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Braun enteroenterostomy during pancreaticoduodenectomy decreases postoperative delayed gastric emptying

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KEYWORDS:
Pancreaticoduodenectomy;
Delayed gastric emptying;
Braun enteroenterostomy;
Child reconstruction;
Pancreatic cancer

Abstract

BACKGROUND: Modified digestive reconstruction during pancreaticoduodenectomy (PD) may affect the postoperative incidence of delayed gastric emptying (DGE). The purpose of this study is to investigate whether Braun enteroenterostomy following PD can reduce the incidence of DGE.

METHODS: Four hundred seven patients who received PD with child reconstruction from June 2000 to March 2013 were divided into 2 groups: 206 patients with Braun enteroenterostomy (Child-Braun group) and 201 patients without Braun enteroenterostomy (Child-non-Braun group). Clinical data were retrospectively extracted; univariate and multivariate analyses were performed to investigate the association between Braun enteroenterostomy and DGE.

RESULTS: DGE was less frequent in the Child-Braun group than in the Child-non-Braun group (6.7% vs 26.87%, $P < .001$). The multivariate logistic regression analysis showed that Braun enteroenterostomy was the only significant independent factor associated with the reduced DGE after PD with Child reconstruction, with an odds ratio of 4.485 (95% confidence interval: 2.372 to 8.482, $P < .001$).

CONCLUSION: Braun enteroenterostomy reduces the incidence of postoperative DGE associated with PD.

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Pancreaticoduodenectomy (PD) is the standard and effective treatment for pancreatic cancer and periampullary adenocarcinoma, but the incidence of postoperative complications remains high, up to 60%.[1] Postoperative pancreatic fistula (POPF) and delayed gastric emptying (DGE) are the 2 most troublesome complications. DGE is a paresis (partial paralysis) of the stomach, resulting in food remaining in the stomach for a longer time than normal. DGE is not a fatal complication after PD, but it may significantly prolong the hospital stay and increase the hospitalization cost.[2] Because DGE symptoms may be misunderstood among patients and their families, in China the incidence of medical complications may well be higher in DGE patients than in those without DGE. The reported incidence of DGE is 38% to 57%.[3–5]

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Therefore, a high priority for surgeons is the search for ways to reduce DGE after PD.

Several factors may contribute to the frequency and severity of DGE after PD: gastric dysrhythmias because of intra-abdominal complications,[6,7] obstruction of the reconstructed alimentary tract,[8] surgical technique,[3,6,9,10] and continuous enteral nutrition.[4] The method of alimentary reconstruction of duodenojejunostomy or gastrojejunostomy strongly influences the occurrence of DGE. Some authors[11,12] have reported a lower incidence of DGE after Braun reconstruction or Roux-en-Y reconstruction, but others have found no difference in incidence between either of the 2 procedures following PD and classic PD.[3] Until now, few articles with very small sample size have focused on the influence of Braun anastomosis (between the afferent and efferent jejunal loops) following PD on the incidence of DGE. Thus, the objective of our study was to determine the clinical impact of Braun enteroenterostomy on the occurrence of DGE after PD.

Patients and Methods

Clinical data

Data of 418 patients who had undergone PD between June 2000 and March 2013 were retrospectively retrieved by chart review. The first 217 patients, operated from June 2000 to March 2009, had a standard antecolic gastroenterostomy with PD. Those patients had a high incidence of DGE. By communication with other surgeons, we realized that the addition of Braun enteroenterostomy might decrease the incidence of postoperative DGE. We also retrospectively reviewed our data on Billroth II reconstruction or Billroth II reconstruction with added Braun enteroenterostomy in distal gastrectomy for gastric cancer, and concluded that the added Braun procedure probably resulted in better patients' recovery and less DGE. Thus, from April 2009 to March 2013, we performed a Braun enteroenterostomy as part of the PD operation in 201 patients.

Altogether there were 259 men and 159 women in our series, with an average age of 58.0 ± 11.03 years. Diseases included 161 pancreatic cancers, 27 pancreatic cystadenomas and cystadenocarcinomas, 39 bile duct cancers, 18 intraductal papillary mucinous neoplasms, 109 ampullary or duodenal cancers, 14 neuroendocrine tumors or carcinoid tumors, 1 gallbladder or cystic duct cancer, 6 pancreatic solid pseudopapillary tumors, 4 gastrointestinal stromal tumors, 1 metastatic cancer, 11 cases of pancreatitis or autoimmune diseases, 1 common bile duct adenoma, 4 duodenal adenomas, and 22 other diseases. Review of patients' records was approved by our hospital's institutional review board.

Pancreaticoduodenectomy procedures

The following PD procedures were performed: distal gastrectomy, resection of the duodenum, removal of the gallbladder and common bile duct, removal of the lesion, and resection of the pancreatic head, neck, and uncinate process. Standard PD was performed in 418 patients: 201 cases with Child reconstruction (Fig. 1A), 206 cases with Child reconstruction plus Braun jejunojejunostomy after gastrojejunostomy (Fig. 1B), and 11 cases with Cattell reconstruction with Braun jejunojejunostomy (Fig. 1C). The jejunum was brought up to do pancreatojejunostomy and bilioenteric anastomosis in a retrocolic manner through a defect created in the colon mesentery. Double-layer

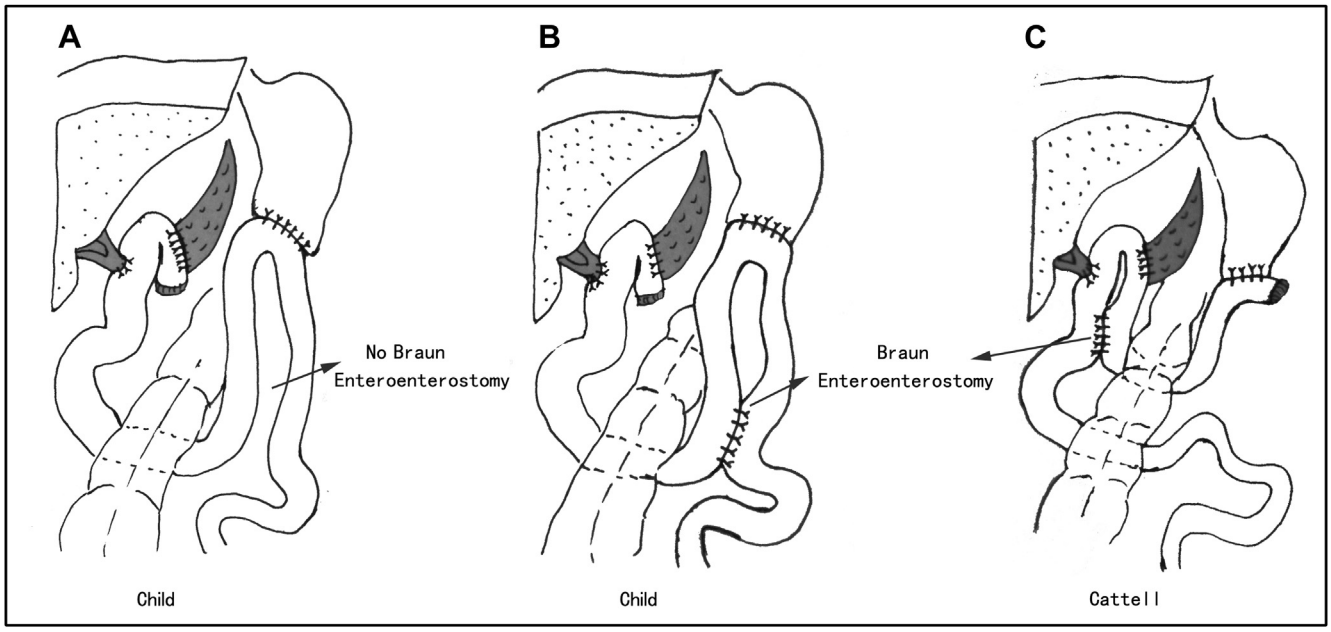

Figure 1 Pancreaticoduodenectomy with different digestive reconstructions. A, Child reconstruction; B, Child reconstruction plus Braun jejunojejunostomy after gastrojeunostomy; C, Cattell reconstruction with Braun jejunojejunostomy.

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