The Epidemiology And Clinical Presentation of Pancreatic Divisum: A Case Series of 57 Case Reports

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Introduction

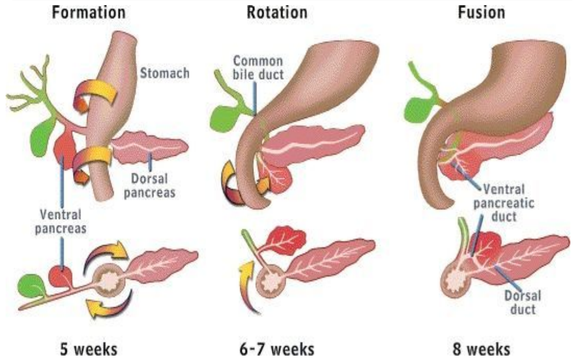
A failure of ventral and dorsal bud fusion causes pancreas divisum. Around 5 weeks of pregnancy, the pancreas emerges as two outpouches, ventral and dorsal pancreas, of the ectodermal lining of the duodenum, immediately distal to the developing stomach. To reach below and beyond the head of the dorsal pancreas, the ventral bud rotates behind the duodenum. The ventral bud gives rise to the rest of the pancreas' head and uncinate process, whereas the dorsal bud gives rise to the rest of the pancreas' head, as well as the whole body and tail. The ventral (Wirsung) duct drains just the ventral pancreatic anlage, whereas the dorsal (Santorini) duct empties the bulk of the gland into minor papilla. The pancreatic divisum is divided into three kinds. The dorsal and ventral buds of the pancreas do not fuse in Type I also known as classic pancreatic divisum. Because the ventral duct is absent in Type II pancreatic divisum, the minor papilla drains the whole pancreases and the major papilla drains a portion of the common bile duct. Finally, type III has a modest residual connection between the dorsal and ventral ducts. The objective of this study is to understand the epidemiological and clinical picture of pancreatic divisum that can help clinicians better diagnose it while also having better understanding of pathologies and treatments commonly associated with such a congenital malformation.

Methods

A systematic search of pancreatic divisum case reports utilizing Google, and scientific databases such as Google Scholar, Medscape, Scopes, and Cochrane and PubMed was done to included case reports and case series that reported different complication and incidental findings of pancreatic divisum. We found 73 studies that met our criteria. After excluding all duplicate studies we finally included 16 published articles in our study which consist of 57 case reports of pancreatic divisum.

Table 1

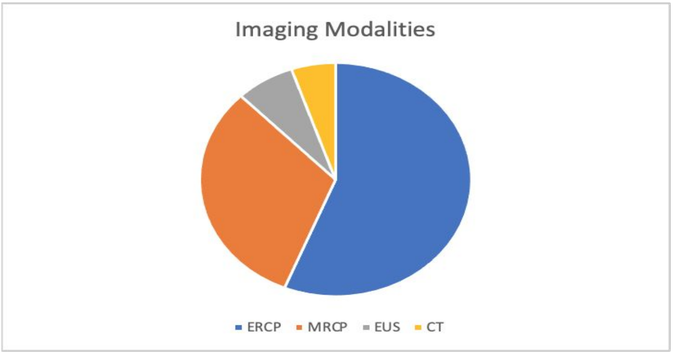
Characteristic	Study finding
Average age	44.49 ± 22.84
Male	40.4%
Female	59.6%
tobacco use disorder	7%
Diabetes	7%
Alcohol use disorder	7%
Respiratory symptoms	7%

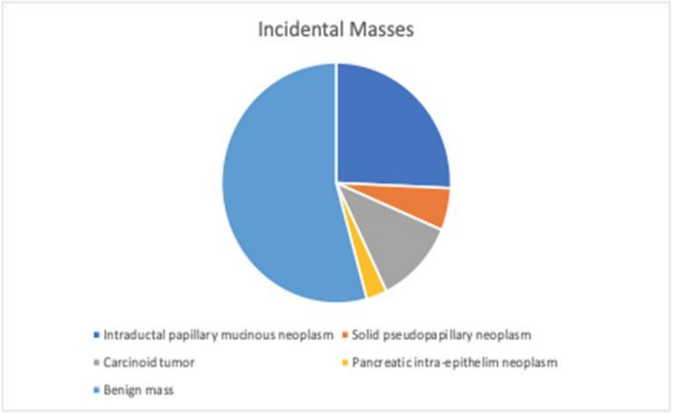


Findings/Complications	Study findings
Abdominal pain	87.72%
Epigastric pain	70%
Pain radiating to the back	21.6%
Nausea and vomiting	30%
Pancreatitis	81%
Recurrent pancreatitis	63.2%
Incidental mass	66.7%
Cholelithiasis	22.8%
Ductal dilation	70.6%

Table 2

Results





Enzyme	Average value	Normal value
Amylase	1068.72 U/L	30-110 U/L
Lipase	2833.47 U/L	25-151 U/L
Alanine aminotransferase	77.22 U/L	8- 33 U/L
Aspartate aminotransferase	96.75 U/L	8- 48 U/L
Alkaline phosphatase	243 IU/L	44-147 IU/L
Total bilirubin	3.703 mg/dL	1.2 mg/dL

Table 3

Discussion

- The prevalence of PD is 4-10 %
- Most common presentation is asymptomatic
- PD can cause acute pancreatitis and chronic pancreatitis. The high flow pancreatic secretions in PD are flowing through the small caliber of minor papilla as compared to the large caliber hepatopancreatic ampulla in a normal variant. The increased flow rate across the minor papilla can lead to dilation, obstruction, and increased ductal pressure causing pancreatitis and other hepatopancreatic problems
- Most common imaging modality used to detect PD is MRCP. In the past, ERCP used to be the diagnostic modality as it can be both diagnostic and therapeutic in the identification of PD, but due to increased risk of intra-procedural bleeding and post-ERCP pancreatitis, other imaging modalities are preferred now.
- 70.6% of diagnosed PD patients had extrahepatic duct dilation (dorsal pancreatic, ventral pancreatic, and common bile ducts) and revealed dilation of the ventral pancreatic duct and common bile ducts at a frequency greater than that of the dorsal pancreatic duct.
- The presence of cysts within the walls of different ducts due to increased inflammation.
- Treatment of pancreatic divisum is only recommended when it becomes symptomatic, the primary goal is to clear the blockage at the level of the minor papilla, Endoscopy (ERCP) and surgery are two treatment options

Conclusion

The goal of this paper was to provide a comprehensive picture of clinical, epidemiological, methods of diagnosis and treatment of PD. In most cases, pancreatic divisum remains asymptomatic throughout the lifetime of an individual, but there is also a considerably increased prevalence of pancreaticobiliary abnormalities in these patients. The pathophysiology behind increased incidence may involve the inability of the small orifice of the minor papilla to maintain the flow rate of increased pancreatic secretions which eventually causes backup of these secretions - leading to recurrent pancreatitis.

Reference for image

https://www.ncbi.nlm.nih.gov/books/NBK54135/figure/fig5/?report=objectonly