



Possibility of ultrathin endoscopy in radial incision and cutting for esophageal strictures

Mako Koseki, MD,¹ Daisuke Kikuchi, MD, PhD,¹ Hiroyuki Odagiri, MD, MPH,¹ Harushi Udagawa, MD, PhD,² Shu Hoteya, MD, PhD³

INTRODUCTION

The radial incision and cutting (RIC) method is known as an effective technique for refractory esophageal stricture.^{1,2} Until now, RIC procedures have mostly been performed using normal-caliber endoscopes. Although the quality of visibility for ultrathin endoscopes has recently drastically improved, ultrathin endoscopic procedures are often not performed because of the limited number of designated devices. Here, we report a case of RIC using an ultrathin endoscope.

DEVICE

For ultrathin endoscopic procedures, we developed 2 instruments: an endoscopic submucosal dissection (ESD) knife (Endosaber Fine; SB Kawasumi Co, Ltd, Tokyo, Japan) (Figs. 1 and 2) and a transparent hood (Nichendo; Fujifilm Co, Tokyo, Japan) (Fig. 3), which are both used for the first time for the RIC procedure in this case and are now both commercially available in Japan.

CASE

A 73-year-old man presented to our department with a possible endoscopic treatment of an esophageal stricture.

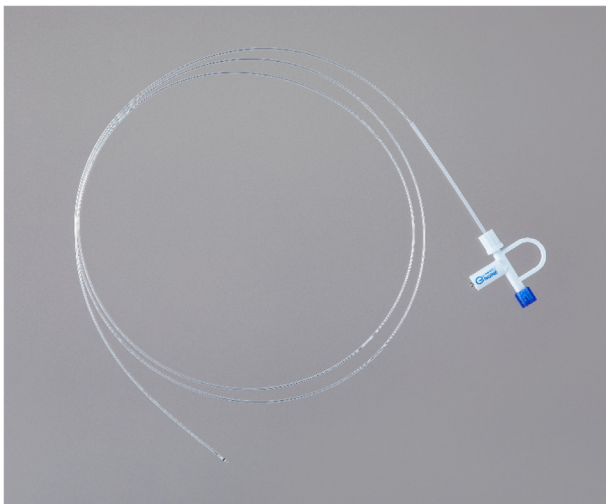


Figure 1. The endoscopic submucosal dissection knife we developed.

He had undergone an esophagectomy with gastric tube reconstruction for advanced esophageal carcinoma 5 years prior. As a result of the anastomotic esophageal stricture, the patient had dysphagia, and he was unable to swallow solid food. Because endoscopic balloon dilation was unsuccessful 3 times, RIC was planned.

A normal-caliber endoscope could not pass through the anastomotic site (Fig. 4). Thus, an ultrathin endoscope (EG-L580NW7; Fujifilm Co) was used along with the ESD knife and transparent hood that we had developed (Video 1, available online at www.giejournal.org).^{3,4} The knife was powered by a high-frequency electrosurgical unit (VIO 300D; ERBE Elektromedizin, Tübingen, Germany). Endocut I, effect 1 interval 1, duration 1 was

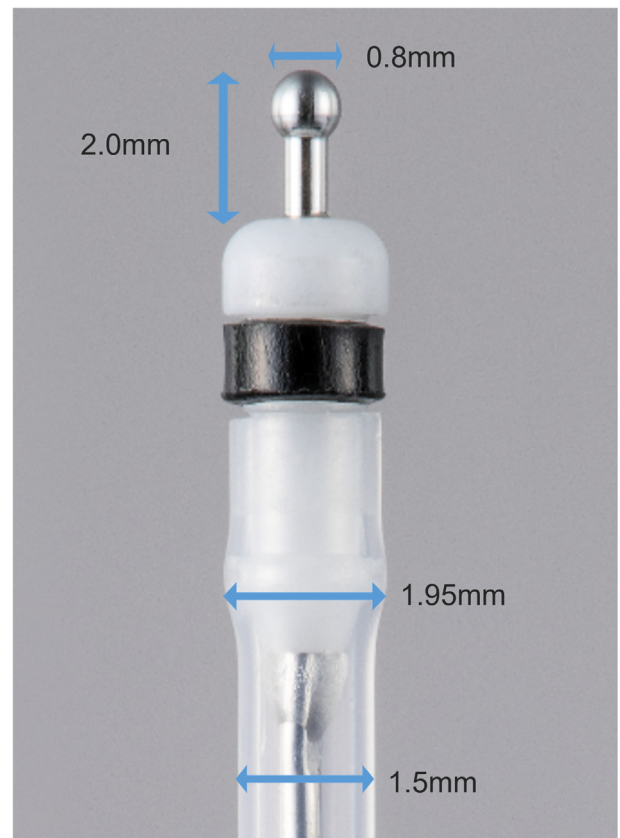


Figure 2. The endoscopic submucosal dissection knife has a maximum diameter of 1.95 mm with a tip fixed with 2-mm length and 0.8-mm width.

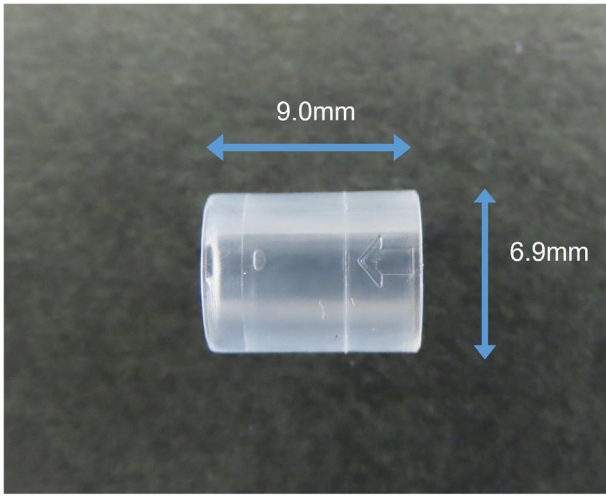


Figure 3. The transparent hood. The transparent hood has an outside diameter of 6.9 mm and a length of 9 mm. It creates a clear and direct view.

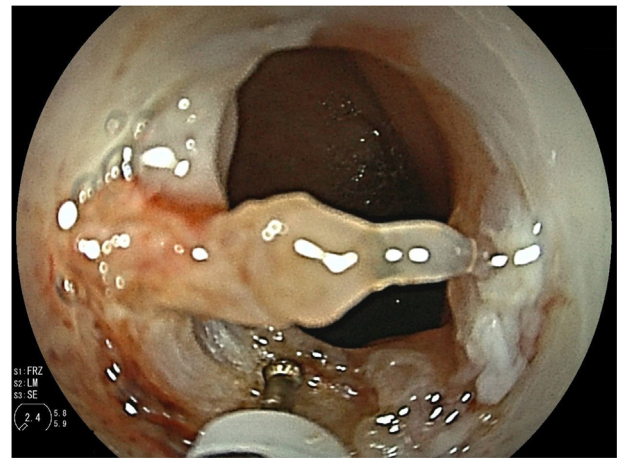


Figure 6. Endoscopic image of the process of exfoliation connecting each vertical line. The fibrotic tissues between the incision lines are removed.



Figure 4. Endoscopic image before radial incision and cutting procedure. Before the procedure, even the ultrathin endoscope with transparent hood could not pass through the stricture.

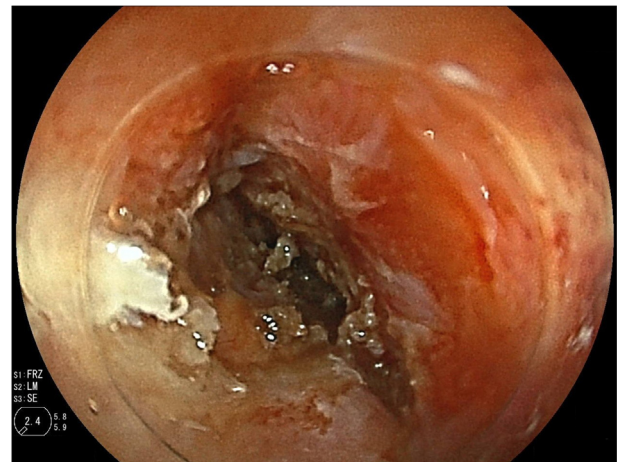


Figure 7. Endoscopic image right after radial incision and cutting procedure. Both the ultrathin and normal-caliber endoscope could pass through the stricture without resistance.

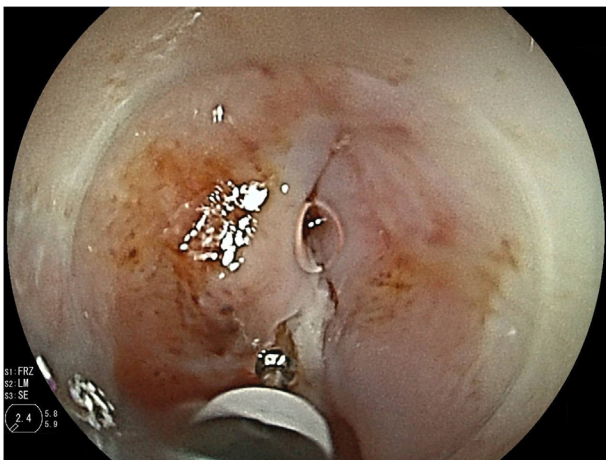


Figure 5. Endoscopic image during vertical incision.

used for making the incision, and swift coagulation effect 3, 40W was used for exfoliation.⁵ Pethidine injection was used as the anesthetic agent. The endoscope was inserted transnasally. First, 4 vertical incision lines were made at the strictures 5 to 8 mm apart using the knife (Fig. 5). Then, the scar tissues between the incision lines were exfoliated (Fig. 6). Finally, 40 mg of triamcinolone acetonide was injected using a 25-gauge injection needle (TOP Co, Tokyo, Japan). The whole procedure took 85 minutes in total with no major adverse events (Fig. 7). The patient was able to swallow solid food the next day. A normal-caliber endoscope could easily pass through the stricture 1 week and 3 weeks after the procedure, and there was no exacerbation to the symptoms (Figs. 8 and 9).

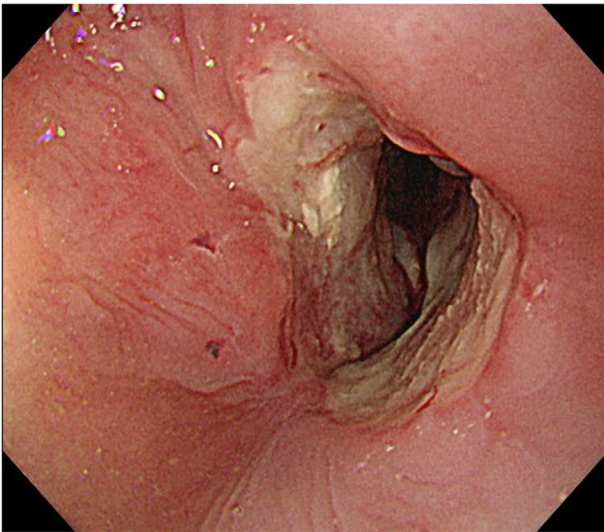


Figure 8. Endoscopic image of the esophageal stricture 1 week after radial incision and cutting procedure. The patient could swallow solid food, and the normal-caliber endoscope could go through the stricture without resistance.

DISCUSSION

To the best of our knowledge, this is the first case of RIC performed using an ultrathin endoscope. Many esophageal strictures do not allow normal-caliber endoscopes to pass through, resulting in a blind area during the procedure. Although most RICs in previous reports used a normal-caliber endoscope with IT knives without transparent hood, in this case both incision and exfoliation were performed using an ultrathin endoscope with a needle-type ESD knife and transparent hood to perform under constant direct vision. The scope maneuverability in this narrow stricture site was better in ultrathin endoscopy. Moreover, ultrathin endoscopy enables repetitive gastric deaeration, leading to less patient discomfort.

However, the disadvantages of ultrathin endoscopes for RIC procedures are that suction is more difficult, visibility is poor during bleeding, and there is no waterjet function. However, the main purpose of the RIC procedure is to remove scar tissue, and bleeding is usually minimal because of fibrotic changes. We observed almost no bleeding in this case, and waterjet function and suction were not necessary.

RIC is known to be an effective procedure for patients on whom balloon dilation has a minimal effect. With promising results for treating refractory esophageal strictures, RIC using ultrathin endoscopy could be a safe, feasible, and useful treatment.

DISCLOSURE

All authors disclosed no financial relationships.

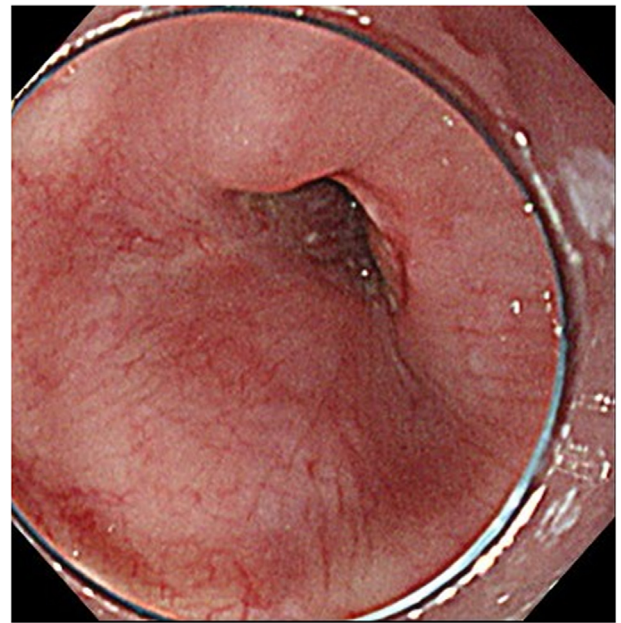


Figure 9. Endoscopic image of the esophageal stricture 3 weeks after radial incision and cutting procedure. The patient could swallow solid food the same as 1 week after, and the normal-caliber endoscope could go through the stricture without resistance.

Abbreviations: ESD, endoscopic submucosal dissection; RIC, radial incision and cutting.

REFERENCES

1. Yano T, Yoda Y, Satake H, et al. Radial incision and cutting method for refractory stricture after nonsurgical treatment of esophageal cancer. *Endoscopy* 2013;45:316-9.
2. Muto M, Ezoe Y, Yano T, et al. Usefulness of endoscopic radial incision and cutting method for refractory esophagogastric anastomotic stricture (with video). *Gastrointest Endosc* 2012;75:965-72.
3. Kikuchi D, Tanaka M, Suzuki Y, et al. Endoscopic submucosal dissection for superficial pharyngeal carcinoma using transnasal endoscope. *VideoGIE* 2021;6:67-70.
4. Kikuchi D, Tanaka M, Nakamura S, et al. Feasibility of ultrathin endoscope for esophageal endoscopic submucosal dissection. *Endosc Int Open* 2021;9:E606-9.
5. Minato Y, Sakai E, Ohata K. Conscious transnasal hybrid endoscopic submucosal dissection enables safe and painless en bloc resection in elderly patients with early gastric cancer. *VideoGIE* 2019;4:157-8.

Department of Gastroenterology, Toranomon Hospital, Tokyo, Japan (1), Department of Gastrointestinal Surgery, Toranomon Hospital, Tokyo, Japan (2), Department of Gastroenterology, Toranomon Hospital, Tokyo, Japan (3).

Copyright © 2022 American Society for Gastrointestinal Endoscopy. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

<https://doi.org/10.1016/j.vgie.2022.07.015>