



Closure of mucosal defect with a micro-ring technique: simple, cheap, and effective

Bianca Maria Quarta Colosso, MD, Haruhiro Inoue, MD, PhD

Effective closure methods of mucosal leakage are a paramount tool for every endoscopist. They are crucial in reducing the need for surgery and allowing us to stretch the limits of interventional endoscopy. The aim of these videos is to share a simple and cheap solution to close large mucosal defects (Videos 1, available online at www.VideoGIE.org).

Many endoscopists observe adverse events like mucosal leakage. It can occur after EMR, endoscopic submucosal dissection, peroral endoscopic myotomy, or other interventional endoscopic procedures. For this reason, multiple advanced closure techniques have been developed in the past few years. Some involve the use of devices in addition to through-the-scope clips; some use other over-the-scope devices such as over-the-scope clips or over-the-scope suturing devices. In previous published reports, all of these methods proved their effectiveness.¹⁻⁵ Despite that, some of them are challenging, expensive, or time consuming.

The technique we present was developed to easily manage large mucosal defects with simple tools and without any time consumption or relevant additional cost.

With a 4-0 suture strand, we created a micro-ring around one arm of a repositionable clip in 3 simple steps (Fig. 1). First, we tied a surgical knot on one arm of the clip (Fig. 2); then, we used the edge of the strand to create a loop around a support (outer sheath of a repositionable clip); finally, we removed the support. The clip and the attached micro-ring were placed in the working channel so

that one side of the mucosal defect could be grasped (Fig. 3). The naked arm of the clip was placed on the ulcer side of the mucosal edge. At this point, a second clip was inserted (Fig. 4). Therefore, it was possible to engage the micro-ring and catch the opposite free edge of the defect, thereby drawing the 2 mucosal edges together; in this way they could be grasped by regular through-the-scope clips (Figs. 5 and 6). Every type of 4-0 surgical strand, and every brand of repositionable clip, can be used for this purpose.

Many advanced closure methods need a dual-channel endoscope for the insertion of 2 devices at the same time (for example, foreign body forceps or endoloop plus one clip). Unfortunately, dual-channel endoscopes are not available everywhere. To avoid this problem, in many centers a modified endoloop-assisted clip closure (so-called king closure) is performed. In fact, in practice, the endoscopist withdraws the endoscope, then inserts a repositionable clip through the scope; once the clip is placed, the endoscopist grasps the endoloop and finally reinserts the scope. This way, the endoloop can be brought in place outside the endoscope. Obviously, this approach can be time consuming in colonic defects, where the reinsertion of the colonoscope can be challenging.

In conclusion, the micro-ring is a feasible, cheap, and easy tool to achieve complete closure of large mucosal

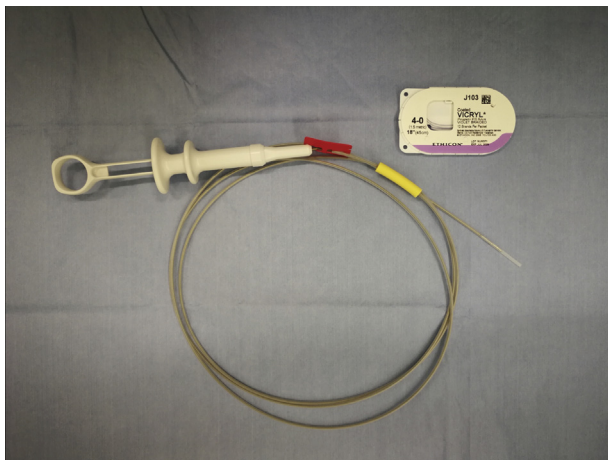


Figure 1. Tools needed to make a micro-ring: single-use repositionable clip + 4-0 strand.

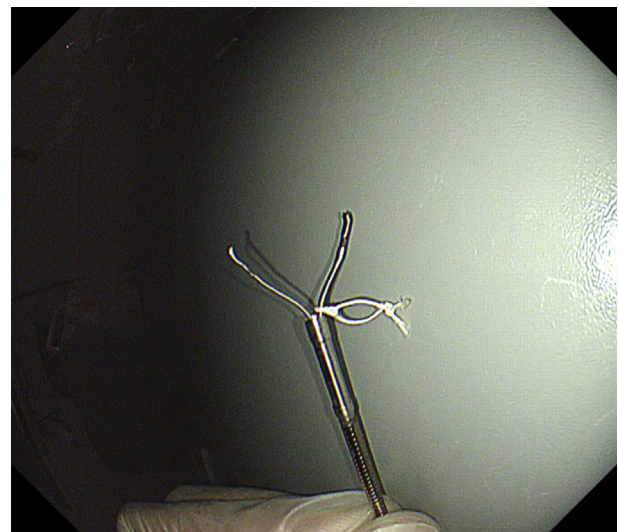


Figure 2. Endoscopic view of micro-ring tied on the first clip.

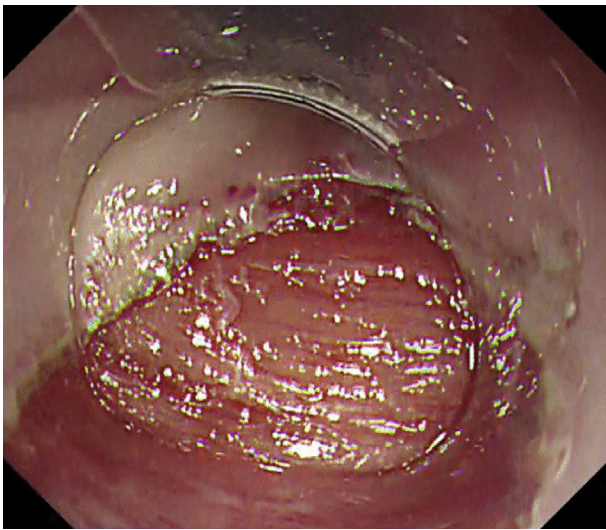


Figure 3. Mucosal defect.

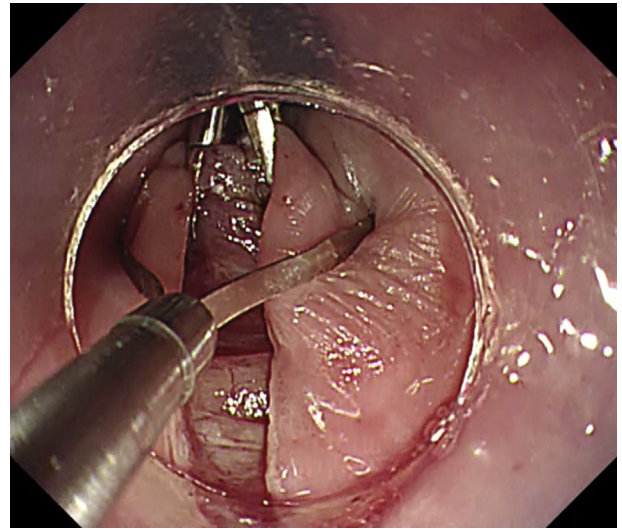


Figure 5. Once the micro-ring is positioned, the 2 mucosal edges can be grasped by a third clip.

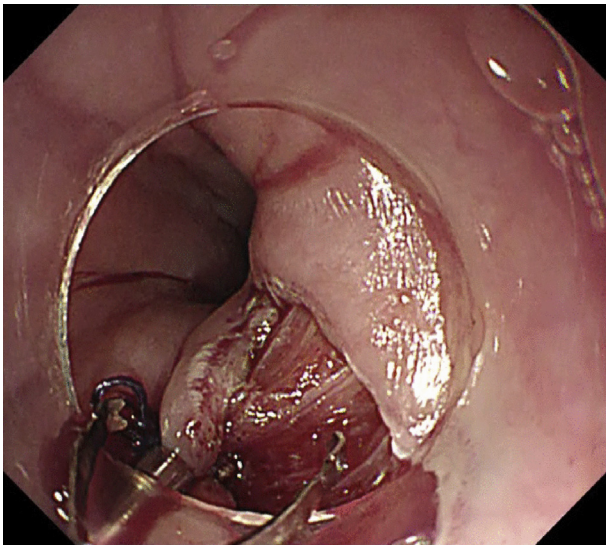


Figure 4. Endoscopic view of the second clip catching the micro-ring.

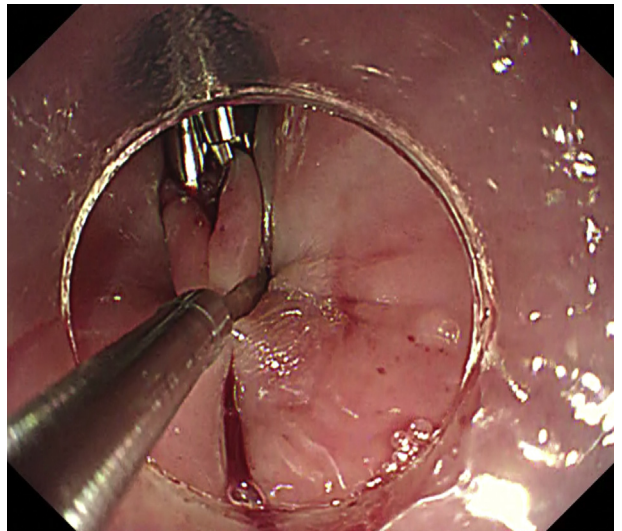


Figure 6. Closure of the mucosal defect, endoscopic view.

leakage in every tract of the GI lumen with every type of endoscope.

DISCLOSURE

Dr Inoue is an advisor for Olympus and Top Corporation and the recipient of educational grants from Olympus Corporation and Takeda Pharmaceutical. The other author disclosed no financial relationships relevant to this publication.

REFERENCES

1. Dolezel R, Ryska O, Tuckova I, et al. A comparison of two endoscopic closures: over-the-scope clip (OTSC) versus KING closure (endoloop + clips) in a randomized long-term experimental study. *Surg Endosc* 2016;30:4910-6.
2. Martínek J, Ryska O, Tuckova I, et al. Comparing over-the-scope clip versus endoloop and clips (KING closure) for access site closure: a randomized experimental study. *Surg Endosc* 2013;27:1203-10.

3. Haito-Chavez Y, Law JK, Kratt T, et al. International multicenter experience with an over-the-scope clipping device for endoscopic management of GI defects (with video). *Gastrointest Endosc* 2014;80:610-22.
4. Raju GS. Endoscopic clip closure of gastrointestinal perforations, fistulae, and leaks. *Dig Endosc* 2014;26:95-104.
5. Banerjee S, Barth BA, Bhat YM, et al. Endoscopic closure devices. *Gastrointest Endosc* 2012;76:244-51.

Digestive Disease Center, Showa University Koto Toyosu Hospital, Tokyo, Japan.

Copyright © 2019 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.2019.11.002>