PANCREAS DIVISUM

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INTRODUCTION

Pancreas divisum is the most common congenital anomaly of the pancreatic anatomy. It occurs when the ductal systems of the ventral and dorsal pancreatic ducts fail to fuse [1]. As a result of nonunion of the ducts, a major portion of pancreatic exocrine secretions enter the duodenum via the dorsal duct and minor papilla. Obstruction to pancreatic exocrine secretory flow through the minor duct and minor papilla can result in pancreatitis in a small number of patients with pancreas divisum [2]. Incomplete or partial divisum is defined as the communication of the dorsal and ventral ducts via a tiny branch. Most people with anomalous pancreatic ductal systems are asymptomatic; however, a significant number of patients present with recurrent attacks of acute pancreatitis [3]. In patients with pancreas divisum, pancreatic history has demonstrated changes of chronic pancreatitis in the dorsal duct distribution and normal parenchyma in the ventral duct distribution. It is observed in 6% of normal persons at autopsy. No racial predominance exists. The male-to-female ratio is 1:1. Median age at diagnosis is 5-7 years [4]. In 1642, Wirsung demonstrated the main pancreatic duct, and in 1775, Santorini accurately described the ductal anatomy and demonstrated the accessory pancreatic duct [5].

CASE REPORT

A 12 year old boy was admitted to surgical ward with complaints of epigastric pain and vomiting for two days. There was no history of prolonged drug intake or abdominal trauma. He had significant past history of recurrent upper abdominal pain from the age of two years for which he was treated symptomaptically. He had laparotomy four years ago for same complaints. It was negative and appendectomy was done. On physical examination he was pale, pulse rate was 120/ min, temperature 37C, Blood pressure 110/ 70 mm Hg and respiratory rate 22/min. Tenderness was positive in epigastrium with sluggish bowel sounds. Chest was clear and heart sounds were normal.

Abdominal ultrasound revealed multiple small cysts with probe tenderness in pancreatic region. No ascites was seen. CT scan of the abdomen showed grossly dilated pancreatic duct (Fig. 1). Rest of the abdominal study was normal. Patient underwent exploratory laparotomy. Operative cholangiogram showed pancreatic divisum with unfused systems of the ventral and dorsal pancreatic ducts. Pancreatic duct was grossly dilated approaching size of duodenum (Fig. 2). Obstruction to pancreatic flow through the duct and minor papilla resulted in pancreatitis and boy presented with recurrent attacks of acute pancreatitis. Changes of chronic pancreatitis seen in the dorsal duct distribution. Trans duodenal sphinteroplasty with stenting done to drain obstructed pancreatic duct. Patient made uneventful recovery in post operative ward. He was discharged symptom free from the hospital one week later. Stent removed after 1 month. Patient had no episode of pain during the last three months.

DISCUSSION

The presence of clear-cut pancreatitis in association with pancreas divisum makes it easier to determine that the pancreas is the site of origin of the abdominal pain. In

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patients with divisum who do not demonstrate clinical pancreatitis, the existence of accessory papilla stenosis is to be determined. Endoscopic retrograde cholangiopancreatography (ERCP) is the test of choice for making a diagnosis of pancreas divisum [6]. ERCP is expensive and invasive, with a reported complication rate of 5%. Criteria for the diagnosis of pancreas divisum

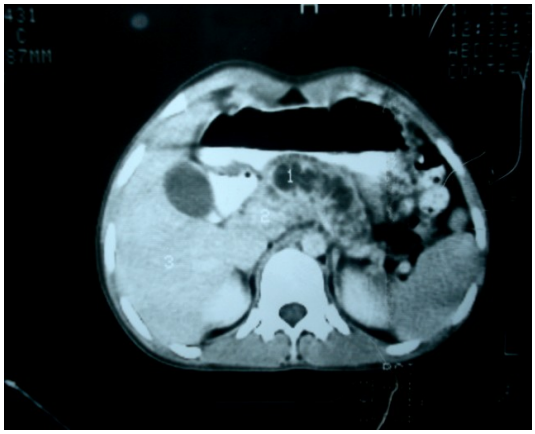

Fig. 1: CT scan representing grossly dilated pancreatic duct.

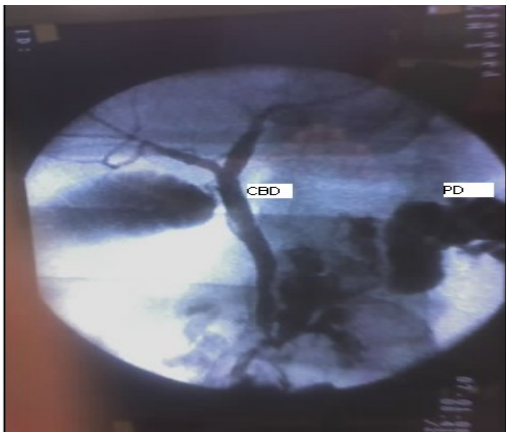

Fig. 2: Operative cholangiogram. Showing grossly diloted Pancreatic duct. PD= Pancreatic duct, CBD= Common bile duct

on ERCP are cannulation of the ampulla of Vater, which allows filling of a short (10-60 mm) and thin (2-mm diameter) main pancreatic duct, located in a posterior position. Cannulation of the accessory papilla (allows filling of a larger duct, 2-4 mm in diameter), which drains almost the entire pancreas from the tail to the anterior part of the head. ERCP is also used for therapeutic intervention in patients with pancreas divisum.

Single or multislice helical computed tomography (CT) occasionally can depict pancreas divisum with 1-3 mm collimation, overlapping reconstructions, and the use of water as a negative contrast agent provide high-quality images amenable to three-dimensional (3D) reformations. While demonstration of ductal anatomy by CT is more difficult than demonstration of gross glandular architecture. CT criterion for the diagnosis of pancreas divisum is visualization of the nonunion of the dorsal and ventral ducts directly joining the common bile duct. Additional evidence is the visualization of a fat-attenuation cleft separating the pancreatic head from the pancreatic body. Zeman [7] definitively identify separate dorsal and ventral ducts in only 5 of 12 patients with known pancreas divisum.

Magnetic resonance cholangiopancreatography (MRCP) is a noninvasive imaging modality that depicts abnormalities of the biliary and the pancreatic ducts and parenchymal structures. MRCP (with or without secretin) will likely replace ERCP for diagnostic purposes in the near future. The use of secretin increases the cost of MRI examination because of the cost of the drug and the additional imaging time. Secretin stimulates the secretion of fluids by the exocrine pancreas, with a consequent increase in the volume of fluid inside the pancreatic ducts. This improves the visualization of pancreatic ductal anatomy on MRCP. Nonunion of ventral and dorsal pancreatic ducts in pancreas divisum can be recognized more readily after secretin-stimulated MRCP. The amount of fluid secreted into the duodenum can also be quantified. Manfredi [8] identified pancreas divisum in 7% of patients (6 of 84) by MRCP before secretin administration and in 14% of patients (12 of

84) following secretin administration. Recent development of half-Fourier pulse sequences and phased-array surface coils enables the acquisition of high-quality images during breath holding, with a high signal-to-noise ratio. Bret [9] identifies pancreas divisum in 6 of 114 MRCP examinations using a body coil and 19 of 154 MRCP examinations using a torso coil.

Secretin-stimulated ultrasound (US) is a noninvasive test that shows great promise [10].The test involves sequential sonographic measurement of the pancreatic duct size following intravenous administration of secretin. A significant limitation of this test is that the pancreas cannot be reliably visualized in all patients because of body habitus, overlapping bowel gas, or pain. Although secretin-stimulated US in pancreas divisum may not demonstrate the anomalous ductal anatomy, it may provide evidence of stenosis in patients with acute recurrent pancreatitis or chronic pancreatitis and predict which patients may respond to surgical or endoscopic therapy.

REFERENCES

1. Mergener K, Kozarek RA. Therapeutic pancreatic endoscopy. Endoscopy 2005; 37: 201-7.
2. Neuhaus H. Therapeutic pancreatic endoscopy. Endoscopy 2004; 36: 8-16.
3. 3.Kamisawa T, Egawa N, Tu Y. Pancreatographic investigation of embryology of complete and incomplete pancreas divisum. Pancreas 2007; 34:96-102.
4. Spicak J, Poulova P, Plucnarova J. Pancreas divisum does not modify the natural course of chronic pancreatitis. J Gastroenterol 2007; 42:135-9.
5. Ertan A. Long-term results after endoscopic pancreatic stent placement without pancreatic papillotomy in acute recurrent pancreatitis due to pancreas divisum. Gastrointest Endosc 2000; 52:9-14.
6. Alazmi WM, Mosler P, Watkins JL. Predicting pancreas divisum by inspection of the minor papilla: a prospective study. J Clin Gastroenterol 2007; 41:422-6.
7. Zeman RK, McVay LV, Silverman PM. Pancreas divisum: thin-section CT. Radiology 1988; 169:395-8.
8. Manfredi R, Costamagna G, Brizi MG. Severe chronic pancreatitis versus suspected pancreatic disease: dynamic MR cholangiopancreatography after secretin stimulation. Radiology 2000; 214:849-55.
9. Bret PM, Reinhold C, Taourel P. Pancreas divisum: evaluation with MR cholangiopancreatography. Radiology 1996; 199:99-103.
10. Warshaw AL, Simeone JF, Schapiro RH, Flavin-Warshaw B. Evaluation and treatment of the dominant dorsal duct syndrome (pancreas divisum redefined). Am J Surg 1990; 159:59-64.
