

CASE REPORT

Post-polypectomy electrocoagulation syndrome: a rare cause of acute abdominal pain

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While generally safe, the most feared complication of colonoscopy is perforation of the colon, occurring in nearly 1 in 1,000 procedures, and is more common when polypectomy is performed and electrocautery is used. Less commonly known is the post-polypectomy electrocoagulation syndrome, a transmural burn of the colon which mimics the signs and symptoms of perforation as well as the time course, but follows a benign course and can be treated conservatively.

Keywords: *tubulovillous polyp; snare polypectomy; transmural burn; post-polypectomy electrocoagulation syndrome*

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Colonoscopy is the gold standard for colon cancer screening, performed 14 million times per year in the United States (1). Polypectomies performed during colonoscopies are generally safe. The most feared complication is perforation of the colon, which presents with symptoms of acute peritonitis following colonoscopy. A lesser-known entity termed post-polypectomy electrocoagulation syndrome can mimic colonic perforation and should be considered in the differential diagnosis when patients present with acute abdominal pain following colonoscopy.

Case presentation

A 78-year-old male with past medical history of coronary artery disease presented to emergency care with complaints of fever and abdominal pain 5 hours after a colonoscopic snare polypectomy of a cecal tubulovillous polyp. Although he initially tolerated the procedure well, he noted development of an intermittent, diffuse cramping abdominal pain after returning home, which was relieved by passing flatus. A few hours later, he developed a 9/10 right lower quadrant abdominal pain aggravated by coughing and movement without significant relieving factors. The patient denied nausea, vomiting, or change in bowel habits.

On examination, the patient had a temperature of 38.1°C with the remainder of his vital signs within normal limits. On abdominal examination, the patient had normal bowel sounds with diffuse tenderness, most prominent in the right lower quadrant. There was no guarding or

rigidity. Laboratory tests revealed a white cell count of 19,000 cells/mcL (reference range: 4,800–10,800 cells/mcL) with 12% bands (reference range: 0–10%). His serum lactate was 1.9 mmol/L (reference range: 0.5–2.2 mmol/L). An abdominal radiograph was read as normal. A CT of the abdomen and pelvis with contrast revealed significant inflammatory changes within the mesenteric fat surrounding the cecum and thickening of the wall of the cecum (Figs. 1 and 2). The patient was evaluated by gastroenterology and general surgery who attributed his symptoms to post-polypectomy electrocoagulation syndrome. He was treated conservatively with intravenous fluids, piperacillin/tazobactam 3.375 g every 8 hours, and clear liquid diet. His abdominal pain resolved over 48 hours. He was discharged home on a regular diet with oral amoxicillin/clavulanate 875–125 mg tablet twice daily to complete a 5-day course of antibiotics. He reported a complete resolution of his symptoms on follow-up visit.

Discussion

Post-polypectomy electrocoagulation syndrome, also known as post-polypectomy syndrome, transmural burn syndrome, or microperforation, has a reported incidence varying from 0.003 to 1% in various studies (2–4). It results from electrocoagulation injury to the colonic mucosa and the underlying muscularis layer, which causes transmural burn with concurrent inflammation of the peritoneum without evidence of colonic perforation on imaging studies (2). In a large multicenter study, risk factors associated with



Fig. 1. CT abdomen and pelvis with contrast (axial view) revealing significant inflammatory change in the right lower quadrant in the mesenteric fat surrounding the cecum (white arrow) and thickening of the cecal wall (dotted arrow).



Fig. 2. CT abdomen and pelvis with contrast (sagittal view) revealing significant inflammatory change in the right lower quadrant in the mesenteric fat surrounding the cecum (white arrow) and thickening of the cecal wall (dotted arrow).

post-polypectomy electrocoagulation syndrome included non-polypoidal lesions, large lesion size (> 2 cm), lesions on the right side of the colon (attributed to decreased wall thickness), and hypertension (5, 6). Our patient's large right-sided lesion illustrates some of these common risks. Endothelial dysfunction and atherosclerosis are also cited by some authors as risk factors (2).

Patients with post-polypectomy electrocoagulation syndrome typically present within 12 hours following a colonoscopy with fever, tachycardia, and generalized abdominal pain. However, the onset of symptoms may be delayed by up to 5–7 days after the procedure (2). Some authors believe that post-polypectomy fever, which is an unexplained fever after colonoscopy with favorable outcomes with medical management alone, may represent a mild version of post-polypectomy electrocoagulation syndrome (2). The abdominal examination in patients presenting with post-polypectomy electrocoagulation syndrome may identify tenderness at the polypectomy site, with guarding and rigidity elicited in 20% of the cases. The laboratory tests can reveal leukocytosis, adding to a picture that mimics colonic perforation. A CT of the abdomen and pelvis is the diagnostic modality of choice to differentiate post-polypectomy electrocoagulation syndrome from colonic perforation. In post-polypectomy syndrome, a CT scan reveals a focal thickening of the colonic wall with surrounding fat stranding without any extramural air (6).

Patients with post-polypectomy electrocoagulation syndrome are generally managed conservatively with intravenous fluids, pain control, gradual advancement of diet as tolerated, with or without antibiotics against Gram-negative and anaerobic pathogens (6). Less severe cases can be managed in an outpatient setting with oral antibiotics and clear liquids for 1–2 days (6, 7). The symptoms tend to resolve within 2–5 days (3). For patients who do not improve with conservative measures, immediate surgical consultation should be considered for possible occult perforation (5). The prognosis in post-polypectomy electrocoagulation syndrome is generally excellent with a 2.9% rate of major complications (requiring ICU admission) and 0% mortality rate in a large multi-center study comprising 34 patients with post-polypectomy electrocoagulation syndrome (5). However, patients with a full thickness burn may have relatively worse outcomes as the bowel wall necrosis can eventually lead to delayed perforation requiring urgent surgical exploration (3).

Submucosal injection of various solutions for elevation of large polyps is often performed to attempt to insulate the rest of the colonic layers from injury due to electrocautery (8), particularly in more complex cases polypectomies involving larger polyps (> 1.5 cm) in the right colon. Right colon polypectomies are believed to confer a higher risk of colonic injury due to the relatively thinner walls (2–3 mm when distended with air), especially if electrocautery is used (4, 8). Techniques utilizing

normal saline injection beneath the polyp with or without epinephrine, sodium hyaluronate, 50% dextrose, and glycerol have all been attempted to shield the underlying colon from injury; however, no one technique has been proven more efficacious in studies (9). In addition, endoscopic techniques may impact the probability of post-procedural complications. The use of hot biopsy forceps poses a considerably higher risk of transmural damage compared to the conventional snare polypectomy (10). Hot snare polypectomy (polypectomy with electrocautery) is frequently utilized by the gastroenterologists for polyps > 7 –8 mm in size (4). During the removal of pedunculated polyps, early application of the energy and slow closure of the snare loop one third or half way up the base of the polyp may decrease the chances of post-procedural complications (4). The thermal injury to the colonic wall can also be reduced by tenting the polyp toward the center of the lumen just before the application of the heat which increases the distance of the submucosa from muscularis propria and serosa (4). Furthermore, suctioning air after placing the snare around the base of the polyp on the thinner right-sided colon may decrease the wall tension, increase wall thickness and polyp amplitude, thereby facilitating polypectomy (4). Steel snares may be associated with significantly deeper tissue injury compared to tungsten snares (11). More research is needed on the best and safest techniques in polypectomy procedures.

Conclusion

In patients presenting with abdominal pain, fever, and/or tachycardia within 12–24 hours of colonoscopy with polypectomy, physicians should consider both perforation and post-polypectomy syndrome. A CT of the abdomen and pelvis should differentiate these two entities.

Conflict of interest and funding

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References

1. Screening colonoscopy: Quality, public awareness key to efficacy. HemOne Today website; 2009. Available from: https://www.google.com/search?newwindow=1&site=&source=hp&q=ama+style+citation+web+page&oq=ama+reference+style+web&gs_l=hp.1.1.0j0i22i10i30j0i22i30l2.969.10415.0.14982.19.16.3.0.0.0.424.2054.2-4jlj2.7.0.msedr...1.c.1.64.hp.9.10.2133.n62cYPPCJAE [cited 22 April 2015].
2. Kim HW. What is different between postpolypectomy fever and postpolypectomy coagulation syndrome? *Clin Endosc* 2014; 47(3): 205–6. doi: <http://dx.doi.org/10.5946/ce.2014.47.3.205>
3. Waye JD. Management of complications of colonoscopic polypectomy. *The Gastroenterologist* 1993; 1(2): 158–64.
4. Kedia P, Waye JD. Colon polypectomy: A review of routine and advanced techniques. *J Clin Gastroenterol* 2013; 47(8): 657–65. doi: <http://dx.doi.org/10.1097/MCG.0b013e31829ebda7>

5. Cha JM, Lim KS, Lee SH, Joo YE, Hong SP, Kim TI, et al. Clinical outcomes and risk factors of post-polypectomy coagulation syndrome: A multicenter, retrospective, case-control study. *Endoscopy* 2013; 45(3): 202–7. doi: <http://dx.doi.org/10.1055/s-0032-1326104>
6. Sethi A, Song LMWK. Adverse events related to colonic endoscopic mucosal resection and polypectomy. *Gastrointest Endosc Clin N Am* 2015; 25(1): 55–69. doi: <http://dx.doi.org/10.1016/j.giec.2014.09.007>
7. Benson BC, Myers JJ, Laczek JT. Postpolypectomy electrocoagulation syndrome: A mimicker of colonic perforation. *Case Rep Emerg Med* 2013; 2013: 687931. doi: <http://dx.doi.org/10.1155/2013/687931>
8. Ferrara F, Luigiano C, Ghersi S, Fabbri C, Bassi M, Landi P, et al. Efficacy, safety and outcomes of “inject and cut” endoscopic mucosal resection for large sessile and flat colorectal polyps. *Digestion* 2010; 82(4): 213–20. doi: <http://dx.doi.org/10.1159/000284397>
9. Luigiano C, Consolo P, Scaffidi MG, Strangio G, Giacobbe G, Alibrandi A, et al. Endoscopic mucosal resection for large and giant sessile and flat colorectal polyps: A single-center experience with long-term follow-up. *Endoscopy* 2009; 41(10): 829–35. doi: <http://dx.doi.org/10.1055/s-0029-1215091>
10. Metz AJ, Moss A, McLeod D, Tran K, Godfrey C, Chandra A, et al. A blinded comparison of the safety and efficacy of hot biopsy forceps electrocauterization and conventional snare polypectomy for diminutive colonic polypectomy in a porcine model. *Gastrointest Endosc* 2013; 77(3): 484–90. doi: <http://dx.doi.org/10.1016/j.gie.2012.09.014>
11. Galloro G, Magno L, Ruggiero S, Iovino P, Formisano C, Cortese L, et al. Comparison between tungsten and steel polypectomy snares: Evaluation of depth of colonic thermal wall injury in a pig model. *Endoscopy* 2013; 45(2): 121–6. doi: <http://dx.doi.org/10.1055/s-0032-1325930>