Case Report

Dilation and stasis: a rare but important late complication of jejunal pouch interposition after proximal gastrectomy

Hiromichi Maeda(1), Tsutomu Namikawa(2), Ken Okamoto(1), Eri Munekage(2), Makoto Toi(3), Makoto Hiroi(3), Atsunori Takeshita(3), Kazuhiro Hanazaki(2), Michiya Kobayashi(1)

1. Cancer Treatment Center, Kochi Medical School Hospital
2. Department of Surgery, Kochi Medical School, Kochi University
3. Department of Diagnostic Pathology, Kochi Medical School Hospital
4. Department of Surgery, Takeshita Hospital

Abstract

Reports suggest that jejunal pouch interposition (JPI) after proximal gastrectomy is superior in terms of food intake volume and prevention of reflux esophagitis early after surgery. However, the long-term results and late complications of the procedure are not well known. This case report describes an excessive pouch dilatation necessitating surgical intervention as a late complication of JPI. The patient was a 62-year-old woman with early gastric cancer who underwent proximal gastrectomy. Gastrointestinal continuity was restored with JPI. The patient’s postoperative course was uneventful and follow-up imaging studies showed no signs of tumor recurrence. However, the patient gradually started to experience difficulty eating food and complained of postprandial nausea and vomiting. Contrast radiography of the upper gastrointestinal tract revealed a dilated jejunal pouch, which eventually required surgical intervention. The jejunal pouch and remnant stomach were resected, followed by Roux-en-Y reconstruction. The postoperative course was uneventful and the symptoms subsided. The present case highlights the importance of a clinical study focusing on the long-term results of this surgical procedure.

(Received June 2, 2017; Accepted June 6, 2017)

Core tip

Jejunal pouch interposition (JPI) after proximal gastrectomy is occasionally chosen due to superiority in terms of food intake volume and prevention of reflux esophagitis early after surgery. Although the early complications have been reported in the literature, the long-term results and late complications of the procedure are not well known. Herein we described a patient who suffered from dilatation and stasis of the interposed jejunal pouch after proximal gastrectomy. Based on two previous cases and the present study, the dilation of the pouch is irreversible, requiring surgical resection of the dilated pouch. Our experience highlights the need for further investigations to elucidate the long-term outcomes of proximal gastrectomy with JPI.

Introduction

Proximal gastrectomy is occasionally chosen for the treatment of gastric cancer located in the upper one-third of the stomach, with the aim of preserving gastric digestion(1-2). Treatment efficacy is the prerequisite for this uncommon procedure. A retrospective study of 128 patients with a preoperative diagnosis of early gastric cancer demonstrated that the outcome of proximal gastrectomy reached the standards in terms of tolerability and tumor curability(3). There are various reconstruction techniques that can be used after proximal gastrectomy, including esophagogastrostomy, jejunal interposition, double tract, and jejunal pouch interposition (JPI). A nationwide survey in Japan revealed that JPI was the most common reconstruction method in only 7% of 154 institutes surveyed; in comparison, 49% of institutes reported esophagogastrostomy as the most common technique(4). However, to prevent reflux esophagitis, jejunal interposition is generally required when the remnant stomach is less than one-third of the entire stomach(5). In this context, although it is not frequently performed, the interposition of the jejunum with or without pouch formation remains an important reconstruction option. Moreover, recent studies indicate that the frequency of tumors located in the upper one-third of the stomach is increasing(6-7), suggesting that there will also be an increase in the number of patients...
needing to undergo proximal gastrectomy.

Several comparative studies have revealed that JPI after proximal gastrectomy has better short- and medium-term postoperative outcomes, including better quality of life (QOL) scores, food intake, and body weight, than total gastrectomy or proximal gastrectomy with simple jejunal interposition\(^1\), \(^2\), \(^8\). However, the long-term outcomes of JPI after proximal gastrectomy have not been fully determined as yet. Herein we report a rare but quite important late complication of JPI after proximal gastrectomy that required surgical resection of the dilated pouch and remnant stomach.

**Case presentation**

A 62-year-old woman with early gastric cancer underwent proximal gastrectomy and JPI. Gastrointestinal continuity was restored by performing JPI with fundoplication\(^9\), \(^10\); a pyloroplasty was not performed. The patient’s postoperative course was uneventful and follow-up imaging studies revealed no signs of tumor recurrence. At 66 years of age the patient started to complain of postprandial nausea and vomiting, which lasted for a short period of time. Endoscopic examination ruled out mechanical obstruction of the upper gastrointestinal tract.

Ten years after her initial surgery, the patient started to complain of frequent vomiting after eating food. Contrast radiography of the upper gastrointestinal tract and computed tomography revealed dilatation of the jejunal pouch (Fig. 1). Positioning the patient in the right lateral decubitus position with a slight tilt towards the prone position enabled the contrast medium to pass smoothly into duodenum, and so the patient was advised to eat food in small quantities and to rest in the right lateral decubitus position. Although these instructions were marginally effective and the patient’s body weight increased slightly, postprandial vomiting and nausea remained.

Twelve years after the gastrectomy, the patient agreed

---

**Fig. 1** (Contrast radiography for upper gastrointestinal examination and results of computed tomography (CT))

(A) Contrast radiography revealed that the barium ran smoothly from the esophagus through the anastomosis into the jejunal pouch. (B) The pouch was excessively enlarged. (C) Placing the patient in the right lateral decubitus position allowed the barium retained in the jejunal pouch to run into the duodenum, and there was no evidence of a mechanical obstruction. (D) Enhanced abdominal CT showed an enlarged pouch and an excessive amount of food residue inside the pouch.
to undergo surgical resection of the interposed jejunal pouch with the remnant stomach, followed by Roux-en-Y reconstruction. On laparotomy, the remnant stomach was slightly atrophic and the jejunal pouch was dilated, although obstruction of the anastomosis was not evident (Fig. 2A, B). The resected jejunal pouch still contained food residue (Fig. 2C), despite preoperative fasting. No strictures or tumors were observed (Fig. 2D, E). The patient’s postoperative course was uneventful, and the procedure alleviated the vomiting and nausea after food intake.

**Discussion**

Gastric cancer is a common cause of cancer-related deaths worldwide. Screening programs for gastric cancer have improved the detection of asymptomatic early gastric cancer, the rate of curative resection, and the chance of long-term survival. The transition of features of gastric cancer further highlight the importance of the postoperative QOL, as well as reducing weight loss and other complications. These considerations gave rise to interposition of the jejunal pouch after proximal gastrectomy, and several studies have reported on the advantages of this technique. For example, a prospective randomized study reported that proximal gastrectomy with JPI is superior to total gastrectomy in terms of several postoperative parameters, including post-gastrectomy symptoms, food intake, and weight recovery. Similarly, a retrospective comparative study revealed that the food intake volume and QOL in the short term were significantly better in patients who underwent JPI after proximal gastrectomy than in those who underwent Roux-en-Y reconstruction after total gastrectomy. Furthermore, both retrospective and prospective randomized studies of the short- and medium-term postoperative results rated JPI after proximal gastrectomy better than simple jejunal interposition after proximal gastrectomy.

However, a retrospective study from a single center claimed that esophagogastrectomy and fundoplication after resection of the upper half of the stomach was a better strategy than jejunal interposition, with or without a pouch, because the rate of occurrence of surgical complications was significantly lower after esophagogastrectomy. In addition, reflux esophagitis was not reported as often after esophagogastrectomy. One of the reasons for the better short-term outcomes after esophagogastrectomy in that study could be the fundoplication. However, it should also be taken into account that the volume of the remnant stomach differed among studies, and this will significantly affect how easily the surgery can be performed and the postoperative outcomes. Thus, we consider that jejunal interposition with or without pouch formation remains a viable option for reconstruction, especially when the remnant stomach is small.

---

**Fig. 2:** Surgical findings and the resected specimen

(A) The serous membrane side of the pouch was whitish. The pouch was enlarged and hypotonic compared with the normal jejunum. (B, C) The resected pouch and remnant stomach contained food residue, despite preoperative fasting. (D) The mucosa of the pouch was reddish without any signs of ulceration or tumor formation. (E) Microscopic evaluation did not show any significant abnormalities and each layer is well maintained. Bar, 500 μm.
In terms of the long-term results after proximal gastrectomy with JPI, descriptive studies are scarce and there are only a few case reports of late complications that highlight the importance of the surgical technique and postoperative follow-up regimen. An important negative consequence of JPI is the recurrence of gastric cancer at the staple line used to create the jejunal pouch\(^9\). Newly diagnosed adenocarcinoma in the jejunal pouch has also been described\(^10\), although it was not clear in that study whether the cancer development was related to pouch interposition or simply coincidence. In each case, these reports suggest the importance of periodic endoscopic evaluation not only of the remnant stomach, but also of the jejunal pouch.

Another important late complication is excessive dilatation of the jejunal pouch and the retention of a considerable amount of food residue. To our knowledge, two cases of pouch dilatation necessitating surgical intervention have been reported in the English literature. Ueno et al. reported on a dilated jejunal pouch, leading to a bent anastomosis and stenosis, in a 23-year-old male patient\(^11\). They concluded that excessive food ingestion caused irreversible pouch dilatation, and highlighted the importance of nutritional instruction for patients after surgery. In another study, Katusube et al. reported excessive dilatation of a jejunal pouch 4.5 years after surgery in a 44-year-old male patient\(^12\). These authors found no abnormality at the anastomosis or pylorus of the stomach other than food residues in the dilated pouch, which is the same finding as in the present patient. From other viewpoints, Katusube et al. discussed the importance of related factors, such as the role of vagal nerve preservation, pyloroplasty, and motility of the intestine, in overcoming complications after this procedure\(^13\). In terms of mortality, an animal experiment of JPI after proximal gastrectomy has revealed the relatively early and persistent recovery of the jejunal pouch, remnant stomach, and jejunum\(^14\). If so, we consider that persistent and occasionally excessive pressure on the gastrointestinal wall would be the most significant underlying cause of this complication, and that pyloroplasty during reconstruction still has a protective role against its development.

In conclusion, herein we have described a patient who suffered from dilatation and stasis of the interposed jejunal pouch after proximal gastrectomy. Based on two previous case reports and the present study, the dilatation of the pouch is irreversible and the effects of conservative management are marginal and temporary. In such cases, surgical resection of the pouch is required. Although this late complication of JPI after proximal gastrectomy is rare in the literature, the present case highlights the need for further investigations to elucidate the long-term outcomes of proximal gastrectomy with JPI.

**Financial support:** none

**Conflict of interest:** none

**Author contributions:** Maeda H, Hanazaki K and Kobayashi M designed the report; Okamoto K, Munekage E, Namikawa T and Maeda H were attending doctors for the patients; Toi M and Hiroi M performed pathological examination; Maeda H and Kobayashi M wrote the manuscript.

**Ethics approval:** Kochi Medical School Institutional Review Board (IRB) reviewed the protocol, and judged that there is no necessity to discuss this study (case report) in IRB.

**Informed consent:** The patient provided written informed consent for the presentation of the case.

**Reference**