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INTRODUCTION

Alcohol use, biliary stones, autoimmune or personal genetic susceptibility, excessive protein and fat calorie intake, smoking, and a deficiency in vitamins and trace minerals are all risk factors for chronic pancreatitis (CP) (1,2). CP with calcification, is characterized by protein plugs, intraductal calculi, irregular pancreatic duct, parenchymal calcification, heterogeneous parenchyma, gland enlargement, and small cavities (3). The primary sign of the disease is persistent pain, and analgesic addiction impairs quality of life (QoL) (4). Conservative symptom-related therapy seems to be the primary approach to treatment for CP. However, patients who have failed conservative or endoscopic procedures and have suspicious malignancy are given the decision of surgery (5). There are still issues regarding Frey's procedure to treat CP, such as the extent of pancreatic head removal and how the procedure's long-term effects correlate with the severity of the disease (6).

Considering Frey's procedure as primary surgical management in chronic pancreatitis and pancreatic stone: A case report

Abstract

Chronic pancreatitis (CP) is characterized by abdominal pain, recurrent acute pancreatitis episodes, and pancreatic fibrosis, which leads to endocrine and exocrine insufficiency. Back in 1987, Frey and Smith demonstrated pancreatic head anterior resection combined with drainage of the main pancreatic duct using pancreaticojejunostomy. A 52-year-old man complained of right upper abdominal pain for 2 weeks. MRI examination presented prominent dilatation of the left and right intrahepatic ducts, and common bile duct due to the main pancreatic duct massive dilatation, accompanied by an irregular filling defect that adhesions to the wall, suggesting pancreatic stones. The patient was diagnosed with chronic calcifying pancreatitis with pancreatic stones. Frey's procedure was chosen as primary surgical management. When conservative therapy fails to relieve the pain from chronic pancreatitis, physicians should consider surgery as a primary intervention. We recommend Frey's procedure for chronic pancreatitis treatment because of its safety and effectiveness.

Keywords: Case report, chronic pancreatitis, Frey's procedure, management, pancreatic stone, surgery

CASE REPORT

This study presents a 52-year-old man who complained of right upper abdominal pain 2 weeks before hospital admission. He experienced intermittent fever, jaundice, and nausea, but no complaint of defecating or tea-like urination. Two years ago, he had a cholecystectomy surgery. On physical examination, his blood pressure was 104/86 mmHg, heart rate 82x/minute, respiratory rate 20x/minute, and temperature 37.7°C. The sclera was not icteric, the abdomen showed scars from previous surgery (Kocher incision), Murphy's sign was negative, tenderness was present, and bowel sounds were normal. Laboratory examination revealed, a hemoglobin level of 14.3 g/dL, hematocrit 43.9%, leukocytes 7,000/uL, platelets 184,000/uL, serum albumin 3.82 g/dL. Alkaline phosphatase was measured at 372u/L. Serum bilirubin levels, liver, and kidney function were within normal range. MRI examination (Figure 1) revealed prominent dilatation of the right and left intrahepatic ducts, and common bile duct

due to the main pancreatic duct massive dilatation, accompanied by an irregular filling defect adhering to the wall, suggesting pancreatic stones. The patient was diagnosed with chronic

calcifying pancreatitis with pancreatic stones. Frey's procedure was chosen as primary surgical management.

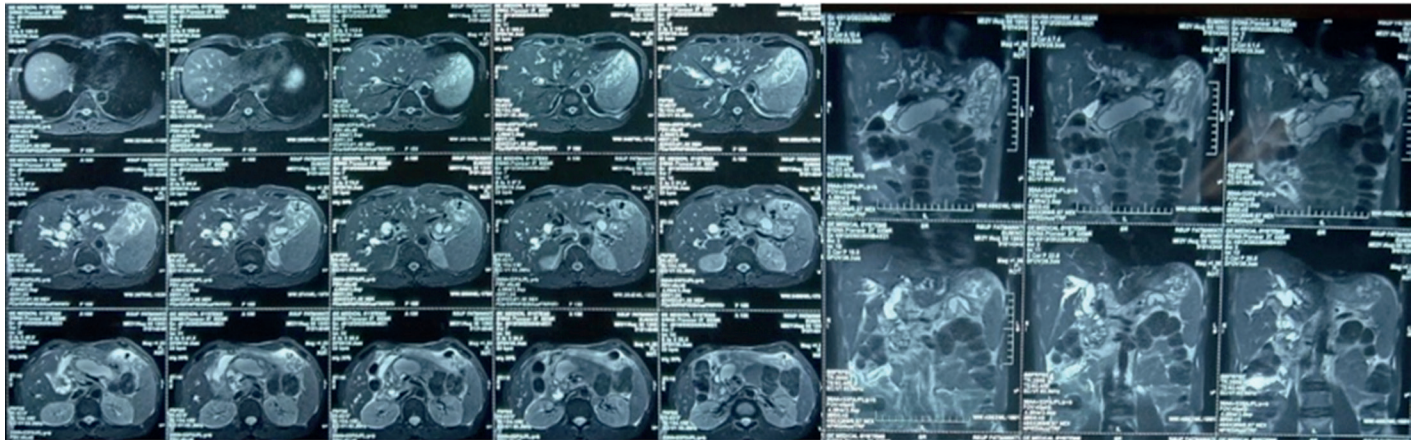


Figure 1. MRI examination result showed prominent dilatation of the right and left intrahepatic ducts, and common bile duct due to massive dilatation of the main pancreatic duct, accompanied by an irregular filling defect that adhesions to the wall

Intraoperatively, we found the omentum attached to the anterior wall and the liver, thus we performed adhesiolysis. The gastrosplenic ligament was opened and exploration of the pancreas to the tail was cystic. Gastroepiploic ligation then. Kocher maneuver was performed and 50 cc of cloudy pancreatic fluid was aspirated. This sample was sent for cytological examination and culture. Afterward, the pancreas was opened and pancreatic stones were found. A cholangioscope procedure was performed towards the head of the pancreas. During evaluation of the stones, calcified components were observed. The head of the pancreas felt solid, prompting the decision to resect it. The cholangioscope procedure was then continued, as the scope entered the duodenum, we observed smooth bile flow from the common bile duct. Pancreaticojejunostomy Roux en Y anastomosis was performed, with the installation of a drain under the anastomosis site. All intraoperative findings are presented in Figure 2.

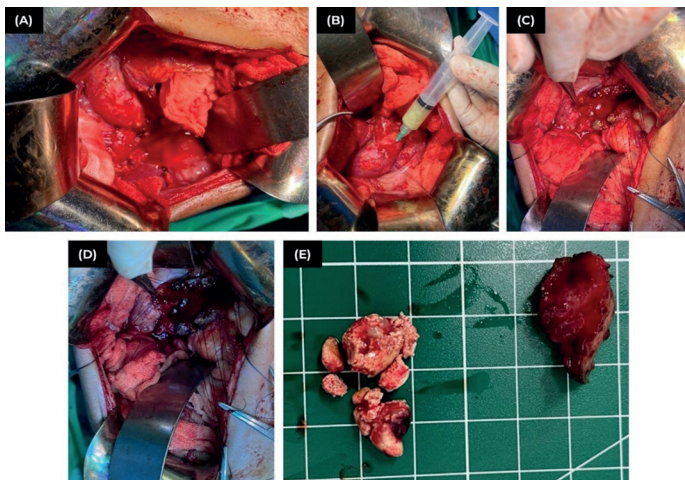


Figure 2. Intraoperative findings, (2A) Dilatation of main pancreatic duct; (2B) Aspiration of pancreatic fluid and pus; (2C) Pancreatic stones was found; (2D) Head of the pancreas was resected and pancreatic stone was removed; (2E) Specimen of pancreatic stones and the size of resected pancreatic head

The patient was discharged from the hospital three days later without any complications reported. All symptoms and laboratory findings were within normal range.

DISCUSSION

The management of chronic pancreatitis (CP) includes analgesics, antioxidants, enzyme supplementation, and the removal of causative factors. Patients who have experienced unsuccessful non-surgical treatment and have local complications may require endotherapy or surgery. Sphincterotomy, stricture dilatation, extracorporeal shock wave lithotripsy (ESWL), and stent implantation are a variety of endotherapy alternatives. Meanwhile, surgery may involve drainage, resection, or drainage mixed with resection (7,8).

The goals of chronic pancreatitis management are pain relief, control of pancreatitis-associated complications, preserving exocrine and endocrine functions as much as possible, social and occupational rehabilitation, and improvement of quality of life. For CP, more than ten operations have been documented. Unfortunately, this extensive list underscores the absence of an excellent surgical treatment for this problem (9).

The management of chronic calcifying pancreatitis, pain, or other CP complications cannot be handled most effectively by a single procedure. The procedure performed must be tailored to the patient's needs (10). Surgical intervention is widely acknowledged as the most effective therapy for managing pain and complications in chronic pancreatitis.

The Frey procedure is known to be superior to both the Partington–Rochelle technique, which was popular in the second half of the last century, and pancreaticoduodenectomy, which has been popular since 1950 (11). Patients with a large pancreatic head and chronic pancreatitis were the intended target group. The notion was that the modified Puestow may not effectively decompress the major pancreatic duct in treating the larger complicated head,

which is full of fibrosis and blocked ducts. The crucial triangle in chronic pancreatitis lies between the distal common bile duct, the duct of Wirsung, and the superior mesenteric portal vein. This triangle should be the target for local resection of the pancreatic head in Frey's procedure (9).

The indication of Frey's procedure consisted of a confirmed diagnosis of chronic pancreatitis, dilatation of Wirsung's duct to a diameter >6 mm, and the absence of obstructive chronic pancreatitis caused by fibrotic stenosis at the pancreatic body or tail. It also became a preoperative selection criterion (12).

Although Frey's technique reduces pain, it also has a big consequence on the pancreas' endocrine and exocrine functions. It is occurred because Frey's procedure involves coring pancreatic parenchymal in already compromised pancreatic tissue. However, many other studies have shown that parenchymal dysfunction improves following Frey's procedure (10). Duct decompression helps protect pancreatic glandular function from deterioration (7,8). Even though overall exocrine and endocrine insufficiency worsened during the follow-up period, greater pain management likely resulted in an improvement in overall quality of life (13).

In a retrospective study by Gestic et al. involving 73 patients with CP, all patients complained of abdominal pain, 46.6% of them experienced it daily and 98.6% of them suffered it moderately or severely. After surgery, 64 patients (91.4%) reported complete pain relief throughout the postoperative follow-up (11). In a prospective study by Fanconi et al., 40 patients with chronic pancreatitis underwent Frey's procedure. In 38 cases (95%), preoperative pain was present. At 1, 2, 3, and 5 years after surgery, the proportion of patients who reported no postoperative pain was 94.7%, 93.7%, 87.5%, and 90%, respectively (12).

Hemorrhage and pancreatic fistula are frequent complications. Pancreatic fistulae rates ranged from 0 to 12%. The median body mass index (BMI) before surgery was 19.1 kg/m² and postoperative BMI was 22.4 kg/m² ($p < 0.001$). The improved weight body means an improved quality of life. Weight loss resulting from the exocrine insufficiency persisted and worsened in some individuals, compromising their quality of life (11). In fact, weight loss was significant in patients with decreased parenchymal dysfunction (12).

The effectiveness of Frey's procedure against preoperative locoregional complications was investigated along with the short and long-term outcomes of the procedure in comparison with pylorus-preserving pancreaticoduodenectomy (PPPD). Seven years after surgery, Frey's procedure was superior rather than PPPD in aspects of physical status ($p < 0.05$) (13). A small number of Frey's subjects experienced postoperative diabetes (12). Same as a subject who received a pancreaticoduodenectomy procedure (13).

After Frey's procedure, there was no recorded mortality, and the surgical morbidity rate was 28.7%. The other study stated the morbidity rate was ranging from 7.5% to 39% (11). Moreover, there were no reoperations or surgery-related mortality in a study

by Falconi et al. (12). In cases where surgery is required and there are no issues related to neoplasia or distal ductal obstruction, the short-term and long-term outcomes justify Frey's procedure as a suitable treatment approach for those with chronic pancreatitis (12).

Frey's procedure was a safe and effective strategy for the surgical management of those with chronic pancreatitis-related intractable pain. Especially regarding to pain management, conserving pancreatic function, and improving QoL over time (11-15).

The recommended surgical treatment option for CP in many parts of the world is Frey's surgery, which is one of the surgical approaches and is renowned for its quick recovery time and acceptable complications (14,15). The novelty of this case report lies in presenting a case of CP with pancreatic stones in an adult. In Indonesia, the Frey procedure is still rarely performed, with only one reported case in CP involving recurrent upper GI bleeding (16) and one case of CP treated with a modified Puestow procedure (17). Both of these cases involved children, and to date, no cases of adult CP have been reported from Indonesia.

CONCLUSION

When conservative therapy fails to relieve the pain from chronic pancreatitis, surgery should be indicated. Because it is safe and effective, Frey's procedure is recommended as primary intervention for chronic pancreatitis.

Conflict of Interests

The authors declare that there is no conflict of interest in the study.

Financial Disclosure

The authors declare that they have received no financial support for the study.

Ethical Approval

The patient was informed of the study and gave written consent to participate. All personal identifiers were removed from the medical records before they were reviewed.

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