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Supplementary uses for a novel injecting needle-knife that facilitate esophagogastric endoscopic submucosal dissection

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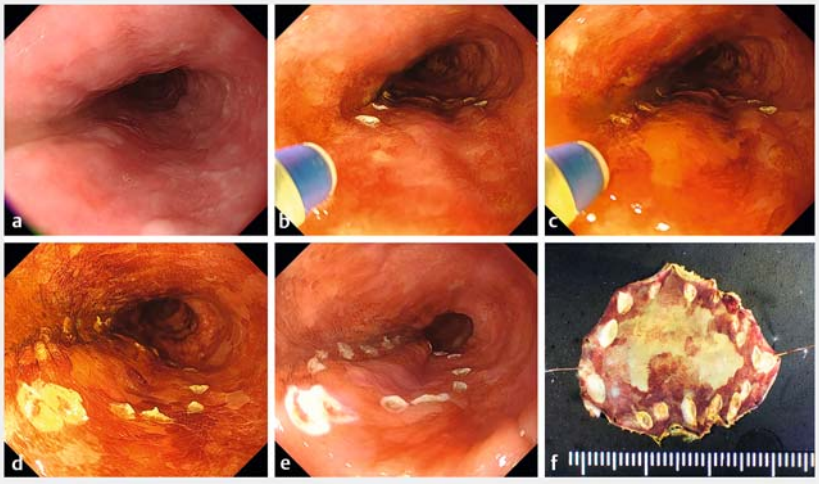
A new needle-type endoknife, ProKnife (Boston Scientific Corp., Marlborough, Massachusetts, USA), for endoscopic submucosal dissection (ESD), has two features that are similar to other endoscopic knives that permit injection as well as dissection [1]. The first is a 24-gauge injection lumen opening at the needle tip, which enables focal injection of highly viscous liquids, such as hyaluronic acid [2,3]. The second is a disk-shaped blunt tip that can selectively hook fibrotic tissues and blood vessels in the submucosal layer without breaking these structures before electric current flows. We present two cases in which these features were highly advantageous in terms of their additional uses during ESD procedures (▶ **Video 1**).

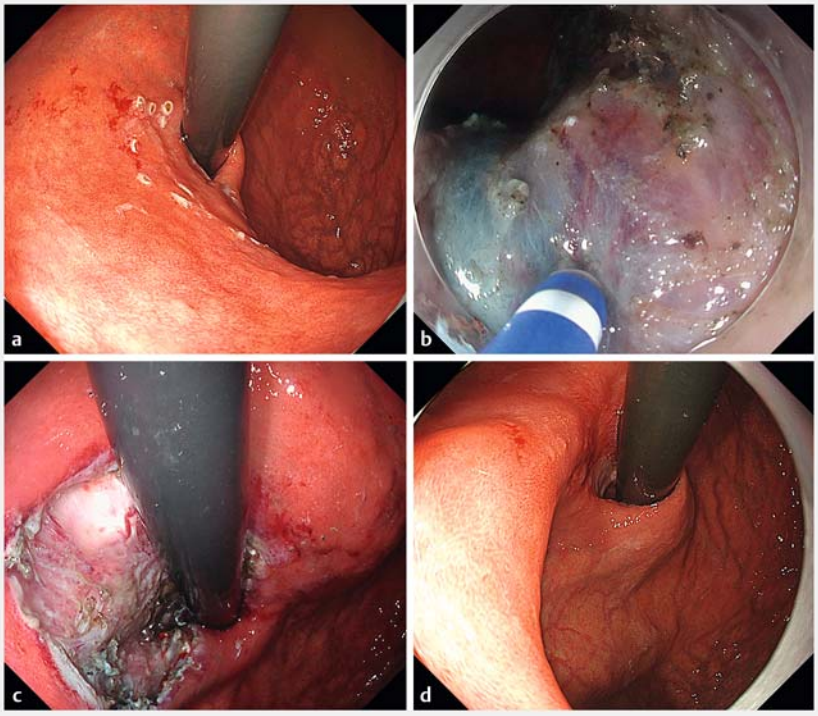
Case 1. Although the color change when using Lugol's solution is useful for diagnosing the extent of superficial esophageal squamous cell carcinoma, it disappears within a few minutes, resulting in the frequent need to reapply it to large lesions. Using the ProKnife, Lugol's solution could be repeatedly sprayed without device exchange (▶ **Fig. 1 a–c**). Moreover, this advantage minimized the amount of focal spray, reducing the risk of aspiration due to backflow. After marking, Lugol's solution in the lumen of the device, as well as in the lesion area, was neutralized by flushing with sodium thiosulfate solution (▶ **Fig. 1 e**), so that the same device could be used throughout the procedure.

Case 2. Although triamcinolone injection into the submucosa after ESD for gastric/esophageal cancer has been reported to be useful in preventing postoperative stenosis [3,4], it poses a risk of perforation when it is inadvertently injected into the muscularis and requires meticulous manipulation. In this case, after ESD for a

Video 1 Use of a novel needle-knife with injection capability to facilitate endoscopic submucosal dissection (ESD) procedures: spraying Lugol's solution and marking using a ProKnife for esophageal carcinoma; and injecting triamcinolone into the submucosa for the prevention of post-ESD stenosis.



▶ **Fig. 1** Marking for esophageal submucosal dissection (ESD) using the ProKnife. **a** A 0-IIc lesion, 20 mm in size, on the posterior wall of the middle thoracic esophagus. **b** During marking, the color change due to the Lugol's solution faded. **c** Additional spraying with Lugol's solution. **d** Complete marking around the entire circumference of the lesion. **e** Neutralization by spraying with sodium thiosulfate. **f** ESD specimen. Marking had been done precisely outside the lesion margin.



▶ **Fig. 2** Injection of triamcinolone into the submucosa using a ProKnife for the prevention of stenosis following endoscopic submucosal dissection (ESD). **a** A 0-IIc adenocarcinoma, at the gastric cardia in the lesser curvature, 15 mm in size. **b** Triamcinolone injection into the post-ESD ulcer. **c** Areas injected with triamcinolone became cloudy in appearance; thus, it was possible to evenly inject the submucosa. **d** Endoscopic view 2 months after ESD. There was no stenosis with the scope unimpededly passing through the treated section.

lesion at the gastric cardia, triamcinolone could be injected selectively into the residual submucosa using a ProKnife. The process seemed safe because the blunt tip did not penetrate into the muscularis even when strong pressure was applied. Esophagogastroduodenoscopy performed 2 months later, showed no stenotic change at the ESD scar (▶ **Fig. 2**).

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Competing Interest

The authors declare that they have no conflict of interest.

The authors

Takeshi Shimizu, Yoshihide Kanno, Taku Yamagata, Tetsuya Ohira, Yoshihiro Harada, Kei Ito
Department of Gastroenterology, Sendai City Medical Center, Sendai, Japan

Corresponding author

Takeshi Shimizu, MD
Department of Gastroenterology, Sendai City Medical Center, 5-22-1 Tsurugaya, Miyagino, Sendai 983-0824, Japan
Fax: +81-222529431
takeshi.shimizu@openhp.or.jp

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