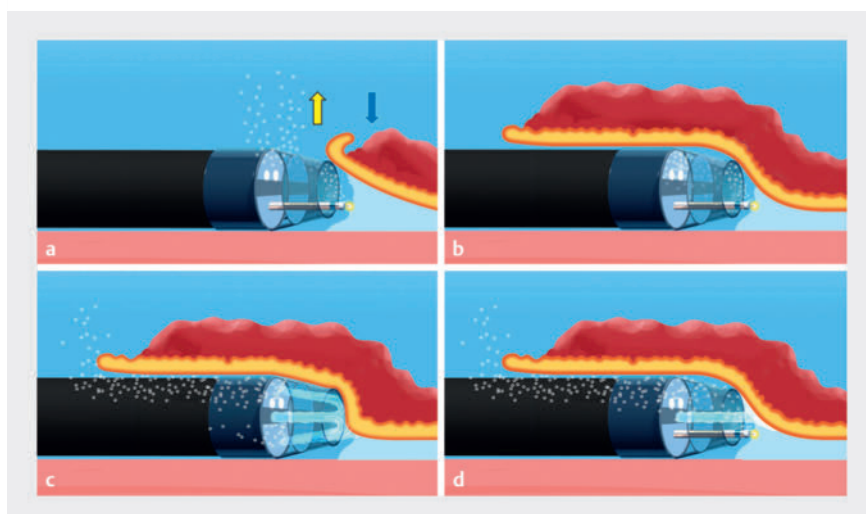


Continuous low water pressure dissection technique minimizing air bubbles during underwater endoscopic submucosal dissection

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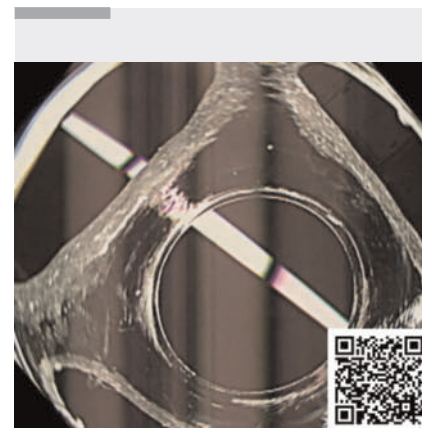


► Fig. 1 Comparison of conventional dissection and continuous low water pressure dissection techniques using a tapered hood with air bubble outlets in underwater endoscopic submucosal dissection. **a** Buoyancy (yellow arrow) automatically removes air bubbles through the air bubble outlets when the lesion is on the gravity side (blue arrow). **b** If the lesion is located opposite to gravity, the tissue obstructs the air bubble outlet, or large air bubbles form, and air bubbles accumulate in the hood. **c** Backflow of water pressure using the waterjet can remove air bubbles through the air bubble outlets. **d** Continuous low water pressure dissection technique. Dissection combined with continuous low water pressure using the waterjet function of the endoscope minimizes and removes air bubbles without the need to turn the waterjet on and off.

Underwater endoscopic submucosal dissection (UESD) in saline offers several advantages [1,2]. However, air bubbles generated during UESD can impair the visual field, particularly when they accumulate in the hood. To address this issue, outlets can be introduced on the side of the hood to facilitate air bubble removal [3,4]. Nevertheless, air bubbles accumulate in the hood in cases where the lesion is located opposite to gravity, the tissue obstructs the air bubble outlet, or large air bubbles form. This repeatedly necessitates the use of the waterjet function of the endoscope to flush out the air bubbles. Under saline, air bubbles are generated by the evaporation of saline caused by the energization of the electro-surgical knife, which creates a “vapor pocket” that enables the knife to perform dissection [5]. Continuous high water

pressure can make dissection difficult by hindering the formation of a sufficient vapor pocket, whereas continuous low water pressure helps maintain dissection power while minimizing and removing air bubbles. Therefore, we propose the continuous low water pressure dissection technique (CDT), which helps maintain the visual field during UESD (► Fig. 1).

► **Video 1** demonstrates UESD using a hood (ST hood short type; DH-29CR; Fujifilm, Tokyo, Japan) with self-made air bubble outlets for a colorectal tumor. As half of the lesion was located against gravity, air bubbles accumulated in the hood. The flushing pump setting (OFP-2; Olympus, Tokyo, Japan) was adjusted from strong to weak after creation of the mucosal flap, and CDT was initiated. CDT removed air bubbles that entered the hood without the need to turn the water-



► Video 1 Underwater endoscopic submucosal dissection using a continuous low water pressure dissection technique and a hood with four self-made air bubble outlets for resection of a laterally spreading tumor in the cecum.

jet on and off, thereby expediting the procedure. Without changing the output of the Swift Coagulation (Effect 3, 30W) in the electro-surgical generator (VIO300D; Erbe, Tübingen Germany), dissection power was maintained (► Fig. 2).

In conclusion, CDT helps maintain the visual field during UESD, enhancing the usefulness of a hood with air bubble outlets.

Endoscopy_UCTN_Code_TTT_1AQ_2AD_3AD

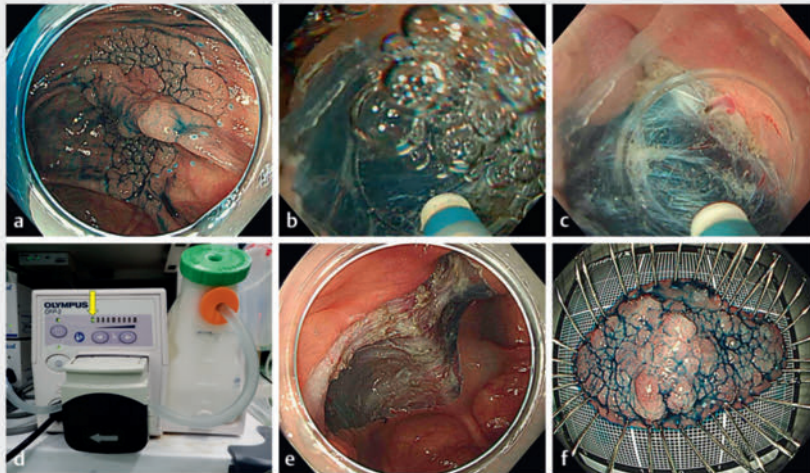
Conflict of Interest

The authors declare that they have no conflict of interest.

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► **Fig. 2** Underwater endoscopic submucosal dissection using the continuous low water pressure dissection technique and a tapered hood with air bubble outlets. **a** The laterally spreading tumor in the cecum was sprayed with indigo carmine. **b** As half of the lesion was located opposite to gravity, air bubbles accumulated in the hood. **c** The continuous low water pressure dissection technique effectively minimized and removed the air bubbles. **d** The flushing pump output (OFP-2; Olympus, Tokyo, Japan) was adjusted to the weakest setting (yellow arrow) to maintain the appropriate water pressure for dissection power. **e** The lesion was resected en bloc without perforation. **f** The resected specimen was sprayed with indigo carmine. Pathological examination revealed high grade dysplasia (World Health Organization classification), measuring 60 mm in size, with negative lateral and vertical margins.

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References

- [1] Nagata M. Usefulness of underwater endoscopic submucosal dissection in saline solution with a monopolar knife for colorectal tumors (with videos). *Gastrointest Endosc* 2018; 87: 1345–1353. doi:10.1016/j.gie.2017.11.032
- [2] Nagata M. Underwater endoscopic submucosal dissection in saline solution using a bent-type knife for duodenal tumor. *Video-GIE* 2018; 3: 375–377. doi:10.1016/j.vgie.2018.09.015
- [3] Nagata M. Tapered hood with wide holes in its sides for efficient air bubble removal during underwater endoscopic submucosal dissection. *Dig Endosc* 2022; 34: 654. doi:10.1111/den.14232
- [4] Nagata M. Underwater endoscopic submucosal dissection using a tapered hood with air bubble outlets for a subcircumferential duodenal tumor. *Dig Endosc* 2024; 36: 225–227. doi:10.1111/den.14696
- [5] Botto H, Leuret T, Barré P et al. Electro-vaporization of the prostate with the Gyrus device. *J Endourol* 2001; 15: 313–316

Bibliography

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