

[ CASE REPORT ]

## Invasive Colon Cancer Inadvertently Resected by Cold Snare Polypectomy

Tetsuro Harada<sup>1,2</sup>, Yasuhiko Hamada<sup>1</sup>, Kyosuke Tanaka<sup>1</sup>, Noriyuki Horiki<sup>1</sup> and Hayato Nakagawa<sup>1</sup>

### Abstract:

A 74-year-old man with anemia underwent colonoscopy, which revealed a 4-mm polyp in the ascending colon. The polyp was subsequently diagnosed as an adenomatous lesion according to the narrow-band imaging (NBI) International Colorectal Endoscopic classification/Japan NBI Expert Team classification and resected via cold snare polypectomy (CSP). However, a pathological examination revealed a well-differentiated adenocarcinoma with a positive vertical margin. We performed additional endoscopic resection at the CSP scar area, revealing residual submucosal cancer with lymphatic involvement. The patient then underwent additional surgical resection. In such cases, additional endoscopic resection might be a treatment option.

**Key words:** cold snare polypectomy, colorectal cancer, endoscopic resection

(Intern Med 62: 227-231, 2023)

(DOI: 10.2169/internalmedicine.9594-22)

### Introduction

Endoscopic removal of a neoplastic polyp is the most effective treatment for colorectal cancer prevention (1, 2). Cold snare polypectomy (CSP) has been widely used for the removal of colorectal polyps due to its low risk of post-procedural bleeding and perforation (3). However, CSP is limited to benign polyps with a size of <10 mm, as larger lesions cannot be resected with sufficient margins to ensure curative resection (4).

Despite the high diagnostic accuracy of narrow-band imaging (NBI)-assisted visualization of colorectal polyps, some cases of diminutive invasive cancer that are difficult to diagnose endoscopically have been reported (5); these cases are at risk of being inappropriately treated with CSP.

We herein report a cautionary case of invasive colon cancer treated with CSP that was managed with additional endoscopic resection.

### Case Report

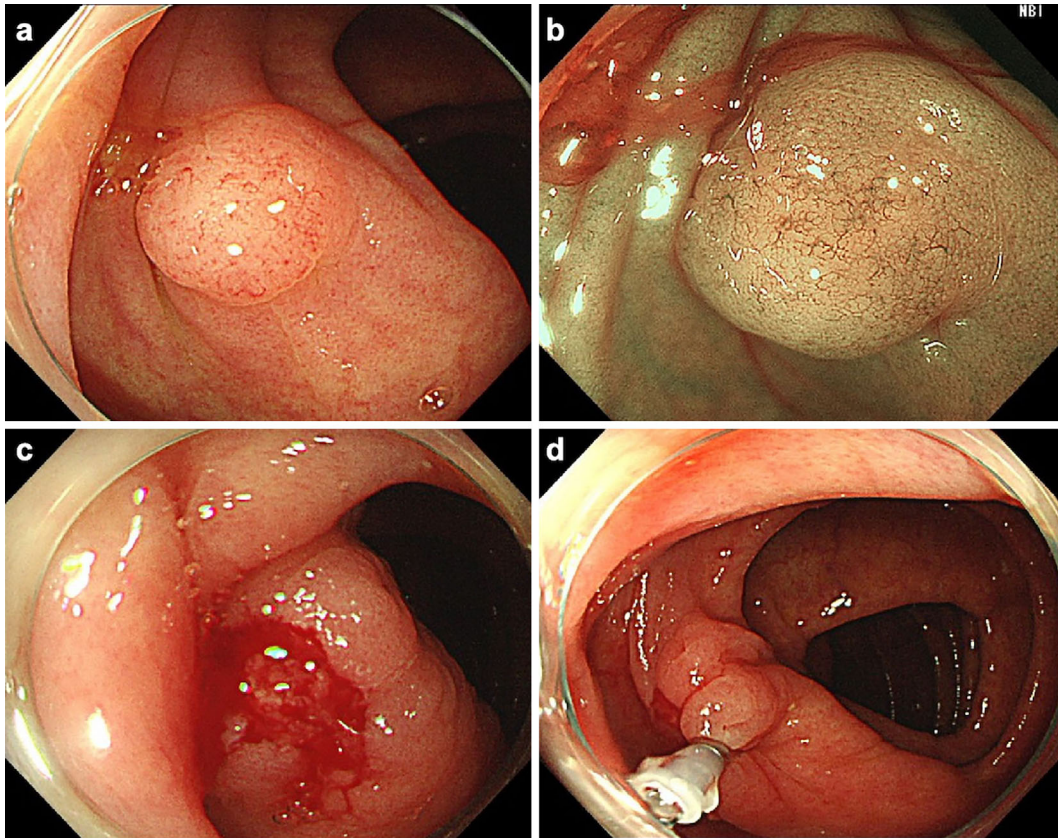
A 74-year-old man underwent colonoscopy because of mild anemia, revealing a 4-mm sessile polyp with a type 0-

Is macroscopic appearance according to the Paris classification in the ascending colon (6). Conventional endoscopy showed a slightly reddish appearance without depression (Fig. 1a). Non-magnified NBI-assisted endoscopy showed a surface pattern composed of white oval structures and a vessel pattern composed of brown vessels surrounding the white structures, which was consistent with an NBI International Colorectal Endoscopic (NICE) classification type 2/Japan NBI Expert Team (JNET) classification type 2A (Fig. 1b) (7, 8). The endoscopist diagnosed the lesion as an adenomatous polyp according to the NICE/JNET classification.

The polyp was resected with CSP since both the qualitative and quantitative characteristics of the polyp met the indications for this procedure (Fig. 1c). The post-CSP ulcer was closed with a clip (Fig. 1d). However, despite meeting the criteria for CSP, the resected specimen was found to be a well-differentiated adenocarcinoma with a positive vertical margin. It was notable for its preservation of the mucosal gland structure, without an adenomatous component or desmoplastic reaction (Fig. 2a-c, Hematoxylin and Eosin staining; 2d-f, cytokeratin AE1/AE3 staining).

According to the 2019 Japanese Society for Cancer of the Colon and Rectum (JSCCR) guidelines for the treatment of

<sup>1</sup>Department of Gastroenterology and Hepatology, Mie University Hospital, Japan and <sup>2</sup>Department of Gastroenterology, Kinan Hospital, Japan  
Received: February 14, 2022; Accepted: April 27, 2022; Advance Publication by J-STAGE: June 7, 2022  
Correspondence to Dr. Yasuhiko Hamada, y-hamada@clin.medic.mie-u.ac.jp



**Figure 1.** Colonoscopy revealed a 4-mm sessile polyp with a slightly reddish appearance and without depression. a: Narrow-band imaging (NBI)-assisted visualization showed a surface pattern composed of white oval structures and a vessel pattern composed of brown vessels surrounding the white structures, consistent with NBI International Colorectal Endoscopic classification type 2/Japan NBI Expert Team classification type 2A. b: The diminutive polyp was resected with cold snare polypectomy (CSP). c: Post-CSP ulcer. d: Closure of the ulcer with a clip.

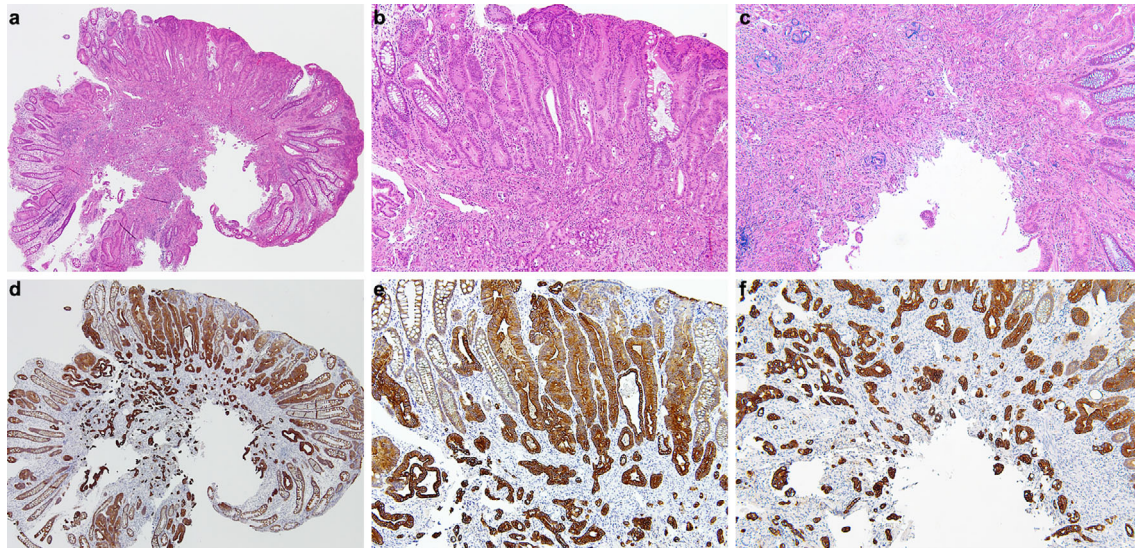
colorectal cancer (9), we recommended that the patient undergo additional surgical resection as a standard treatment option. Furthermore, additional endoscopic resection was offered as an alternative treatment option. After a discussion with the patient, additional endoscopic resection was finally chosen and performed at the scar area of the previous CSP one month later. The CSP scar area was resected en bloc by endoscopic mucosal resection (Fig. 3). However, the resected specimen revealed the presence of residual cancer that had invaded the submucosal layer at 2,700  $\mu\text{m}$  (Fig. 4a, b) with lymphatic involvement (Fig. 4c). The patient therefore underwent additional surgical resection, and the resected specimen revealed no residual cancer or lymph node metastasis. The patient has had no recurrence in the three years since the surgery.

## Discussion

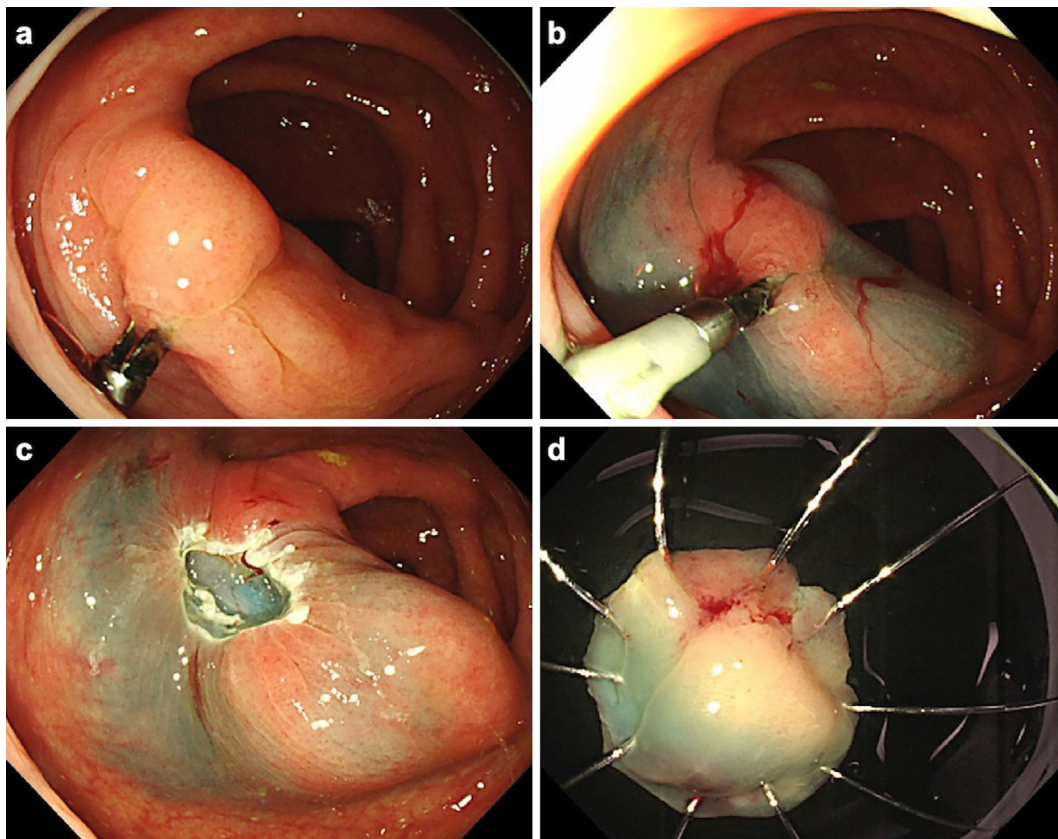
CSP is a well-established method for resection of small colorectal polyps (4); however, given the possibility of incomplete resection, it is recommended only for benign tumors. Among all diminutive colorectal polyps, the incidence of cancer has been reported to be 0.4-2.0%, while the inci-

dence of submucosally invasive cancer has been reported to be 0.04-0.2% (10, 11). The NICE/JNET classification is useful in the qualitative and quantitative diagnosis of colorectal polyps through NBI-assisted visualization (12-14). Therefore, diminutive polyps with NBI findings of NICE type 2/JNET type 2A are generally considered to be good candidates for CSP (7).

However, this case of a diminutive polyp was misdiagnosed, as it did not exhibit the NBI findings characteristic of an invasive cancer, such as NICE/JNET type 3. A few factors might explain this misdiagnosis. First, the NBI observation could not properly capture the deepest part of the lesion. Second, the CSP specimen did not pathologically reveal a desmoplastic reaction, which is characteristic of invasive cancer. A previous study reported a case of a 3-mm *de novo*-type intramucosal cancer with a slightly elevated form, and the NBI findings closely resembled those of the current polyp (15). The authors suggested that some *de novo*-type cancers have NBI findings without features suggestive of cancer in the initial phase of progression; therefore, the current polyp may have been a *de novo*-type cancer. Furthermore, careful white-light observation was not performed in this case. When retrospectively reviewing the white-light en-



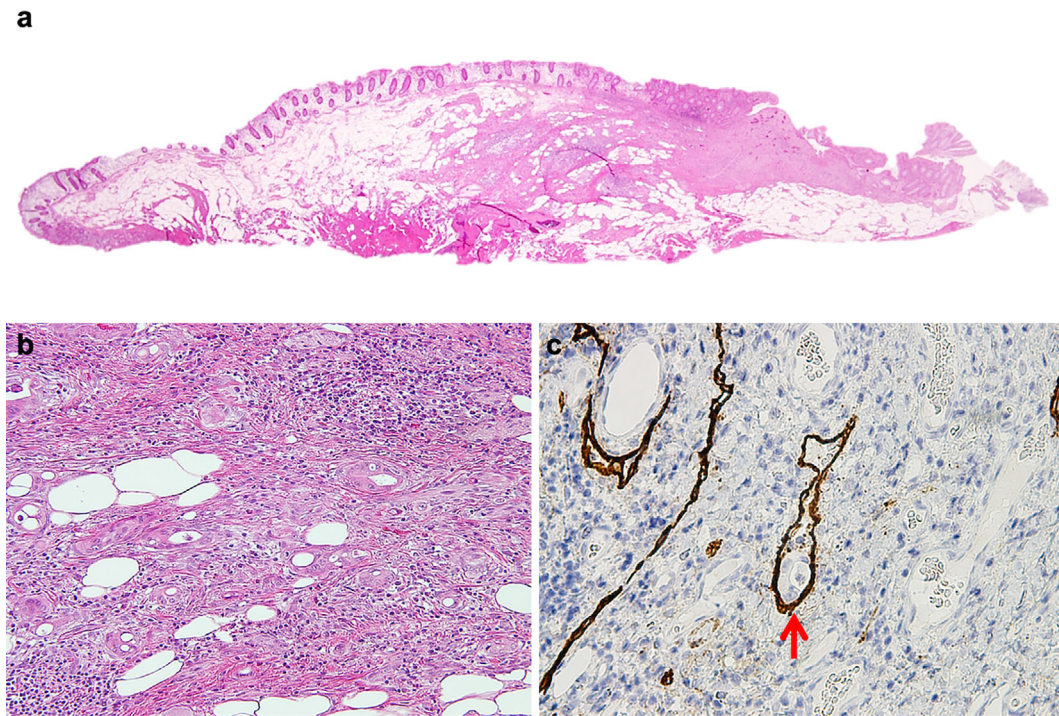
**Figure 2.** The resected specimen was a well-differentiated adenocarcinoma with a positive vertical margin. The mucosal gland structure was preserved without the adenomatous component and desmoplastic reaction. a: Hematoxylin and Eosin (H&E) staining  $\times 40$ . b: Mucosal area, H&E staining  $\times 100$ . c: Vertical margin, H&E staining  $\times 100$ . d: Cytokeratin AE1/AE3 staining  $\times 40$ . e: Mucosal area, cytokeratin AE1/AE3 staining  $\times 100$ . f: Vertical margin, cytokeratin AE1/AE3 staining  $\times 100$ .



**Figure 3.** Additional endoscopic resection (endoscopic mucosal resection) was performed at the scar area of the previous cold snare polypectomy (CSP). a: A clip remained at the CSP scar. b: Submucosal injection. c: Post-CSP ulcer. d: Resected specimen.

oscopic images, a significant finding of “sessile lesions with normal mucosa of the lesion border similar to submucosal tumor,” which is characteristic of invasive cancer, was

noted (16). Therefore, if careful observation of white-light endoscopy had been performed, inappropriate CSP could have been avoided.



**Figure 4.** The resected specimen revealed a residual cancer that invaded the submucosal layer at 2,700  $\mu\text{m}$ . a: Hematoxylin and Eosin (H&E) staining  $\times 12.5$ . b: H&E staining  $\times 200$ . c: Lymphatic involvement, D2-40 staining  $\times 400$ , arrow.

Several cases of inadvertent treatment of diminutive cancerous polyps with CSP have been reported (17, 18). However, the management of such cases remains controversial, as there is no robust evidence supporting appropriate salvage and surveillance methods. Yoshida et al. analyzed 80 follow-up lesions after CSP for intramucosal (78 lesions) or submucosal (2 lesions) invasive cancer (19). In their study, they performed periodic surveillance colonoscopies after CSP and observed five local recurrent lesions. All lesions were completely resected with additional endoscopic resection, with no recurrence. These results show that most cases can be managed with periodic surveillance colonoscopy. However, their study included only two cases of invasive cancer, and the median follow-up period of 24 months was insufficient to confirm recurrence.

In our case, the specimen obtained by additional endoscopic resection showed residual submucosal invasive cancer that required surgical resection. In the 2019 JSCCR guidelines for the treatment of colorectal cancer, surgical resection is recommended when the vertical margin is positive after endoscopic resection of a submucosally invasive cancer (9). Accordingly, in such a case, surgical resection should be recommended as the standard treatment option, with additional endoscopic resection offered merely as an alternative.

However, we believe that the application of additional endoscopic resection has some advantages in such cases. First, it enables the local control of tumor spread. Second, it allows for a detailed pathological evaluation, including information on tumor invasion depth and lymphovascular in-

volvements and consequently an estimation of the subsequent recurrence risk. However, a previous study reported that second local recurrence with advanced cancer occurred after additional endoscopic resection for local recurrence following CSP (20). Given the above, additional endoscopic resection should be performed in a select subset of patients, such as those at a high-risk of surgery.

In conclusion, we encountered a cautionary case of diminutive invasive colon cancer resected inadvertently with CSP. In certain similar cases, additional endoscopic resection might be a treatment option.

Informed consent was obtained from the patient to publish his information and imaging findings.

**The authors state that they have no Conflict of Interest (COI).**

Tetsuro Harada and Yasuhiko Hamada contributed equally to this work.

## References

1. Winawer SJ, Zauber AG, Ho MN, et al.; The National Polyp Study Workgroup. Prevention of colorectal cancer by colonoscopic polypectomy. *N Engl J Med* **329**: 1977-1981, 1993.
2. Zauber AG, Winawer SJ, O'Brien MJ, et al. Colonoscopic polypectomy and long-term prevention of colorectal-cancer deaths. *N Engl J Med* **366**: 687-696, 2012.
3. Horiuchi A, Nakayama Y, Kajiyama M, Tanaka N, Sano K, Graham DY. Removal of small colorectal polyps in anticoagulated patients: a prospective randomized comparison of cold snare and

- conventional polypectomy. *Gastrointest Endosc* **79**: 417-423, 2014.
4. Kawamura T, Takeuchi Y, Yokota I, Takagaki N. Indications for cold polypectomy stratified by the colorectal polyp size: a systematic review and meta-analysis. *J Anus Rectum Colon* **4**: 67-78, 2020.
  5. Hotta K, Imai K, Yamaguchi Y, et al. Diminutive submucosally invasive cancers of the colon and rectum. *Endoscopy* **47**: E2-E3, 2015.
  6. Participants in the Paris Workshop. The Paris endoscopic classification of superficial neoplastic lesions: esophagus, stomach, and colon: November 30 to December 1, 2002. *Gastrointest Endosc* **58**: S3-S43, 2003.
  7. Hamada Y, Tanaka K, Katsurahara M, et al. Utility of the narrow-band imaging international colorectal endoscopic classification for optical diagnosis of colorectal polyp histology in clinical practice: a retrospective study. *BMC Gastroenterol* **21**: 336, 2021.
  8. Sano Y, Tanaka S, Kudo SE, et al. Narrow-band imaging (NBI) magnifying endoscopic classification of colorectal tumors proposed by the Japan NBI Expert Team. *Dig Endosc* **28**: 526-533, 2016.
  9. Hashiguchi Y, Muro K, Saito Y, et al. Japanese Society for Cancer of the Colon and Rectum (JSCCR) guidelines 2019 for the treatment of colorectal cancer. *Int J Clin Oncol* **25**: 1-42, 2020.
  10. Matsuda T, Kawano H, Hisabe T, et al. Current status and future perspectives of endoscopic diagnosis and treatment of diminutive colorectal polyps. *Dig Endosc* **26**: 104-108, 2014.
  11. Oka S, Tanaka S, Nakadoi K, Asayama N, Chayama K. Endoscopic features and management of diminutive colorectal submucosal invasive carcinoma. *Dig Endosc* **26**: 78-83, 2014.
  12. Hewett DG, Kaltenbach T, Sano Y, et al. Validation of a simple classification system for endoscopic diagnosis of small colorectal polyps using narrow-band imaging. *Gastroenterology* **143**: 599-607.e591, 2012.
  13. Hayashi N, Tanaka S, Hewett DG, et al. Endoscopic prediction of deep submucosal invasive carcinoma: validation of the narrow-band imaging international colorectal endoscopic (NICE) classification. *Gastrointest Endosc* **78**: 625-632, 2013.
  14. Murano T, Ikematsu H, Shinmura K, et al. Endoscopic prediction of advanced histology in colorectal lesions sized <10 mm using the Japan Narrow-band Imaging Expert Team classification. *Dig Endosc* **32**: 785-790, 2020.
  15. Kishida Y, Hotta K, Shimoda T. A diminutive *de novo* cancer of the sigmoid colon with nondepressed morphology. *Clin Gastroenterol Hepatol* **14**: e132-e133, 2016.
  16. Tanaka S, Saitoh Y, Matsuda T, et al. Evidence-based clinical practice guidelines for management of colorectal polyps. *J Gastroenterol* **56**: 323-335, 2021.
  17. Yoshida N, Naito Y, Murakami T, et al. A diminutive T1 cancer 4 mm in size resected by cold snare polypectomy. *Case Rep Gastroenterol* **12**: 27-31, 2018.
  18. Katagiri A, Inoki K, Konda K, Yamamura F, Yoshida H. Case of colorectal cancer after cold snare polypectomy successfully salvaged on endoscopic submucosal dissection. *Cureus* **12**: e11182, 2020.
  19. Yoshida N, Fukumoto K, Hasegawa D, et al. Recurrence rate and lesions characteristics after cold snare polypectomy of high-grade dysplasia and T1 lesions: a multicenter analysis. *J Gastroenterol Hepatol* **36**: 3337-3344, 2021.
  20. Kato M, Shiraishi J, Uraoka T. Second local recurrence with advanced rectal cancer after salvage endoscopic mucosal resection of local recurrence following initial cold polypectomy. *Dig Endosc* **29**: 636, 2017.

The Internal Medicine is an Open Access journal distributed under the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License. To view the details of this license, please visit (<https://creativecommons.org/licenses/by-nc-nd/4.0/>).