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Case Report

ANOMALOUS UNFUSED PANCREATIC DUCT PATTERN

N.Vinay Kumar *[1], T. S. Guga Priya [2], S. D. Nalina Kumari [3].

*[1] Assistant professor, [2] Associate professor, [3] Professor and Head.
Department of Anatomy, Chennai Medical College Hospital and Research Centre, Irungalur, Trichy – 621105, Tamilnadu, India.

ABSTRACT

Pancreas divisum is a congenital anomaly of the duct system of pancreas that occurs due to the failure of fusion of dorsal and ventral pancreatic ducts. This anomaly has been hypothesized as the predisposing factor for chronic, recurrent and idiopathic pancreatitis. During routine dissection, we observed 2 cases of complete type of pancreas divisum. In the observed cases, the patent dorsal pancreatic ducts terminated onto minor duodenal papilla and measured 15.6 cm and 17.3 cm respectively. The patent ventral pancreatic ducts measured 3.2 cm and 2.7 cm respectively and terminated onto the major duodenal papilla after joining with common bile duct. The major papillae were antero-superiorly related to minor papillae and the distance between them measured 4.3cm and 1.4 cm respectively. Awareness and timely detection of this commonly occurring pancreatic anatomical anomaly helps the clinicians to prevent or manage potential recurrent pancreatitis.

KEYWORDS: Pancreas Divisum; Pancreatitis; Pancreatic duct.

Address for Correspondence: Dr. N. Vinay Kumar, Assistant professor, Department of Anatomy, Chennai Medical College Hospital and Research Centre, Irungalur, Trichy – 621105, Tamilnadu, India. **E-Mail:** vinaydr1981@gmail.com

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INTRODUCTION

Pancreas divisum, first described by Joseph Hyrtl [1] is the most common congenital anomaly of pancreatic ductal system occurring in approximately 5 to 14 % of population in autopsy series and 1.3 to 10% of patients undergoing EndoscopicRetrograde Cholangio pancreato graphy(ERCP)/Magnetic Resonance Cholangio pancreatography (MRCP) [2, 3].

This anomaly results when the ventral and dorsal pancreatic ducts fail to fuse during the seventh week of gestation resulting in two independent duct systems. Pancreas divisum is of two types [4, 5].

1. Complete Pancreas divisum where a completely separate pancreatic duct system is seen in a grossly undivided gland.

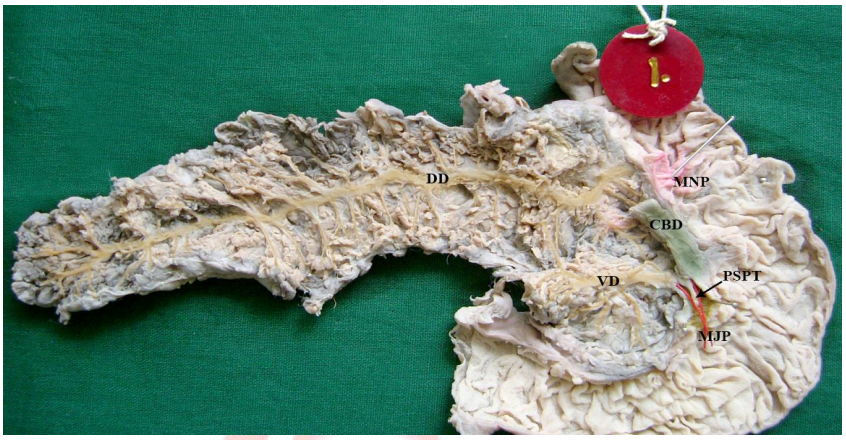
2. Incomplete Pancreas divisum where an inadequate communication exists between ventral and dorsal pancreatic ducts.

The dorsal pancreatic duct (DD) drains the major portion of the pancreas and opens on the minor papilla (MNP), while the ventral duct (VD) drains only the ventral pancreatic bud and opens on the major papilla (MJP).

Studies have hypothesized that Pancreas divisum cause chronic, recurrent and idiopathic pancreatitis in patients with nonalcoholic or non biliary lithiasis due to inadequate drainage of secretions from the body, tail and part of the pancreatic head through the minscule minor papilla [5].

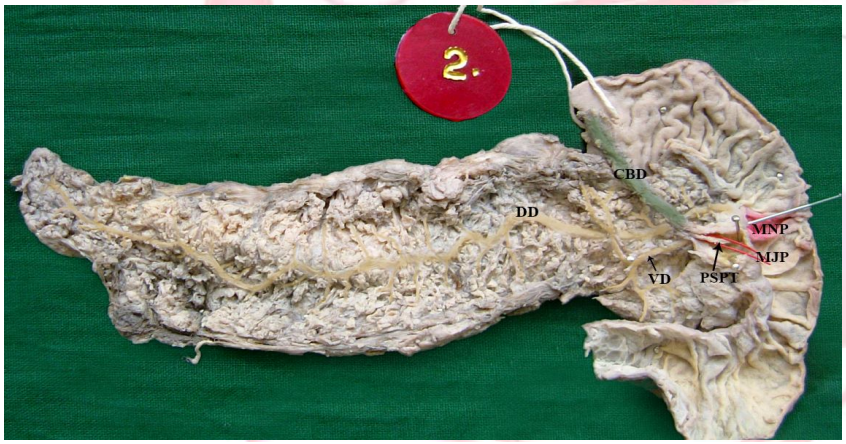
OBSERVATIONS

Fig. 1: Complete Pancreas divisum with partial septum in hepatopancreatic ampulla.



DD- Dorsal Pancreatic Duct,
VD- Ventral Pancreatic Duct,
CBD- Common Bile Duct,
MNP- Minor Duodenal Papilla,
MJP- Major Duodenal Papilla,
PSPT- Partial Septum.

Fig. 2: Complete Pancreas divisum with partial septum in hepatopancreatic ampulla.



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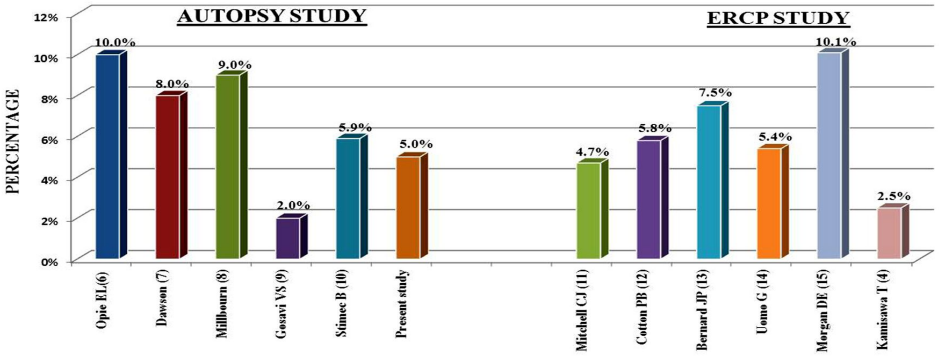

Graph 1: Incidence of Pancreas divisum in autopsy and ERCP Studies.

We observed two cases of Pancreas divisum over a period of 4 years among 40 cadavers. We visualized the duct pattern by routine dissection and tested the duct patency by injecting 1% aqueous solution of eosin through the ducts.

Case: 1

During routine dissection of a 43 year old male cadaver the pancreas was found to have retained the embryonic pattern – Complete Pancreas divisum. Dorsal pancreatic duct was formed in the tail by junction of several interlobular ducts and it traversed the body and neck midway between the superior and inferior borders of the pancreas. Then it coursed transversely to the right in the upper part of the head towards minor papilla anterior to common bile duct. The interlobular ducts from most of upper third of head joined the dorsal duct only. The duct measured 15.6 cm and terminated on to minor duodenal papilla which was 4.3cm antero - superior to major papilla.

In the left end of the lower part of the head the Ventral pancreatic duct was formed by union of superior tributary from deeper portion of the upper part and an inferior tributary from the

lower part and uncinate process. It coursed transversely to the right towards the major papilla and terminated by joining with common bile duct (CBD) forming a hepatopancreatic ampulla with partial septum (PSPT). The length of the hepatopancreatic ampulla measured 10 mm and the ventral duct 3.2 cm. Both ventral and dorsal ducts exhibited positive patency.

Case: 2

In a 35 year old male cadaver, the pancreatic duct system exhibited Complete Pancreas divisum. The dorsal duct measured 17.3 cm, followed similar course and duct pattern as in case 1 and terminated onto minor duodenal papilla which was 1.4 cm antero-superior to major papilla. The pattern of ventral duct was similar to case 1 and it terminated onto major papilla by joining with common bile duct forming a hepatopancreatic ampulla with partial septum. The length of hepatopancreatic ampulla measured 7 mm and the ventral duct 2.7 cm. Both ventral and dorsal ducts exhibited positive patency.

DISCUSSION

The pancreas divisum has been reported in many studies with varied incidence both in autopsy and ERCP series (Graph - 1). In ERCP series, 0.8 to 5.8 % accounts for Complete Pancreas divisum [16]. The present case report of two cases of complete pancreas divisum out of 40 cadavers coincides with the previous reports.

The length of the ducts and the relationship between the papillae described in the present case report has anatomical significance but the patency of the duct and its orifice holds functional importance.

The incidence of Acute Pancreatitis in Pancreas Divisum has been reported in 14 – 58% of cases [2,17]. Studies have hypothesized the following mechanisms for occurrence of pancreatitis in cases of pancreas divisum [18, 19, 20].

1. Uniformly stenotic dorsal ductal orifice

2. Disproportion between the size of the dorsal duct and volume of the secretions

3. Obstruction to the flow of pancreatic secretions through the stenotic minor papilla with an elevated intraductal pressure.

The absence of dorsal ductal orifice stenosis even under magnification in the present report questions the above mentioned hypotheses. Though many recent studies support the association of pancreas divisum with recurrent pancreatitis, evidence of earlier pancreatitis was not seen in the present cases. Further studies may be planned to study the association of pancreatitis occurring in pancreas divisum with the possibility of gene mutations.

CONCLUSION

Congenital abnormalities of Pancreas may be encountered in adulthood or in childhood. They may be significant or asymptomatic. ERCP should be employed to visualize the duct system in all patients with recurrent acute pancreatitis. Failure to recognize this anomaly may result in anatomically inappropriate operations. Awareness and timely detection of this commonly occurring pancreatic anatomical anomaly helps the clinicians to prevent or manage potential recurrent pancreatitis.

Conflicts of Interests: None

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