Colonoscopy-Induced Acute Diverticulitis

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Even though colonoscopy is a common and widely performed procedure, it can cause many complications. If any sign of inflammation is observed, a perforation or postpolypectomy coagulation syndrome should be considered. Diverticulitis, a very rare complication with an incidence of 0.04% to 0.08%, also can occur after the diagnostic and therapeutic procedure. We report a case of acute diverticulitis after colonoscopy, diagnosed with typical computed tomography findings after excluding other complications. The patient was treated in the same manner as for complicated diverticulitis, with bowel rest, hydration, and broad-spectrum antibiotics. Acute diverticulitis as a rare complication can occur following prolonged colonoscopy or colonoscopic polypectomy, especially in those with additional risk factors such as obesity and smoking.

Key Words: Colonoscopy, Complications, Diverticulum, Diverticulitis

CASE REPORT

INTRODUCTION

Even though colonoscopy is a very common diagnostic and therapeutic tool for lower intestinal diseases, it may cause some complications such as abdominal pain, discomfort, infection, postpolypectomy coagulation syndrome, hemorrhage, perforation, and gas explosion. Diverticulitis can also rarely occur as a complication¹⁾. The incidence of acute diverticulitis after colonoscopy is 0.04% to 0.08%^{2,3)}, and only one case report was found in Korea⁴⁾. Although diverticulitis is one of the most common presentations of diverticular disease, it is very rare but can occur as a complication of colonoscopy. The causes of colonic diverticulitis have not been conclusively established. However, the prevailing opinion is that stasis of colonic contents and formation of fecaliths may lead to bacterial overgrowth and local tissue ischemia⁵⁾. While there may be many causes leading to diverticulitis, this study reports a rare case of acute diverticulitis following a colonoscopic procedure.

A 65-year-old man presented for polypectomy of several colonic polyps that were diagnosed by colonoscopy a year prior. When the patient visited Veterans Hospital, he had no abdominal pain or tenderness, and no abnormality was seen on an abdominal X-ray. His vital signs were normal, and the peripheral blood test showed a white blood cell (WBC) count of 6,700/mm³ (segmented neutrophils: 48.6%) and C-reactive protein (CRP) 0.31. He was a 40 pack-year smoker, took nonsteroidal anti-inflammatory drugs (NSAIDs) for backache, and had a body mass index of 26.64 kg/m².

Polypectomy for 11 polyps found throughout the entire colon was performed by therapeutic colonoscopy (Fig. 1). For an 8-mm polyp located 70 cm from the anal verge, endoscopic mucosal resection (EMR) and electrocoagulation were performed. Even though many diverticula were noted in the ascending colon and cecum during the colonoscopy, no diverticulitis was detected. About 2 hours after the procedure, the patient complained of severe abdominal pain and tenderness in the left upper quadrant and epigastric area. There was no fever, but a peripheral blood test revealed mild inflammation with an increased WBC count of 11,200/mm³ (segmented neutrophils: 72.4%), and CRP level increased to 2.05 mg/dL. Emergency computed tomography (CT) of the abdomen and pelvis demonstrated a thickened colonic wall around a diverticulum

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in the ascending colon, and pericolic fat stranding (Fig. 2). Since the CT findings were deemed typical diverticulitis, treatment for diverticulitis was started. The patient was permitted nothing by mouth during treatment with ceftriaxone and metronidazole combination therapy. The symptoms were relieved in three days, and a peripheral blood test normalized. He was discharged and followed up in the outpatient department. One month later, colon wall thickening and pericolic fat stranding disappeared on abdominal CT (Fig. 3).

DISCUSSION

Colonoscopy is relatively safe and is widely used as a diagnostic and therapeutic tool for lower intestinal diseases. However, this procedure can cause complications such as perforation, hemorrhage, postpolypectomy coagulation syndrome, death, infection, fistula and abscess, gas explosion, abdominal pain/discomfort, appendicitis, and diverticulitis^{2,6)}.

If a patient develops severe abdominal pain after the procedure and has a fever or signs of inflammation, perforation or postpolypectomy coagulation syndrome should be considered.

If abdominal wall rigidity is present or signs of inflammation such as leukocytosis, and an elevated CRP or erythrocyte sedimentation rate is/are observed, peritonitis should be considered¹⁾. In general, perforation is diagnosed by plain radiographs of the chest and abdomen which may demonstrate free air^{3,7)}. CT and magnetic res-

onance imaging are also useful for identifying free air⁸⁾.

Postpolypectomy coagulation syndrome results from electrocoagulation injury to the bowel wall, which induces a transmural burn and localized peritonitis without evidence of perforation on radiographic studies²⁾. Patients with postpolypectomy coagulation syndrome may have fever, localized abdominal pain, localized peritoneal signs, and leukocytosis 1–5 days after colonoscopy. Treatment includes adequate hydration, broad-spectrum antibiotics, and nothing by mouth until the symptoms subside. Oral antibiotics are also useful^{9,10)}.

Postcolonoscopy appendicitis should also be considered. It is such an unusual and extremely rare complication that causation by colonoscopy has not yet been adequately documented¹¹⁾.

When diverticulosis is found during the procedure, how-

Fig. 2. Emergency abdominal computed tomography (CT) findings. CT revealed thickening of the ascending colon wall, numerous diverticula with colon wall thickening, and pericolic fat stranding (white arrow).

Fig. 1. Colonoscopic findings. Image demonstrating numerous diverticula of the colon in the absence of inflammation.

Fig. 3. Follow-up abdominal computed tomography (CT) findings after 1 month. CT revealed improvement of diverticulitis compared with Fig. 2. Colon wall thickening and pericolic fat stranding has disappeared.

ever, diverticulitis must also be considered, as another inflammatory complication. Guidelines published by the American Society for Gastrointestinal Endoscopy in 2011 mentioned diverticulitis as a miscellaneous complication²⁾. Levin et al.¹²⁾ reported 6 patients among 16,318 who developed diverticulitis after colonoscopy, and 2 patients required surgery. Ko et al.¹³⁾ reported diverticulitis as a complication of colonoscopy requiring hospitalization in 5 of 21,375 patients. In Korea, only one case report was found as a complication after colonoscopy; this was diagnosed with CT and recovered with broad-spectrum antibiotics and bowel rest⁴⁾.

Diverticula are pouch-like structures of the colon, and seem to develop as a result of raised intracolonic pressure in certain areas of the colon. Vasa recta penetrating the bowel wall create areas of weakness through which a portion of the colonic mucosa and submucosa can herniate¹⁴⁾. Diverticulitis refers to one or more of the diverticular sacs, and is often accompanied by gross or microscopic perforation. The causes of colonic diverticulitis have not been conclusively established. The prevailing opinion is that a low fiber diet may cause alteration of gastrointestinal transit time and lead to an increase in intracolonic pressure, inhibiting the colonic contents from being evacuated. Stasis or obstruction in the narrow necked pseudodiverticulum may lead to bacterial overgrowth and local tissue ischemia, findings that are similar to those described in appendicitis. The following have been suspected to increase the incidence of diverticular diseases: increase in overall meat intake, physical inactivity, obesity, smoking, constipation, increased intracolonic pressure, and treatment with NSAIDs⁵⁾. CT is recommended as the initial radiologic examination. The presence of diverticula, inflammation of tissues including the pericolic fat, at least 4 mm in bowel wall thickness, or a peridiverticular abscess strongly suggest diverticulitis. Broad-spectrum antimicrobial therapy including coverage against anaerobic microorganisms is recommended for treatment. The ciprofloxacin-metronidazole combination is popular, but metronidazole and a third-generation cephalosporin are also effective^{1,5)}. According to a recent study, rifaximin, mesalazine, a high-fiber diet, and probiotics are also effective for diverticular disease. They are also useful for prevention of acute diverticulitis¹⁵⁾.

In this patient, most inflammatory postcolonoscopy complications that cause abdominal pain and inflammation

were considered. Colonic perforation was excluded because there had been no sign of abdominal wall rigidity, and no free air had been visible on his abdominal X-ray and CT. Postpolypectomy coagulation syndrome was excluded since abdominal pain and inflammation had appeared too early, and the EMR and inflammatory sites did not coincide with the abdominal CT findings. Postcolonoscopy appendicitis was also excluded due to the absence of right lower quadrant pain or abdominal tenderness. As abdominal CT revealed the typical features of diverticulitis, and other inflammatory postcolonoscopy complications were not found, the patient was diagnosed with diverticulitis. We surmise that increased intracolonic pressure as a result of a prolonged procedure to remove the polyps, a history of taking NSAIDs, and obesity were the causes or risk factors for this patient's diverticulitis.

When a diverticulum is detected during colonoscopy, it seems prudent to avoid injecting too much air into the colon because excessive intracolonic pressure may cause diverticular disease. If a procedure is prolonged by the removal of multiple polyps, special care and attention to air injection are required, or it may be preferable to perform several procedures at different times.

In conclusion, if diverticulosis is found during colonoscopy or a colonoscopic procedure, diverticulitis should also be considered as another inflammatory complication, especially when the procedure is prolonged or the patient is a smoker, obese, or taking NSAIDs. This case report is intended to create awareness that diverticulitis is very rare, but can occur as a complication of colonoscopy. As it is difficult to find a report on this post-colonoscopy complication, further studies should examine prevention, incidence, proper diagnosis, and treatment.

Conflict of Interest Disclosures: The researchers claim no conflicts of interest.

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