

EDITORIAL

Closing the Gap in Prophylactic Treatment of Duodenal Endoscopic Submucosal Dissection Defects



Since their introduction for clinical use in 2007, over-the-scope clips (OTSCs) have become an essential tool for the endoscopic treatment of refractory nonvariceal gastrointestinal hemorrhage, perforations, and anastomotic leaks.^{1–3} In recent years, OTSCs have also been increasingly applied for prophylactic closure of large mucosal defects following endoscopic submucosal dissection (ESD) in the stomach and colon in an effort to reduce rates of delayed bleeding and perforation.⁴ The practice of ESD in the duodenum, however, not only poses higher rates of delayed perforation attributed to a thin muscularis propria and submucosal exposure to gastric acid, pancreatic enzymes, and bile,^{4,5} but can also render defects particularly difficult to close due to a narrower lumen, acute angulation, and thinner mucosa. Thus there is a need for a safe, effective and efficient method for duodenal ESD defect closure.

It has been theorized that application of OTSCs for mucosal closure after duodenal ESD might mitigate risk similar to elsewhere in the GI tract,⁵ but data is scarce, and their deployment may be met by the same limitations of the duodenum mentioned earlier. While a handful of small case series have shown that OTSCs may be safe and feasible in this setting,^{6–8} there are no appropriate use criteria to guide clinicians in using OTSCs vs conventional through-the-scope (TTS) clips for mucosal closure after ESD in the duodenum.

In this issue of *Gastro Hep Advances*, Jinushi and colleagues sought to explore this role of OTSCs.⁹ The authors compared mucosal closure rates when using OTSCs vs conventional clips following ESD of superficial non-ampullary duodenal epithelial tumors in a single center retrospective cohort study. Between April 2017 and February 2022, at least one OTSC (in combination with conventional clips and/or PolyLoops ligating device sutures) was used at the endoscopists' discretion to attempt mucosal closure in 55 cases, while conventional clips alone were used in 27 cases. The OTSC method was used for mucosal closure of significantly larger tumors (mean diameter 20mm) with larger resected specimen areas (339.1mm²) than the conventional clips method (mean tumor diameter 15mm; mean resected specimen area 169.6 mm²; $P < .001$). The majority of OTSC closures were performed using the suction method (91%). Despite the larger resection area, OTSCs had equally impressive rates of complete mucosal defect closure (98.2%) as conventional clips (100%). OTSCs were efficacious even in difficult anatomical locations, including the superior duodenal angle

and inferior duodenal angle ($n = 11$, 20% of the total group). Notably, duodenal bulb cases were excluded from this study. Despite the larger resection areas in the OTSC group and need for scope withdrawal for OTSC setup, there were no differences in closure time or rates of delayed bleeding between the two groups (3.6% and 3.7% for OTSC vs conventional clips, respectively), and there were no cases of delayed perforation.

Given that OTSCs are considerably more expensive than conventional TTS clips, establishing practical criteria for their appropriate use is essential for cost-effective endoscopic therapy. By comparing the mucosal closure techniques by tumor size and resection area, the authors concluded that OTSCs are effective for mucosal closure of duodenal tumors >18 mm, while conventional clips can be safely deployed for smaller tumors ≤ 18 mm. Importantly, the estimated preoperative tumor size strongly correlated with the resected specimen area, suggesting that endoscopists may be able to reliably predict which mucosal closure method will be most effective prior to undertaking the procedure. As such, this study not only demonstrates the feasibility and effectiveness of OTSCs for mucosal closure in the duodenum, but provides a pragmatic, evidence-based approach to clinical decision making during ESD procedures.

There are some aspects of the study design that warrant consideration. Mucosal closures and ESDs were performed by highly experienced endoscopists at a single center in Japan, where expertise, particularly in the technically challenging duodenum, is likely superior to most other areas of the world and limit generalizability. To establish external validity of these findings, it would be important to perform a multi-centered study—ideally in a randomized trial with a priori size criteria for closure technique—that includes Western centers, where ESD expertise is still forming. It is not specified what proportion of OTSC closures required adjunctive closure with PolyLoops or TTS clips and to what extent, although it is promising that there was no increased closure time despite the larger resection areas, therefore potentially improving overall efficiency for an often time-intensive resection. It is also unclear how OTSCs compare to other novel methods of mucosal closure, such as over the scope or TTS endoscopic suturing devices (Overstich and X-Tack respectively, Apollo Endosurgery), large capacity TTS clips that can approximate defects up to 3 cm (MANTIS, Boston Scientific), and prophylactic hemostatic agents.¹⁰

Nonetheless, the current study begins to fill in a major gap in the current approach to duodenal ESDs as experience and comfort with ESD grows across the world. As the armamentarium of endoscopic tools to facilitate safe and effective ESD continues to expand, so too will the ability to improve the outcomes for patients with early tumors and lesions of the gastrointestinal tract.

JOHN B. DOYLE

KAVEL VISRODIA

Digestive and Liver Diseases

Columbia University Irving Medical Center-NYP

New York, New York

References

1. Kirschniak A, Kratt T, Stüker D, et al. A new endoscopic over-the-scope clip system for treatment of lesions and bleeding in the GI tract: first clinical experiences. *Gastrointest Endosc* 2007;66:162–167.
2. Kobara H, Mori H, Nishiyama N, et al. Over-the-scope clip system: a review of 1517 cases over 9 years. *J Gastroenterol Hepatol* 2019;34(1):22–30.
3. Lee JH, Kedia P, Stavropoulos SN, et al. AGA clinical practice update on endoscopic management of perforations in gastrointestinal tract: expert review. *Clin Gastroenterol Hepatol* 2021;19(11):2252–2261.e2.
4. Draganov PV, Wang AY, Othman MO, et al. AGA institute clinical practice update: endoscopic submucosal dissection in the United States. *Clin Gastroenterol Hepatol* 2019;17(1):16–25.e1.
5. Fujihara S, Mori H, Kobara H, et al. Management of a large mucosal defect after duodenal endoscopic resection. *World J Gastroenterol* 2016;22(29):6595–6609.
6. Tashima T, Ohata K, Sakai E, et al. Efficacy of an over-the-scope clip for preventing adverse events after duodenal endoscopic submucosal dissection: a prospective interventional study. *Endoscopy* 2018;50(5):487–496.
7. Dohi O, Yoshida N, Naito Y, et al. Efficacy and safety of endoscopic submucosal dissection using a scissors-type knife with prophylactic over-the-scope clip closure for superficial non-ampullary duodenal epithelial tumors. *Dig Endosc* 2020;32(6):904–913.
8. Ohata K, Sakai E, Suzuki Y, et al. Risk factors of delayed bleeding after endoscopic resection of superficial non-ampullary duodenal epithelial tumors and prevention by over-the-scope and conventional clipping. *Dig Endosc* 2021;33(3):390–398.
9. Jinushi R, Tashima T, Fujita A, et al. Conventional clips vs over-the-scope clips for mucosal defects closure after duodenal endoscopic submucosal dissection. *Gastro Hep Adv* 2023;2(8):1034–1039.
10. Subramaniam S, Kandiah K, Chedgy F, et al. A novel self-assembling peptide for hemostasis during endoscopic submucosal dissection: a randomized controlled trial. *Endoscopy* 2021;53(1):27–35.

Received October 17, 2023. Accepted October 17, 2023.

Correspondence:

Address correspondence to: Kavel Visrodia, MD, Columbia University Medical Center, 161 Fort Washington Avenue, Floor 8, New York, New York 10032. e-mail: khv2105@cumc.columbia.edu.

Conflicts of Interest:

The authors disclose no conflicts.

Funding:

The authors report no funding.



Most current article

Copyright © 2023 The Authors. Published by Elsevier Inc. on behalf of the AGA Institute. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

2772-5723

<https://doi.org/10.1016/j.gastha.2023.10.005>