



Continuous saliva suction tube to prevent aspiration pneumonia during upper GI endoscopy

Takashi Muramoto, MD, PhD,¹ Ayumi Aoki, RN,² Yuichiro Suzuki, MD,¹ Maki Hishida, RN,² Ken Ohata, MD, PhD¹

Endoscopic submucosal dissection (ESD) has been established as a minimally invasive treatment modality and has been adopted worldwide for the treatment of early GI tract cancer. However, aspiration pneumonia, a sedation-related adverse event, is reportedly detected on postoperative CT images in 32.0% of cases after esophageal ESD¹ and 6.6% to 14.4% of cases after gastric ESD.^{2,3} Clinical symptoms in the majority of patients are often mild, but symptoms can become serious in elderly patients. Furthermore, because the number of endoscopic treatments for elderly patients is expected to continue to increase in the future, a new strategy is needed to prevent aspiration pneumonia associated with liquid reflux and saliva retention in the oral cavity.

Herein, we introduce a continuous saliva suction tube that can be used during endoscopy (Salsuction; Fujifilm Medical Co, Ltd, Tokyo, Japan) (Fig. 1; Video 1, available online at www.giejournal.org). Not only is this device disposable and easy to set up with a mouthpiece (Fig. 2A), it also has 3 other advantageous features. First, it can be directly connected to the tube of the aspirator. Second, the soft tip of the suction tube has multiple slits on its side, making it difficult for the tip to stick to the oral mucosa and cause damage (Fig. 2B). Third, the tube is made from stainless steel, making it malleable and able to maintain a particular shape.

The device can be set as follows. First, place the mouthpiece as usual. Then fix the tube of the aspirator through the axilla and connect the aspirator tube to the Salsuction. Next, place the tip of the tube in the oral cavity. Finally, bend the Salsuction in 2 places and fix it to the bed (Fig. 2A). All of these settings can be completed in less than 30 seconds. The tube rarely interferes with the operation of the endoscope.

Several reports have described use of the device for continuous saliva suction.^{1,4} In one report, the device was attached to an endoscope to prevent aspiration during

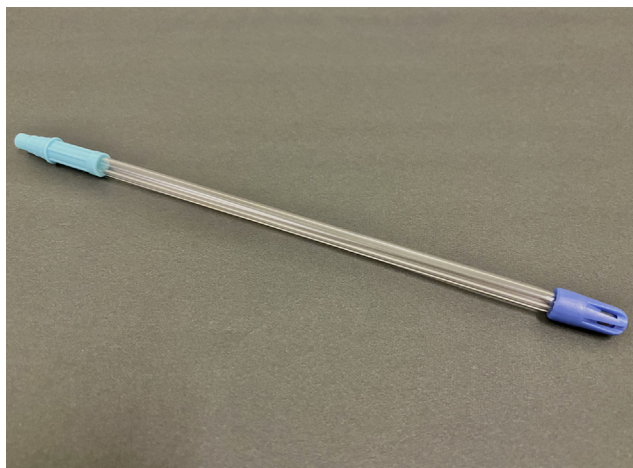


Figure 1. Salsuction (FUJIFILM Medical Co, Ltd, Tokyo, Japan).



Figure 2. **A,** The settings of the Salsuction. **B,** Status of the Salsuction in the oral cavity.

esophageal ESD,¹ but special settings were required, and continuous suction under all situations was difficult because the degree of suction was affected by the operation of the endoscope. Furthermore, although this method was useful for the suctioning of liquid pooling in the esophageal lumen to prevent backflow into the oral cavity, suctioning of saliva in the oral cavity itself was difficult.

In a second report, the suction tube was integrated into the mouthpiece⁴; fine-tuning the position of the suction tube during the examination was difficult, depending on where the saliva was collecting. However, this device is inexpensive (costing about USD \$3), easy to set up, can easily change suction position in the oral cavity when manipulated from outside the body, and can be used in all cases, regardless of the endoscopic manipulations. Because time-consuming treatments such as ESD, endoscopic hemostasis for the upper GI tract, and ERCP often increase saliva production, this device can be constantly used to prevent aspiration. Furthermore, because the risk of aspiration, regardless of the examination time, is high, this device can be used for procedures in elderly patients and for Lugol voiding during examinations. In addition, in view of the current COVID-19 pandemic, saliva can be a source of severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) infection⁵ for endoscopists and assistants, and this device might be useful for preventing salivary transmission of the virus.

This device has the potential to prevent aspiration pneumonia during upper GI endoscopic procedures, including ERCP. Further clinical studies examining larger samples and randomized controlled trials are needed to assess the incidence of aspiration pneumonia.

DISCLOSURE

All authors disclosed no financial relationships.

Abbreviation: ESD, endoscopic submucosal dissection.

REFERENCES

1. Hatta W, Koike T, Okata H, et al. Continuous liquid-suction catheter attachment for endoscope reduces volume of liquid reflux to the mouth in esophageal endoscopic submucosal dissection. *Dig Endosc* 2019;31: 527-34.
2. Watari J, Tomita T, Toyoshima F, et al. The incidence of "silent" free air and aspiration pneumonia detected by CT after gastric endoscopic submucosal dissection. *Gastrointest Endosc* 2012;76:1116-23.
3. Nakanishi T, Araki H, Ozawa N, et al. Risk factors for pyrexia after endoscopic submucosal dissection of gastric lesions. *Endosc Int Open* 2014;2: E141-7.
4. Maekita T, Kato J, Nakatani Y, et al. Usefulness of a continuous suction mouthpiece during percutaneous endoscopic gastrostomy: a single-center, prospective, randomized study. *Dig Endosc* 2013;25: 496-501.
5. Baghizadeh Fini M. Oral saliva and COVID-19. *Oral Oncol* 2020;108: 104821.

Department of Gastrointestinal Endoscopy, NTT Medical Center Tokyo, Tokyo, Japan (1), Department of Nursing, NTT Medical Center Tokyo, Tokyo, Japan (2).

Copyright © 2021 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.vgje.2020.11.002>

Endoscopyedia

Endoscopyedia has a new look! Check out the redesign of the official blog of *GIE* and *VideoGIE*. Keep up with the latest news and article discussions and post your comments or questions to *VideoGIE* authors. Visit us at www.endoscopyedia.com.