



# Cold Snare Resection of Small Colorectal Adenomas: The Second Time's a Charm

Mike T. Wei<sup>1</sup> · Shai Friedland<sup>1,2</sup>

Accepted: 11 October 2021 / Published online: 3 November 2021

© The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature 2021

## Introduction

Snare resection without cautery application, colloquially referred to as cold snare resection, has replaced snare-cautery and has become the preferred modality for treatment of <1 cm (small) nonpedunculated colorectal adenomas due to a combination of its efficiency and safety profile [1]. Adenomas of this size can typically be removed in one piece as the snare is closed, a process that takes only a few seconds once the snare has been positioned at the target, using devices that are widely available and inexpensive. Immediate bleeding is generally minimal and stops without treatment in nearly all patients. Since delayed bleeding, which can occur within 10 days when polyps are removed with snare-cautery, presumably due to the tissue reaction generated by the applied electrothermal stress, is exceedingly rare following cold snare polypectomy, prophylactic measures such as clip application are generally unnecessary. Perforation, which occurs very rarely with snare-cautery removal of small polyps, has not been reported to occur with cold snare resection of polyps <1 cm [2]. With careful attention to technique, it is possible to remove small adenomas with a rim of normal mucosa and obtain histologic confirmation of complete resection in over half of cases; in the remaining cases, a visually complete-appearing resection is generally considered adequate. Given all of these favorable characteristics, it should come as no surprise that current practice guidelines recommend cold snare resection as the preferred modality for treatment of small colorectal adenomas.

Despite its safety and efficacy, the cold snare technique does, however, have some significant limitations. Detailed histologic analysis has demonstrated that the deep resection margin is not always in the submucosa, with significant areas of incomplete mucosal resection in a substantial minority of cases [3]. Though this in itself is not overly concerning for benign tubular adenomas, incomplete resection of the neoplastic mucosa is problematic for the occasional small lesions that harbor more advanced histology, or for early cancer. A meticulous examination of the lesion for visual features suggestive of advanced histology prior to resection is therefore important. At the very least, well-studied clinical tools such as the Japanese Narrow-band imaging Expert Team (JNET) classification of lesions under narrow-band-imaging should be employed in an attempt to identify rare small lesions that would benefit from a more oncologically appropriate resection technique such as endoscopic submucosal dissection or endoscopic mucosal resection in order to ensure adequate treatment [4].

In light of these considerations, it would be useful to determine if recurrent small polyps, defined as those recurring in a visible scar, differed from de novo diminutive adenomas resected by cold snare resection in terms of completeness of removal, complications, and other key parameters. In this issue of *Digestive Diseases and Sciences*, Yoshida et al. [5] analyzed the results of repeat cold snare polypectomy of 48 patients harboring 80 recurrent  $\leq 10$  mm colorectal polyps following prior cold snare polypectomy of  $\leq 10$  mm polyps. They compared the results to a control group of 276 patients harboring 454 previously untreated  $\leq 10$  mm polyps who had also undergone follow-up colonoscopy at within 2 years. The authors routinely used magnification narrow-band-imaging or blue laser imaging to inspect lesions both on the initial colonoscopy and on follow-up colonoscopies. Two of the 82 detected recurrences after initial cold snare resection were excluded from repeat cold snare treatment due to concerning visual features: One was an adenoma, and the other was high-grade dysplasia. They were able to

✉ Mike T. Wei  
mtwei@stanford.edu

Shai Friedland  
shaif@stanford.edu

<sup>1</sup> Gastroenterology Department, Stanford University, 430  
Broadway Ave, Redwood City, CA 94036, USA

<sup>2</sup> Veterans Affairs Palo Alto Health System, Palo Alto, CA,  
USA

demonstrate that the procedure was safe, with no postoperative hemorrhage or perforation, and generally effective, with only one recurrence detected among 50 cases that underwent a follow-up colonoscopy.

Compared with the control group of de novo lesions, the recurrences were slightly smaller ( $4.1 \pm 2.3$  vs  $5.3 \pm 2.8$  mm) but did not differ in morphology (56 vs 58% polypoid), location (66 vs 71% right sided), or histology (83 vs 87% adenoma). The resection time was longer in the recurrent lesions (0.9 vs 0.4 min), and fewer resections were completed *en bloc* (79 vs 98%). There were no postoperative hemorrhages or perforations in either group. In the subset of 50/80 recurrent lesions with available follow-up, the recurrence rate was not statistically different between the 2 groups: 2% vs 0.7% at a median follow-up interval of 12 months in both groups. These results suggest that from a technical perspective, treatment of small recurrences is reasonably similar to treatment of de novo lesions.

Although the technique is widely used and recommended by practice guidelines, data on the recurrence rate after cold snare resection and indeed even on the natural history of untreated diminutive adenomas are more limited. There is agreement that the vast majority of very small adenomas ( $\leq 5$  mm in diameter) do not progress rapidly even if left untreated, supported by a Japanese observational study [6]. It is therefore difficult to justify undertaking a large prospective study to serially examine cold snare resection sites by repeated colonoscopies over a number of years in patients who do not have other indications to undergo these procedures. Observational studies of patients undergoing surveillance colonoscopy one or more years after cold snare polypectomy may also be limited by the difficulty in definitively identifying the site since the scar from prior cold snare polypectomy is often extremely faint or even impossible to identify. Observational studies of patients who only have one or two small adenomas would be very difficult to carry out in the USA due to practice guidelines that recommend a repeat colonoscopy after 7–10 years with no differentiation between de novo small adenomas and recurrent small adenomas recurring after initial cold snare resection [7]. It may not be possible to definitively identify cold snare resection sites after so many years have elapsed. Fortunately, the authors were able to perform repeat colonoscopy in a large retrospective cohort of patients at a median of 1 year after cold snare resection, as well as a second repeat colonoscopy 1 year after repeat cold snare resection of recurrent lesions, which provided a unique set of data to analyze.

Despite the challenges in interpreting imperfect real-life data, there are a few striking results from this article. Cold snare is a remarkably efficient procedure for small benign adenomas and serrated polyps. The authors report a recurrence rate of only 0.7% at a median follow-up interval of 1 year for naïve lesions. When these lesions did recur, the

recurrences were typically quite small, with a median diameter of 4 mm, with repeat cold snare successful in all 80 cases in which it was attempted (recall that 2 cases were treated by other methods due to concern about potential advanced histology). 79% of the recurrent lesions were successfully removed in 1 piece (*en bloc*). While the *en bloc* rate was lower than the 98% success rate for de novo lesions, it is still remarkably high. Only a minority of recurrent lesions (44%) were resected with negative margins, lower than the 60% rate for de novo lesions. While achieving *en bloc* resection with negative margins with cold snare resection is commendable, confirming that the lesion was completely removed is not generally considered necessary for low-risk adenomas. Indeed, snares often capture tissue by lodging at the margins of elevated lesions after slipping off adjacent flat mucosa as they are closed; in these cases, the lesion has been removed completely, but the pathologist is unable to histologically confirm a complete resection. Nonetheless, the ultimate metric of success is the absence of recurrence on follow-up colonoscopy supported by the very low recurrence rate of 2% among the 50 lesions out of the 80 recurrent lesions for which a repeat colonoscopy was performed, confirming the remarkable success of the cold snare technique.

There are some limitations to the data presented in the article. As expected, the authors noted that there was difficulty in locating the scar in some patients. Unfortunately, the authors did not report the precise number of patients in which the scar was not identified, which complicates the accurate ascertainment of recurrence rates after both the initial and repeat resection procedures. When the scar cannot be found—for example, if it is located behind a fold and not visualized during the follow-up colonoscopy—it is impossible to exclude a recurrence, which could potentially lead to a significant undercounting of recurrences. It is also theoretically possible that some recurrences could actually be mislabeled as de novo lesions if the scar was not correctly identified and the endoscopist wrongly assumed that the polyp did not arise from the prior resection site. Conscious or unconscious bias on the part of the endoscopist performing the follow-up colonoscopy, who was likely aware of the details of the prior resection (such as whether the resection was *en bloc* and histologically complete) could also potentially influence the results. Though a prospective study in which resection sites were marked—for example, by placement of a tattoo at a prespecified distance from the site—and the endoscopist was blinded as to the results of the prior procedure, would likely be more accurate, the logistic challenges and costs associated with such a study would likely make it impractical to conduct due to high costs incurred by its complicated logistics.

In summary, this study demonstrates that repeat cold snare resection of recurrent small benign colorectal lesions is remarkably safe and effective. Through a combination of

meticulous examination to identify the resection scar and short-term follow-up colonoscopy at a median of 1 year after both the initial resection procedure and the second resection procedure, the authors were able to convincingly and quantitatively assess the efficacy of the technique.

## References

1. Kaltenbach T, Anderson JC, Burke CA et al. Endoscopic removal of colorectal lesions—recommendations by the US multi-society task force on colorectal cancer. *Gastrointest Endosc* 2020;91:486–519.
2. Sanchez JR, Alonso MS, Urquiza MP. The “bubble sign”: a novel way to detect a perforation after cold snare polypectomy. *Endoscopy* 2019;51:796–797.
3. Shichijo S, Takeuchi Y, Kitamura M et al. Does cold snare polypectomy completely resect the mucosal layer? A prospective single-center observational trial. *J Gastroenterol Hepatol* 2020;35:241–248.
4. Sano Y, Hirata D, Saito Y. Japan NBI Expert Team classification: narrow-band imaging magnifying endoscopic classification of colorectal tumors. *Dig Endosc* 2018;30:543–545.
5. Yoshida N, Hashimoto H, Inoue K et al. Repeat cold snare polypectomy can be performed for recurrent benign lesions after cold snare polypectomy. *Dig Dis Sci*. (Epub ahead of print). <https://doi.org/10.1007/s10620-021-07292-9>.
6. Mizuno K-I, Suzuki Y, Takeuchi M et al. Natural history of diminutive colorectal polyps: long-term prospective observation by colonoscopy. *Dig Endosc* 2014;26:84–89.
7. Gupta S, Lieberman D, Anderson JC et al. Recommendations for follow-up after colonoscopy and polypectomy: a consensus update by the US multi-society task force on colorectal cancer. *Gastrointest Endosc* 2020;91:463–485.

**Publisher's Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.