 2** Images from patient 2 showing: **a** a 2-cm elevated lesion on white-light endoscopy; **b** the same lesion on narrow-band imaging; **c** a regularly arranged glandular structure with sparse small round nuclei on endocytoscopy; **d** a hyperplastic polyp on histopathology of the endoscopic resection specimen.



► **Video 1** Endocytoscopy with CM double staining (1% methylene blue and 0.05% crystal violet) to characterize two elevated-type gastric lesions. The first case showed some enlarged, disarranged, hyperchromatic nuclei, with complete distortion of the glandular structure, consistent with gastric cancer. The second case revealed a regularly arranged glandular structure with sparse small round nuclei, which was recognized as being a benign lesion.

Corresponding author

Ching-Tai Lee, MD

Department of Internal Medicine, E-Da Hospital/I-Shou University, No.1, Yida Road, Jiaosu Village, Yanchao District, Kaohsiung City 82445, Taiwan
fattoo@gmail.com

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