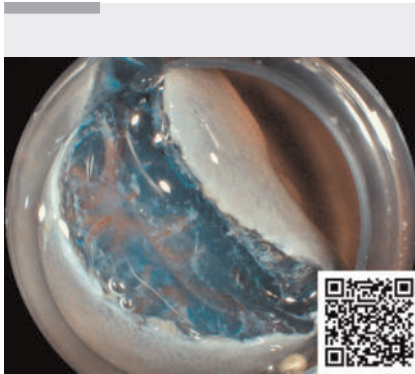


Enhanced visualization of vessels in submucosa by amber red color imaging in colonic endoscopic submucosal dissection

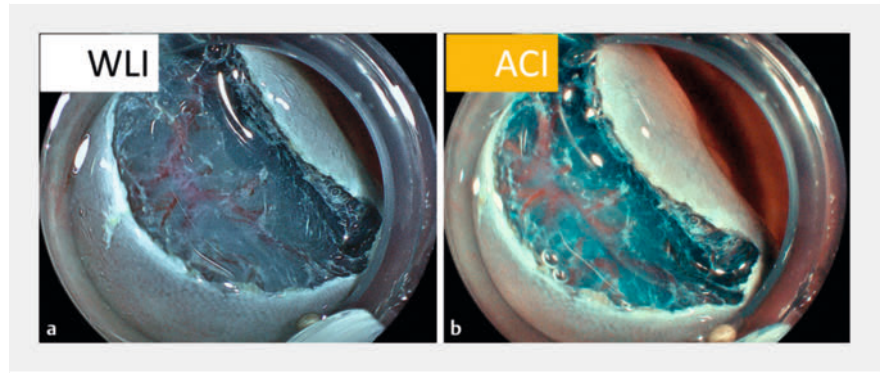
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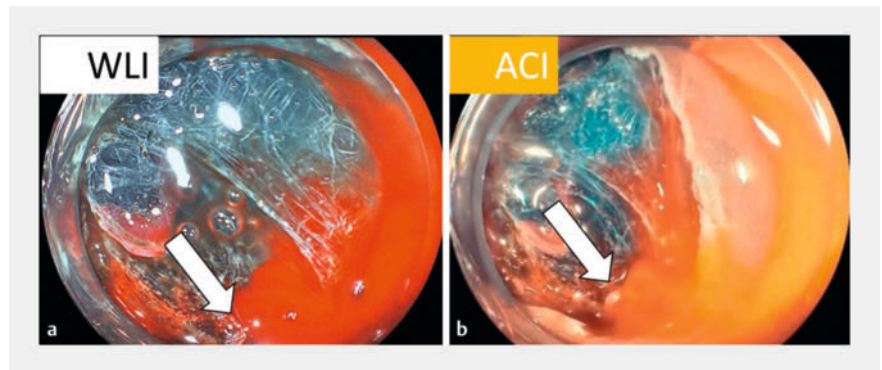
▶ Video 1 Enhanced visualization of vessels in submucosa by amber red color imaging in colonic endoscopic submucosal dissection.

Intraoperative bleeding is a major complication of endoscopic submucosal dissection (ESD). Various devices and techniques have been developed to control intraoperative bleeding [1–4]. Amber red color imaging is a recently developed observation modality that integrates brightness and color-enhancement technology used in linked color imaging, characterized by an increased proportion of long-wavelength relative linked color imaging, which targets the mucosa [5]. These amber red color imaging features improve the visibility of blood vessels and active bleeding points in the deep submucosa. Herein, we present a case of a colonic laterally spreading tumor that was treated with ESD using amber red color imaging (▶ **Video 1**).

A 25-mm laterally-spreading tumor was detected in the sigmoid colon. ESD was performed using an electrosurgical knife (Flush Knife BT 1.5; Fujifilm, Tokyo, Japan) and EC-760ZP-V/M colonoscope (Fujifilm) paired with an ELUXEO 7000 video system (Fujifilm). Mucosal injection and circumferential incision followed by submucosal dissection were performed from the anal side to the oral side. With the blue color of the submu-



▶ Fig. 1 Endoscopic images during mucosal incision obtained with white light imaging and amber red color imaging. **a** White light imaging. **b** Amber red color imaging.



▶ Fig. 2 Endoscopic images of active bleeding during submucosal dissection obtained with white light imaging and amber red color imaging. Arrow indicates the active bleeding point. **a** White light imaging. **b** Amber red color imaging.

cosa preserved, the overall visibility of the submucosa obtained with amber red color imaging was equivalent to that obtained with white light imaging (WLI). The visibility of vessels in the deep submucosa is greatly enhanced by amber red color imaging, which facilitates the easy and safe precoagulation of thick vessels and reduces the risk of intraoperative bleeding (▶ **Fig. 1**). Even when intraoperative bleeding occurred in the submucosa, amber red color imaging visualized active bleeding points as deep yellow against a background of surrounding yellow, indicating accumulated blood, whereas these points were not

clearly visible with WLI (▶ **Fig. 2**). Using amber red color imaging, quick and effective hemostasis was achieved in this case and en bloc resection was achieved without complications. In conclusion, amber red color imaging in ESD could be useful for reducing the risk of intraoperative bleeding by identifying thick vessels and active bleeding points, facilitating quick and safe hemostasis. Amber red color imaging makes ESD easier and safer.

Endoscopy_UCTN_Code_TTT_1AQ_2AD_3AD

Conflict of Interest

Mitsuru Esaki is a consultant for AI Medical Service Inc. Ogino Haruei is part of an endowed course supported by Miyarisan Pharmaceutical Co., Ltd.; Fujifilm Medical Co., Ltd.; Terumo Corporation; and Fancl Corporation. Ihara Eikichi received lecture fees from Takeda Pharmaceutical Co., Ltd. and EA Pharma Co., Ltd. The other authors declare no conflicts of interest.

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References

- [1] Kita A, Kuribayashi S, Itoi Y et al. Efficacy of using red dichromatic imaging throughout endoscopic submucosal dissection procedure. *Surg Endosc* 2023; 37: 503–509. doi:10.1007/s00464-022-09543-w
- [2] Ikenoyama Y, Iri A, Imai H et al. Endoscopic submucosal dissection of an early-stage gastric tumor with minimal bleeding using full-time red dichromatic imaging. *Endoscopy* 2022; 54: E1001–E1002. doi:10.1055/a-1887-6024
- [3] Tanaka S, Toyonaga T, Morita Y et al. Efficacy of a new hemostatic forceps during gastric endoscopic submucosal dissection: A prospective randomized controlled trial. *J Gastroenterol Hepatol* 2017; 32: 846–851. doi:10.1111/jgh.13599
- [4] Maehara K, Esaki M, Sumida Y et al. Comparison of hemostatic ability between spray coagulation and forced coagulation modes in endoscopic submucosal dissection in patients with early gastric neoplasms: a study protocol for multicenter randomized controlled trial (Spray-G trial). *Trials* 2024; 25: 53. doi:10.1186/s13063-023-07852-6
- [5] Shinozaki S, Kobayashi Y, Hayashi Y et al. Colon polyp detection using linked color imaging compared to white light imaging: Systematic review and meta-analysis. *Dig Endosc* 2020; 32: 874–881. doi:10.1111/den.13613

Bibliography

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