

Needle Knife-assisted Endoscopic Polypectomy for a Large Inflammatory Fibroid Colon Polyp by Making Its Stalk into an Omega Shape Using an Endoloop

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Colonic inflammatory fibroid polyp (IFP) is an uncommon benign polypoid lesion, which is composed of fibroblasts, numerous small vessels and edematous connective tissue with marked eosinophilic inflammatory cell infiltration. This condition is frequently detected in the stomach and small intestine, but uncommon in the colon. Although IFP is a benign lesion, surgical resections are performed in most colonic cases because the polyps are usually too large to resect endoscopically. Only three patients underwent endoscopic polypectomy in our literature reviews. Here, we present a case of IFP in the descending colon successfully endoscopically resected using a novel technique of trapping its stalk with an endoloop, forming the stalk into an omega shape, and then dissecting the stalk with a needle knife.

Key Words: Inflammatory fibroid polyp, needle knife, endoloop, polypectomy

INTRODUCTION

Inflammatory fibroid polyp (IFP) of the gastrointestinal tract is an uncommon benign polypoid mass. IFP arises in the submucosa and is composed of numerous vessels, fibroblasts, and edematous connective tissue with marked inflammatory cells infiltration, which mainly composed of eosinophils.¹ Most cases of IFP are located in the stomach and small intestine, but infrequently in the colon and esophagus.^{2,3}

In the immunohistochemical stain, CD 34 are

often expressed in the stromal cells of IFP, but c-kit stain are not showed.^{4,5} It was recognized that these stromal cells are reactive status but has no malignant potential, which was supported by the natural course that neither recurrence nor metastasis has been observed.^{3,6} These benign pseudotumors continue to grow until they cause symptoms related to bleeding or obstruction. Surgical intervention is usually required for most symptomatic IFP's due to their large size and submucosal involvement.⁷⁻⁹ There has not been, to the best of our knowledge, a case reported previously in which the large colonic IFP was treated with needle knife assisted endoscopic polypectomy. Furthermore, no study has described IFP removal by snaring and making the stalk into an omega shape using an endoloop.

CASE REPORT

A 23-year-old woman was admitted for the proper evaluation and management of severe iron deficiency anemia (IDA). She had experienced intermittent hematochezia and vague lower abdominal pain for two years but had no specific family history such as colon cancer or polyp, or past medical history of inflammatory bowel disease. Physical examination showed the pale conjunctivae but no other abnormal findings. Laboratory data and peripheral blood tests showed a severe IDA pattern (hemoglobin level 5.4 g/dL, serum iron 3 ug/dL, total iron binding capacity 578 ug/dL, ferritin 2.4 ng/mL). Esopha-

Received January 9, 2007

Accepted March 21, 2007

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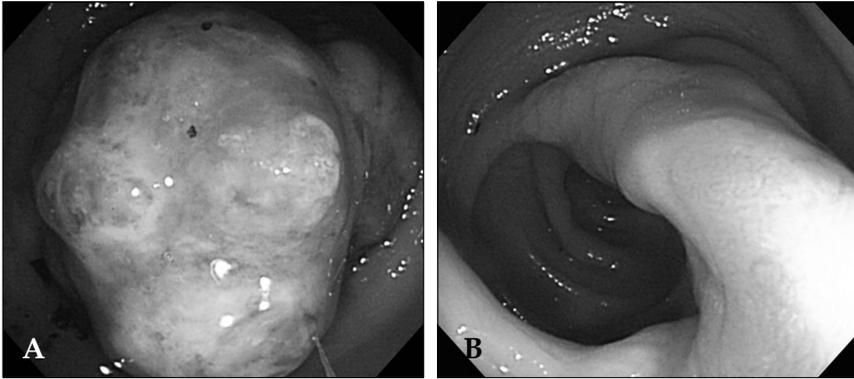


Fig 1. Colonoscopic findings demonstrated a 4.5 cm-sized pedunculated polyp (A) with multiple surface erosions, exudates, and nodules on its head and long, thick stalk (B) in the distal descending colon. The polyp occupied nearly the entire colonic lumen.

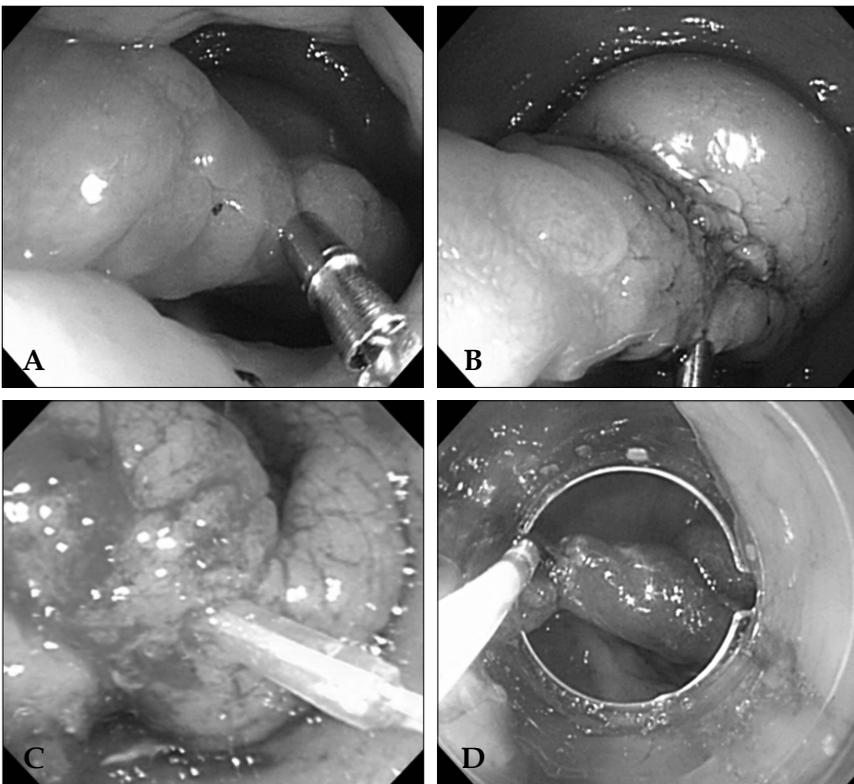


Fig 2. The polyp was treated by needle knife assisted endoscopic polypectomy because of the difficulty in trapping the large pedunculated shape using an endoloop. For the first step, an endoclip was positioned to partially clamp the stalk (A). Next, hypertonic saline was injected at the base of stalk (B). Dissection of the stalk with a needle knife was attempted, but significant bleeding from the stalk was observed, and consequently dissection was stopped. Next, we tried to trap the polyp with an endoloop, which was not satisfactorily performed due to the large head and rambling mobility of the polyp. Endolooping was finally carried out by tightly seizing the omega shaped stalk (C). We reinserted the scope with a translucent cap, and dissected the stalk of the polyp with a needle knife (D).

gogastroduodenal endoscopic examination was normal. Colonoscopic examination revealed a 4.5 cm-sized pedunculated polyp with multiple erosive surfaces and nodularity on the polyp head. The polyp was located in the distal descending colon and occupied nearly all of the colonic lumen with its large head and long, thick stalk (Fig. 1). First, we attempted to snare the stalk with a conventional method, but this was not possible due to the large size of polyp. Thus, we attempted to remove the polyp by dissecting its

stalk using a needle knife. Second step, an endoclip was positioned to partially clamp the stalk and hypertonic saline was injected at the base of the stalk to prevent bleeding (Figs. 2A and B). We then attempted to dissect the stalk with a needle knife, but significant bleeding from the stalk was observed, which halted the dissection. Third step, we tried to trap the stalk of polyp with an endoloop, which was not successful again due to the large head and rambling mobility of the polyp. Fourth step, two-channel colonoscope was

inserted for the polypectomy assisted with endoloop and forceps. But, the endoloop could not capture the stalk of polyp even in assistance with forceps. Fifth step, endolooping was eventually carried out by trapping the stalk and forming it into a tight omega shape (Fig. 2C) thereby allowing the proximal portion of stalk to be dissected with a needle knife (Fig. 2D). After resection, we applied an endoclip to prevent delayed bleeding from the remnant stalk.

The specimen was $4.8 \times 2.8 \times 3.0$ cm in size, and had multiple nodularities and erosions on its surface with exudates (Fig. 3). The microscopic findings showed mucosal ulceration with the

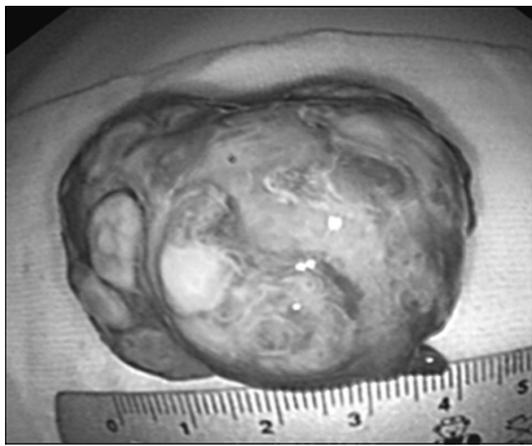


Fig 3. The specimen was $4.5 \times 2.8 \times 3.0$ cm in size, had multiple nodules, and an erosive surface with exudates.

proliferation of stromal cells, fibrosis, onion-skin-like spindle-shaped cells, lymphocytes, many vascular structures, and eosinophils, which was consistent with IFP (Fig. 4). Immunohistochemical staining indicated that CD-34, c-kit, and S-100 were not observed in spindle cells. The patient recovered from anemia and hematochezia uneventfully and was discharged.

DISCUSSION

IFP had been known as a proliferating lesion with eosinophilic infiltration. Also, it has been known by a variety of names, such as submucosal granuloma with eosinophilic infiltration, granuloblastoma, and eosinophilic granuloma. Helwig et al. first proposed the term 'inflammatory fibroid polyp', which became a widespread term for this lesion.¹⁰ The etiology of IFP is obscure. Some authors have reported that IFP represents a localized pattern of eosinophilic gastroenteritis, but in general IFP is a different disease entity from eosinophilic gastroenteritis.

Microscopically, IFP shows the cellular proliferation possibly originating from the submucosa, and is composed of a fibrous and edematous stroma containing many variable-sized blood vessels, spindle cells and diffuse inflammatory cells infiltrate, including eosinophils, plasma cells,

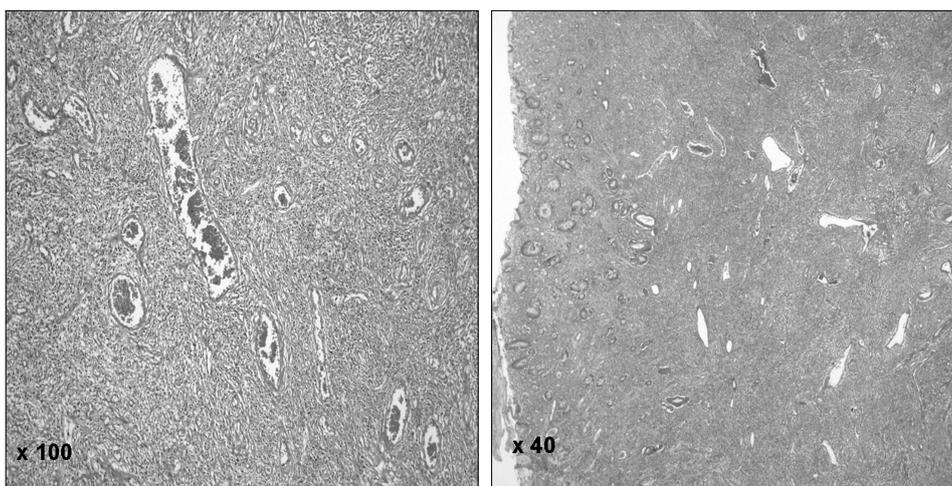


Fig 4. Microscopic findings showed mucosal ulceration with the proliferation of stromal cells, onion-skin-like spindle-shaped cells, lymphocytes, many vascular structures, fibrosis and eosinophils, which is consistent with an inflammatory fibroid polyp (hematoxylin and eosin stain).

lymphocytes, macrophages, and mast cells.^{1-9,11,12} In immunohistochemistry for CD34, S100, c-kit, Bcl-2, and p53, spindle cells of polyp often are stained with CD34 or S100 antibodies but do not react to c-kit, or Bcl-2, or p53 antibodies.^{4,5} Immunoreactivity for S-100 is rare and negative reactivity for c-kit and Bcl-2 helps to differentiate IFPs from GIST and solitary fibrous tumor.¹¹ In addition, a positive staining for CD34 helps in differentiating IFPs from inflammatory fibroblastic tumors.¹²

IFP has no gender predilection and is usually detected solitary lesion in the gastrointestinal tract. Although IFP is most commonly detected in adults, it is possibly found in all age groups.¹⁰ IFP is located mostly in the gastric antrum, and sometimes in the small intestine, but it is infrequently located in the colon and esophagus.^{3,10,13}

In a literature review, there are 29 cases of IFP located in the colon, including the present case.^{2,7,8,14-30} The clinical characteristics of these cases are presented in Table 1. The mean polyp size of these cases was 4.2 cm (range: 0.5 - 10.8 cm). The sites of the IFPs were usually located in the right colon (cecum, ascending colon, and transverse colon; 48.4%, 17.2%, and 20.7%, respectively). Colonic IFPs were less common in females (the male:female ratio was 17:7, with six unspecified cases). The mean age of patients with IFPs was 43.9 years, but they were found in all age groups (range: 4 - 79). The gross appearance was that of the pedunculated type in 51.7% of cases, and the sessile type in 17.2%. The surface mucosa of the IFP was usually ulcerated or erosive (69.0%) (Table 1).

Table 1. Summary of Clinicopathological Features of Colonic Inflammatory Fibroid Polyp Based on a Literature Review^{2,7,8,14-30}

Clinical factors		%	
Patient characteristics			
Sex	Male : Female	17 : 7	
Age (yrs)		43.9 (range: 4 - 79)	
Polyp characteristics			
Size (cm)		4.2 (range: 0.5 - 10.8)	
Location			
	Cecum	14	48.4
	Ascending colon	5	17.2
	Transverse colon	6	20.7
	Descending colon	2	6.9
	Sigmoid colon	1	3.4
	Rectum	1	3.4
Shape			
	With pedunculation	15	51.7
	Without pedunculation	5	17.2
	Not described	9	31.1
Surface of mucosa			
	With ulcer and erosion	20	69.0
	Without ulcer and erosion	1	3.4
	Not described	8	27.6
Treatment			
	Surgical resection	20	69.0
	Endoscopic resection	4	13.8
	Not described	5	17.2

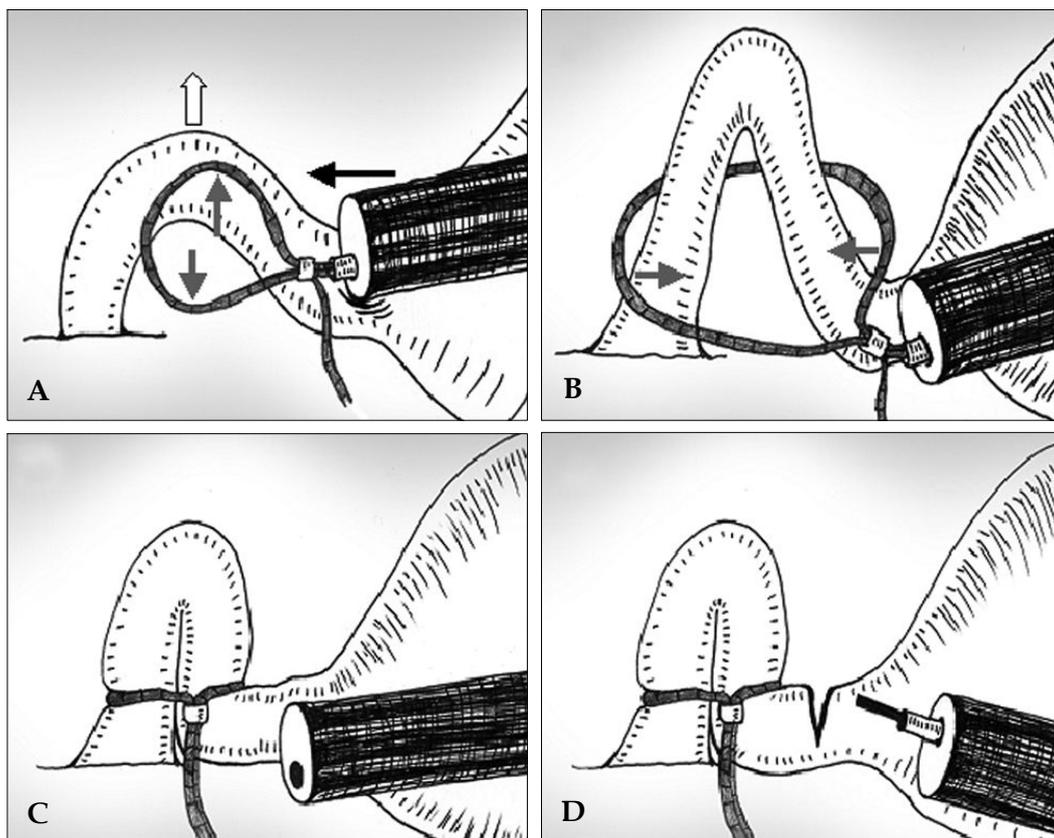


Fig 5. The illustration of schematic polypectomy procedure in our case. For the first step, the colonoscope approached the stalk of polyp with endoloop slowly expanded (A). Next, we pushed up the stalk with the scope making it crooked and further expanded the endoloop simultaneously (B). Endolooping was finally carried out by tightly seizing the stalk into omega shape (C). The scope with a translucent cap was inserted again, and the proximal portion of stalk was dissected with a needle knife (D).

Although the pathogenesis of IFP remains obscure, it has been thought that it is a benign polyp with no malignant potential and a negligible recurrence rate.²⁵ Clinical manifestations may rely on the gross morphology of the lesion and its location in the gastrointestinal tract. The major clinical symptoms for colonic IFP are abdominal pain, bloody stool, weight loss, diarrhea, and anemia. Occasionally, large sized colonic IFPs may cause various complications such as intestinal obstruction and intussusception.^{2,7,8,14-30}

The standard approach to treatment for symptomatic IFP is surgical or endoscopic resection. IFP of the colon has predominantly been treated by surgical resection (69.0%), while endoscopic resections were performed in only four cases (13.8%) including the case described in this study (Table 1). Because IFP is a benign condition, endoscopic

resection can be really useful treatment and diagnosis method. However, the large size of these polyps often precludes successful endoscopic approach to resection. Similar limitations, such as size and risk of bleeding, were observed in the present case. Some reports have suggested several techniques for safer resection.³¹⁻³⁵ Based on those techniques, we first attempted the hemoclip and cut method, but the stalk was too thick to completely apply the hemoclip. Therefore, we also injected hypertonic saline to the base of the stalk and attempted to dissect the upper part of the stalk with a needle knife. However, significant bleeding from the stalk was observed. In a second attempt, we used the conventional endolooping technique for trapping the stalk, which again failed due to the large head of the polyp and its high mobility. In the next attempt, two-channel colonoscope was inserted

for the polypectomy assisted with endoloop and forceps. This method of polypectomy using two-channel scope has been reported to be a valuable method for the large sized head and thick stalk of polyp.³³⁻³⁵ Despite of several attempts, the endoloop could not capture the stalk of polyp due to large sized head and high movability of polyp. Finally, we trapped the stalk by forming it into an omega shape with an endoloop. An endoscopic polypectomy was performed by means of dissection with a needle knife through an attached translucent cap without any further bleeding. We made a simple drawing of our procedure for better understanding (Fig. 5).

In conclusion, we have reported a case of colonic IFP that was resected endoscopically using a needle knife after endolooping the stalk into an omega shape to prevent bleeding. Therefore, we propose that the novel technique described herein could be useful for the removal of giant pedunculated colorectal polyps when other procedures for the prevention of bleeding are not feasible.

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