



TECHNICAL REPORT

A case of colonic fecal impaction caused by excessive dietary fiber intake that was endoscopically treated with intra-fecal injection of a bowel-cleansing agent

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ABSTRACT

Background and Aim: A 75-year-old man who had eaten half a head of chopped raw cabbage (approximately 600 g) daily was suffering from the left lower pain, abdominal fullness, and constipation. He was diagnosed with colonic ileus and obstructive colitis due to a fecal impaction in the sigmoid-descending junction. During colonoscopy, a tapered catheter was repeatedly inserted into the impacted feces to inject a bowel-cleansing agent. Finally, the feces were broken to be fragmented enough to path the endoscope through. After the procedure, his symptoms were immediately relieved. **Relevance for Patients:** Excessive dietary fiber intake can induce fecal ileus. Endoscopic treatment with intra-fecal injection of a bowel-cleansing agent is useful and worth attempting for disimpaction of feces.

1. Introduction

Fecal impaction is an uncommon cause of large bowel obstruction, with an estimated incidence of <5% among these cases [1,2]. It most frequently occurs in children, the institutionalized or impaired elderly, and patients with mental disorders or medical conditions associate with a predisposition to constipation [2]. Three of the most important risk factors are colonic hypomotility and inadequate dietary fiber and water intake [3]. An increase in fiber intake to 30 g/day coupled with adequate hydration helps prevent constipation and fecal impaction [3,4].

Patients with fecal impaction should be immediately treated as this condition may induce colonic ulceration and perforation [4,5]. Management of fecal impaction is divided into three main components: disimpaction, evacuation of the colon, and prevention of recurrence [2,3,6]. Water-soluble contrast enema is recommended as a diagnostic and therapeutic procedure in cases of proximal impaction [2,3]. Recently, endoscopic disimpaction is attempted and favorable outcomes are reported [6,7-9].

We herein report a rare case of colonic fecal impaction caused by excessive dietary fiber intake that was endoscopically treated with injection of a bowel-cleansing agent.

2. Case Report

The patient was a 75-year-old man. Regarding his medical history, there were no problems, including abdominal or neurological illnesses. He was suffering from the left lower pain, abdominal fullness and constipation, which had persisted for 2 days before admission, until

then he reported having daily regular bowel movement. He had eaten half a head of chopped raw cabbage (approximately 600 g) daily for over 3 years. He had been taking amlodipine besilate and atorvastatin calcium hydrate for the treatment of hypertension and dyslipidemia for more than 5 years.

In a physical examination, his abdomen was soft and distended, and he felt tenderness at the left lower abdomen; however, neither rebound tenderness nor an abdominal mass were found. His laboratory data revealed no abnormal findings besides high inflammatory change (white blood cell count; $14.5 \times 10^3/\text{mm}^3$, C-reactive protein level; 0.99 mg/dL). An abdominal X-ray showed colonic gas distention from the cecum to the splenic flexure and irregular narrowing in the descending colon with an oval, heterogeneous, high-density mass of approximately 50 mm in diameter near the sigmoid-descending junction (Figure 1). Computed tomography (CT) revealed an oval, heterogeneous fecal impaction in the sigmoid-descending junction (Figure 2A), the oral side wall of which in showed inflammatory thickening in the descending colon (Figure 2B). We diagnosed fecal colonic ileus and obstructive colitis, and then performed emergent colonoscopy for colonic decompression by removal of the impacted feces after obtaining the patient's written informed consent.

Using fluoroscopy and endoscopy, we confirmed the presence of large amount of hard, spherical-shaped, impacted feces at the sigmoid-descending junction which was mixed with a large amount of fiber component (Figure 3A and B). We attempted to remove the impacted feces; however, it could not be broken only by water-jetting, snaring, or grasping. We then repeatedly inserted a tapered catheter (MTW; MTW Endoskopie, Wesel, Germany) into the impacted feces to inject each 20 mL of a bowel-cleansing agent (Niflec, EA pharma Co.,Ltd., Tokyo, Japan) (Figure 3C). Finally, the feces were broken to be fragmented enough to path the endoscope through after approximately 20 times-injection (Figure 3D). A diffuse edematous and reddish mucosa with erosions was observed in the descending colon (Figure 3E). After the procedure, his symptoms were immediately relieved. He started oral intake from the following day uneventfully. At 1 month after the procedure, endoscopy revealed a normal colonic mucosa without any mass lesion.

3. Discussion

Two important clinical issues were noted in the present case: (1) Excessive dietary intake of fiber can induce fecal ileus and (2) endoscopic treatment with intra-fecal injection of a bowel-cleansing agent is effective for colonic fecal impaction.

First, excessive dietary intake of fiber can induce fecal ileus. In general, dietary fiber has been shown to have beneficial association with various diseases and mortality [10-16]. Higher fiber intake (25 – 29 g/day) is associated with a reduced risk of all-cause mortality and mortality from coronary heart disease and cancer, and with a lower incidence of coronary heart disease, stroke, diabetes, and colorectal cancer in comparison to a lower fiber intake [12]. In addition, dietary fiber was inversely associated with some types of cancer (gastric, breast, and ovarian



Figure 1. An abdominal X-ray showed colonic gas distention from the cecum to the splenic flexure and irregular narrowing in the descending colon with an oval, heterogeneous, and high-density mass of approximately 50 mm in diameter near the sigmoid-descending junction (arrows).

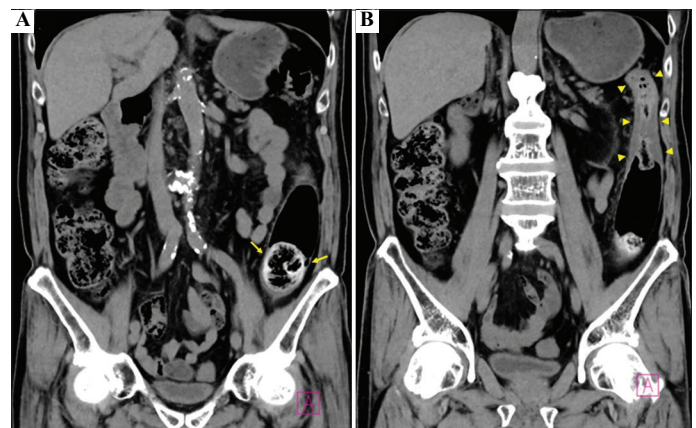


Figure 2. Computed tomography (CT) revealed an oval and heterogeneous fecal impaction in the sigmoid-descending junction (arrows) (A), the oral side wall of which in showed inflammatory thickening in the descending colon (arrowheads) (B).

cancer) [13-16]. Furthermore, dietary fiber is recommended in the treatment of gastrointestinal disorders, such as irritable bowel syndrome, inflammatory bowel disease and diverticular disease, and in the management of specific gastrointestinal symptoms, such as constipation [11]. These benefits of dietary fiber intake, with few adverse effects, may encourage health-conscious people to consume a large amount of dietary fiber, including vegetables and fruits. In the present case, the patient's dietary fiber intake was massive (almost 30 times more than optimal intake), which may have promoted the formation of a fiber-rich, large, and hard fecaloma. As the proverb says, more than enough is too much. Proper nutritional education is needed to protect patients from dietary fiber-induced fecal impaction.

Second, endoscopic treatment with intra-fecal injection of a bowel-cleansing agent was effective for treating colonic fecal

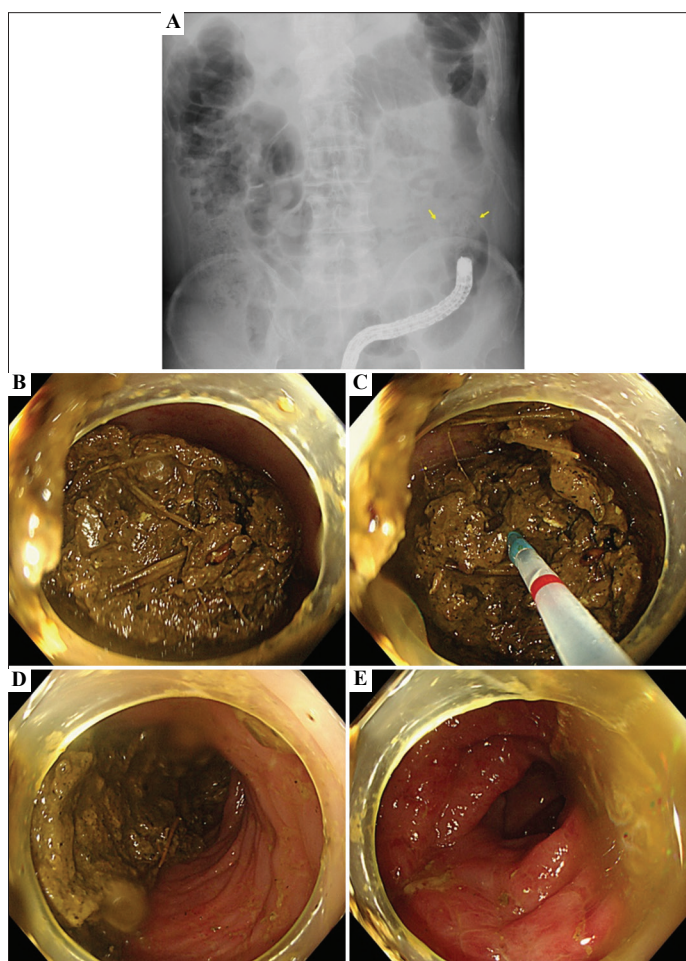


Figure 3. The presence of large amount of hard, spherical-shaped, and impacted feces at the sigmoid-descending junction which was mixed with a large amount of fiber component was confirmed using fluoroscopy (arrows) (A) and endoscopy (B). A tapered catheter was repeatedly inserted into the impacted feces to inject a bowel-cleansing agent (C). Finally, the feces were broken to be fragmented enough to path the endoscope through (D). A diffuse edematous and reddish mucosa with erosions was observed in the descending colon (E).

impaction. Digital manipulation and enema are effective for patients with rectal fecal impaction; however, water-soluble contrast enema which is used in cases of proximal impaction, is not fast-acting and often fails. Furthermore, increased intraluminal pressure due to large volume enema may induce colonic perforation. Colonoscopy is helpful not only for making a diagnosis by directly viewing impacted feces but also for treatment by direct intervention. However, endoscopic disimpaction, using a grasping forceps or snare, or water-jet injection is often difficult as the impaction may be too large and hard to grasp or snare. Therefore, we attempted the repeated intra-fecal injection of a bowel-cleansing agent using a tapered catheter, which was inserted in the impacted feces. This successfully broke the feces into fragments without adverse events. This is a safe and useful procedure that can be easily performed for the disimpaction of feces. To our knowledge, this is the first report showing the utility

of this technique. Okada *et al.* successfully treated fecal impaction during endoscopy using a looped guidewire [9]. The combination of these techniques can ensure easier and faster disimpaction. However, minimum gas insufflation and a careful and gentle operation is warranted to prevent serious complications, including bleeding and perforation.

4. Conclusion

Excessive dietary fiber intake can induce fecal ileus. Endoscopic treatment with intra-fecal injection of a bowel-cleansing agent is useful and worth attempting for disimpaction of feces in patients with colonic fecal impaction. More experience is needed to confirm its utility.

Conflicts of Interest

The authors declare no conflicts of interest.

Ethical Approval and Consent to Participate

Written informed consent was obtained from the patient before participating.

Consent for Publication

Informed consent was obtained from the patient.

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