Intussusception after Colonoscopy: A Case Report and Review of Literature

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Intussusception after colonoscopy is an unusual complication. A MEDLINE search revealed only 7 reported cases. We present a report of a 28-year-old man who developed abdominal pain several hours after routine colonoscopy and in whom computed tomography (CT) revealed colocolic intussusception. We postulate that this condition is iatrogenic and induced by suctioning of gas on withdrawal of the colonoscope. A common observation among the reported cases was abdominal pain several hours after colonoscopy and right-sided intussusception. All cases had colonoscopy reaching the right side of the colon. Treatment for adult intussusception remains controversial with regard to reduction versus resection, especially given the high association with a pathological cause and malignancy. Among the 8 reported cases, only the current case did not require surgery. A combination of benign colonoscopy, CT, and the clinical picture should provide sufficient information to initially choose a more conservative treatment approach.

Key Words: Colonoscopy; Intussusception; Colon; Iatrogenic disease; Adult

INTRODUCTION

Intussusception after colonoscopy is rare. A MEDLINE search revealed only 7 reported cases. We present a report of a 28-year-old man who developed abdominal pain several hours after routine colonoscopy and in whom computed tomography (CT) revealed colocolic intussusception.

CASE REPORT

A 28-year-old man presented with a 2-day history of crampy right iliac fossa pain that began a few hours after gastroscopy and colonoscopy. The pain was associated with nausea, vomiting, and diarrhea, with a small amount of blood mixed in the stool.

The endoscopy procedure was performed at an external site to investigate iron deficiency anemia. Gastroscopy revealed erosive antral gastritis and duodenal mucosa that appeared atrophic. Colonoscopy was normal to the distal terminal ileum. Biopsies were taken from the stomach, duodenum, terminal ileum, and colon. Histology revealed patchy, mildly active chronic gastritis, which was negative for Helicobacter pylori. Other biopsies were normal.

Past medical history included iron deficiency anemia and vitamin D deficiency.

On examination, he had tachycardia at 104 beats/min and fever of 37.7°C. He had right abdominal tenderness with localized guarding.

Laboratory findings showed leukocytosis of $13.2 \times 10^9/L$ (normal range, $4.0–11.0 \times 10^9/L$) and C-reactive protein level of 252 mg/L (normal range, 0–5 mg/L).

Abdominal CT revealed a 7-cm-long ascending colon to the hepatic flexure colocolic intussusception associated with congestive edema of the proximal large bowel (Fig. 1). There was no evidence of perforation or small bowel obstruction. No ob-
vious mass lesion acting as an intussusceptum was appreciable on CT.

He was managed with fasting, nasogastric tube decompression, maintenance intravenous fluids, and intravenous ceftriaxone and metronidazole. The symptoms improved without immediate surgery. Thus, colonoscopy was performed with intention to proceed to laparotomy if required. The right colon appeared inflamed and edematous, with a large submucosal nodular swelling at the proximal extent of the inflammation in the proximal transverse colon (Figs. 2, 3). The terminal ileum was entered and appeared normal. Biopsies were taken from the inflamed colon and the suspected intussusceptum site. As intussusception was not present during colonoscopy and the patient was clinically better, laparotomy was deemed unnecessary. Histology showed acute colitis with features not typical of infective or inflammatory colitis but consistent with the effect of recent intussusception.

The patient continued to improve with normalizing inflammatory markers, and was discharged home 2 days later.

DISCUSSION

Intussusception is an invagination of the bowel, in which a proximal segment (the intussusceptum) telescopes into the lumen of the adjacent distal segment (the intussuscipiens).

The occurrence of intussusception is rare in adults, representing approximately 5% of all intussusception cases. In adults, 70%–90% of intussusception is associated with a pathological cause that acts as the lead point in the mechanism of intussusception, such as adhesions, inflammatory lesions, benign tumors, malignant lesions, and Meckel’s diverticulum. Malignant causes have been attributed for 24% of adult enteroenenteric intussusception. In contrast, there is a far higher association of adult colonic intussusception with malignancy, at approximately 54%–68%. Idiopathic intussusception, the mechanism of which is still poorly understood, accounts for approximately 8%–30% of all intussusception and is more common in small bowel intussusception.

Intussusception after colonoscopy, however, is extremely uncommon. The literature review revealed that only 8 cases, including the present case, have been reported to date. The first case was reported in 2000 by Yamazaki et al; other cases are mentioned in Table 1. The age of presentation ranged from 19 to 73 years, with a male predominance of 5:2. All patients had onset of abdominal pain within hours of colonoscopy and presented early to the hospital. Remarkably, all

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Fig. 1. Computed tomography demonstrating a right-sided colocolic intussusception.

Fig. 2. Colonoscopy—inflamed and edematous colonic mucosa with a large submucosal nodular swelling.

Fig. 3. Colonoscopy—inflamed and edematous colonic mucosa.
sites of intussusception after colonoscopy were on the right side of the colon. Only 1 case was an ileocolic intussusception, while the rest were colocolic intussusceptions. All patients had undergone colonoscopy reaching the right colon. Three cases achieved terminal ileum intubation but terminal ileum biopsy was only reported in 1 case. Of those 3 cases, 1 had an unresectable large polyp in the terminal ileum.

Four cases were managed with laparotomy, 3 of which proceeded with right hemicolectomy, and 1 had an ileocolic resection. The other 3 cases were managed with laparoscopy. Of those, 2 had laparoscopic reduction, and 1 proceeded with colonoscopy to confirm the viability of the colonic mucosa. None of the cases had malignant pathology.

A mechanism of intussusception after colonoscopy has been postulated by several authors. Yamazaki et al. suggested that intussusception was induced by hyperperistalsis, which would vent gas and empty the insufflated colon after colonoscopy. Ho et al. added that post polypectomy edema could be acting as the lead point; however, 2 of the cases (Theodoropoulou et al. and Lasithiotakis et al.) did not allude to any biopsy being performed. In the sole case of ileocolic intussusception, the ileal polyp was the potential lead point. Lasithiotakis et al. speculated that aspiration of insufflated air while withdrawing the colonoscope, coupled with ongoing propulsive small intestinal peristalsis and relaxation of the ileocecal valve, led to invagination of the ileal polyp through the ileocecal valve, and development of ileocolic intussusception.

We hypothesize that aspiration of gas during withdrawal of the colonoscope would have created a vacuum effect to draw in the proximal colon, causing it to collapse and invaginate into the distal colon as the colonoscope was retrieved. We postulate that this is a phenomenon seen in the right colon because the cecum is mobile and free to move within the abdomen. A similar phenomenon was observed in vivo in a case reported by Santos-Antunes et al., in which colonoscopy was performed for a patient with a colonic volvulus. The authors observed intussusception occurring during colon decompression and retrieval of the scope.

### Table 1. Review of Reported Post Colonoscopic Intussusception Cases

| Study                  | Age/Gender | Pre-morbid colonoscopy report | Presenting complaints<sup>a</sup> | Site of intussusception | Type of intussusception | Operative strategy                      |
|------------------------|------------|-------------------------------|----------------------------------|-------------------------|-------------------------|----------------------------------------|
| Yamazaki et al. (2000)<sup>6</sup> | 48/M       | Two 5 mm polyp in the caecum and hepatic flexure, biopsied | 1/7 abdominal pain | Right colon | Colo-colic | Laparotomy+Ileocolic resection |
| Theodoropoulou et al. (2009)<sup>7</sup> | 19/M       | Ileo-colonoscopy              | 1/7 abdominal pain | Right colon | N/A | Laparotomy+Right hemicolectomy |
| Ho et al. (2010)<sup>8</sup> | 32/M       | Small polyp mid ascending colon removed with snare cautery | 1/7 RLQ pain V | Ascending colon | Colo-colic | Laparoscopic reduction+Intraoperative colonoscopy |
| Nachnani et al. (2012)<sup>9</sup> | 73/F       | Normal to caecum+random colonic biopsy | 1/7 RLQ pain | Hepatic flexure | Colo-colic | Laparoscopic reduction |
| Lasithiotakis et al. (2012)<sup>10</sup> | 58/M<sup>b</sup> | 4-cm diameter pedunculated polyp in the terminal ileum approximately 10 cm from the ileocecal valve | 1/7 abdominal pain NVD | Terminal ileum | Ileocolic | Laparotomy+Right hemicolectomy |
| Lee et al. (2013)<sup>11</sup> | 47/M       | 15-mm non-polypoid lesion (0-IIa type) located at the caecal base, polypectomy | 1/7 abdominal pain | Caecum | Colo-colic | Colonoscopy+Laparotomy+Right hemicolectomy |
| Min et al. (2017)<sup>12</sup> | 31/F       | No significant abnormality, mild congestion throughout the colon. Patent colorectal anastomosis in mid rectum | 1/7 abdominal pain | Right colon | Colo-colic | Laparoscopic exploration+Ileocolic resection |
| Current (2017)         | 28/M       | Normal to ileum. Random colon biopsies | 2/7 abdominal pain NV fever | Right colon | Colo-colic | Colonoscopy |

<sup>a</sup>1/7=1 day; 2/7=2 day, whereby the denominator 7 indicates 7 days in one week.

<sup>b</sup>It was initially written as 58 year old man in the abstract but changed to 58 year old women in the case report.

RLQ, right lower quadrant; NVD, nausea, vomiting, diarrhea; N/A, not available.
As the current general consensus that surgical resection should be performed for colonic adult intussusception due to the high association with neoplastic etiology, excluding the single case with the large polyp, it is not surprising that 4 of the 7 reported cases were managed with bowel resection despite benign colonoscopy.

Considering that patients with an intussusception after colonoscopy would already have undergone a recent colonoscopy, such cases are unique compared to the usual demographic of adult intussusception that mandates operative management. The combination of normal premorbid colonoscopy, CT without signs of bowel compromise, and a clinically stable patient, there should be enough information for clinician to opt for a more conservative initial approach with a colonoscopy.

Conflicts of Interest

The authors have no financial conflicts of interest.

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Investigation: WAWH
Methodology: WAWH
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