

## Case Report

# Inflammatory granulation polyp caused by diverticulitis with a complication of brisk post-polypectomy bleeding

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Received June 29, 2017; Accepted March 21, 2018; Epub June 15, 2018; Published June 30, 2018

**Abstract:** Inflammatory polyps are associated with chronic inflammation in patients with inflammatory bowel disease and other types of colitis. However, an inflammatory granulation polyp caused by diverticulitis is not only rare but also difficult to distinguish from a colon neoplasm and to remove without complications. We report a case of a granulation polyp caused by diverticulitis for which we performed polypectomy followed by hemostasis. We also performed a literature review of this condition.

**Keywords:** Granulation polyp, diverticulitis, endoscopy

### Introduction

Colon diverticulum is a pseudo-diverticulum caused by a weakened colon wall or by increased intra-colonic pressure. The incidence of colonic diverticulosis is increasing in Asian countries, including Korea [1]. In Western countries, 10% to 40% of patients with colonic diverticulosis develop complications, including diverticulitis, hemorrhage, perforation, abscess, and obstruction [2]. Colon diverticulitis has mostly been observed in the left colon in Western patients and in the right colon in Asian patients [3, 4]. Colonoscopy is a useful modality not only for identifying colon diverticula but also for treating diverticular bleeding [5, 6].

Most inflammatory polyps develop as a result of inflammatory bowel disease, which causes chronic inflammation. They are also often associated with non-inflammatory bowel disease, such as ischemic colitis and infectious colitis [7, 8]. However, inflammatory granulation polyps caused by diverticulitis have been rarely reported [9, 10]. It is difficult to distinguish between a colon neoplasm and an inflammatory granulation polyp that arises from a diverticulitis using colonoscopy and to remove the polyp without complications.

We report a rare case of an inflammatory granulation polyp due to diverticulitis.

### Case report

A 39-year-old man underwent a screening colonoscopy. The patient had experienced an episode of diverticulitis 8 weeks before the colonoscopy. On admission for that episode, he reported a 4-day history of right lower abdominal pain. He was medically stable with a blood pressure of 110/80 mmHg, pulse of 82 beats per minute, and temperature of 37.8°C. There was no specific finding of abdominal auscultation, but tenderness was observed in his right lower abdomen.

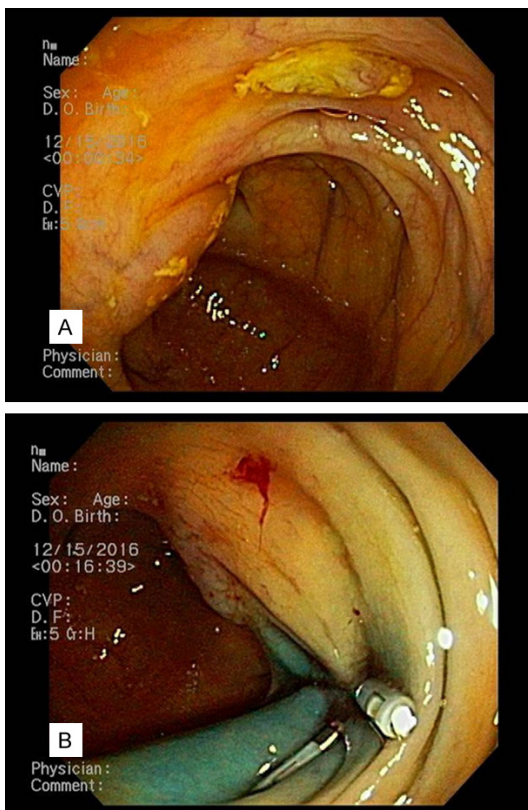
The patient's blood laboratory data were as follows: a white blood cell count of 8700/ $\mu$ L (segmented neutrophils 80.7%), hemoglobin of 12.9 g/dL, hematocrit of 32.4%, platelet count of 26,500/ $\mu$ L, and C-reactive protein level of 5.12 mg/dL. Abdominal computed tomography showed wall thickening with adjacent fatty infiltration around the ascending colon (**Figure 1**). He was diagnosed with diverticulitis and treated with antibiotics; he was discharged without complications.

The colonoscopy was performed 8 weeks after discharge for diverticulitis. The colonoscopy

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**Figure 1.** Abdominal computed tomogram showing acute diverticulitis of the ascending colon with wall thickening and adjacent fatty infiltration.



**Figure 2.** Colonoscopic image. A: There were several outpouching openings of the diverticulum in the cecum and proximal part of the ascending colon. The polyp adjacent to the orifice of the diverticulum was approximately 6 mm in diameter; the surface of the polyp was smooth but hyperemic with a yellowish exudate. B: After the polypectomy, hemostasis with hemoclips was performed because of the risk of immediate and brisk post-polypectomy bleeding.

revealed several outpouching openings of the diverticulum and a sessile polyp, 6 mm in diameter, in the proximal part of the ascending colon (**Figure 2A**). The surface of the polyp was smooth but with hyperemic surfaces. The polyp was covered by a yellowish exudate and was adjacent to the orifice of a diverticulum. To confirm the histological diagnosis, we performed a polypectomy after a submucosal saline injection because we were unable to determine whether the polyp was an inflammatory polyp or a neoplasm. We performed hemostasis with hemoclips due to the risk of immediate and brisk post-polypectomy bleeding (**Figure 2B**). Histopathologically, the lesion was composed of inflamed granulation tissue (**Figure 3**). We finally diagnosed it as an inflammatory granulation polyp caused by diverticulitis.

### Discussion

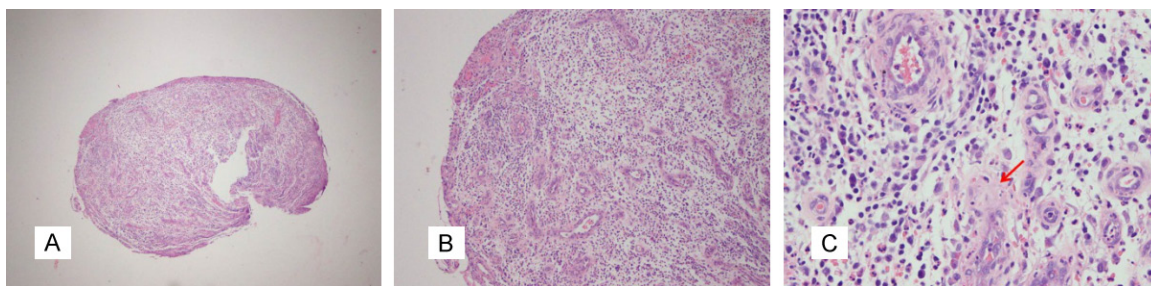
We have described a rare case of an inflammatory granulation polyp caused by diverticulitis. Most inflammatory polyps of the colon are in the regenerative and healing phases of inflammation and diverticulitis induced inflammatory granulation polyps are rarely reported.

On colonoscopy, a colonic polyp with diverticulosis was noted. The appearance of the diverticulitis 8 weeks prior, pathological findings of the lesion indicating an inflammatory granulation polyp, and the polyp being near to the diverticular opening led to the diagnosis of inflammatory granulation polyp caused by diverticulitis.

In the five previous reports of polyps caused by diverticulitis, the histopathology varied from normal to malignant [6, 9-12]. The most common location was the left colon (descending colon, sigmoid colon, and rectum); therefore, we hypothesized that colonic diverticulitis occurs more frequently in the left colon than in the right colon in Western patients (**Table 1**).

It is important to determine whether a polyp with a diverticulum is an inflammatory polyp or a neoplasm. The surfaces of most granulation polyps associated with diverticulitis are smooth and hyperemic, and occasionally have an exudate in the diverticular orifice [9-11]. However, inflammatory polyps mimic invasive colorectal neoplasms and adenomatous neoplasms arising from the diverticulum [9, 10, 13]. Therefore, a modality such as chromoendoscopy with indi-

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**Figure 3.** Histopathological findings of the resected polyp. A, B: The polypoid tissue was “inflamed granulation tissue” without overlying epithelium (H&E,  $\times 40$  and  $\times 100$ ). C: The polypoid tissue was composed of loose and edematous connective tissue with vessels and mixed inflammatory cells (H&E,  $\times 400$ ).

**Table 1.** The five previous reports of polyps associated with diverticulitis

Case/Reference	Age/Sex	Location	Size	Histopathology
Yoshida M, et al. [6]	45/M	Sigmoid colon	30 mm	Normal
Mori H, et al. [9]	62/F	Sigmoid colon	25 mm	Granulation
Seo HI [10]	49/M	Ascending colon	10 mm	Granulation
Ghorai S, et al. [11]	62 <sup>a</sup> /F <sup>b</sup>	Sigmoid colon <sup>c</sup>	2-6 mm	N/A
Fu KI, et al. [12]	71/M	Descending colon	15 mm	Adenocarcinoma
Present case	39/M	Ascending colon	6 mm	Granulation

<sup>a</sup>Mean age, <sup>b</sup>15 of the 21 patients are female, <sup>c</sup>Sigmoid colon in 20 patients and ascending colon in 1 patient. F: female; M: male; N/A: not available.

go carmine and narrow band imaging-magnified endoscopy can be used to distinguish between an inflammatory granulation polyp and a neoplasm [14].

Diverticular disease occurs in 25% of colon diverticula that are associated with pain or complications. Of these, 75% are diverticulitis and 25% are diverticular bleeding [15]. Likewise, the removal of a polyp associated with a diverticulum is associated with the risk of perforation or bleeding [9, 11]. In our case, we performed hemostasis with hemoclips due to the risk of immediate and brisk post-polypectomy bleeding. In a previous case, a full thickness resection using a pre-full thickness suture with an over-the-scope-clip, or inverting of the polyp and diverticulum into the colon were used to prevent post-polypectomy bleeding and delayed perforation [9]. In addition to this, safe methods for the removal of polyps associated with diverticula should be developed.

In conclusion, endoscopists should be aware of the possibility of an inflammatory granulation polyp caused by diverticulitis. Differentiating between an inflammatory granulation polyp

and a neoplasm in a diverticulitis is difficult. However, it is necessary for proper endoscopic treatment, not only to determine whether the polyp with a diverticulum is an inflammatory polyp or a neoplasm, but also to determine the most appropriate resection method.

### Disclosure of conflict of interest

None.

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