CLINICAL IMAGES

Annular pancreas

S Moodley, M Hegarty, S R Thomson

A 59-year-old man presented with a 6-day history of nonspecific upper abdominal pain. This was the first episode and there was no associated vomiting.

The only significant finding was severe epigastric tenderness. Amylase assays were normal, as was upper endoscopy and sonography. He settled on antispasmodics and was discharged. He returned a week later with pain, food fear and dyspepsia. His evaluation continued with a barium meal study (Fig. 1) which revealed an extrinsic compression of the second part of the duodenum. The upper endoscopy was repeated and revealed a non-distensible second part of the duodenum. Random biopsies revealed normal mucosa. A computed tomography (CT) scan failed to demonstrate an abnormality.

Persistent pain and an abnormal barium study led to surgical exploration. At laparotomy, a constricting band of pancreatic tissue was identified around the second part of the duodenum, and the penny dropped — an annular pancreas (Figs 2a and b). A duodeno-duodenostomy was performed. The patient subsequently made an uneventful recovery with no recrudescence of symptoms.

Annular pancreas is a rare condition and understanding its embryological derivation[1] is essential for treatment. The pancreas develops from a dorsal (body and tail) and a ventral bud (head) that arise from the foregut. The 'migration' of the ventral bud is in fact due to selective expansion of the duodenum, and results in fusion of the two components in their final position. This is illustrated schematically in Figs 3a and b. Development of an annular pancreas is thought to occur when the free end of the ventral bud (V) becomes fixed anteriorly and as it 'migrates' posteriorly it comes to encircle the duodenum[1] (Figs 4a and b). Patients commonly present in infancy with pain or features of gastric outlet obstruction.[2]

S Moodley, a general surgeon with an interest in surgical gastroenterology, is a consultant in the Department of Surgery, Nelson R Mandela School of Medicine, University of Natal, Durban. S R Thomson is Professor and senior specialist in the same department, and has a special interest in upper gastrointestinal surgery. M Hegarty was a consultant surgeon in private practice and has now retired to a senior specialist post in Manchester, UK.

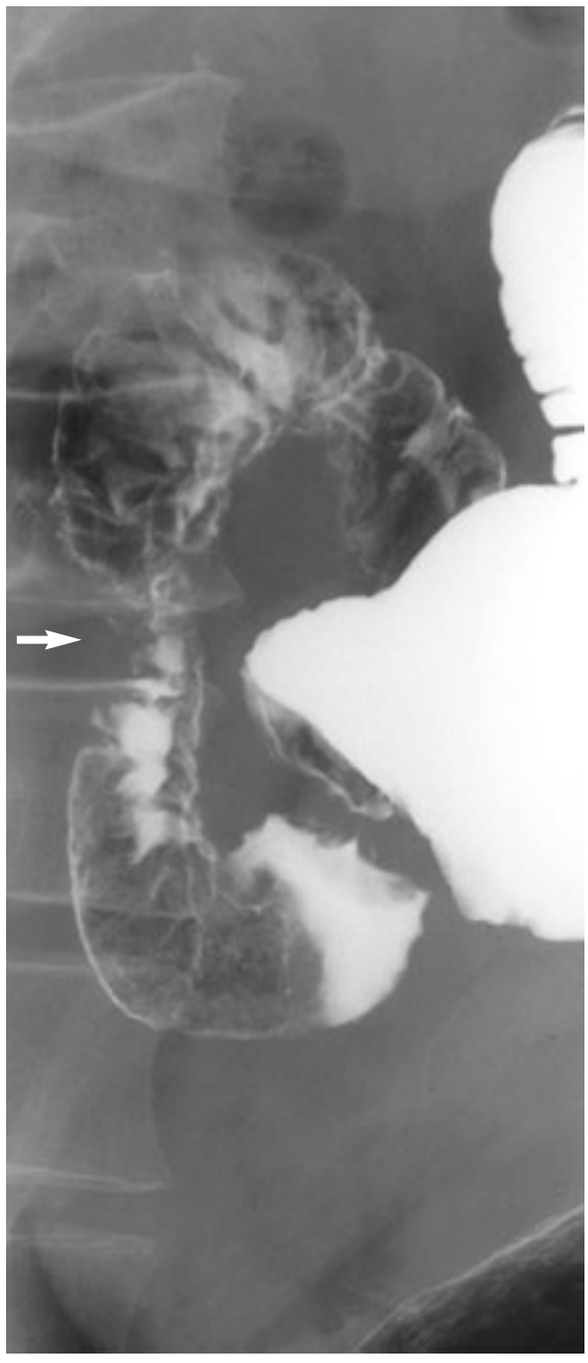

Fig. 1. Barium meal illustrating extrinsic compression of the second part of the duodenum.

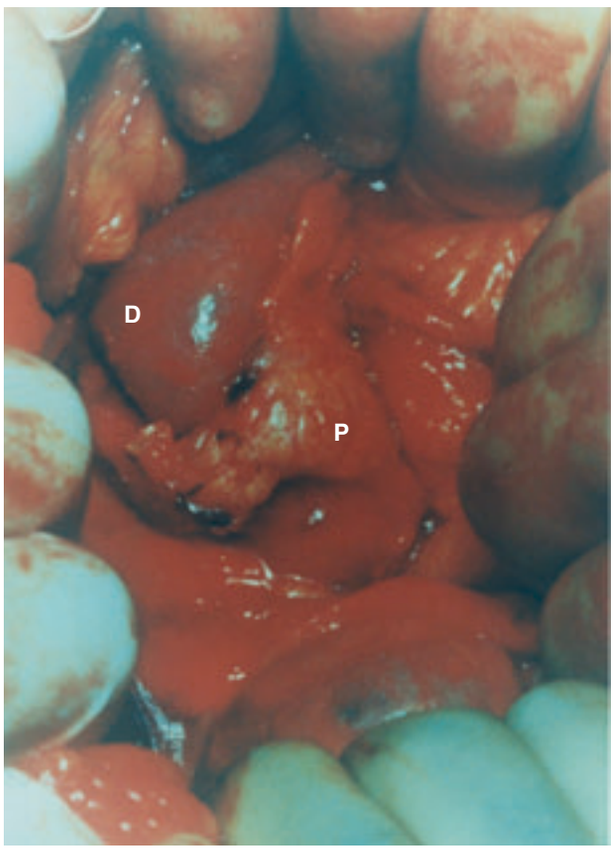

Fig. 2a. Operative picture illustrating the annular pancreas. The rim of pancreatic tissue (P) is seen encircling the second part of the duodenum (D).

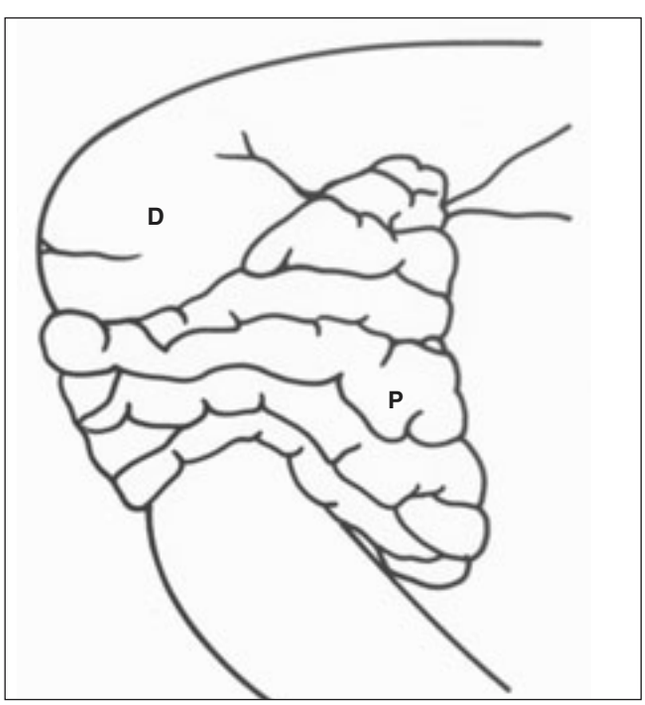

Fig. 2b. Schematic representation of the pancreatic annulus. The abnormal pancreatic tissue (P) encircles the duodenum (D).

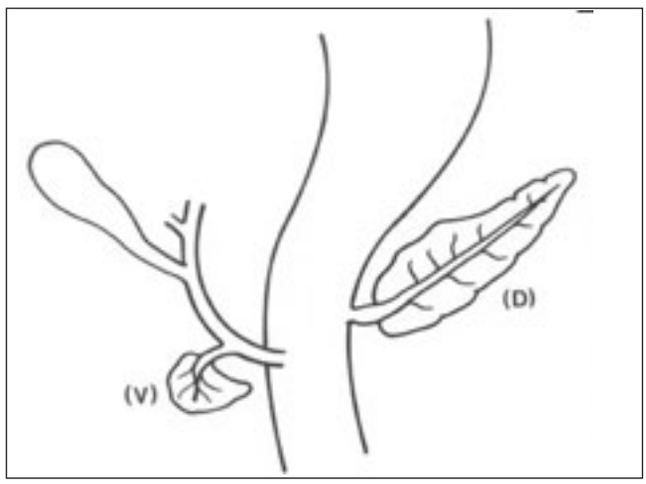

Fig. 3a. Schematic representation of initial normal development of the pancreas. The ventral bud (V) rotates clockwise to fuse with the dorsal bud (D).

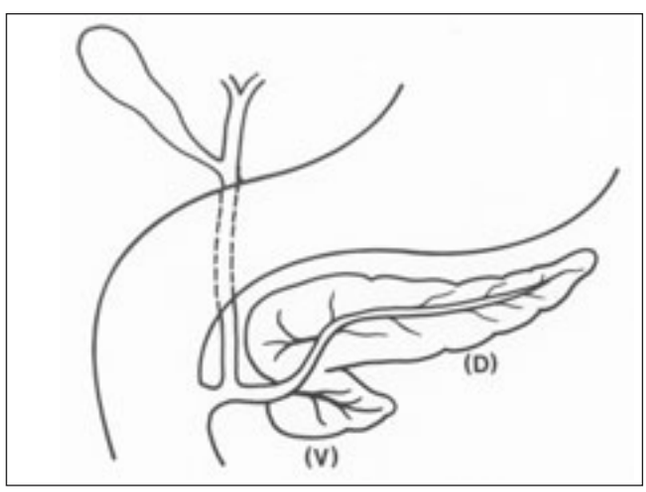

Fig. 3b. Schematic representation of completed normal development showing fusion of the ventral (V) and dorsal (D) buds.

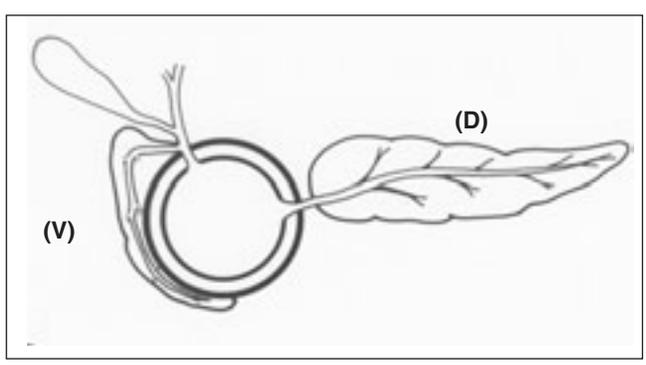

Fig. 4a. Schematic representation of the development of an annular pancreas. The ventral bud (V) becomes fixed anteriorly and starts to encircle the duodenum as it rotates clockwise.

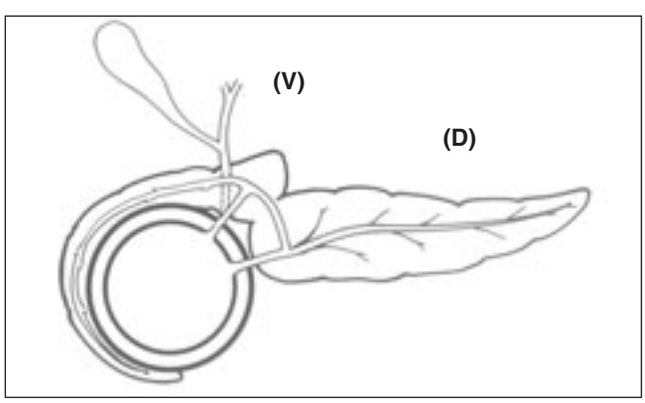

Fig. 4b. Schematic representation of the annulus following rotation of the ventral bud (V) to fuse with the dorsal bud (D). The annulus encircles the second part of the duodenum.

Other congenital abnormalities, viz. Down's syndrome and malrotation frequently co-exist. Presentation in adulthood[3,4] is often in the fourth decade and symptoms are usually nonspecific. Pain is the most prominent symptom and may be accompanied by vomiting, jaundice or pancreatitis. What precipitates this late presentation is as yet unclear. Not infrequently it poses diagnostic difficulty, as was the case in our patient. Endoscopic retrograde cholangiopancreatographic (ERCP) examination is diagnostic if the diagnosis is entertained preoperatively, but often a barium meal and surgical exploration lead to the diagnosis and appropriate treatment, as was the case in our patient. The treatment[1] is surgical, the ideal being a duodeno-duodenostomy or a duodeno-jejunostomy. A gastro-jejunostomy is less favoured. Simply splitting the band of pancreatic tissue is inappropriate and fraught with the complications of fistula formation, pancreatitis and persistence of obstruction due to intrinsic duodenal narrowing.[5]

1. Lloyd-Jones W, Mountain JC, Warren KW. Annular pancreas in the adult. *Ann Surg* 1972; **176**(2): 163-170.
2. Kiernan PD, ReMine SG, Kiernan PC, *et al*. Annular pancreas. *Arch Surg* 1980; **115:** 46 - 50.
3. Ravitch MM. The pancreas in infants and adults. *Surg Clin North Am* 1975; **55:** 377-385.
4. Urayama S, Kozarek R, Ball T, *et al*. Presentation and treatment of annular pancreas in an adult population. *Am J Gastroenterol* 1995; **90:** 995 - 999.
5. Hyden WH. The true nature of annular pancreas. *Ann Surg* 1963; **157:** 71-77.