

Frey procedure combined with biliary diversion in chronic pancreatitis

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Background. The Frey procedure has become the standard operative treatment in chronic painful pancreatitis. Biliary diversion could be combined when associated with common bile duct obstruction. The aim of the present study was to evaluate the impact of the type of biliary diversion combined with the Frey procedure on late morbidity.

Methods. The data from consecutive patients undergoing the Frey procedure and having a minimum follow-up of 2 years were extracted from a maintained prospective database. The mean endpoint was the rate of secondary biliary stricture after the Frey procedure combined with biliary diversion (bilioenteric anastomosis or common bile duct reinsertion in the resection cavity).

Results. Between 2006 and 2013, 55 consecutive patients underwent the Frey procedure. Twenty-nine patients had common bile duct obstruction (52.7%). The technique of biliary diversion resulted in bilioenteric anastomosis in 19 patients (65.5%) and common bile duct reinsertion in 10 patients (34.5%). Preoperative characteristics and early surgical outcomes were comparable. Pain control was similar. There was significantly more secondary biliary stricture after common bile duct reinsertion than after bilioenteric anastomosis (60% vs 11%, $P = .008$).

Conclusion. Combined bilioenteric anastomosis during the Frey procedure is an efficient technique for treating common bile duct obstruction that complicates chronic painful pancreatitis. Bilioenteric anastomosis was associated with less secondary biliary stricture than common bile duct reinsertion in the pancreatic resection cavity. (Surgery 2016;■:■-■.)

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PAIN IS THE MAIN SYMPTOM CAUSED BY CHRONIC PANCREATITIS (CP).¹ However, an inflammatory pancreatic head mass could also affect adjacent organs. Common bile duct (CBD) stricture appears in 3–46% of patients and could lead to chronic cholestasis, cholangitis, and eventually to secondary biliary cirrhosis.² In addition to pancreatic head cancer, painful inflammatory pancreatic head mass has long been considered a classic indication for pancreaticoduodenectomy. Morbidity and mortality rates of pancreaticoduodenectomy have decreased during the past decades. Nevertheless, various surgeons have tried to introduce more conservative

procedures, such as duodenum-preserving pancreatic head resection, that cause less morbidity.³ The Frey procedure (FP), which was first described in 1987 and combines inflammatory head mass resection and pancreatic main duct drainage, has become a suitable alternative.⁴

However, in case of CBD compression associated with a pancreatic head mass, there is no guideline on the method to remove this compression during FP. Pancreatic head mass resection or enucleation may be sufficient in some cases to restore bile flow. However, an associated procedure is needed if intraoperative cholangiography still indicates a biliary stricture. This drainage commonly is achieved with bilioenteric anastomosis. The type of bilioenteric anastomosis (Roux-en-Y choledochojejunostomy or choledochoduodenostomy) depends on the surgeon's awareness of the situation.

In 1997, Izbicki et al⁵ described an alternative surgical approach consisting of the reinsertion of the distal CBD in the resection cavity during duodenum-preserving pancreatic head resection.

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Since the description of this procedure, only a few authors have studied this technique and have not made a significant conclusion about the results of this technique.⁶ The present study aimed to compare morbidity and follow-up between 2 types of biliary diversion combined with FP for painful chronic pancreatitis complicated by CBD stricture.

METHODS

Patients. A database of consecutive patients who underwent the FP in a tertiary center has been created and maintained prospectively since 2006. Data were collected regarding demographics, preoperative procedures (endoscopic, radiologic), surgical variables, duration of hospital stay, postoperative morbidity, and follow-up. Patients operated on between 2006 and 2013 were included in the analyses (allowing at least 2 years of follow-up, except for patients who died prematurely or were lost to follow-up). Diagnosis of chronic pancreatitis was based on the clinical (clinical history, physical examination) and imaging findings (computed tomographic [CT] scan, magnetic resonance [MR] cholangiopancreatography, echoendoscopy). Indication for operation was determined systematically during a multidisciplinary meeting that included surgeons, gastroenterologists, and radiologists.

Operative procedure. FP was performed by 1 senior pancreatic surgeon (LS) according to the technique first described in 1987 by Frey and Smith.⁴ The need for biliary diversion was determined preoperatively or perioperatively when CBD stricture persisted as observed by perioperative cholangiography. The type of biliary diversion chosen in case of CBD stricture depended on the accessibility of the CBD in the resection cavity and was left to the discretion of the surgeon.

The technique of CBD reinsertion combined a 1-cm longitudinal cut of the distal CBD in the pancreatic head resection cavity and an anastomosis to pancreatic parenchyma using 5-0 polydioxanone interrupted sutures. A Roux-en-Y choledochojejunostomy was performed if bilioenteric anastomosis was chosen. The same Roux-en-Y jejunal loop was used for the bilioenteric anastomosis and the pancreaticojejunal anastomosis. The distal extremity of the jejunal loop was first anastomosed with the pancreas.

Definitions. The postoperative morbidity was defined as any complication that occurred within 90 days of the operation. The complications were categorized according to the Clavien-Dindo classification.⁷ Major complications were categorized as grades III–V in the Clavien-Dindo classification.

Postoperative pancreatic fistula was classified into 3 groups according to the criteria given by the International Study Group of Pancreatic Fistula.⁸ Postoperative delayed gastric emptying was classified according to the criteria given by the International Study Group of Pancreatic Surgery, but only grades B and C were used for this study as our center's policy was to maintain the nasogastric tube until at least postoperative day 5.⁹ Postpancreatectomy hemorrhage, including intra- and extraluminal bleeding, was classified according to the International Study Group of Pancreatic Surgery definition.¹⁰

Biliary fistula was defined as the appearance of bile in peritoneal drains.

The primary biliary dilatation was suspected on preoperative cholangio-MRI and/or CT scan and confirmed intraoperatively by systematic cholangiography.

The secondary biliary stricture was suspected on biologic laboratory results or occurrence of cholangitis during follow-up and was systematically confirmed by cholangio-MRI before treatment.

Pain control was assessed during postoperative follow-up at 3, 6, 12, and 24 months and defined as an absence of morphinic use.

Statistical analysis. Qualitative variables are expressed as numbers with percentages and were compared using χ^2 or Fisher exact tests as appropriate. Quantitative variables are expressed as mean values \pm the standard deviation and were compared using Mann-Whitney *U* test. Analyses were performed with R statistical software (<http://www.r-project.org/>).

RESULTS

Fifty-five consecutive patients underwent FP for painful CP between 2006 and 2013. Twenty-nine (53%) patients had painful CP complicated with CBD stricture. Mean follow-up was 37.25 ± 24.69 months (range, 1.8–104.5 months). The mean volume of pancreatic enucleation was 27.3 ± 19 cm³, and the mean larger diameter of the specimen was 4.2 ± 1.2 cm.

The clinical characteristics of patients according to the presence of biliary dilatation are compared in [Table I](#). Patients were comparable with respect to exocrine insufficiency rate ($P = .84$), diabetes rate ($P = .4$), and American Society of Anesthesiologists score ($P = .42$).

Endoscopic biliary stenting was done prior to surgical biliary diversion in 5 patients (17.2%). Biliary preoperative dilatation did not influence postoperative outcomes.

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