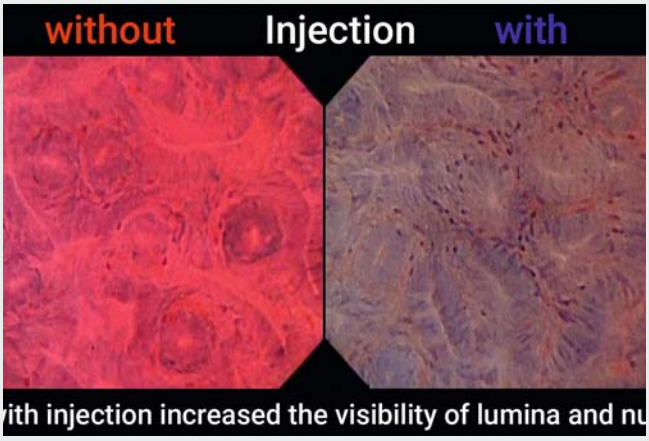
New techniques in endocytoscopy: submucosal injection heightens the visibility

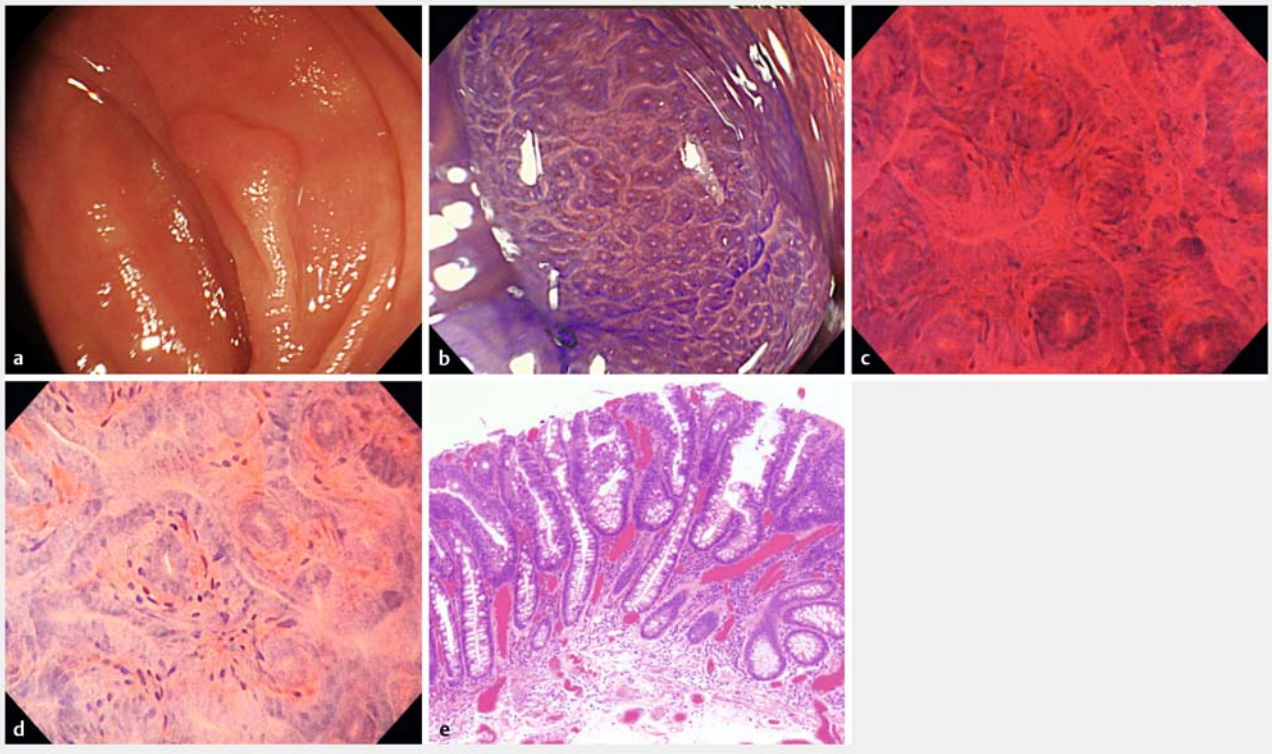
Endocytoscopy involves the use of a light contact microscope capable of magnifying endoscopic images up to × 520, allowing optical biopsy to the cellular level [1, 2].

A 69-year-old patient had an 8-mm 0-IIa lesion located in the transverse colon. We performed colonoscopy using endocytoscopy (CF-H290ECI; Olympus, Tokyo, Japan) without distal attachment (▶ **Video 1**).

Magnifying narrow-band imaging (NBI) showed Japan NBI Expert Team classification type 2A around the whole surface of the lesion (▶ **Fig. 1 a**) [3]. We then stained the lesion with 0.05 % crystal violet. Magnifying chromoendoscopy revealed type IIIL pit pattern (▶ **Fig. 1 b**) based on Kudo's classification [3].



Video 1 Endocytoscopy for an 8-mm 0-IIa lesion, located in the transverse colon. Because of the lack of light, we performed submucosal injection. Submucosal injection increased visualization of the lesion at the cellular level. EC, endocytoscopy.



▶ **Fig. 1** Endoscopic findings, treatment, and pathology. **a** An 8-mm 0-IIa lesion was located in the transverse colon. **b** Magnifying chromoendoscopy using crystal violet staining identified a type IIIL pit pattern. **c** The lesion was stained with methylene blue and endocytoscopic examination was performed (× 520). **d** Submucosal injection was performed and endocytoscopic examination was repeated. **e** The lesion was pathologically diagnosed as low grade adenoma.

Subsequently, the lesion was stained with 1% methylene blue (▶ **Fig. 1 c**, ×520). Diagnosis was made on the basis of Kudo's endocytoscopy classification [4]. However, it was difficult to evaluate lumina and nuclei, and we considered the lack of light to be the cause. Therefore, we performed submucosal injection of 0.9% saline under the lesion. In addition to the light reflected from the scope into the submucosal layer, submucosal injection led to a thickening of the submucosal layer, increasing the amount of light from the surroundings. The increased light intensity provided a clearer contrast to the background stroma and improved the visibility of the lumina and nuclei. The endocytoscopy image showed slit-like smooth lumina, and uniform and roundish nuclei (▶ **Fig. 1 d**). Furthermore, because we did not find irregular and rough lumina and a large number of roundish nuclei, we diagnosed the lesion as EC2. Endoscopic mucosal resection was performed and histopathological findings showed low grade adenoma (▶ **Fig. 1 e**).

Submucosal injection improved cellular visualization because swelling of the submucosal layer with saline strengthened the contrast between stroma, lumina, and nuclei. This method may improve the diagnostic ability of endocytoscopy. Further assessment is necessary to evaluate the effectiveness.

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Competing interests

The authors declare that they have no conflict of interest.

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