Usefulness of a handmade distal endoscope attachment with a transparent tape

Marie Kurebayashi, MD, Eiji Sakai, MD, PhD, Yuichiro Suzuki, MD, Ken Ohata, MD, PhD

Distal attachments placed on the endoscope tip can improve visualization of the endoscopic field and have been applied for a variety of endoscopic procedures (eg, colonic insertion, detection, diagnosis, and treatment).[1] Although manufactured distal attachments are commercially available, it may be necessary to prepare different types to suit different endoscopes because the distal outer diameters of endoscopes vary widely. In addition, cost-effectiveness leads to hesitation about the use of commercially available distal attachments in daily practice. Herein, we present a handmade distal attachment created with transparent tape (Fig. 1) and introduce its usefulness for a variety of endoscopic procedures (Video 1, available online at www.VideoGIE.org). This study was approved by the ethics committee of NTT Medical Center Tokyo (ID: 19-72).

The only necessary tools to make the tape hood are a pair of scissors and a ruler. The tape we used is made of polyvinyl chloride; the thickness is 0.02 mm (YAMATO, Hyogo, Japan). The tape has adequate firmness, flexibility, and adhesive force. Because tape made of polyvinyl chloride is inexpensive, and thus used commonly in households, similar products can be purchased all over the world.

The process of making the tape hood is demonstrated in Figure 2. First, the tape was cut to match the diameter of each endoscope plus an additional 5 mm. For example, the circumference of the CF-HQ 190 colonoscope (Olympus, Tokyo, Japan) is approximately 40 mm; therefore, the tape hood would be 45 mm. The fore end of the adhesive tape is laterally folded in 2, and thus the adhesive surface of the tape is not exposed. Because the surface of polyvinyl chloride is smooth, debris and mucus can be easily flushed out. The corners of the tape ends are folded to prevent mucosal injury. Finally, the transparent tape is wrapped around the endoscope tip over a suitable length. Additional tape can be used to fix the hood to prevent detachment from the tip.

As shown in Video 1 (available online at www.giejournal.org), the tape hood can be made easily and at little cost. A short lecture would suffice to teach the tape hood technique. Because the process of making the tape hood is simple, it only requires a few minutes. From our experience, a nurse or technician can make it within 3 minutes after the short lecture. Of note, the tape hood can be applied for all types of endoscopes, regardless of their outer diameters.

The usefulness of the tape hood was confirmed in lower GI endoscopy. As for colonic insertion, the tape hood improves the endoscopic field for a moderate distance from the fronting mucosa. In addition, it enables holding of the colonic folds, thereby helping in the identification of polyps hidden within the folds. The hardness of the tape hood was sufficient for performing retroflexion in the rectum.

Distal attachments are often applied for therapeutic endoscopy. In particular, endoscopic submucosal dissection (ESD) requires an adequate length of hood so that a safe submucosal dissection plane close to the muscularis layer can be selected and traction can be provided with the tip. We applied the tape hood for colonic ESD. The length of the tape hood can be adjusted freely according to the operators' needs. We consider a tape hood 2 to 3 mm in length to be suitable for routine endoscopic examination. We used a 4 to 5 mm tape hood for therapeutic endoscopy (eg, ESD).

The hardness of the tape hood was much improved when the tape was wound twice around the endoscope. Although we consider single winding to be strong enough for a short hood (2-3 mm), double winding may be recommended for therapeutic endoscopy, such as ESD (4-5 mm). Recently, we performed 2 cases of ESD using a transnasal endoscope.[2,3] Because distal attachments are not available for small-caliber endoscopes, we used the handmade tape hood. An additional advantage of the tape hood is its thin nature (~0.1 mm), such that the GI mucosa is not injured even when the endoscope is passed through narrow spaces, such as the nasal cavity or luminal constrictions.

There are several limitations to be addressed. A tape hood longer than 5 mm is not hard enough and collapses easily during ESD. In addition, we were not able to modify the shape of the hood to shapes other than its original cylindrical shape. We recommend the use of a ready-made

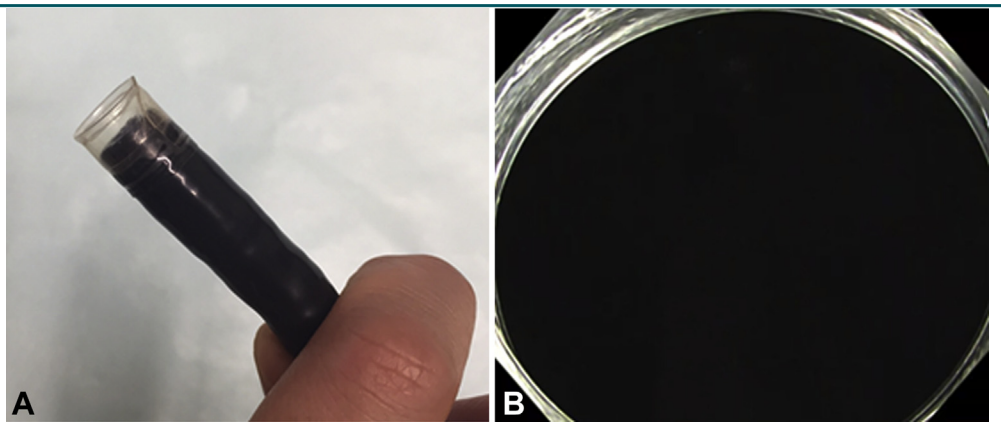

Figure 1. The tape hood. **A,** Exterior of the tape hood. **B,** Interior of the tape hood.

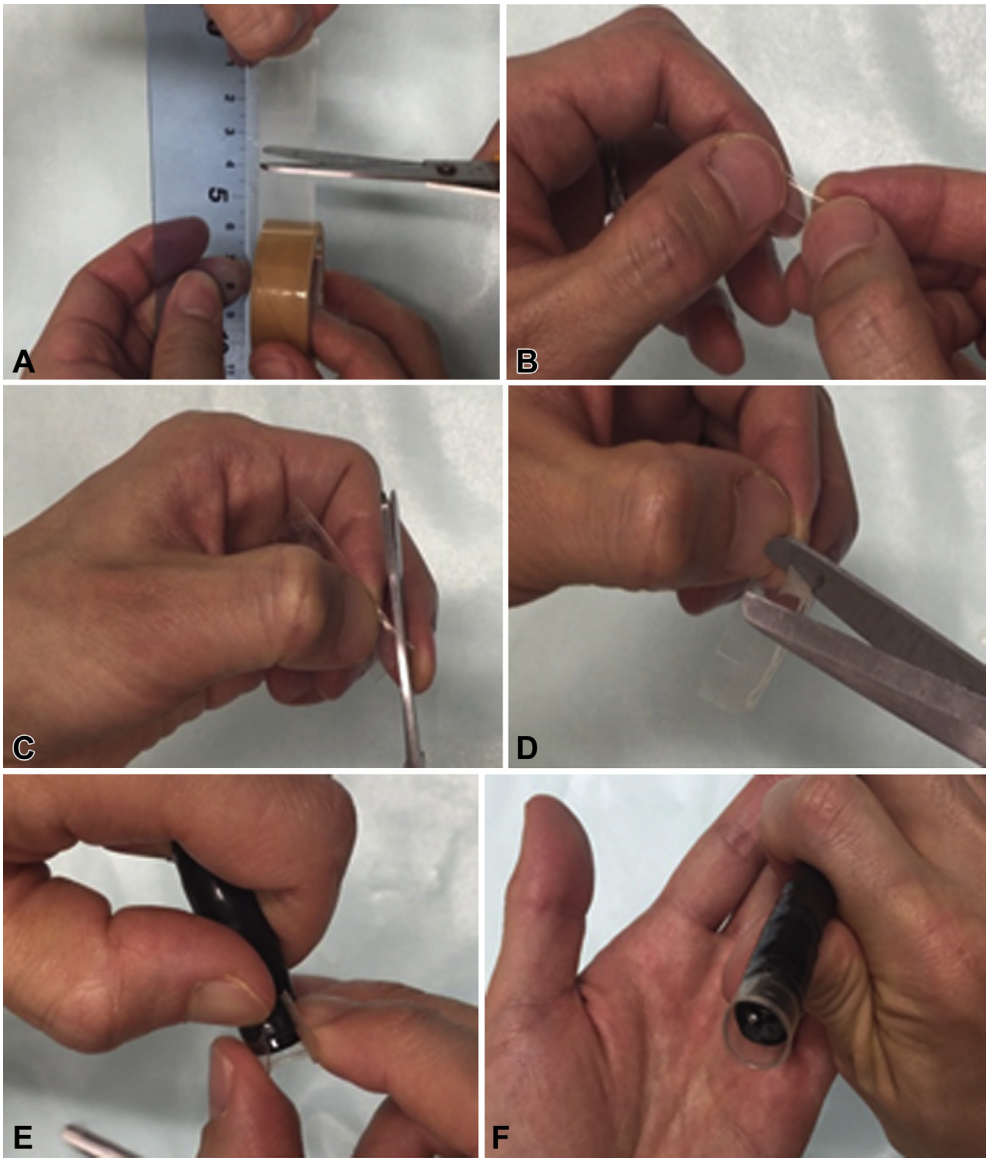

Figure 2. The process of making of the tape hood. **A,** Cut the tape to match the diameter of the endoscope. **B,** Fold the fore end of the adhesive tape. **C,** Cut the corner on the curve of both tape ends. **D,** Cut the one inner corner of the tape to prevent mucosal injury. **E,** Finally, wrap transparent tape around the endoscope tip to be a suitable length. **F,** The entire process is completed within a few minutes.

hood when use of corn-shaped hoods is required (eg, ST hoods; Fujifilm, Tokyo, Japan).

In conclusion, the tape hood is simple to make, is highly cost-effective, and can be applied for all types of endoscopes, regardless of their outer diameters. In addition, the length of the tape hood can be modified to suit each operator's need. The video demonstrates the usefulness of the tape hood, which can help in completing several endoscopic procedures, such as colonic examination or ESD.

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Department of Gastrointestinal Endoscopy, NTT Medical Center Tokyo, Tokyo, Japan.

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