

Single Case

Phlegmonous Colitis after Cold Snare Polypectomy in an Immunosuppressed Patient: A Case Report

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Keywords

Phlegmonous colitis · Cold snare polypectomy · Immunosuppressed patients · Case report

Abstract

Introduction: Cold snare polypectomy (CSP) is a procedure with a low risk of complications. Here, we present our experience of a rare case of submucosal abscess following CSP in an immunosuppressed patient. **Case Presentation:** Seventy-eight-year-old man underwent CSP, developing a fever, chills, and right lower abdominal pain 8 days later. Ultrasound and computed tomography revealed wall thickening of the ascending colon, presenting as whitening and thickening of the same region, and excretion of pus was observed after biopsy. The diagnosis was made as phlegmonous colitis, for which antibiotic therapy was commenced. The patient was diagnosed with chronic myelomonocytic leukemia (CMML) during admission. We considered the following reasons as possible causes of infectious complications after CSP: (1) the patient had a highly immunosuppressed state with comorbidities such as CMML as well as diabetes mellitus and (2) disruption of the mucosal barrier occurred during endoscopic resection. **Conclusion:** Although CSP is generally considered safe, our case highlights the potential for serious complications in immunosuppressed patients. Therefore, the decision to perform CSP in such patients should be made with caution to avoid unnecessary interventions. In instances where treatment is essential, thorough bowel preparation and prophylactic antibiotic use may be necessary to mitigate the risks.

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Introduction

Cold snare polypectomy (CSP) is an endoscopic resection technique that was first reported as a technique for the excision of small colorectal polyps without electrocautery [1]. The method was introduced to Japan in 1997 [2] and is currently widely applied to resect small polyps.

CSP is a highly safe procedure for removing small polyps without recurrence [3, 4]. A prior meta-analysis showed no significant differences in delayed bleeding after CSP compared to hot snare polypectomy (HSP). Generally, CSP is considered to have a much lower complication rate compared with HSP and endoscopic mucosal resection (EMR) [5–8]. Nevertheless, we experienced a case of phlegmonous colitis after CSP in an immunosuppressed patient. Thus, we describe a rare case of complication after CSP, which suggests the need for caution when using this technique in immunocompromised patients.

Case Report

A 78-year-old man with a history of myocardial infarction, diabetes mellitus (DM), chronic kidney disease, and arteriosclerosis obliterans was brought to the emergency room via ambulance. Upon arrival, he exhibited clear consciousness (JCS 0), with a blood pressure of 148/68 mm Hg, pulse rate of 92/min, and body temperature of 36.8°C. He presented with fever, chills, and right lower abdominal pain. Physical examination revealed tenderness in the right lower abdomen. Laboratory tests showed elevated inflammatory markers (white blood cell count: 111,100/ μ L; CRP: 31.1 mg/dL), as detailed in Table 1. Abdominal ultrasound and computed tomography (CT) revealed bowel wall thickening in the ascending colon, indicating panniculitis (shown in Fig. 1a, b).

Eight days earlier, he underwent colonoscopy to remove six polyps in the ascending colon using CSP, which were subsequently diagnosed as adenomas. Each polyp was approximately 7 mm in diameter and was sessile. The patient was taking two antithrombotic drugs (aspirin and clopidogrel). Following guidelines for gastrointestinal endoscopy in patients on antithrombotic medication, CSP was performed 5 days after discontinuing clopidogrel while continuing aspirin [9]. Bowel preparation was performed with 2 L of polyethylene glycol, and the bowel preparation quality was “excellent” using the Aronchick scale [10]. Post-resection mucosal defects were irrigated with tap water, and the resection site was secured with endoscopic clips (shown in Fig. 2).

Following the initial assessments in the emergency room, we initiated antibiotic therapy with meropenem (0.5 g/day) due to the patient’s high inflammation levels and abdominal pain. This choice was made after considering his clinical symptoms and imaging findings. Six days post-admission, a repeat colonoscopy revealed multiple dirty ulcers with white granulation at the previous CSP site. Notably, the clips from the polypectomy/infection site were absent. We did not suspect deep mucosal injury from the post-polypectomy. These ulcers were much larger than those just after CSP and had swelled because of phlegmonous colitis. We incised the post-CSP ulcers using biopsy forceps and pus drainage was observed. This is likely due to the phlegmonous colitis (shown in Fig. 3a–c). Despite negative cultures from blood and pus samples, meropenem treatment was continued due to persistent symptoms and high inflammatory markers. The patient was started on a diet 9 days after admission once the fever had resolved, and the abdominal pain and inflammatory markers had improved and meropenem was discontinued.

A follow-up CT performed 2 weeks after admission revealed not only an improvement in the thickness of the panniculitis in the ascending colon but also a reduction in previously elevated CT values (shown in Fig. 1c). We further performed a follow-up colonoscopy 1 month

Table 1. Laboratory test results of the patient at hospitalization and discharge

Variables	At hospitalization	At discharge
White blood cell, $\times 10^2/\mu\text{L}$	1,111	48
Neutrophil, %	–	65.4
Monocyte, %	6.6	20.0
Hemoglobin, g/dL	7.3	8.8
Platelet, $\times 10^4/\mu\text{L}$	25.2	26.0
BUN, mg/dL	86.0	52.9
Creatinine, mg/dL	5.85	4.47
C-reactive protein, mg/dL	31.1	3.97

after admission, which showed improvement in the ascending colon wall (shown in Fig. 3d, e). The patient's inflammatory markers were improved (CRP was 3.97 mg/dL), and he was finally discharged 35 days after admission. During hospitalization, a significant increase in mononuclear cells was observed, and a bone marrow examination led to the diagnosis of chronic myelomonocytic leukemia (CMML). As of December 2022, the patient is currently undergoing treatment by a hematology team.

Discussion

Overall, we experienced a case of phlegmonous colitis after CSP in a CMML, DM patient. Although CSP is a procedure with few complications, in the present case, CSP in our immunosuppressed patient resulted in a serious infection requiring 35 days of hospitalization.

Complications after polypectomy have been reported (shown in Table 2). In particular, one study reported a case of pyogenic liver abscess after colonoscopic polypectomy [11]. The infection may have been caused by mucosal disruption after colonoscopic polypectomy. Another report described a case of submucosal abscess and intussusception after EMR [12]. These two reports suggest three reasons for the occurrence of infectious complications after polypectomy: (1) insufficient preparation of the bowel, (2) susceptibility to infection due to DM, and (3) disruption of the mucosal barrier by endoscopic resection.

These reasons for infectious complications after polypectomy are not specific to CSP as they can occur after HSP or EMR. In the present case, the patient had a highly immunosuppressed state with comorbidities such as CMML, DM, and chronic kidney disease. Endoscopic resection in immunosuppressed patients should be performed with careful consideration of postoperative infections. As shown in Table 2, the frequency of complications following CSP is low, and only two cases of perforation have been reported [17]. Nevertheless, the present study indicates the importance of recognizing the possibility of infection after CSP in immunosuppressed patients.

There are varying reports regarding prophylactic antibiotics. While large-scale randomized controlled studies have shown no benefit of prophylactic antibiotics for lesions larger than 20 mm [18], contrary evidence suggests that prophylactic antibiotics significantly reduce adverse events associated with colorectal ESD or EMR for lesions over 10 mm. Additionally, post-ESD antimicrobial use is linked to lower rates of post-ESD coagulation syndrome, reduced CRP levels, and less abdominal pain [19]. In this case, the patient was immunosuppressed; thus, we believe that prophylactic antimicrobials should be considered for immunosuppressed patients scheduled for endoscopic resection, including CSP. As mentioned above, inadequate preparation has also been reported to result in infection after

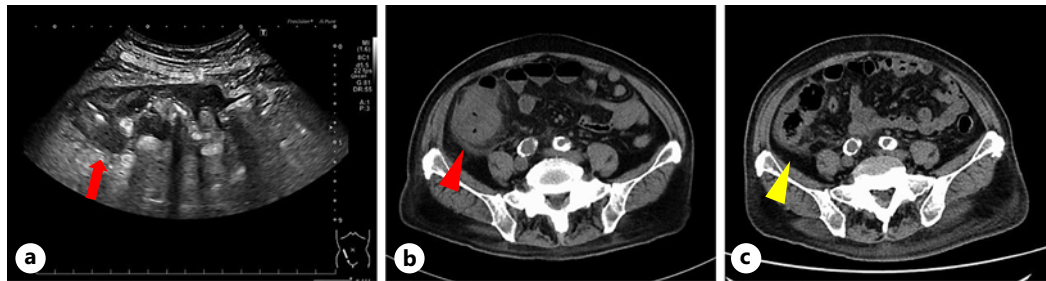


Fig. 1. **a** Ultrasound showing bowel wall thickening of the ascending colon (arrow). **b** Abdominal computed tomography (CT) showing bowel wall thickening and increased CT value of panniculitis of the ascending colon (red arrowhead). **c** Follow-up CT after 2 weeks showing improvement in bowel wall thickening and an increased CT value of panniculitis of the ascending colon (yellow arrowhead).

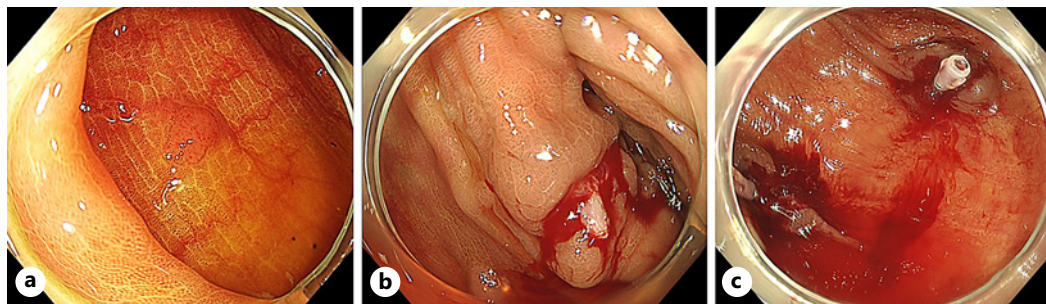


Fig. 2. **a–c** First colonoscopy of polypectomy; mucosal defects were irrigated with a water jet to reduce oozing, and the resection site was sutured with endoscopic clips.

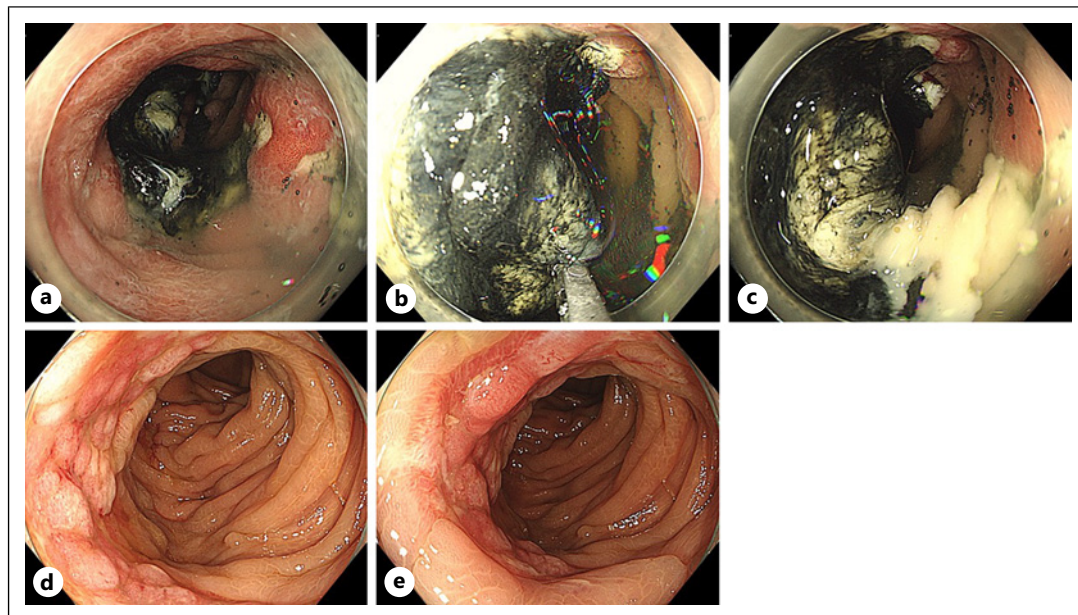


Fig. 3. Colonoscopy was performed 6 days after admission. **a** Ulcers at the site of cold snare polypectomy (CSP) with bowel wall thickening of the ascending colon. Black deposits are caused by the carbon in uremic drugs. **b, c** Excretion of pus was observed after application of biopsy forceps. **d, e** Follow-up colonoscopy 1 month after admission showing improvement of the ascending colon wall.

Table 2. Previously reported cases of complications of polypectomy

Author	Year	Cases	Complications	Polypectomy method	Risk factors			Bowel preparations	Other possible causes
					DM	CKD	others		
Satake et al. [12]	2016	1	Submucosal abscess and intussusception	EMR	+	-	-	bad	Disruption of the mucosal barrier by endoscopic resection
García-García et al. [13]	2016	1	Abdominal wall abscess	Polypectomy	-	-	-	N/A	The mesenteric fatty tissue covering the delayed perforation had extended into the abdominal wall over time
Kim et al. [11]	2020	3	Liver abscess Liver cyst infection	EMR	-	-	-	N/A	Disruption of the mucosal barrier by endoscopic resection
Young et al. [14]	2021	1	Perforation	CSP	-	-	-	N/A	Not described
Geng et al. [15]	2022	1	Septic shock	EMR	+	-	-	N/A	(1) Prolonged bleeding and hematoma restricted blood supply to the submucosal layer (2) Chronic mucosa inflammation by parasitic infection may have contributed to infection
Iwano et al. [16]	2022	1	Perforation	CSP	-	+	PSL user	N/A	Delayed wound healing and intestinal wall weakness, thinning, and necrosis by corticosteroids

EMR, endoscopic mucosal resection; DM, diabetes mellitus; CSP, cold snare polypectomy; CKD, chronic kidney disease; PSL, prednisolone; N/A, not available.

polypectomy [12]. Although preparation was sufficient in the present case, adequate preparation is important when endoscopic resection is performed in immunosuppressed patients even with CSP.

This case report's significance lies in its highlighting the potential risks of CSP in immunocompromised patients, challenging the prevailing assumption of its universal safety. The report also serves as a vital reminder that CSP is not without risk, especially in vulnerable patient populations. The limitation of this report is its singular case-based nature.

In conclusion, we experienced a case of phlegmonous colitis after CSP with an immunosuppressed patient. Even with CSP, clinicians must be aware of the possibility of post-operative infection. Immunocompromised patients should carefully evaluate the necessity of undergoing CSP to prevent unwarranted interventions. When CSP is essential, thorough bowel preparation and prophylactic antibiotic use might be required. The CARE Checklist has been completed by the authors for this case report, attached as online supplementary material (for all online suppl. material, see <https://doi.org/10.1159/000536487>).

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Statement of Ethics

Ethical approval is not required for this study in accordance with local or national guidelines. Written informed consent was obtained from the patient for publication of the details of their medical case and any accompanying images.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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Author Contributions

K.K. contributed to the planning, literature review, and writing of the article. C.I. edited the article. C.S., T.N., M.N., J.K., H.H., and A.S. provided professional suggestions in the conduct of the case report. All authors commented on the draft versions and approved the final version of the manuscript.

Data Availability Statement

All data that support the findings of this study are included in this article. Further inquiries can be directed to the corresponding author.

References

- 1 Tappero G, Gaia E, De Giuli P, Martini S, Gubetta L, Emanuelli G. Cold snare excision of small colorectal polyps. *Gastrointest Endosc*. 1992;38(3):310–3.
- 2 Uno Y, Obara K, Zheng P, Miura S, Odagiri A, Sakamoto J, et al. Cold snare excision is a safe method for diminutive colorectal polyps. *Tohoku J Exp Med*. 1997;183(4):243–9.
- 3 Uraoka T, Ramberan H, Matsuda T, Fujii T, Yahagi N. Cold polypectomy techniques for diminutive polyps in the colorectum. *Dig Endosc*. 2014;26(Suppl 2):98–103.
- 4 Repici A, Hassan C, Vitetta E, Ferrara E, Manes G, Gullotti G, et al. Safety of cold polypectomy for <10 mm polyps at colonoscopy: a prospective multicenter study. *Endoscopy*. 2012;44(1):27–31.
- 5 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*. 2020;4(2):67–78.
- 6 Fujiya M, Sato H, Ueno N, Sakatani A, Tanaka K, Dokoshi T, et al. Efficacy and adverse events of cold vs. hot polypectomy: a meta-analysis. *World J Gastroenterol*. 2016;22(23):5436–44.
- 7 Qu J, Jian H, Li L, Zhang Y, Feng B, Li Z, et al. Effectiveness and safety of cold versus hot snare polypectomy: a meta-analysis. *J Gastroenterol Hepatol*. 2019;34(1):49–58.
- 8 Shinozaki S, Kobayashi Y, Hayashi Y, Sakamoto H, Lefor AK, Yamamoto H. Efficacy and safety of cold versus hot snare polypectomy for resecting small colorectal polyps: systematic review and meta-analysis. *Dig Endosc*. 2018;30(5):592–9.
- 9 Fujimoto K, Fujishiro M, Kato M, Higuchi K, Iwakiri R, Sakamoto C, et al. Guidelines for gastroenterological endoscopy in patients undergoing antithrombotic treatment. *Dig Endosc*. 2014;26:1–14.
- 10 Aronchick CA, Lipshutz WH, Wright SH, Dufrayne F, Bergman G. A novel tableted purgative for colonoscopic preparation: efficacy and safety comparisons with CoLyte and Fleet Phospho-Soda. *Gastrointest Endosc*. 2000;52(3):346–52.
- 11 Kim TH, Heo NY, Park SH, Moon YS, Kim TO, Park J, et al. Pyogenic liver abscess or liver cyst infection after colonoscopic polypectomy. *Korean J Gastroenterol*. 2020;75(5):300–4.
- 12 Satake M, Mikami T, Sawaya M, Sakamoto Y, Iino O, Aihara T, et al. A case of adult intussusception with a submucosal abscess after endoscopic mucosal resection of a colon adenoma. *Gastroenterol Endosc*. 2016;58:2268–72.
- 13 García-García ML, Jiménez-Ballester MÁ, Girela-Baena E, Aguayo-Albasini JL. Abdominal wall abscess secondary to colonoscopic polypectomy. Radiological management. *Gastroenterol Hepatol*. 2017;40(7):463–4.
- 14 Young E, Ruszkiewicz A, Singh R. Gastrointestinal: a case of cold-snare polypectomy perforation: avoiding this rare complication. *J Gastroenterol Hepatol*. 2022;37(4):607.
- 15 Geng ZH, Zhu Y, Liu XY, Gao PT, Huang Y, Li QL, et al. Severe septic shock after colonoscopic polypectomy. *J Dig Dis*. 2022;23(2):130–2.
- 16 Iwano H, Sato T, Ishii Y, Niki S, Sawaya R, Tamakawa S, et al. Delayed perforation after cold snare polypectomy for small colonic polyps in a patient receiving oral corticosteroids. *DEN Open*. 2023;3(1):e157.
- 17 Uraoka T, Takizawa K, Tanaka S, Kashida H, Saito Y, Yahagi N, et al. Guidelines for colorectal cold polypectomy (supplement to “Guidelines for colorectal endoscopic submucosal dissection/endoscopic mucosal resection”). *Dig Endosc*. 2022;34(4):668–75.
- 18 Shichijo S, Takeuchi Y, Shimodate Y, Yamashina T, Yamasaki T, Hayashi T, et al. Performance of perioperative antibiotics against post-endoscopic submucosal dissection coagulation syndrome: a multicenter randomized controlled trial. *Gastrointest Endosc*. 2022;95(2):349–59.
- 19 Zhang QS, Han B, Xu JH, Gao P, Shen YC. Antimicrobial prophylaxis in patients with colorectal lesions undergoing endoscopic resection. *World J Gastroenterol*. 2015;21(15):4715–21.