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Additional irrigation tube with therapeutic endoscope to aid gel immersion endoscopic submucosal dissection

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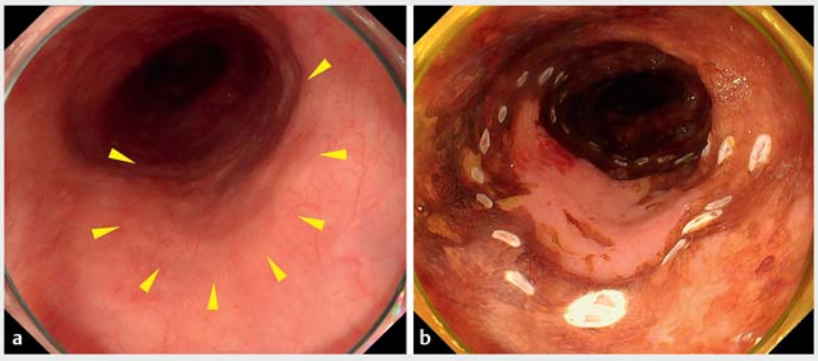
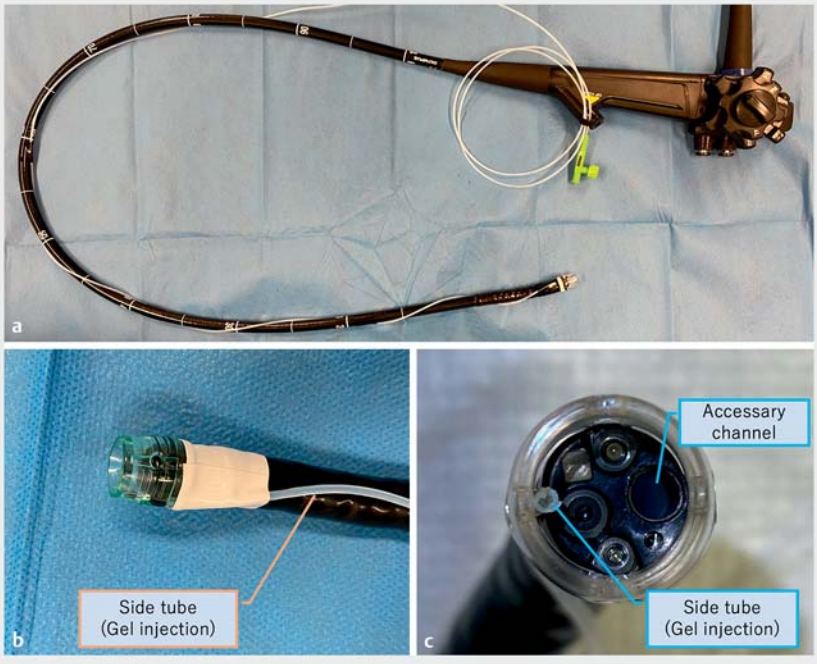
Gel immersion endoscopy has several advantages including low pressure (to prevent patient discomfort) [1], easy implementation of hemostasis with clear visibility of the bleeding point [2, 3], a clear visual field, and the buoyancy effect during endoscopic submucosal dissection (ESD) [4, 5]. However, gel immersion endoscopy requires a specific device, the BioShield irrigator (US Endoscopy, Mentor, Ohio, USA) [4, 5], which combines the gel supply, device insertion, and aspiration line into one accessory channel. This arrangement interferes with the gel or the air during insertion and removal of endoscopic devices, and wastes gel in the channel collected by aspiration. To overcome these disadvantages, we developed a novel technique using a scope fitted with an easily available tube for gel supply, and we achieved successful esophageal ESD with it.

A man in his 70 s had a superficial esophageal squamous cell carcinoma, 28 mm in size (▶ **Fig. 1**). The lesion was located on the left-side wall of the middle thoracic esophagus, where water accumulates due to gravity. We decided to perform gel immersion ESD to secure a clear field. A general catheter for endoscopic retrograde cholangiopancreatography was prepared along with the scope (GIF-H290T; Olympus, Medical Systems Corp., Tokyo, Japan) to supply the gel products (Viscoclear gel; Otsuka Pharmaceutical Factory, Tokushima, Japan) (▶ **Fig. 2**, ▶ **Video 1**), which allowed us to supply the gel independently without wasting any of it. Air bubbles caused by thermal effects with an endoknife sometimes decreased visibility. Placing the tube tip on the opposite side of the accessory channel allowed air bubbles at the side of the tube not accessible via the accessory channel to be cleaned out by the pressure of the injected gel. Eventually, curative resection was achieved by gel immersion ESD without complications (▶ **Fig. 3**, ▶ **Fig. 4**).



▶ **Fig. 1** Endoscopic images of a superficial esophageal squamous cell carcinoma, 28 mm in size, located on the left-side wall of the middle thoracic esophagus. **a** White-light imaging; **b** Lugol's iodine staining.



▶ **Fig. 2** **a** A therapeutic endoscope has a catheter for endoscopic retrograde cholangiopancreatography attached to inject the gel independently, without using an accessory channel of the scope. **b** The endoscope and the tube are attached with adhesive tapes, and their tips are attached with a transparent hood. **c** By placing the tube tip on the opposite side to the accessory channel, air bubbles at the side of the tube that cannot be reached by the accessory channel are cleaned out by the pressure of the injected gel.

Video 1 Gel immersion endoscopic submucosal dissection for a superficial esophageal cancer using a therapeutic endoscope with an additional irrigation tube attached for gel supply.

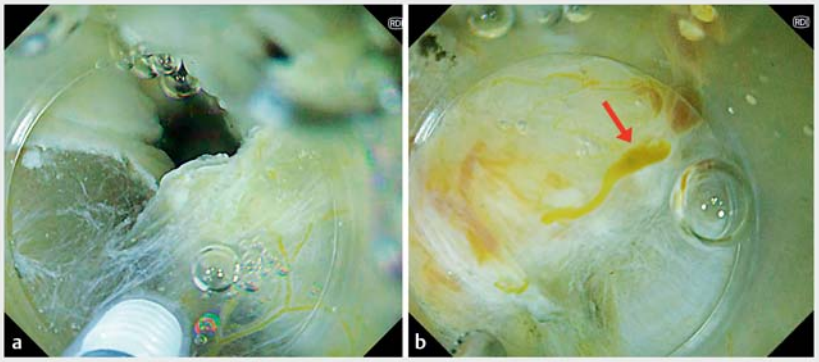


Fig. 3 Endoscopic images of esophageal endoscopic submucosal dissection (ESD) using the gel immersion technique in dual red imaging mode. The gel supply makes the visual field clear during esophageal ESD. **a** Gel immersion can makes the lesion clearer and helps with the dissection. **b** It also makes the bleeding point (red arrow) clearly visible.

An additional irrigation tube with a therapeutic endoscope may be helpful for gel immersion ESD.

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Competing interests

The authors declare that they have no conflict of interest.

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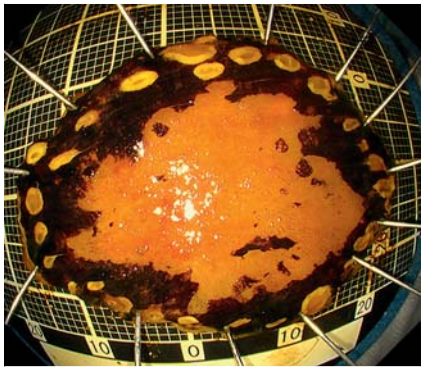

Fig. 4 Macroscopic image of the resected specimen of a superficial esophageal squamous cell carcinoma. Curative resection was achieved by ESD using the gel immersion technique.

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