

Post-polypectomy coagulation syndrome: a tricky to diagnose hot snare problem that can be eliminated thanks to cold snare revolution

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ABSTRACT

Post-polypectomy syndrome or post-polypectomy coagulation syndrome (PPCS) is a rare adverse event of thermal injury caused during hot snare aided, endoscopic mucosal resection of colon polyps. Its diagnosis is tricky as it is commonly misdiagnosed as perforation leading to unnecessary exploratory abdominal surgeries. The authors aim to present an early diagnosed and successfully treated, case of PPCS, and to highlight the difference in the safety profile of two techniques; hot snare versus cold snare polypectomy.

KEYWORDS: Post-polypectomy coagulation syndrome; endoscopic mucosal resection adverse events; hot snare polypectomy; cold snare polypectomy

INTRODUCTION

Post-polypectomy coagulation syndrome (PPCS); also known as post-polypectomy syndrome, post-polypectomy electro coagulation syndrome, transmural burn syndrome, or post-polypectomy syndrome; is an uncommon complication of lower gastrointestinal endoscopy, which occurs when electro coagulation is used to perform colon polyp's excision [1].

PPCS develops when an electrical current that is applied during an electro-coagulation-aided polypectomy extends past the mucosa into the muscularis propria and serosa, resulting in a transmural burn and peritoneal inflammation but without bowel perforation [2].

Diagnosis of PPCS is challenging as its clinical presentation is similar to colon perforation. The symptoms include abdominal pain and tenderness, fever and laboratory tests reveal leukocytosis. Although bowel perforation does not occur, patients with PPCS develop inflammation of the peritoneum. The differentiation between the two conditions is vital in order to avoid unnecessary exploratory laparotomies; as PPCS completely resolves with medical treatment [1,3].

Among the risk factors of PPCS development, large polyp size (≥ 10 mm) non polypoid lesion shape seems to be of great importance [4]. Herein, we present a case of PPCS development after endoscopic mucosal resection (EMR)

of a subpedunculated polyp of size 9mm in the ascending colon.

CASE PRESENTATION

A 72-year-old woman who underwent screening colonoscopy for colorectal cancer was diagnosed with a subpedunculated polyp (Isp according to Paris Classification) of size 9mm in the ascending colon [Fig. 1].

The polyp was removed by endoscopic mucosal resection (EMR) technique and the procedure was performed with high definition Fujinon series endoscope. Firstly the submucosal was injected with mixed blue de methylene - adrenaline solution 1:10.000 in normal saline. After that the endoscopist used a hot snare of diameter 15mm and cut the polyp (ERBE ICC 200, Auto cut effect/forced 100/50 Watt). The excision was performed en block and two hemostatic clips were placed at the polypectomy site for delayed bleeding prophylaxis. The lesion was retrieved and sent for pathology examination.

One hour after endoscopy, the patient suddenly developed periumbilical pain with nausea and general malaise. Physical examination revealed abdominal distention and tenderness which advanced to rebound tenderness and high fever 39°C. A slightly dilated ascending colon and the presence of clips were depicted at the abdominal X-ray, but no air sub diaphragmatically. The air concentration and air fluid levels were considered a normal finding as interventional endoscopy had preceded [Figure 2].

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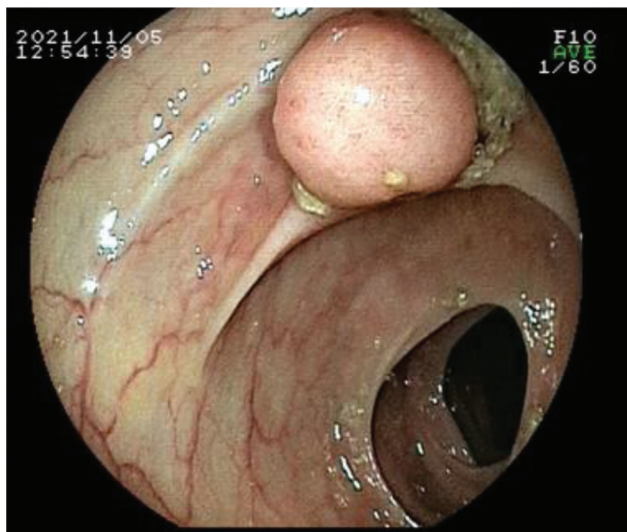


Fig. 1. Colon polyp (Paris classification Isp) in the ascending colon.



Fig. 2. Abdominal X-ray. Dilated ascending colon and presence of two haemostatic clips (arrow).

Laboratory examinations in the first hours were within normal limits but five hours later revealed a white blood cell count of $15.17 \times 10^3/\mu\text{L}$, 88.9% neutrophils, creatine phosphokinase (CPK) 599 U/L, C-reactive protein (CRP) 22,25 U/L. Abdominal computed tomography (CT) scan revealed collections of intraluminal air bubbles around the clips without evidence of free extraluminal air [Figure 3]. Additional findings were sigmoid diverticula and previous



Fig. 3. Abdominal CT scan. Collections of intraluminal air bubbles around the clips without evidence of free extraluminal air.

cholecystectomy which was referred at patient's medical history.

General surgeon consultation excluded perforation and other conditions requiring surgical management and the patient's symptoms were attributed to PPCS.

After diagnosis the patient received intravenous fluids as well as intravenous antibiotics; ciprofloxacin 400mg twice a day and intravenous metronidazole 500mg three times a day. In twenty four hours the patient's clinical status improved with no further complications.

DISCUSSION

The complication presented is a rare yet well-known adverse event of electro-coagulation-aided colon polypectomy techniques. Its incidence rate is about 1% but it has been described that it can exceed up to 2% [3,5]. In a large clinical study including 47,083 patients, PPCS's incidence was 0.07% [4].

Risk factors and clinical outcomes of PPCS were firstly described in 2013 in a retrospective case-control study. Elevated arterial pressure, large polyp size, and absence of stalk (non-polypoid lesions) were independently associated with the syndrome. Prognosis of PPCS is generally excellent. Major form of PPCS was calculated as 2.9 % and mortality as 0 %. [4] Furthermore, lesions in the right part of the colon appear to have higher rates of PPCS because at these sites (ascending and cecum) the bowel wall is thinner when distended with air (2-3mm thickness) [6].

PPCS symptoms usually present right after endoscopy but can also present one week after the procedure [2]. The differential diagnosis includes several conditions some of which are related to colonoscopy and some of which are not. Severe colonoscopy related complications are bowel perforation [7]. Patients with PPCS present with abdominal pain of varying severity and clinical examination may reveal mild tenderness or even guarding or/and rigidity. Fever and hemodynamic destabilization may also occur [8,9]. Clinical manifestations must be accompanied by radiographic signs in computed tomography that exclude bowel perforation and other conditions requiring surgical management like presence of extra luminal air [10]. Management of PPCS is based on

intravenous antibiotics against anaerobic and Gram negative bacteria, fluids and nil per os in order to allow bowel rest if needed according to patient's clinical status [7,10].

Complications after electro coagulation – aided polypectomy occur in up to 9%. Except for post polypectomy coagulation syndrome, hot snare polypectomy techniques are responsible for delayed bleeding and bowel perforation [11]. In order to avoid the electrocoagulation-related complications of hot snare polypectomy, researchers have focused on indications, safety profile and efficacy of cold snare technique. According to ESGE guidelines (ESGE: European Society of Gastrointestinal Endoscopy) diminutive polyps (size of ≤ 5 mm) and sessile polyps of size 6-9mm should be removed by cold snare because of lower complication rates [12]. The authors aim to highlight that referring to the case presented here, EMR was chosen by the endoscopist who performed the excision, because the size of the polyp was at the upper limit for cold snare polypectomy.

The authors aim to highlight that referring to the case presented here, EMR was chosen by the endoscopist who performed the excision, because the size of the polyp was at the upper limit for cold snare polypectomy. Furthermore, it is widely accepted that among the complications of polypectomy, delayed bleeding is the most common one. According to this aspect and because of the size of the polyp (upper limit), the endoscopist decided to apply prophylactic hemostasis, though the patient did not receive antithrombotic agents nor had anticoagulant disorders. However, the data about the necessity of prophylactic clipping are limited. Risk factors predisposing to delayed bleeding are: antithrombotic agents, polyp size > 10 mm, polyp located at the right colon, histology with villous components, non-pedunculated polyps [12]. In attempts to eliminate this complication, considering of prophylactic clipping in high risk patients is reasonable. However this strategy is not cost effective and yet not proved to be related to statistically significant reduction of delayed bleeding, especially referring to polyps < 20 mm [12,13].

CONCLUSION

The great advantage of cold snare polypectomy technique is that there is no risk of thermal injury to the colon wall, as electro cauterization is not part of this method. As a result, bowel perforation, delayed bleeding and post-polypectomy syndrome, caused by thermal damage are set to zero when cold snare is applied [14]. Nowadays, indications for cold snare polypectomy exclude pedunculated and sub-pedunculated polyps. In opposition to this a few studies have been conducted to examine the safety profile of cold snare polypectomy for pedunculated and subpedunculated with encouraging results supporting high level of safety of cold snare excision even for these lesions. [15,16].

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Conflict-of-interest statement

All authors declare no conflict of interests for this article.

Informed consent

Authors confirm that informed patient consent was obtained for publication of the case details.

REFERENCES

- Kus J, Haque S, Kazan-Tannus J, et al. Postpolypectomy coagulation syndrome - an uncommon complication of colonoscopy. *Clin Imaging*. 2021; 79:133-5. Epub 2021 Apr 29. PMID: 33940490. doi: 10.1016/j.clinimag.2021.04.037.
- Kim HW. What Is Different between Postpolypectomy Fever and Postpolypectomy Coagulation Syndrome? *Clin Endosc*. 2014; 47(3):205-6. Epub 2014 May 31. PMID: 24944980; PMCID: PMC4058534. doi: 10.5946/ce.2014.47.3.205.
- Hirasawa K, Sato C, Makazu M, et al. Coagulation syndrome: Delayed perforation after colorectal endoscopic treatments. *World J Gastrointest Endosc*. 2015; 7:1055-61. doi: 10.4253/wjge.v7.i12.1055.
- Cha JM, Lim KS, Lee SH, et al. Clinical outcomes and risk factors of post-polypectomy coagulation syndrome: a multicenter, retrospective, case-control study. *Endoscopy*. 2013; 45(3):202-7. Epub 2013 Feb 4. PMID: 23381948. doi: 10.1055/s-0032-1326104.
- Castro G, Azrak MF, Seeff LC, Royalty J. Outpatient colonoscopy complications in the CDC's Colorectal Cancer Screening Demonstration Program: a prospective analysis. *Cancer*. 2013; 119 Suppl 15:2849-54. PMID: 23868479. doi: 10.1002/cncr.28159.
- Choo WK, Subhani J. Complication rates of colonic polypectomy in relation to polyp characteristics and techniques: a district hospital experience. *J Intero Gastroenterol*. 2012; 2(1):8-11. Epub 2012 Jan 1. PMID: 22586542; PMCID: PMC3350902. doi: 10.4161/jig.20126.
- Jehangir A, Poudel DR, Masand-Rai A, Donato A. A systematic review of splenic injuries during colonoscopies: Evolving trends in presentation and management. *Int J Surg*. 2016; 33 Pt A:55-9. Epub 2016 Jul 30. PMID: 27479605. doi: 10.1016/j.ijsu.2016.07.067.
- Benson BC, Myers JJ, Laczek JT. Postpolypectomy electrocoagulation syndrome: a mimicker of colonic perforation. *Case Rep Emerg Med*. 2013; 2013:687931. Epub 2013 Jul 15. PMID: 23956889; PMCID: PMC3728495. doi: 10.1155/2013/687931.
- Levenson RB, Troy KM, Lee KS. Acute Abdominal Pain Following Optical Colonoscopy: CT Findings and Clinical Considerations. *AJR Am J Roentgenol*. 2016; 207(3):W33-40. doi: 10.2214/AJR.15.15722.
- Waye JD. Management of complications of colonoscopic polypectomy. *Gastroenterologist*. 1993; 1(2):158-64. PMID: 8049888.
- Ortigão R, Weigt J, Afifi A, Libânio D. Cold versus hot polypectomy / endoscopic mucosal resection-A review of current evidence. *United European Gastroenterol J*. 2021; 9(8):938-46. Epub 2021 Aug 5. doi: 10.1002/ueg2.12130.
- Mangira D, Ket SN, Majeed A, Gibson PR, Brown G. Post-polypectomy prophylactic clip closure for the prevention of delayed postpolypectomy bleeding: A systematic review. *JGH Open*. 2018; 2(3):105-10. doi: 10.1002/jgh3.12047.
- Bahin FF, Rasouli KN, Williams SJ, Lee EY, Bourke MJ. Prophylactic clipping for the prevention of bleeding following wide-field endoscopic mucosal resection of laterally spreading colorectal lesions: an economic modeling study. *Endoscopy*. 2016;48(8):754-61. doi: 10.1055/s-0042-105558.
- Colorectal polypectomy and endoscopic mucosal resection (EMR): European Society of Gastrointestinal Endoscopy (ESGE) Clinical Guideline. *Endoscopy*. 2017; 49(03):270-97. doi: 10.1055/s-0043-102569.
- Arimoto J, Chiba H, Ashikari K, et al. Safety and efficacy of cold snare polypectomy for pedunculated (Ip) polyps measuring less than 10 mm in diameter. *Int J Colorectal Dis*. 2020; 35(5): 859-67. Epub 2020 Feb 28. PMID: 32112197. doi: 10.1007/s00384-020-03547-5.
- Arimoto J, Chiba H, Ashikari K, et al. Management of Less Than 10-mm-Sized Pedunculated (Ip) Polyps with Thin Stalk: Hot Snare Polypectomy Versus Cold Snare Polypectomy. *Dig Dis Sci*. 2021; 66(7): 2353-61. Epub 2020 Jul 4. PMID: 32623550. doi: 10.1007/s10620-020-06436-7.