

The Hypertrophic Uncinate Process of the Pancreas Wrapping the Superior Mesenteric Vein and Artery —A Case Report—

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ABSTRACT: The hypertrophic uncinata process of the pancreas wrapping the superior mesenteric vein and artery was discovered during surgery on a patient with nodular chronic pancreatitis. Such a rare anomaly has never been noted in the English literature so far as we have been able to find. This malformation of the pancreatic uncinata process was considered to be due to excess fusion between the ventral and dorsal pancreatic anlagen during embryonic stage.

KEY WORDS: pancreas, uncinata process

INTRODUCTION

Cases of an annular pancreas enveloping the second portion of the duodenum have been occasionally reported in the field of pediatric or general surgery. This morphological anomaly may or may not cause obstruction. The etiology of an annular pancreas is generally considered to be due to a developmental malformation of the pancreatic head during embryonic stage.

We recently experienced a patient in whom the pancreatic uncinata process surrounded both the superior mesenteric vein and artery.

CASE REPORT

A 51-year-old Japanese woman presented in May 1984 with right upper abdominal pain. She denied any history of abdominal

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trauma, chronic alcohol consumption, gallstones or medications. There were no such perinatal abnormalities as Down's syndrome, maternal hydramnios or esophageal fistula. Her family history was unremarkable. Physical examination of the abdomen revealed no particular abnormalities.

Serum and urine amylase levels were slightly elevated. Peripheral blood, liver function test and serum carcinoembryonic antigen showed normal levels, but as microscopic hematuria was noted on routine examination, computed tomography of the upper abdomen, including both kidneys, was carried out to check for renal tumor. Although both kidneys showed no abnormalities, swelling of the pancreatic uncinata process with poor demarcation was revealed. The lymph-nodes around the pancreatic head were not swollen and the body and tail of the pancreas were normal (Fig. 1).

Selective celiac angiography showed that one angle of the second-order ramification of the superior anterior pancreaticoduodenal artery was slightly wide. This finding suggested an avascular mass on the pancreatic uncinata process. On selective supe-

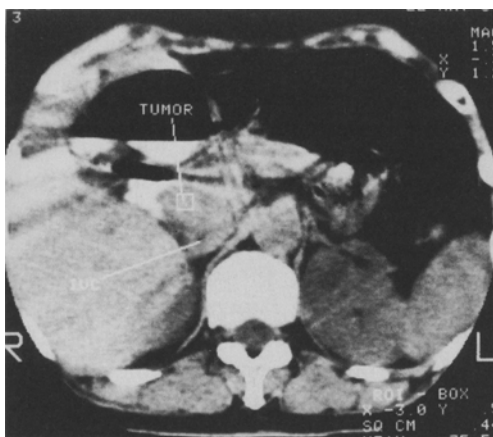


Fig. 1. Computed tomography. The patient has been imaged in the supine position. Swelling of the pancreatic uncinata process with obscure margin is revealed. (□)

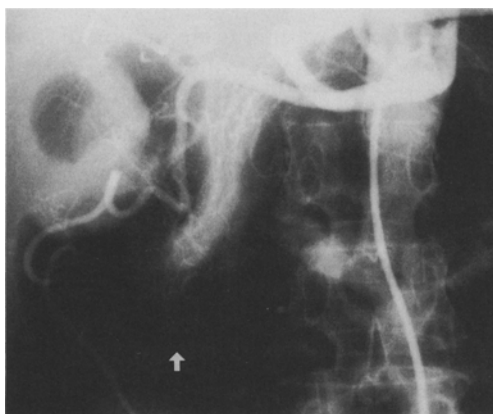


Fig. 2. Selective celiac angiography. One angle of the second-order ramification of the superior anterior pancreaticoduodenal artery is wide. (arrow)

rior mesenteric angiography, the posterior pancreaticoduodenal artery and the portal vein were seen to be normal (Fig. 2).

Endoscopic retrograde pancreatography showed nothing other than scanty branches of the pancreatic duct in the vicinity of the uncinata process (Fig. 3). We defined preoperatively that she had chronic pancreatitis with swelling of the uncinata process.

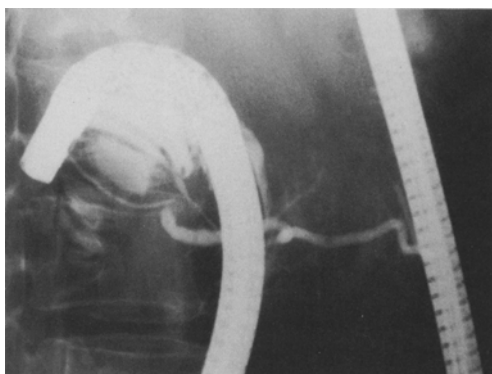


Fig. 3. Result of endoscopic retrograde pancreatography showing scanty branches of pancreatic ducts in the uncinata process.

Exploratory laparotomy revealed an approximately 3×4×4 cm elastic-hard induration in the pancreatic uncinata process near the neck. Frozen sections of the biopsied material showed fibrosis and inflammation with no evidence of malignancy. Pancreatoduodenectomy without lymph-node dissection was performed instead of a simple enucleation of the mass, without risking leakage of the pancreatic juices.

During the operation we discovered that the pancreatic head was fused not only to the body over the superior mesenteric vessels, but also to the body below them. The uncinata process of the pancreatic head was elongated toward the body below the vessels and was completely continuous to the body. There was hardly any break seen in the pancreatic parenchyma between the uncinata process and the body. This continuity was not due to inflammatory or fibrous adhesion.

We reconstructed the remaining pancreatic body, which was situated on the superior mesenteric vessels, by Child's method, but closed the other cut edge of the pancreatic body below them using interrupted Ti-cron® sutures, since there was no macroscopic pancreatic duct connection between the uncinata process and the body (Fig. 4).

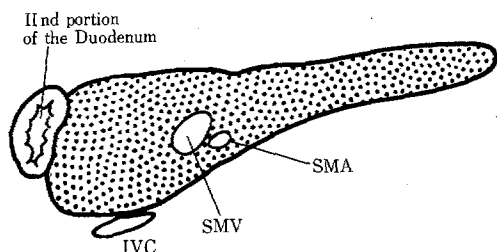


Fig. 4. Schema of surgical findings. Cross-section of the pancreas. IVC, inferior vena cava; SMV, superior mesenteric vein; SMA, superior mesenteric artery

The resected specimen revealed nothing other than chronic inflammation and no etiologic mechanism about this patient was identified. The patient's postoperative course was uneventful.

DISCUSSION

The pancreas, so soft an organ that it has been called the sweetbread since the middle ages,¹ lies transversely in the retroperitoneal sac, between the duodenum on the right and the spleen on the left. Its shape is hammer-like and it consists of the head, the body and the tail. The caudal part of the head is the uncinate process which extends under the superior mesenteric vessels which run through a notch called the incisura pancreatis.²

Heterotopic pancreas, annular pancreas, pancreas divisum and failure of some parts of the pancreas are representative morphological anomalies of the pancreas. Their etiology is embryologically explained as follows: The pancreas first appears in embryos which are approximately 4 mm size in the fourth week of gestation. At this time there develop two outpouches from the entodermal lining of the duodenum; the ventral pancreas and the dorsal pancreas. The dorsal anlage grows more rapidly, and by sixth week it is an elongated nodular structure extending into the dorsal mesentery within which its growth continues. The ventral pancreas remains smaller and is carried

away from the duodenum by its connection with the common bile duct. The two primordia are brought into apposition by the uneven growth of the duodenum and become fused by the seventh week. The tail, body and the part of the head of the pancreas are formed by the dorsal component, whereas the remainder of the head and the uncinate process arise from the ventral pancreas.³ Pancreatic buds may be scattered anywhere on the intestine to become heterotopic pancreas. While part of the ventral anlage is fixed to the anterior surface of the duodenum, clockwise rotation of the ventral anlage may occur around the duodenum. Thus an annular pancreas is formed. Fusional failure of the dorsal and the ventral anlages may result in pancreas divisum. A developmental defect in either of the two anlages may cause the failure of some parts of the pancreas.⁴

From the above-mentioned embryological facts, we have analogically tried to explain the etiology of the uncinate process around the superior mesenteric vein and artery. If the ventral anlage were to develop and to be hypertrophied too far toward the left side after rotation, it could fuse with the dorsal anlage behind the mesenteric vessels. In this circumstance it would clearly be possible for the superior mesenteric vein and artery to become wrapped within the pancreatic parenchyma.

We should be extremely careful in drawing conclusions about the curious connection between the uncinate process and the body, since fibrous binding existing between them, behind the superior mesenteric vessels, is not so rarely found upon usual surgery for chronic pancreatitis or pancreatic carcinoma. Over the last seven years we have performed fifty pancreatoduodenectomies and nineteen total pancreatectomies for such conditions as pancreatic carcinoma, bile duct carcinoma, ampullary carcinoma, gallbladder carcinoma, gastric carcinoma or pancreatic trauma. We therefore feel sufficiently qualified to recognize whether the

pancreatic uncinata process is connected to the body behind the mesenteric vessels by congenital malformation, or by secondary fibrous change due to chronic pancreatitis or pancreatic carcinoma.

Arey described an annular pancreas encircling and constricting the duodenum, and also that, though less frequently, constriction of the bile duct or portal vein sometimes occurs.⁵ In a certain illustration of annular pancreas, showing the manner in which the duodenum is surrounded by the elongated pancreatic head, the vena et arteria mesenterica superior are seen to be buried within the pancreatic parenchyma.² However, no clear case report has ever been published in the English literature.

Upon usual surgery for chronic pancreatitis or pancreatic carcinoma, more attention should be given to structural abnormalities which might help to clarify the development of the pancreas. Furthermore, with regard to diagnosis, especially using computed tomography of the pancreas, the physician should

be aware of this malformation when he is consulted about a swelling of the pancreatic uncinata process. Neither angiography nor endoscopic retrograde pancreatography, however, offered any help in detecting this unusual anomaly.

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