Annular Pancreas:
Demonstration of the Annular Duct on Cholangiography

ROBERT L. HEYMANN, * MAJ., MC, USA, THOMAS J. WHELAN, JR., ** COL., MC, USA

* From the U. S. Army Tripler General Hospital, Honolulu, Hawaii

Since Tiedmann first described annular pancreas in 1818, over two hundred and fifty cases have been reported. Recent reviews have adequately analyze the etiology, pathogenesis and treatment of this entity. In vivo demonstration of ductal relationships of the annulus and head of the pancreas has been lacking. In the case here reported, operative cholangiography delineates these relationships and re-emphasizes and clarifies difficulties that may be encountered by division of the annular pancreas.

Case Report

A 49-year-old Portuguese male was admitted to U. S. Army Tripler General Hospital on November 8, 1965, with a 6-year history of duodenal ulcer. This admission was occasioned by an increase in epigastric pain which was incompletely relieved by a medical regimen, and the onset of postprandial bloating combined with fatty food intolerance. He had no nausea or vomiting. In the past the patient had been taking various steroid preparations for rheumatoid arthritis for ten years prior to this hospitalization. Physical examination and laboratory determinations were unremarkable with the exception of a gastric aspirate which showed 0° free acid and 34° total acid. Oral cholecystogram showed multiple radiolucent stones and an upper gastrointestinal x-ray series showed dilatation of the first portion of the duodenum and medial deviation of the second portion—deformities associated with annular pancreas. There was no obstruction to passage of the barium meal. Preoperative diagnoses were cholecystitis, duodenal ulcer and annular pancreas.

At laparotomy, the patient was found to have a complete annular pancreas at the level of the ampulla of Vater (Fig. 1). Cholecystectomy was performed and operative cholangiograms were obtained through the cystic duct using Hypaque. The first injection (Fig. 2) showed a normal biliary tract with the common bile duct joining the duct of Wirsung to form a common channel prior to entering the duodenum. The main pancreatic duct, however, passed posterior and lateral to the duodenum. A subsequent injection of contrast medium (Fig. 3) demonstrated the duct of the annular pancreas. It is apparent from this film that the main pancreatic duct is in direct continuity with the duct of the annulus and this duct enters the ampulla of Vater. The accessory duct of Santorini is also clearly visualized. The remainder of the pancreatogram was normal.

Duodenotomy was performed and in the area beneath the annulus there was a mural thickening with resultant duodenal stenosis. The duodenal bulb was normal and there was no evidence of ulceration. An anterior duodenoduodenostomy was performed and the postoperative course was uneventful. Five months following operation, the patient was still receiving steroid therapy. An upper gastrointestinal x-ray series showed no duodenal distention and the patient was asymptomatic and had regained his preoperative weight.

Discussion

Treatment of annular pancreas involves either division of the annulus or a bypass procedure. Currently, surgical opinion favors bypass of the obstruction although some authors continue to report good results with division of the annulus. Aside from intramural pancreatic extensions, congenital stenosis, fibrosis and atresia, an important feature which has detracted from the popularity of annulus di-
Fig. 1. Operative view of the annular pancreas (arrow). Note the distended duodenum proximal to the annulus.

vision has been the high incidence of pancreatic fistulæ following this operation. The pancreatogram obtained in the case presented demonstrates that division of the annulus would involve transsection of a major pancreatic duct in direct communi-

Fig. 2a. Operative cholangiogram. The duct of Wirsung (arrow) passes posterior to the common bile duct to form the duct of the annulus.

Fig. 2b. Schematic demonstration of relationships portrayed in Figure 2a. A) ampulla of Vater; B) duct of Wirsung; C) beginning of annular duct.

Fig. 3a. Operative cholangiogram, second injection, demonstrates the annular duct as it continues anteriorly and medially (lower arrow) and joins the main pancreatic duct. Also the duct of Santorini (upper arrow) is visualized.

cation with the main pancreatic ductal system. In this instance, and perhaps in others in which the annulus has been successfully divided without fistula formation, transsection might have been accomplished since both halves of the annular duct would have been decompressed, the proximal half via
the ampulla and the distal half via the duct of Santorini. If either of these communications is lacking, however, as when the duct of Santorini is deficient or does not communicate with the main pancreatic duct, transsection of the annular duct may leave distal functioning pancreatic tissue without adequate ductal decompression. Under such circumstances the tendency for pancreatic fistulization would be great.

Summary

A case of annular pancreas is reported in which the diagnosis was made preoperatively and in which operative cholangiography clearly demonstrated relationships of the annular duct, the ducts of Wirsung and Santorini and the common bile duct.

This ductal configuration explains the frequent occurrence of pancreatic fistulae following division of the annular pancreas.

References