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Case Report

A Long-Term Follow-Up Result of Pouch Plasty for Severe Dysfunction of Jejunal Pouch Reconstruction After Total Gastrectomy: A Case Report

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A 78-year-old woman with malignant lymphoma of the stomach underwent total gastrectomy with a jejunal-pouch (J-pouch) reconstruction in 1994. Twelve years after surgery the patient began to suffer epigastric distress and reflux symptoms. Eventually, she was unable to take anything by mouth. A series of diagnostic images seemed to indicate that the main cause of the dysfunction was flaccidity of the J-pouch and deformity of the outflow route induced by chronic excessive dilatation of the pouch wall. Because all conservative managements only led to temporary improvement and ended in failure, she hoped to receive the operation. We designed "pouch plasty" capable of ameliorating the pouch dysfunction. The aim of pouch plasty was to improve uneven tension of the pouch wall and repair deformity of the outflow route of the food. After the operation, the J-pouch resumed adequate drainage and had good reservoir function. More than 7 years later, the patient had no further complications.

Key words: Jejunal pouch reconstruction – Gastrectomy – Delayed emptying – Pouch plasty

There remains controversy over the optimum reconstruction after total or proximal gastrectomy for malignant disease. To ameliorate both the overall symptoms and nutritional status after surgery, many types of gastric replacement have been applied. Jejunal-pouch (J-pouch) procedures after either a total or proximal gastrectomy have been reported to have important advantages in the patient's postoperative quality of life based on the functional capacity of the gastric substitute.[1–4] On

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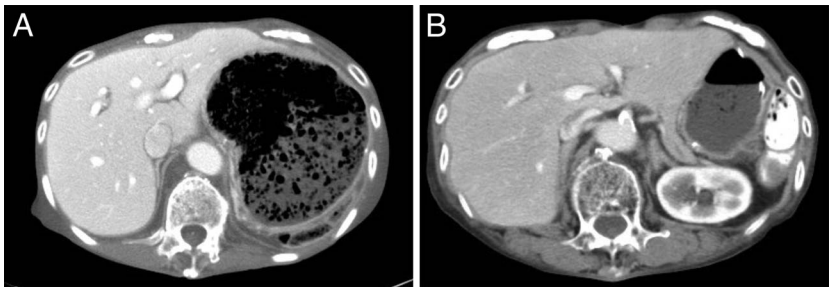

Fig. 1 Abdominal computed tomography (CT) before and after the secondary operation, "pouch plasty." (A) Abdominal CT showed severe dilatation of the jejunal pouch with a huge amount of food residue. (B) Abdominal CT showed the adequate capacity of the J-pouch at 7 years after the secondary operation.

the other hand, these procedures can be associated with serious complications after surgery, including delayed emptying and reflux symptoms.[5] Ultimately, these events lead to dysfunctional dilatation of the J-pouch in rare cases. In cases of severe dilatation of the J-pouch, failure of conservative management commonly requires reoperation using conventional reconstructive methods, including removal of the dysfunctional J-pouch.[6] These operations have a considerable impact on the reservoir capacity for ingested food. If possible, it is advisable for functional recovery of the J-pouch to be achieved without needing to remove the original J-pouch. As a consequence of long-term follow-up, we describe a successful case of "pouch plasty" as a novel operative technique capable of improving the functioning of the J-pouch.

Case Report

A 78-year-old woman who had malignant lymphoma of the stomach underwent total gastrectomy with a Roux-en-Y reconstruction in 1994. A stapled J-pouch with a 15-cm-long line was constructed with a stapled anastomosis between the pouch and esophagus. The alimentary limb was passed through the transverse mesocolon (an antecolic route). At 12 years after surgery, the patient began to suffer epigastric fullness and reflux symptoms. These symptoms worsened, and finally she could hardly eat. Abdominal computed tomography showed a markedly dilated J-pouch with accumulation of a huge amount of food residue but without any evidence of disease recurrence or metastases (Fig. 1A). Likewise, gastrointestinal fluoroscopy showed atonic dilatation of the J-pouch and obstruction of the passage of food (Fig. 2A). These findings indicated that the main cause of the dysfunctional J-pouch was likely to be flaccidity and deformity of the outflow route induced by chronic excessive stretching of the pouch wall. In addition, we considered that postoperative adhesion formation contributed to the flaccidity and deformity of the J-pouch. All conservative managements (*i.e.*, decompression using a stomach tube and other measures) were tried. These procedures led to temporary improvement, but the function of the J-pouch gradually worsened. Because of failure of symptomatic improvement, the patient agreed to undergo surgery in 2007.

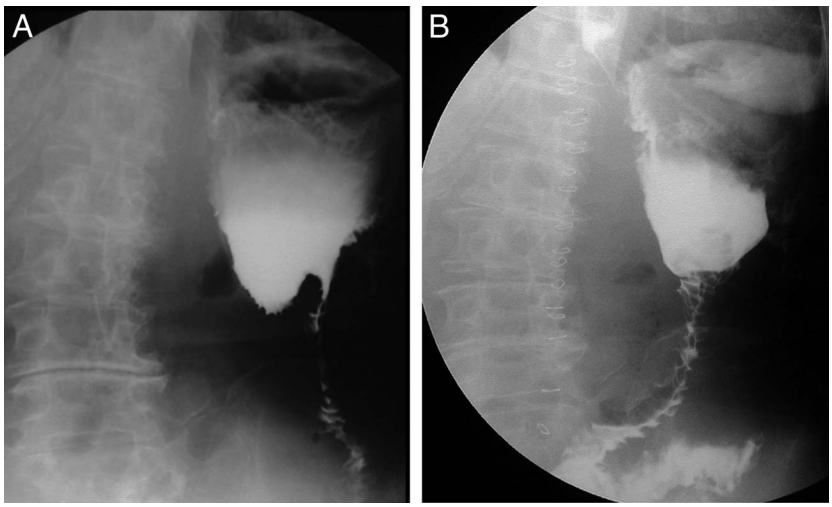

Fig. 2 Gastrointestinal fluoroscopy before and after the secondary operation, "pouch plasty." (A) Preoperative gastrointestinal fluoroscopy showed atonic dilatation of the J-pouch and obstruction of the passage of food. (B) Postoperative gastrointestinal fluoroscopy showed smooth passage of water-soluble contrast material, and there was no flabby part in the J-pouch.

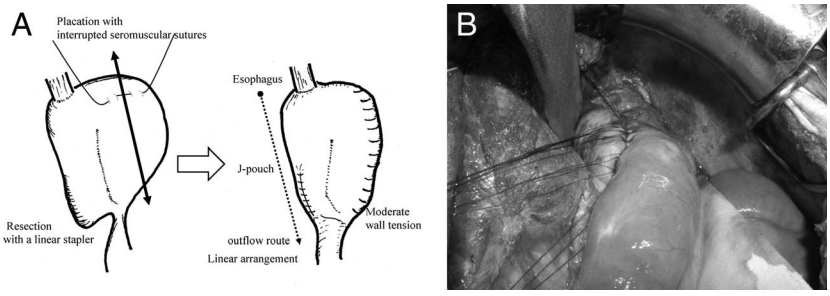

Fig. 3 Operative procedure of pouch plasty. (A) Pouch plasty was designed so that there was no flabby wall and the outflow route was changed linearly in the direction of the vent. (B) The flabby wall was resected with a linear stapler, and the staple line was buried using interrupted seromuscular sutures.

At laparotomy, the J-pouch was found to be adherent to the anterior left upper abdominal wall after splenectomy had accompanied the gastrectomy. There was no evidence of recurrent disease. Removal of multiple intestinal adhesions was achieved by surgical synechiotomy. A diagnosis of a J-pouch functional disorder was made. We then attempted pouch plasty as a novel operative technique. The aim of pouch plasty was to restore moderate tension of the pouch wall and repair the deformity of the outflow route. Pouch plasty was designed so that there was no flabby wall and the outflow route was changed linearly in the direction of the vent (Fig. 3A). The flabby wall was resected with a linear stapler, and the staple line was buried using interrupted seromuscular sutures (Fig. 3B). For the prevention of postoperative adhesion to the anterior left upper abdominal wall, we adjusted the bowel position and interfered with the adhesion of the pouch to the abdominal wall.

The patient had an uncomplicated postoperative course. Postoperative gastrointestinal fluoroscopy showed smooth passage of water-soluble contrast material, and there was no flabby part in the J-pouch (Fig. 2B). As a result, the outflow route was secured. At the same time, the J-pouch resumed good reservoir functioning capable of sufficient food intake. More than 7 years later, abdominal computed tomography showed the adequate capacity of the J-pouch (Fig. 1B). She had encountered no other complications, eaten three meals a day regularly, and enjoyed an improved quality of life without weight loss.

Discussion

Malnutrition followed by loss of body weight after gastrectomy is generally considered to be the result of inadequate caloric intake rather than maldigestion or malabsorption.[7] Many types of pouch

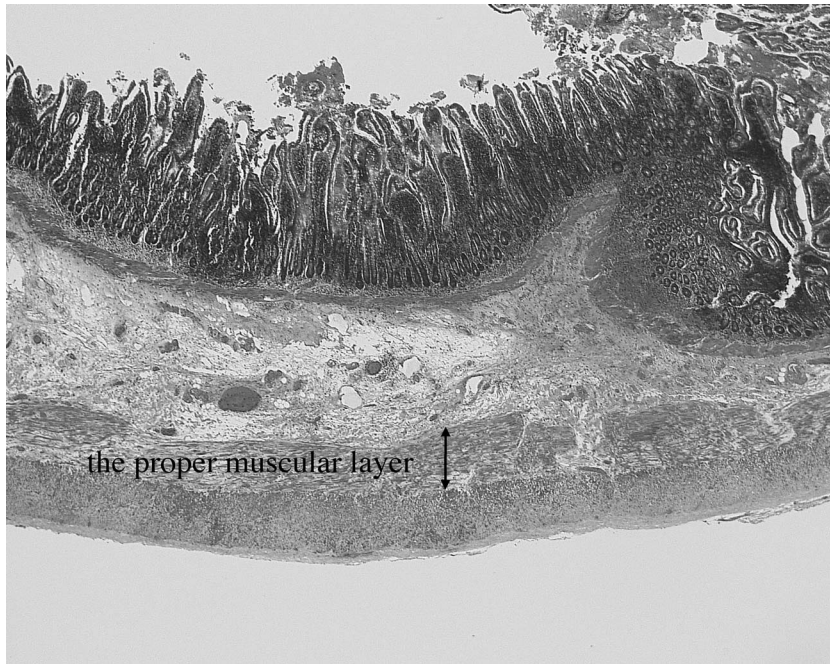

Fig. 4 Histopathologic examination of the partially resected pouch wall showed the preservation of almost normal histologic structure in the muscular coat proper. Fontana-Masson stain (×20).

procedure have been tried in order to provide an adequate reservoir function for food and nutritional advantage.[1–4,7] The construction of a gastric reservoir during pouch operation is thought to reduce adverse outcomes after gastrectomy, such as postoperative dumping syndrome, impaired food intake, and bile reflux into the esophagus.[4,8] However, there have been few studies reporting long-term quality of life. One of the most serious events caused by a pouch operation is delayed emptying of the pouch, which gives rise to a sensation of epigastric fullness or nausea and leads to poor food intake.[6] Moreover, chronic accumulation of a huge amount of food residue can result in dysfunctional dilatation of the pouch. Several factors are involved in delayed pouch emptying, including the size and length of the pouch, peristalsis or myoelectric activity, preservation of the blood and nerve supply, and others.[1,6] Nakane *et al*[7] reported that widening the mesenteric pedicle might prevent unusual contraction of the interposed jejunal segment because of blood disturbance and denervation. Further studies are needed to understand physiologically the motility of the jejunal pouch. In a clinical situation, in the presence of a dysfunctional pouch resistant to various conservative therapies, the most common option is reoperation using conventional reconstructive methods, including removal of the dysfunctional pouch. However, from the perspective of pouch operations, the advisable reoperation should be to maintain the reservoir function as well as improve the emptying performance of the pouch. On the other hand, Morar *et al*[9] reported that a pouch-enteric bypass is a suitable treatment option for patients with functional jejunal pouch dysmotility following a total gastrectomy. However, in this method, the dysfunctional pouch remained with little modification. We therefore designed "pouch plasty" as a novel operative technique capable of ameliorating pouch dysfunction. The main cause of the dysfunction was thought to be flaccidity of the J-pouch and deformity of the outflow route induced by chronic excessive stretching of the pouch wall. The aim of pouch plasty was to restore moderate tension of the pouch wall and repair the deformity of the outflow route. Pouch plasty was designed so that the outflow route was changed linearly in the direction of the vent. In addition, achieving moderate wall tension was important for repairing pouch flaccidity. Histopathologic examination of the partially resected pouch wall showed the preservation of almost normal histologic structure in the muscular coat proper (Fig. 4). The cause of pouch flaccidity was considered to be not defects in the muscular layer, but instead excessive stretching beyond the ability of the muscular layer. In other words, it suggested that pouch plasty could be an option for patients with a dysfunctional pouch. The patient regained a favorable dietary status with body weight gain, and had recorded no complications more than 7 years after this secondary surgery.

In conclusion, "pouch plasty" appears to be a promising procedure for cases of dysfunctional dilatation of the J-pouch. This technique might be an option before selecting conventional reconstructive methods, including removal of the dysfunctional pouch. Long-term follow-up and further experience are necessary to clarify this point.

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