Triangle-tip jet knife with hood attachment: novel modification to endoscopic knife

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Recently, a novel versatile knife (TriangleTipKnife J; Olympus, Tokyo, Japan) has become commercially available and is used especially in endoscopic submucosal dissection and peroral endoscopic myotomy.[1-3] The TriangleTipKnife J (TTJ knife) is an endo-knife with a water supply function (Fig. 1). Other endo-knives supply water from the sheath tip (ie, the base of the needle), not from the needle tip.[3] Because the needle tip goes deep into the puncture site, it is significantly more effective than local injection from the base of the needle. The knife length of the TTJ knife is 4.5 mm, and the triangular tip provides efficient incision and dissection without tissue sliding, but care must be taken to avoid perforation during the pull-through cut because of the long knife length.

The TTJ knife reduces the frequency of switching devices through the working channel for additional submucosal injection, which makes for more efficient endoscopic treatment; however, with regard to hemostasis, it still usually requires replacement to a hemostatic device as with other knives. Longer procedure times increase the total amount of anesthesia and affect postoperative awakening. Furthermore, the endoscope's field of view changes during device exchange, which can make hemostasis more difficult.

We report here the TTJ knife with hood attachment, in which the knife length is adjusted to 2 mm by attaching a sheath of disposable clip (QuickClip Pro; Olympus) to the tip (Fig. 2). This modification is very simple: just attach the sheath to the tip and cut it with scissors to make the knife length 2 mm (Video 1, available online at www.videogie.org; Figs. 3-5). The part of the sheath attached to the tip serves as a hood covering the knife. With the needle out, it is suitable for tissue incision and dissection, while with the needle in, it is suitable for marking and hemostasis (Fig. 6).

Abbreviations: APC, argon plasma coagulation; TTJ, TriangleTipKnife J.

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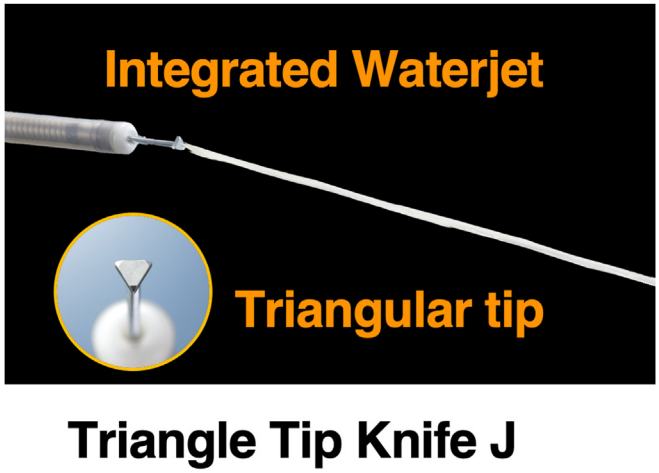

Figure 1. The TriangleTipKnife J is an electrosurgical knife with a water jet function.

Figure 2. The TriangleTipKnife J with hood attachment, in which the knife length can be adjusted to 1.5 to 2 mm by attaching a disposable outer sheath mantled to the knife's distal end cover.

The first advantage of the TTJ knife with attachment is that hemostasis with a closed needle attached to the mantle allows for noncontact coagulation such as argon plasma coagulation (APC). This hemostasis allows for uniform ablation to a depth of 1 to 3 mm, suitable for coagulation of superficial blood vessels. This feature makes hemostasis easier and shortens the procedure time. Of course, unlike APC, there is no carbonization of the probe tip and abdominal distention. Second, the knife's 2-mm length allows for more secure incision and dissection without feeling different from other devices and could

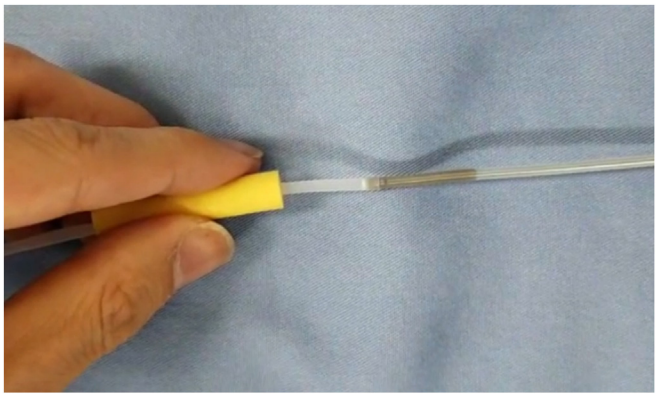

Figure 3. How to make TriangleTipKnife J with hood attachment. First, the outer sheath is attached to the distal end cover of the knife. The making of the TriangleTipKnife J with hood attachment is very simple: just attach the outer sheath to the distal end cover of the knife and cut it with scissors depending on the knife length of your choice.

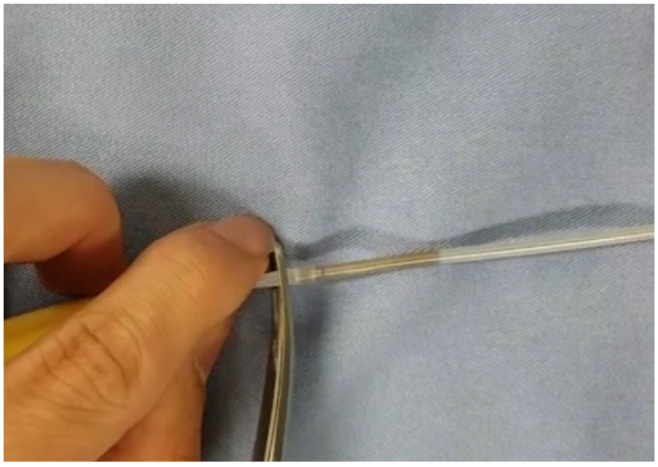

Figure 4. How to make TriangleTipKnife J with hood attachment. Then, cut with scissors depending on the knife length of your choice.

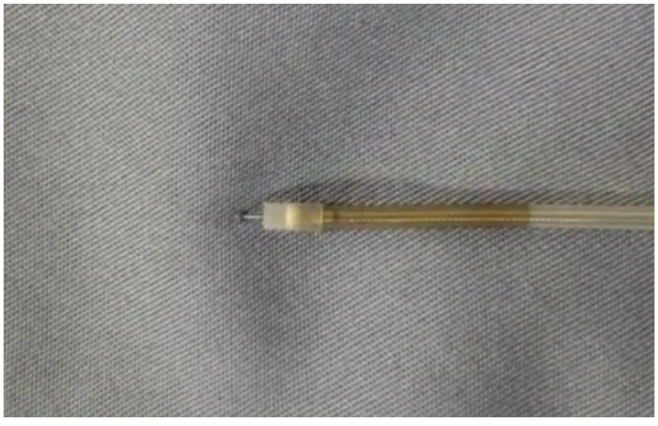

Figure 5. Complete Triangular Tip Knife J with hood attachment.

also be used for safer incision and dissection during pull-throughs. Finally, direct injection from the tip and effective hemostasis with the TTJ knife with attachment itself can considerably reduce device exchange, resulting in significantly shorter procedure times. This modification is likely more cost effective than using other devices for hemostasis, such as coagulation forceps.

Figure 6. With the knife out, the TriangleTipKnife J is suitable for tissue incision and dissection; with the knife in, it is suitable for marking and hemostasis.

In summary, the TTJ knife with attachment maintains the features of the TTJ knife itself, which allows stable injection from the center of the needle tip and effective incision and dissection with the triangular tip. One of the advantages of the TTJ knife with attachment itself is that the knife length can be adjusted to 2 mm by attaching a sheath, allowing for safer incision and dissection and reducing the risk of perforation. The other advantage is that this knife allows for a simple and effective hemostasis, similar to APC, by discharging with the needle closed. We have found that the TTJ knife with attachment is likely more cost effective than using other devices for hemostasis. Therefore, future studies should be prospective and aim to confirm the safety and efficacy for endoscopic treatment using the TTJ knife with attachment as compared to conventional needle knives.

In conclusion, the TTJ knife with attachment could be a novel, more effective, and safer device.

DISCLOSURE

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