Cold snare endoscopic mucosal resection for the removal of large nonpedunculated colon polyps
Tobias Zuchelli, MD, Andrew Watson, MD, Cyrus Piraka, MD

For large, >1-cm, nonpedunculated colon polyps, resection has historically been performed by using an electrocautery-based (hot) snare. Previous studies, including a large recent systematic review and pooled analysis, suggest that cold-snare EMR is safer than hot-snare EMR. Data have shown a decreased risk of adverse events such as delayed bleeding, postpolypectomy syndrome, and perforation when using cold-snare EMR compared with hot-snare EMR. In addition, cold-snare EMR has been shown to be at least as effective as conventional electrocautery-based resection with regard to complete resection and recurrence rates. This video (Video 1, available online at www.giejournal.org) demonstrates the technique of cold-snare EMR for large, >1-cm, nonpedunculated colon polyps.

Cold-snare EMR is indicated for the resection of nonpedunculated colon polyps. This technique is contraindicated if the polyp is pedunculated or if there is a suspected invasive lesion, given the importance of resecting an early invasive lesion en bloc. To perform cold-snare EMR, a high-definition endoscope is necessary. We use a clear distal cap attachment on the tip of the endoscope to allow for visualization and stabilization of the polyp. An injectant/lifting solution is typically used, and resection is performed using a small-diameter, stiff, thin-wire snare.

The technique is performed as follows for polyps >1 cm. First, assessing the polyp’s characteristics and mucosal pit pattern is vital to ensure that EMR is the appropriate next step in management. This is done by using a high-definition endoscope with an affixed clear distal cap and by using advanced imaging technology, such as narrow-band imaging and near focus (Fig. 1). If the polyp is nonpedunculated and lacks features suspicious for malignancy, then cold-snare EMR offers a safe and acceptable approach. Although lifting is not necessary with cold-snare EMR, it is typically preferred to aid in resection and define the submucosal layer (Fig. 2). Furthermore, dilute epinephrine may help in reducing background venous oozing to keep the field clear.

Currently, we prefer a lifting solution of dilute epinephrine (1:500,000) in saline solution with either methylene blue or indigo carmine. Methylene blue or indigo carmine is used for submucosal staining to help assess the resection base for residual polyp. A small, stiff, thin-wire snare is used, and the polyp is resected in overlapping pieces, ensuring wide lateral margins (Figs. 3 and 4). The amount of ensnared polyp should be limited to 10 or maybe up to 15 mm to ensure that the snare will cut through the tissue. If the snare has difficulty cutting through the polyp, the endoscopist should loosen the snare slightly, release the deeper tissue, deflect from the base of the colon, and close the snare again. These steps can be repeated to loosen entrapped tissue and saw through the superficial submucosal layers.
Once the polyp is resected, the base and margins are closely inspected to assess for residual polyp (Figs. 5-7). A cold snare or cold forceps can then be used to remove any suspected residual polypoid tissue and to safely extend lateral margins.3 Because no electrocautery is used, there is minimal risk of delayed bleeding, and prophylactic clip placement is not typically indicated. Furthermore, bleeding is rarely a concern with cold EMR. This is likely due to the fact that the wall of arteries has far more connective tissue and smooth muscle in the tunica media and tunica externa than the walls of veins. This makes it extremely difficult to transect the wall of an artery without cautery; thus, pulsatile arterial bleeding is rarely, if ever, seen.

Bleeding with cold EMR is generally a low-pressure venous phenomenon, with oozing that is mitigated by the presence of dilute epinephrine in the submucosal injectate, typically 1:500,000 in our practice. Bleeding may therefore still be a concern in the setting of a patient with portal hypertension or coagulopathy, and prophylactic clipping may be considered in those settings if there is a clinical concern for delayed venous oozing after cold EMR. As such, we do not routinely clip cold EMR defects but would consider doing so if there is pulsatile bleeding or ongoing oozing or a specific concern in a particular patient.

In conclusion, this video demonstrates the technical aspects and safety of cold-snare EMR for the removal of large, >1-cm, nonpedunculated colon polyps. This technique appears to be feasible, safe, and efficacious compared with traditional electrocautery-based endoscopic resection. This technique also may be more cost-effective given the lack of the need for an electrocautery machine and prophylactic clip closure. Finally, the low risk of delayed bleeding and perforation coupled with standard recurrence rates makes this procedure generalizable for gastroenterologists.

**DISCLOSURE**

Dr Zuchelli is a consultant for Boston Scientific. All other authors disclosed no financial relationships.
REFERENCES

1. Ferlitsch M, Moss A, Hassan C, et al. Colorectal polypectomy and endoscopic mucosal resection (EMR): European Society of Gastrointestinal Endoscopy (ESGE) Clinical Guideline. Endoscopy 2017;49:270-97.

2. Toguluva Chandrasekar V, Spadaccini M, Aziz M, et al. Cold snare endoscopic resection of nonpedunculated colorectal polyps larger than 10 mm: a systematic review and pooled-analysis. Gastrointest Endosc 2019;89:929-36.e3.

3. Piraka C. Cold snare resection of large duodenal and colonic polyps. Gastroenterol Hepatol (NY) 2018;14:539-41.

Henry Ford Hospital, Division of Gastroenterology, Detroit, Michigan.

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https://doi.org/10.1016/j.vgie.2020.09.009

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