

CASE REPORT

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Successful cruciate incision of the minor papilla in a patient with acute pancreatitis due to pancreas divisum: A case report

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Abstract

Pancreas divisum is a congenital anatomical anomaly characterized by a lack of fusion of the ventral and dorsal parts of the pancreas, which sometimes causes pancreatitis. Most cases of pancreas divisum are difficult to treat, and no established guidelines are currently available. Here we describe the case of patient with acute recurrent pancreatitis caused by pancreas divisum who was successfully treated with cruciate sphincterotomy of the minor papilla. A 70-year-old female was admitted to our hospital due to an emergency of acute abdominal pain, which was subsequently diagnosed as acute pancreatitis caused by pancreas divisum. The patient, recalcitrant to conservative endoscopic management of minor papilla, underwent the cruciate incision of the minor papilla, which allowed drainage of the pancreatic duct. Following this intervention, the patient's clinical condition and serum amylase level promptly improved. No recurrence was observed over a follow-up period of 48 months. Cruciate incision of the minor papilla is an effective and safe technique for minimally invasive treatment of pancreas divisum.

Keywords: Pancreas divisum, minor papilla, sphincterotomy, cruciate incision, pancreatitis, case report

Introduction

Pancreas divisum is a congenital anatomical anomaly characterized by the lack of fusion of the ventral and dorsal parts of the pancreas [1]. Owing to this anatomical variation, pancreatic juice is mainly drained through the accessory papilla. Most patients with pancreas divisum are asymptomatic; however, 5% of these may present with recurrent acute pancreatitis, chronic pancreatitis, or chronic abdominal pain, which are typically difficult to treat [1-3]. Although endoscopic therapy is commonly used for managing pancreas divisum, the treatment outcome remains controversial. We successfully treated a patient with acute recurrent pancreatitis caused by pancreas divisum with cruciate incision of the minor papilla.

Case report

A 70-year-old female without a history of alcohol abuse was admitted to our hospital for an emergency of acute abdominal pain. She had a history of occasional epigastric pain and vomiting

for the past 5 years without any specific diagnosis. On admission, she exhibited severe tenderness in the upper abdomen. Her white blood cell count was 12,940/L and serum amylase level was 2,780 IU/L (normal range, 39–115 IU/L). C-reactive protein (CRP) level was elevated 15.65 mg/dl (normal range, <0.30 mg/dl). Abdominal ultrasonography showed an edematous pancreas head, though it was poor study because of a lot of gas in the bowel. Abdominal CT revealed an edematous pancreas, peripancreatic fat stranding, and pararenal fluid accumulation. Acute pancreatitis was diagnosed, but the etiology was not clarified. Her symptoms were gradually diminished by the conservative treatment, but she started complaining of epigastric pain and nausea again, and serum amylase level re-elevated right after the oral intake began on day 6. For determination of the etiology, magnetic resonance cholangiopancreatography (MRCP) was performed on day 9, which revealed a dilated accessory pancreatic duct crossing the common bile duct and directly extending into the main pancreatic duct (Figure 1). The ventral duct was undetectable. A diagnosis of pancreas divisum was suspected and we decided to perform endoscopic retrograde cholangiopancreatography (ERCP) for the diagnosis and the treatment decision-making. On day 12, an attempt to cannulate the minor papilla failed because of duodenal compression caused by the enlarged pancreatic head and swollen parapancreatic duodenal mucosa. However, the diagnosis and

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treatment of the minor papilla was considered essential because of the patient's history of recurrent epigastric pain and acute pancreatitis. Also she still was not able to take any food, even low- fat diet, except for just a small amount of elemental diet, because initiating a solid diet induced epigastric pain and nausea, and in addition, abdominal CT on day 20 revealed circumscribed fluid collection which seemed to be forming a pseudo-cyst . The conservative treatment seemed insufficient to remove her symptoms. On failure of the second cannulation attempt 2 weeks later, minor papilla sphincterotomy was performed using a needle knife. Finally, successful cannulation of the minor papilla was achieved 1 week after papillotomy. Pancreatography of the minor papilla revealed an accessory pancreatic duct, which was not communicating with the ventral duct and was directly extending into the main pancreatic duct (Figure 2). With a diagnosis of pancreas divisum, papillotomy of the minor papilla was performed using a standard papillotomy knife (CleverCut 3VTM Olympus), and a 5-Fr endoscopic pancreatic stent (EPS; Geenen Pancreatic Stent Sets) was placed across the minor papilla to prevent restenosis after papillotomy on day 37 after admission. The clinical course of the patient was uneventful. On day 75, we replaced the 5-Fr EPS with a 7-Fr EPS (Advanix Pancreatic Stent-Straight) to enlarge the orifice and allow normal pancreatic enzyme flow. Subsequently, the patient complained of abdominal pain, and serum amylase and CRP levels were again elevated. With a diagnosis of recurrent acute pancreatitis, ERCP was repeated. However, this time, we made cruciate incision of the minor papilla for the drainage of the pancreatic duct (Figure 3 A, B). It was performed over the previously placed EPS using a needle knife by cutting along the stent at approximately 1 mm away from the orifice in 3, 6, 9, and 12 o'clock positions. After the incision, a 5-Fr endoscopic nasopancreatic drain was inserted into the dorsal duct and removed the next day. No adverse events were observed. After the intervention, the patient did not suffer from any kind of abdominal symptoms over a follow-up period of 48 months. Follow-up CT and magnetic resonance imaging revealed that the pancreatic pseudocyst gradually diminished in size and disappeared within 2 years, and no further deterioration was observed. Adequate follow-up is crucial owing to the possibility of relapse.



Figure 2. Pancreatography from minor pancreatic duct, not communicating with ventral duct, and directly extended into the main pancreatic duct. The diagnosis was pancreas divisum

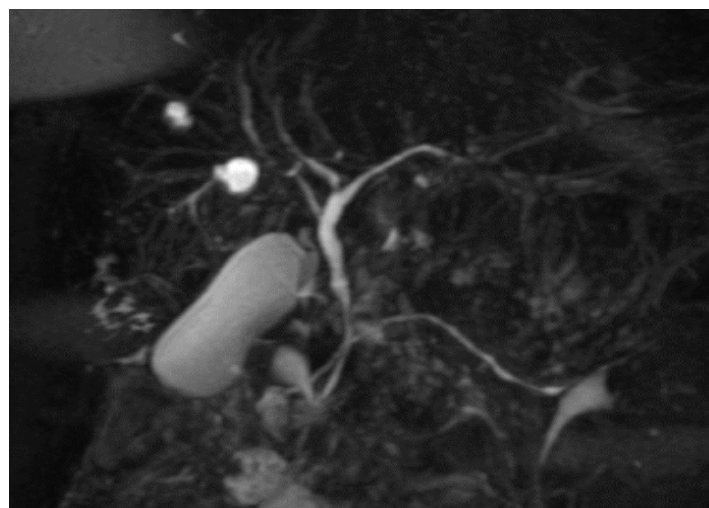
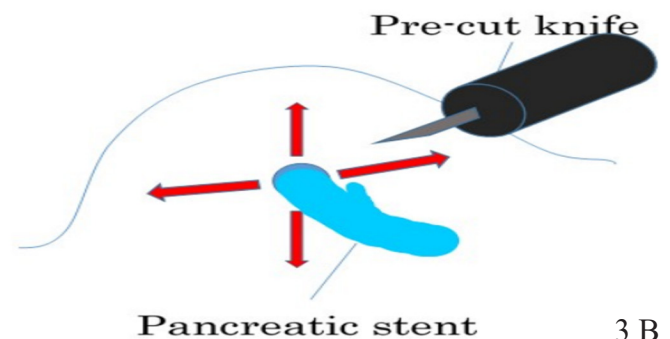
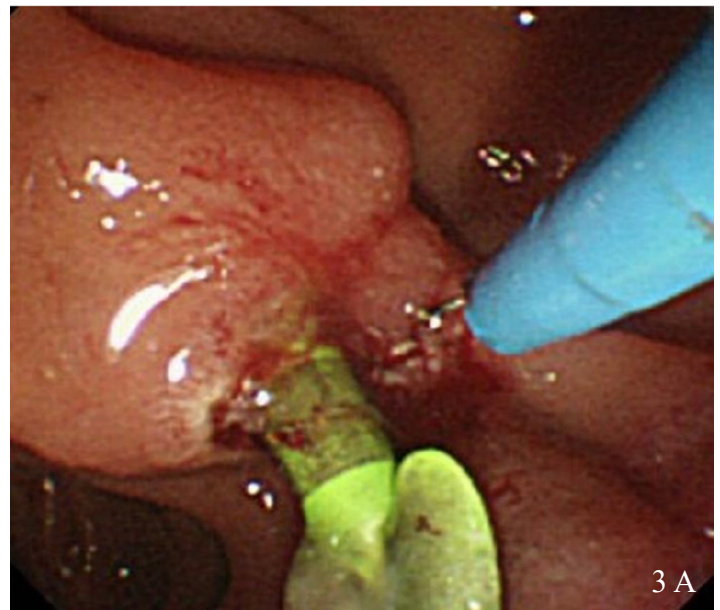


Figure 1 Magnetic resonance cholangiopancreatography(MRCP) showing the presence of an accessory pancreatic duct directly extended into the main pancreatic duct and crossing the common bile duct. The ventral duct is not detectable

Figure 3. Cruciate incision of the minor papilla. A: Endoscopic view; B: Simplified illustration. It is performed with a standard needle knife over a previously placed minor papilla/dorsal pancreatic duct stent, cutting along the stent about 1 mm away from the orifice in 3, 6, 9 and 12 o'clock position

Discussion

Pancreas divisum is a congenital variant of pancreatic ductal anatomy, with an incidence of approximately 6.0% in Europe and 1.5% in Asia; this condition occurs because of failure of the fusion of the embryological ventral and dorsal buds[1-3]. Because of this anatomical variation, the pancreatic juice is mainly drained through the accessory papilla. The treatment of symptomatic cases of pancreas divisum varies and has not been well established[2-4]. When medical therapy fails, endoscopic approaches are attempted to decompress the dorsal duct using stent insertion, minor papilla dilatation, or papillotomy, particularly in patients with acute recurrent pancreatitis[5-8]. These procedures enlarge the opening of the accessory duct and allow a normal flow of pancreatic enzymes. If needed, open surgical procedures must be performed. The placement of a pancreatic stent is desirable after minor papillotomy to maintain the patency of the pancreatic duct and prevent post-ERCP pancreatitis [6-8]. However, prolonged stent therapy for avoiding restenosis is not generally recommended because of the associated risks of ductal injury[1,6,7]. Although endoscopic intervention of the minor papilla is challenging and the recurrent pancreatitis often requires sequential ERCPs, it should be a reasonable first choice because it is much less invasive than surgery. Our patient not only experienced recurrent acute pancreatitis but also had a history of chronic abdominal pain. It was resistant to the conservative treatment, and, in addition, standard endoscopic sphincterotomy was not sufficient to decompress the pancreatic duct. Finally we cruciately performed sphincterotomy for adequate opening of the minor papilla. This intervention resolved both the conditions of recurrent acute pancreatitis and chronic abdominal pain, and after that the patient did not suffer from any abdominal symptoms over a follow-up period of 48 months. With adequate drainage of the pancreatic duct, better clinical outcomes can be achieved using this method. We propose a new method of “the cruciate incision of minor papilla”, when re-intervention is required after a standard sphincterotomy. It also precludes the need for exchanging EPS and avoids the associated adverse events. Restenosis or other adverse events, such as perforation, bleeding, or post-ERCP pancreatitis, can be identified using an endoscopic method of minor papilla, and long-term effectiveness of this endotherapy still remains unclear. The long term outcomes of patients with pancreas divisum who have undergone endotherapy have not been studied in detail [10]. Lehman GA estimated a restenosis rate of 10%–20% after any minor papilla treatment [1]. In a study by Saltsman JR, 73% of patients with pancreas divisum demonstrated short-term improvement after minor papillotomy, whereas only 43%

demonstrated long-term benefits [3]. Short-term observations are insufficient to evaluate the effects of minor papilla therapy. To draw definitive conclusions, several years or life-long follow-up along with a larger sample size may be required.

Conclusion

Cruciate incision of the minor papilla is feasible for the treatment of pancreas divisum, when conventional endoscopic treatment does not resolve the symptom enough, and it is also proposed to have long-term benefits.

Competing interests

The authors declare that they have no competing interest.

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