Pancreas Divisum: Five Years’ Experience in a Teaching Hospital
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Abstract

Aim: To study the frequency and significance of pancreas divisum.

Methods: Retrospective analysis of all pancreatograms carried out between July 1989 and June 1994.

Results: The 809 pancreatograms performed included 207 in patients with pancreatitis (acute 74, chronic 133), 339 with biliary disease, 238 with obscure abdominal pain and 34 with pancreatic malignancy. Of these, 36 patients (3.7%) were diagnosed to have pancreas divisum – 26 had type I variant, one had type II variant and three had type III variant. Accessory papillary cannulation was attempted in 10 patients; 8 were successful, with dorsal ductography confirming pancreas divisum in all of them. Two of these 8 patients had changes of chronic pancreatitis in the dorsal duct. The frequency of pancreas divisum in patients with pancreatitis (19 of 207, 9.2%) was significantly higher than in patients with biliary diseases and those with obscure abdominal pain (11 of 568, 1.9%; p < 0.001).

Conclusions: Pancreas divisum is not an uncommon condition in India and its frequency in patients with idiopathic pancreatitis is higher than that in patients with other abdominal conditions. It should be looked for in any case of idiopathic pancreatitis.


Key words: Pancreatitis - idiopathic, chronic.

Introduction

Pancreas divisum is an anatomical variant of pancreatic ductal configuration in which the dorsal and ventral duct segments do not fuse during organogenesis. The reported prevalence of pancreas divisum in the West has varied from 3-7% in clinical series 1–3 and from 5-10% in autopsy specimens. 4 Epidemiological studies from the West show an increased frequency among patients with idiopathic pancreatitis. 1–5 However, some authors do not consider pancreas divisum as a cause of disease. 6

While an occasional case of pancreas divisum has been reported from India,7 there is no published systematic study on its frequency in this country. The present study was aimed at determining the frequency of pancreas divisum in a large hospital in northern India, and to study its relationship to pancreatitis.

Methods

All endoscopic retrograde cholangiopancreatography (ERCP) films obtained in the department between July 1989 and June 1994 were reviewed and all 809 in whom the pancreatic duct was opacified were studied. Clinical data were obtained from the medical records of the hospital with regard to clinical presentation and relevant laboratory parameters, viz serum amylase, liver function tests, malabsorption tests, ultrasonography (US) and computed tomography (CT).

Patients were classified into the following three groups. i) Pancreatitis: Acute pancreatitis was diagnosed in patients presenting with abdominal pain, elevated serum amylase and US/CT evidence of acute pancreatitis, whereas chronic pancreatitis was diagnosed in the presence of a compatible clinical history, laboratory evidence of malabsorption and/or US or CT evidence of pancreatic atrophy, fibrosis or ductal dilatation, and an ERCP appearance suggestive of chronic pancreatitis ie ductal dilatation, irregularity, stone or stricture. History of alcohol consumption and presence or absence of gallstones were also recorded. ii) Biliary disease: this included patients with gallstones, biliary strictures, carcinoma of the gall bladder and cholangiocarcinoma. iii) Obstructed abdominal pain: this included patients with abdominal pain whose the cause of pain was undiagnosed after extensive laboratory and radiological investigations, including ERCP.

Pancreas divisum was diagnosed by the criteria proposed by Warshaw et al. 8 Classic or type I pancreas divisum was diagnosed when routine ERCP cannulation of the major papilla opacified a foreshortened ventral pancreatic duct (of Wirsung, VPD) less than 6 cm in length, with tapering and fine terminal arborization (Fig 1). A rudimentary or foreshortened VPD due to pancreas divisum was differentiated from a blocked pancreatic duct (eg due to pseudocyst or carcinoma) by the fact that in pancreas divisum the aicinarization pattern surrounded the pancreatic duct on all sides whereas in a blocked duct, the aicinarization pattern stopped short of the site of block. Type II pancreas divisum was diagnosed if the VPD was completely absent (Fig 2), and type III if the
VPD communicated with the dorsal pancreatic duct (DPD) by a tiny, functionally inadequate connection (Fig 3).

Dorsal ductography by cannulation of the accessory papilla was attempted during the latter phase of the study in 10 patients using a metal-tipped ERCP cannula (Wilson-Cook Inc, Winston-Salem, USA). Chronic pancreatitis was attributed to pancreas divisum if the dorsal pancreatic duct showed irregularity of the side branches or the main duct, the VPD being normal. Changes of chronic pancreatitis at ERCP were graded according to the Cambridge classification.9

Statistical analysis was carried out using the \( \chi^2 \) test.

Results

Of the 207 patients diagnosed to have pancreatitis, (acute 74, chronic 133), significant alcohol consumption (80 g/day of absolute alcohol at for least five years) was noted in 56 (27%) patients, gallstones were detected in 19 (9.2%) and the remaining 132 patients were labelled as having pancreatitis of unknown etiology. Nineteen patients (9.2%) with pancreatitis were considered to have pancreas divisum, including 16 (12.1%) of those with unknown etiology. Eleven of these presented as acute pancreatitis and 8 as chronic pancreatitis.

Six of 330 cases (1.8%) with biliary disease had pancreas divisum, as also 5 of 238 (2.1%) with obscure abdominal pain. Thus, pancreas divisum was found more commonly in patients with pancreatitis when compared to those with biliary tract disease obscure abdominal pain. The frequency was significantly higher in patients with acute pancreatitis compared to those with chronic pancreatitis, while there was no significant difference in relation to etiology of pancreatitis.

Of the types of pancreas divisum, type I accounted for 26 (86.7%) cases, type II for 1 (3.3%) and type III for 3 (10%) cases. Of the 10 patients in whom accessory papilla cannulation was attempted, it was successful in 8 and in two of them this showed changes of chronic pancreatitis (mild-1, moderate-1) in the dorsal pancreatic duct (Fig 2).

Discussion

Whereas data from the West indicate the prevalence of pancreas divisum in the general population to be 3% to 7%,1,3 its frequency in idiopathic pancreatitis has been as high as 12% to 25.6%.1,4 Pancreas divisum has also been reported to be more common in pancreatitis than...
in patients with obscure abdominal pain (3.3%) and in biliary disease (2.2%).

In the present study, the overall prevalence of pancreas divisum in symptomatic patients was similar to that reported from the West. It was present in 12.1% of cases with non-alcoholic, non-gallstone induced pancreatitis. Its occurrence in patients presenting with pancreatitis was significantly higher than that in patients with obscure abdominal pain and biliary disease. These data support the observation that pancreas divisum is causally related to the occurrence of pancreatitis. Type I pancreas divisum was the commonest type in our experience, followed by types III and II. This is similar to the distribution reported from the West.

Since a significant proportion of patients with pancreas divisum do not develop pancreatitis, some authors have considered this to be only an anatomical variant without any potential for disease. It is now believed that pancreas divisum alone is not important if the accessory duct and its orifice are adequate or if the ventral and dorsal ducts communicate and the major papilla is healthy. Warshaw et al. suggested that stenosis of the accessory papilla (diameter less than 0.75 mm) is essential for pancreatitis to occur; this was demonstrated by the use of lacrimal duct probes during surgical sphincteroplasty. Such patients also responded well to sphincteroplasty of the accessory papilla. Elevated dorsal duct pressures in symptomatic patients with pancreas divisum have also been reported.

Mild to moderate changes of chronic pancreatitis were seen in 2 of our patients in the DPD, while the VPD was uninvolved. This is similar to the prevalence reported by Benage et al.

The findings of the present study suggest that pancreas divisum is not uncommon in India among patients with idiopathic pancreatitis and that a causal relationship is possible. Accessory papilla cannulation is recommended to definitively diagnose this condition and should be attempted in all suspected cases.

References