

Waterjet-assisted endoscopic submucosal dissection in the colorectum: safe and effective?

Sneha John

Endoscopy, Gold Coast University Hospital, Southport, Australia

See “Endoscopic submucosal dissection in colorectal neoplasia performed with a waterjet system-assisted knife: higher *en-bloc* resection rate than conventional technique” by Paolo Cecinato, Matteo Lucarini, Francesco Azzolini, et al., on page 775–783.

Endoscopic submucosal dissection (ESD) is increasingly used for *en bloc* resection of advanced colorectal neoplasia. This technique allows curative resection of advanced pathologies, such as high-grade dysplasia and superficial submucosal invasive cancers, and has lower recurrence rates than piecemeal endoscopic mucosal resection. However, the lengthy duration of these procedures, steep learning curve, and risk of significant adverse events have impacted their uptake in Western countries.^{1,2}

Improvements in technology and techniques are especially of significant benefit to Western endoscopists in aiding the achievement of safe and effective ESD in the colorectum. In populations with low prevalence of early gastric cancer, endoscopists are confined to the early practice of ESD in the rectum and distal colon. Traction-assisted ESD is increasingly described as a helpful technique.^{3,4} Traction and counter traction devices are more available but are not entirely without challenges. Completing difficult lesions with hybrid techniques involving dissection followed by snaring to complete the resection, has

been well described. However, successful *en bloc* resection with this technique is also dependent on the endoscopist's skill and is determined by the presence of fibrosis and ability to visualize adequately while snaring.⁵ Similarly, performing underwater ESD with saline infusion has been described as a relatively newer technique.⁶ This may be particularly helpful to novices in differentiating the submucosal plane and reducing the risk of injury to the muscle layer. Furthermore, this technique is suggested to aid experts in situations with recurrent lesions or fibrosis.⁷ Many different ESD accessories and newer types of knives have been added to our therapeutic armament. Many of these now have the combined capabilities of injection, cutting, and dissection with electrocautery, as well as hemostatic abilities. Whilst they are far more evolved than the original versions, intraprocedural changes to accessories are still required for incremental submucosal injections and hemostasis. Procedural duration is definitely incremented by these necessary changes. Non-experts are also more likely to require these and not having achieved the confidence of experts in always distinguishing the submucosal plane, be more reliant on frequent submucosal injectates.

A new knife that allows a high-pressure waterjet function simultaneously with cutting or dissection has previously been described.⁸ In a pilot study, Zhou et al.⁹ described the benefits of adopting the hybrid knife technique in a subgroup of patients with gastric neoplasia. In a randomized controlled trial comparing conventional ESD to waterjet-assisted ESD, the mean

Received: October 2, 2022 **Revised:** November 14, 2022

Accepted: November 14, 2022

Correspondence: Sneha John

Endoscopy, Gold Coast University Hospital, Southport, Australia

E-mail: sneha.john@health.qld.gov.au

© This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

procedure time was established to be significantly shorter in the waterjet-assisted ESD group than in the other. In addition, changes in accessories was less frequently required. However, there were no significant differences in R0 resection, adverse events, or recurrence rates on follow-up. In the current issue of *Clinical Endoscopy*, Cecinato et al.¹⁰ describe the first large series comparing conventional ESD to waterjet-assisted ESD in the colorectum. A retrospective series of 123 waterjet-assisted ESD procedures performed in a tertiary center over seven years was analyzed. This study excluded patients with recurrent lesions and those with fibrosis and dysplasia associated with inflammatory bowel disease. In their series compared to 50 conventional ESD during the same period, *en bloc* resection rates are suggested to be higher (91.4%) with the waterjet-assisted technique. Interestingly, complete resection rates, curative resections, speed of procedure, and adverse events were similar between the two groups. It is pertinent to note that the waterjet-assisted technique was used for far more lesions in the rectum and lesions with recurrence or fibrosis were treated using the conventional technique. Nevertheless, this study highlights the many potential benefits of a newer ESD technique using the hybrid knife for colorectal neoplasia. A well-designed randomized controlled trial may further elaborate on the subgroups of lesions that may be best managed with this approach.

Conflicts of Interest

The author has no potential conflicts of interest.

Funding

None.

ORCID

Sneha John

<https://orcid.org/0000-0001-9332-3826>

REFERENCES

1. Kato M, Gromski M, Jung Y, et al. The learning curve for endoscopic submucosal dissection in an established experimental setting. *Surg Endosc* 2013;27:154–161.
2. Lee EJ, Lee JB, Lee SH, et al. Endoscopic submucosal dissection for colorectal tumors: 1,000 colorectal ESD cases: one specialized institute's experiences. *Surg Endosc* 2013;27:31–39.
3. Abe S, Wu SYS, Ego M, et al. Efficacy of current traction techniques for endoscopic submucosal dissection. *Gut Liver* 2020;14:673–684.
4. Bordillon P, Pioche M, Wallenhorst T, et al. Double-clip traction for colonic endoscopic submucosal dissection: a multicenter study of 599 consecutive cases (with video). *Gastrointest Endosc* 2021;94:333–343.
5. Jung Y, Kim JW, Byeon JS, et al. Factors predictive of complete excision of large colorectal neoplasia using hybrid endoscopic submucosal dissection: a KASID multicenter study. *Dig Dis Sci* 2018;63:2773–2779.
6. Nagata M. Usefulness of underwater endoscopic submucosal dissection in saline solution with a monopolar knife for colorectal tumors (with videos). *Gastrointest Endosc* 2018;87:1345–1353.
7. Yoshii S, Akasaka T, Hayashi Y, et al. "Underwater" endoscopic submucosal dissection: a novel method for resection in saline with a bipolar needle knife for colorectal epithelial neoplasia. *Surg Endosc* 2018;32:5031–5036.
8. Neuhaus H, Wirths K, Schenk M, et al. Randomized controlled study of EMR versus endoscopic submucosal dissection with a water-jet hybrid-knife of esophageal lesions in a porcine model. *Gastrointest Endosc* 2009;70:112–120.
9. Zhou PH, Schumacher B, Yao LQ, et al. Conventional vs. waterjet-assisted endoscopic submucosal dissection in early gastric cancer: a randomized controlled trial. *Endoscopy* 2014;46:836–843.
10. Cecinato P, Lucarini M, Azzolini F, et al. Endoscopic submucosal dissection in colorectal neoplasia performed with a waterjet system-assisted knife: higher *en-bloc* resection rate than conventional technique. *Clin Endosc* 2022;55:775–783.