

## Pancreas Divisum Pancreatitis: Surgical Sphincteroplasty, a Case Report

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### Abstract

**Introduction:** Pancreas divisum is the most common anatomical variation of pancreatic ductal system affecting 5 - 10% of population. Therapy includes different endoscopic and surgical procedures. Some patients with pancreas divisum (PD) develop symptoms of recurrent pancreatitis. This is probably caused by insufficient drainage of the pancreatic duct. Magnetic resonance cholangiopancreatography (MRCP) is a non-invasive test reported to be highly accurate in diagnosing PD. Endoscopic minor papilla sphincterotomy is most effective in the treatment of patients with PD and pancreatic stones.

**Case Report:** We report a case of 17-year-old boy with epigastric pain was admitted to our emergency department who has suffered from several abdominal pain attacks with alimentary intolerance in the last year. The abdominal CT and magnetic resonance cholangiopancreatography revealed a stone in the wirsung duct, with impaction of the stone being the most likely cause of the acute episode. Therefore, endoscopic sphincterotomy of the major papilla was done and no minor papilla was found, neither the endoscopic opacification of the wirsung, suggesting a pancreas divisum. Another attempt of ERCP with Ecoendoscopy was done for stone removal and minor papilla sphincterotomy, but failed. The patient has another episode of pancreatitis with an MRCP revealing a dilated wirsung duct of 10 mm. Two months later surgical sphincteroplasty was done with an excellent clinical result, the patient's pain resolved, without new episodes of pancreatitis with 3 years of follow up.

**Keywords:** *Pancreas Divisum; Surgical Sphincteroplasty; Pancreatitis*

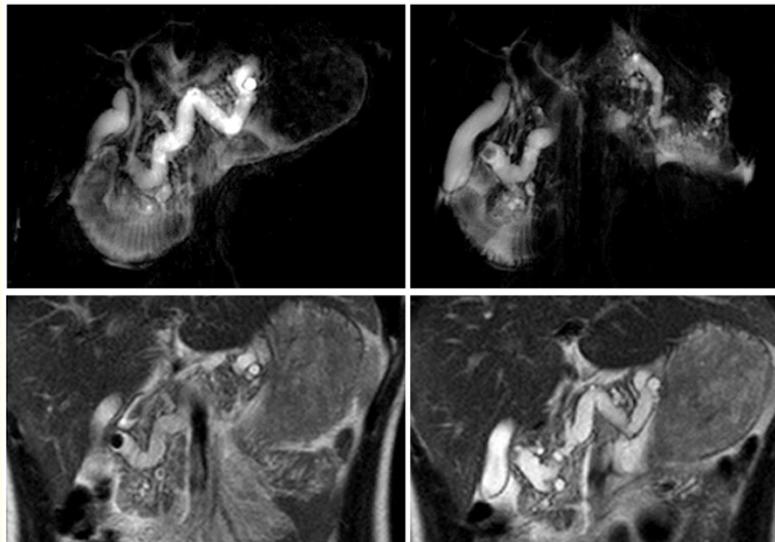
### Introduction

Pancreas divisum is the most common anatomical variation of pancreatic ductal system affecting 5 - 10% of population [1]. Therapy includes different endoscopic and surgical procedures. Some patients with pancreas divisum (PD) develop symptoms of recurrent pancreatitis. This is probably caused by insufficient drainage of the pancreatic duct. Due to the malfusion of pancreas buds during the gestational age three different variations can be happened. Complete PD is the most common type of PD with 71%, incomplete PD with 23% is the second variation and the last type is dorsal duct PD with the rate of 6% [2].

### Case Report

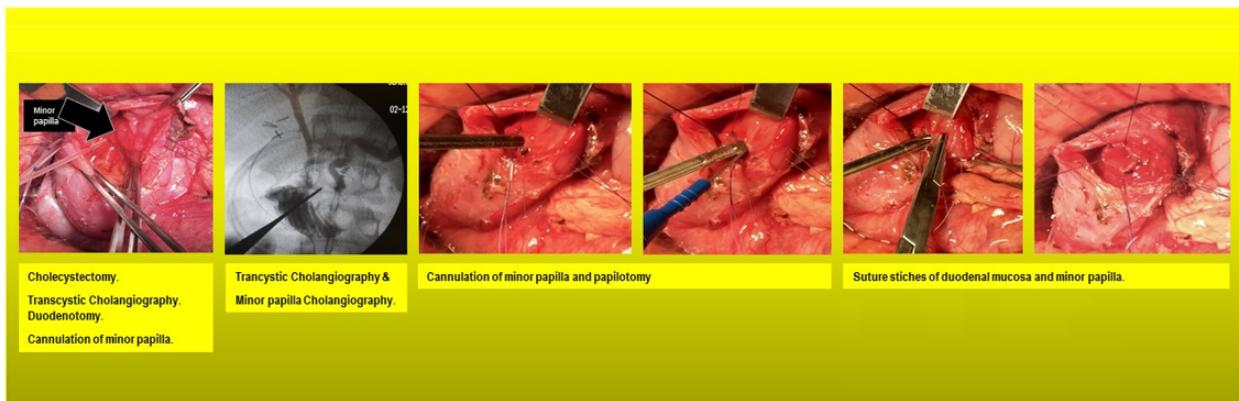
A 17-year-old boy with epigastric pain was admitted to our emergency department who has suffered from several abdominal pain attacks with alimentary intolerance in the last year. The abdominal CT and magnetic resonance cholangiopancreatography revealed a stone in the wirsung duct, with impaction of the stone being the most likely cause of the acute episode (Figure 1). Therefore, endoscopic sphincterotomy of the major papilla was done and no minor papilla was found, neither the endoscopic opacification of the wirsung, suggesting a pancreas divisum. Another attempt of ERCP with Ecoendoscopy was done for stone removal and minor papilla sphincterotomy but failed. The patient has another episode of pancreatitis with an MRCP revealing a dilated wirsung duct of 10 mm.

He underwent surgical exploration, cholecystectomy and an intraoperative cholangiography that was normal. We perform a duodenotomy and search for minor papilla, while major papilla was cannulated transcistically. We found a punctiform minor papilla in the first



**Figure 1:** Preoperative cholangioresonam with dilated wirsung duct.

segment of the duodenal mucosa and perform a simultaneous transcystic and trans minor papilla cholangiopancreatography (Figure 2). No Stone was found in the wirsung duct. Patient underwent a minor papilla sphincterotomy and fixation with stiches on duodenal wall and duodenotomy closure with an intraabdominal drain placed subhepatic. Post-operative period was uneventful. Patient was started to oral feeds on day 3. At present time we have 3 years of follow up with no symptoms or new pancreatitis episodes with normal exocrine pancreatic function on images and laboratory tests.



**Figure 2:** Surgery: Cholecystectomy and sphincteroplasty of papilla minor.

### Discussion

Pancreas divisum develops in the 7<sup>th</sup> - 8<sup>th</sup> week of intrauterine life. In addition to the complete separation variant, there are other variants in which a minor link is established between the two pancreas channels, so that usually the pancreatic secretion is drained through the minor papilla, although the opposite is also possible. This results from the lack of regression of the Santorini duct and its lack of fusion with the Wirsung duct.

Pancreas divisum may not lead to any clinical symptoms, so it is then diagnosed during an unrelated investigation. Alternately, patients can present with acute pancreatitis syndromes, varying in severity, starting with mild forms corresponding to the edematous pathological aspect and reaching severe forms that correspond to the necrotico-hemorrhagic type. Pancreatitis usually results as a consequence of the disproportion between the size of the papillary opening and the secretory debit of the corresponding pancreatic region. Alternately, patients may present recurrent episodes of acute pancreatitis that may progressively lead to chronic pancreatitis.

Hafezi M., *et al.* performed a systematic review to summarize actual evidence on endoscopic and surgical treatment of PD. This systematic review and quantitative analysis represents the most comprehensive aggregation of available evidence within this context. Symptom improvement was significantly more often achieved in surgically treated patients (72% surgical group vs. 62.3% endoscopic group). Furthermore, the complication rate of endoscopic procedures was significantly higher than that associated with surgery (31.3% vs. 23.8%, respectively). Lastly, the re-intervention rate was significantly higher in endoscopically treated patients (28.3% vs. 14.4%). Data on duration of hospital stay and time to first oral intake was rarely available in existing studies, which does not allow drawing any firm conclusions. In summary, comparing surgical and endoscopic therapy of PD, there were a higher treatment success, lower morbidity and lower re-intervention rate found in surgically treated patients [3].

Decision for surgery or endotherapy should be made individually. Many centers prefer endoscopic intervention as the first choice because it is less invasive. ERCP with subsequent endoscopic minor papilla sphincterotomy or endoscopic dilation and stenting are standardized approaches. The relative success rate in terms of symptom relief is reported to be up to 90% [4,5]. However, many patients require multiple ERCP procedures to achieve this goal [6].

The complication rates and subsequent re-intervention after endoscopic treatment are relatively high. It has to be considered, that additional interventions after unsuccessful treatment are not only burdening the patient but also increase the risk of further morbidity [7]. In comparison, surgery for symptomatic PD shows a lower complication rate. The surgical resection of the minor papilla and reimplantation creates a greater orifice than simple endoscopic sphincterotomy and stenting. This may be the reason why patients who do not benefit from an initial endoscopic approach can successfully be treated by surgical sphincteroplasty. In addition, reinsertions of the papilla should be performed as a first and limited surgical intervention in patients with a soft pancreas when symptoms persist despite adequate endoscopic treatment. Therefore an endoscopic intervention can be considered as a primary therapeutic approach, but an adequate surgical procedure has to be taken into account for the patients who fail to improve, as described previously by Schneider, *et al* [8].

### Conclusion

We investigated in depth an unusual case of pancreatitis in a boy with pancreas divisum in whom the endoscopic approach failed. Surgical treatment of PD may be superior to endoscopic treatment in terms of treatment success, complications and re-intervention rates. The surgical resection of the minor papilla and reimplantation creates a greater orifice than simple endoscopic sphincterotomy and stenting.

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