Retrograde Jejunio-Jejunal Intussusception after Total Gastrectomy

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Key Words

Retrograde intussusception · Jejunio-jejunal intussusception · Post gastrectomy complication

Abstract

An eighty-year-old female was transferred to the hospital after experiencing abdominal pain and nausea. She had had a history of total gastrectomy for gastric cancer 14 years previously. Abdominal X-ray revealed a localized expansion of the small bowel. Computed tomography revealed a mass with a lamellar structure in a concentric circle. With a tentative diagnosis of small bowel obstruction due to intussusception, she underwent emergency operation. Laparotomy revealed a retrograde jejunio-jejunal intussusception. Bowel resection was performed due to the severe ischemic damage. All reported intussusception cases after total gastrectomy displayed retrograde characteristics and could occur both during the early and late period after surgery. It is important to consider the possibility of intussusception for patients presenting with acute abdomen who have previously undergone gastric resection.

Introduction

Among the complications that arise following gastrectomy, such as reflux esophagitis, anastomotic ulcer, dumping syndrome or adhesional ileus, intussusception of the small bowel is a rare but severe complication which frequently requires emergency operation. This report describes the case of a patient who presented with retrograde jejunio-jejunal intussusception occurring 14 years after total gastrectomy.

Case Report

An eighty-year-old woman was transferred to the hospital complaining of abdominal pain and nausea. She had undergone total gastrectomy and reconstruction 14 years earlier which was performed with a modified Billroth II method for gastric cancer.

A mobile mass was palpated in the left lower quadrant and tenderness was present at the epigastrium. Laboratory analysis showed moderate leukocytosis and minor anemia. Biochemical findings, electrolyte findings and tumor markers were normal. Abdominal X-ray revealed a localized expansion of the small bowel ([fig. 1a](#)). Computed tomography (CT) revealed a lamellar structure arranged in a concentric circle; however, no mass lesion was found ([fig. 1b](#)).

With a tentative diagnosis of small bowel obstruction due to intussusception, she underwent emergency laparotomy. The surgery revealed a jejuno-jejunal intussusception. The distal (anal) intestine had been engulfed by the oral end in the region of the jejunojejunostomy (Braun's anastomosis) ([fig. 2](#)). Necrosis of the small intestine was evident after manual reintegration. Bowel resection was therefore performed. The postoperative course was uneventful and no recurrence of the intussusception has been observed during follow-up.

Discussion

Intussusception after gastrectomy is a comparatively rare disorder. Intussusception occurs in only 0.07–2.1% of individuals who undergo gastrectomy [1]. However, 87.7% of intussusceptions following abdominal surgery occur after gastrectomy [1]. Intussusception can be categorized as anterograde (normal peristaltic) or as retrograde (reverse peristaltic) intussusception. Many anterograde intussusceptions occur during the early period following gastrectomy, while the retrograde cases generally arise later [2]. Many cases of intussusception are associated with a Billroth II reconstruction I or the Roux-en-Y method; those associated with a Billroth I reconstruction are rare [3]. Intussusceptions are frequently observed in the region of the anastomotic entrance, including Braun's anastomosis [4].

A review of the literature revealed 20 cases of intussusception occurring after total gastrectomy, including the current case ([table 1](#)). A Roux-en-Y reconstruction (the double tract method is included) was reported more frequently (12 cases) than reconstruction using the Billroth II method (including the modified Billroth II, 7 cases). The interval between total gastrectomy and intussusception was more than one year (up to 21 years) in most of the cases; however, some patients experienced intussusception only 6, 16, or 23 days after surgery, thus suggesting that it can occur during both the early and late period. The locus of the intussusception was near the anastomotic region (Roux-en-Y anastomosis and Braun's anastomosis) in all cases. Enterectomy was performed in the majority of cases, but 6 cases required only reintegration.

All intussusceptions after total gastrectomy were characterized as retrograde. A retrograde peristalsis is a normal phenomenon in the small bowel and is often reported among the pathogenic factors of jejuno-jejunal intussusception. Antiperistalsis could be favored by the segmentary motor activity of the small bowel in response to hyperacidity, which is possible after gastrectomy [5]. Various causes of retrograde intussusception are suggested with regard to functional factors, such as (1) helminth aberration and adhesion bending, (2) anastomotic hypersize, (3) excessive behavior of the efferent loop, and (4) intestinal convulsion [1]. These factors affect each other and/or overlap, thus leading to the development of intussusception. Gastrectomy might cause many pathognomonic factors associated with the formation of intussusception, although it was not possible to determine the definitive cause in the current case.

Echography and CT are extremely useful for the diagnosis of this condition. A target sign or multiple concentric rings are the characteristic findings [6]. There is a report of a jejunal retrograde intussusception to the remaining stomach which was observed using an upper gastrointestinal endoscope [7]. Most of the cases require emergency surgery because of circulatory disturbances in the incarcerated bowel [5, 8], whereas the postoperative course is usually good and a recurrence of this condition is quite rare. In patients who do not experience bowel necrosis, some adjuvant modifications are performed to prevent recurrence, such as conversion from a Billroth I to a Billroth II, a chorion suture between the afferent and efferent loop, and so on [9, 10]. However, the long-term results of these modifications remain unclear.

Conclusion

This report documents a recent case with retrograde jejuno-jejunal intussusception after total gastrectomy. The early diagnosis of a jejuno-jejunal intussusception is crucial since it requires immediate surgical treatment in many cases, often including an enterectomy. Therefore, it is important to consider intussusception as a post gastrectomy complication both immediately after surgery and during the long-term follow-up.

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Table 1. Jejuno-jejunal intussusception following total gastrectomy: summary of cases reported in the literature

No.	Author	Year	Age/ sex	Disease	Reconstruc- tive method	Interval since gastrectomy	Locus of intussusception	Form	Treat- ment
1	Davey [11]	1954	63/M	gastric cancer	Roux-en-Y	3 years	? cm more anal from Braun's anastomotic region	retro- grade	no ope- ration, died
2	Nishi	1965	48/F	gastric cancer	Roux-en-Y	23 days	8 cm more oral from R-Y anastomotic region	retro- grade	resection
3	Kato [12]	1965	65/M	gastric cancer	Roux-en-Y	6 days	10 cm more anal from R-Y anastomotic region	retro- grade	reintegra- tion
4	Freeman [10]	1966	40/M	sarcoma	Roux-en-Y	5 years	? cm more anal from R-Y anastomotic region	retro- grade	resection
5	Christeas [13]	1968	71/M	gastric ulcer	Billroth II	6 years	? cm more anal from Braun's anastomotic region	retro- grade	resection
6	Hanyu [14]	1984	39/F	gastric cancer	Roux-en-Y	16 days	3 cm more anal from R-Y anastomotic region	retro- grade	reintegra- tion
7	Ogata [15]	1988	59/M	gastric cancer	Billroth II	12 years	20 cm more anal from Braun's anastomotic region	retro- grade	resection
8	Hwang [16]	1990	59/M	gastric ulcer	Billroth II	10 years	5 cm more anal from Braun's anastomotic region	retro- grade	resection
9	Suganuma [17]	1992	52/M	gastric cancer	Billroth II	4 years	30 cm more anal from Braun's anastomotic region	retro- grade	resection
10	Hashimoto [18]	1993	61/F	gastric cancer	Roux-en-Y	10 years	15 cm more anal from R-Y anastomotic region	retro- grade	reintegra- tion
11	Narishima [19]	1994	58/F	sarcoma	Roux-en-Y	1 year	10 cm more anal from R-Y anastomotic region	retro- grade	resection

12	Goto [20]	1999	75/M	esophageal cancer	Roux-en-Y	9 years	20 cm more anal from R-Y anastomotic region	retro-grade	reintegration
13	Yoshioka [21]	1999	71/M	gastric cancer	Billroth II	11 years	5 cm more anal from Braun's anastomotic region	retro-grade	resection
14	Sumi [22]	2000	82/M	gastric cancer	Billroth II	10 years	20 cm more anal from Braun's anastomotic region	retro-grade	resection
15	Ietsugu [23]	2001	72/M	gastric cancer	double tract	1.5 year	10 cm more anal from jejuno-jejunal anastomotic region	retro-grade	resection
16	Tahara [24]	2003	75/F	plasma cytoma	Graham method	7 years	10 cm more anal from Braun's anastomotic region	retro-grade	resection
17	Akiyama [25]	2005	60/M	gastric cancer	Roux-en-Y	4 years	10 cm more anal from R-Y anastomotic region	retro-grade	reintegration
18	Matsumoto [26]	2005	74/F	gastric cancer	Roux-en-Y	12 years	5 cm more anal from R-Y anastomotic region	retro-grade	resection
19	Sato [27]	2006	74/F	gastric cancer	Roux-en-Y	21 years	20 cm more anal from R-Y anastomotic region	retro-grade	reintegration
20	our case	2008	80/F	gastric cancer	Billroth II	14 years	10 cm more anal from Braun's anastomotic region	retro-grade	resection

Fig. 1. **a** Preoperative abdominal X-ray indicates a localized expansion of the small intestine (arrow). **b** Abdominal CT indicates a lamellar structure arranged in a concentric circle (arrow). However, no mass lesion was observed.

Fig. 2. The surgical findings of retrograde intussusception observed close to the anal side of the jejunojejunostomy.

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