

## DEN Video Article

# Modified underwater endoscopic mucosal resection for a laterally spreading tumor: “Underwater” snaring and “undergas” resection

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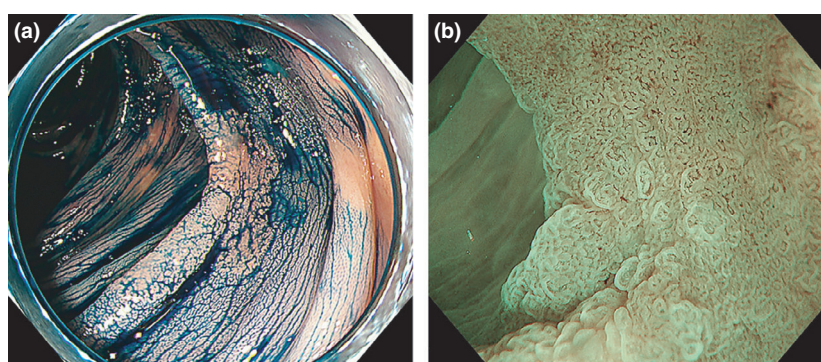
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## BRIEF EXPLANATION

UNDERWATER ENDOSCOPIC MUCOSAL resection (UEMR) was first described by Binmoeller *et al.*<sup>1</sup> Recently, the usefulness and safety of UEMR have been demonstrated.<sup>2–4</sup> In a randomized controlled trial, UEMR was significantly superior in terms of R0 resection rate for intermediate-size sessile colorectal lesions compared with conventional EMR.<sup>5</sup> However, perforation during UEMR has been reported. In case of perforation, water leakage may aggravate peritonitis. Here, we report a safer modified UEMR method.

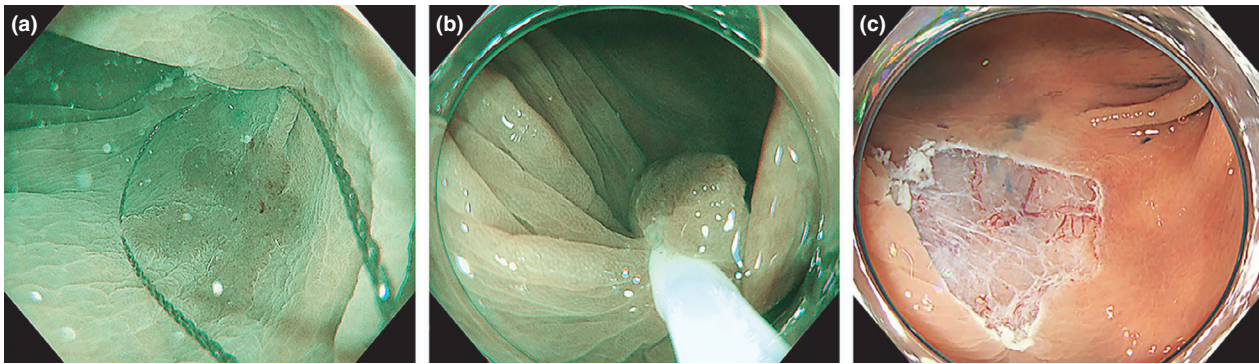
A 65-year-old woman had a laterally spreading tumor (non-granular type, 0-IIa), 20 mm in diameter in the

transverse colon (Fig. 1a). Magnifying endoscopy with narrow-band imaging (NBI) showed regular microvessels and surface structures, suggesting an adenoma (Fig. 1b). Degassed water was infused until complete filling of the lumen using a mechanical water pump (OFP-2; Olympus, Tokyo, Japan). The lesion was captured by a 25-mm snare (Snaremaster; Olympus) under water (Fig. 2a). Infused water was removed and the lumen was inflated with CO<sub>2</sub> after snaring to avoid water leakage into the abdominal cavity in case of perforation. After water removal, resection was performed using electrocautery (Endo-cutQ, Effect2, Duration1, and Interval4; VIO300D, Erbe Elektromedizin GmbH, Tübingen, Germany; Fig. 2b). *En bloc* resection was achieved, and no residual lesion was seen on the wound's



**Figure 1** (a) Chromoendoscopy (indigo carmine) showed a laterally spreading tumor, non-granular type (0-IIa). (b) Magnifying endoscopy with narrow-band imaging; brown vessels surrounding white structures were observed.

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**Figure 2** (a) Snaring under the water. (b) Resection after removing the water and inflating CO<sub>2</sub>. (c) The wound with no residual lesion after resection.

edge (Fig. 2c; Video S1). Endoscopic clipping was easily performed under gas situation as usual. Pathological findings indicated a low-grade adenoma with negative margin.

All procedures of the original UEMR were done underwater. We consider the most significant advantage of UEMR is ease of snaring and risk of perforation is theoretically the same whether under water or gas. However, there are some concerns such as loss of a heat-sink effect and post-polypectomy syndrome, so we are planning a feasibility study to demonstrate the utility and safety of this novel method. Our method may be able to avoid severe peritonitis caused by leaking unclean water when a perforation occurs.

## CONFLICT OF INTEREST

**A**UTHOR Y.T. HAS received honoraria for lectures from Olympus, Boston Scientific (Japan), Daiichi-Sankyo, Miyarisan Pharmaceutical, Asuka Pharmaceutical, AstraZeneca, EA Pharma, Zeria Pharmaceutical, Fujifilm, Kaneka Medix, Kyorin Pharmaceutical, and Japan Gastroenterological Endoscopy Society. The other authors declare no conflict of interest for this article.

## REFERENCES

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## SUPPORTING INFORMATION

**A**DDITIONAL SUPPORTING INFORMATION may be found in the online version of this article at the publisher’s web site.

**Video S1** Modified underwater endoscopic mucosal resection for a laterally spreading tumor.