

## Experimental study on the etiologic effect of pancreas divisum on chronic pancreatitis and the pathogenesis

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### Abstract

**AIM:** To investigate the etiologic association of pancreas divisum (PD) with chronic pancreatitis and to clarify the pathogenesis.

**METHODS:** A PD canine model was established in 32 dogs. The dogs were randomly divided into 4 groups ( $n = 8$ ). Group I: The communicating branch between the dorsal and ventral pancreatic ducts was partly ligated remaining about 1.0 mm diameter. Group II a: The communicating branch was amputated and completely ligated. Group II b: The dorsal duct was amputated and ligated at 2 mm distance to the minor papilla. Group III: A sham operation without any amputation or ligation was performed. before and after operation, the activities of serum phospholipase A2 (PLA2) and amylase (Ams) were assayed and the basal pressures of the ducts were measured when secretin was injected. Pancreatic ductography and the pathologic examination were performed.

**RESULTS:** (1) The activities of serum PLA2 and Ams in Group I, II a and II b were significantly increased 5 d-80 d after operation. (2) At sacrifice, the basal pressures of the ventral duct were significantly increased 30 min-60 min after provocation in Group I, II a and II b, especially in Group II b, the pressures returned to the normal level till 90 min. The pressures of the dorsal duct were significantly increased in Group II b but no difference in Group I and II a. (3) Light microscope observation: The fibrosis of interlobus and periductes, the destruction of acini and infiltration of inflammatory cell in dorsal and ventral pancreas were found in Group II b. But in Group I and II a, these findings were present only in ventral pancreas. (4) Electron microscope observation: In ventral pancreas of Group I and II a and the dorsal and ventral pancreas of Group II b, the rough endoplasmic reticulum of the acinar cells showed granules-scaling, fusion and relation. The zymogen granules decreased and the mitochondria was swollen.

**CONCLUSION:** A definite etiologic relationship was confirmed between PD and chronic pancreatitis. The pathogenesis was due to the functional obstruction of the minor papilla at the peak stage of secretion.

**Key words:** Pancreas divisum/complications; Pancreatitis/etiology; Pancreatitis/physiopathology; Disease models, animal; Chronic diseases

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