CYSTS OF PANCREAS

An Essay
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By

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LIST OF ABBREVIATIONS

ACC	Acinar cell cystadenocarcinoma
CA	Cancer antigen
CBD	Common bile duct
CCK	Cholecystokinin
CEA	Carcino embryonic antigen
CT	Computed tomography
DNA	Deoxyribo nucleic acid
ERCP	Endoscopic retrograde choiangiopancreatography
EUS	Endoscopic ultrasound
F	Female
FNA	Fine-needle aspiration
FNAC	Fine-needle aspiration cytology
HPP	Human pancreatic polypeptid
IOPN	Intraductal oncocytic papillary neoplasms
IPMN	Intraductal papillary mucinous neoplasm
LEC	Lymphoepithelial cyst
M	Male
MCA	Mucinous cystadenoma
MCAC	Mucinous cystadenocarcinoma
MRCP	Magnitic resonance cholangiopancreatography
MCN	Mucinous cystic neoplasm
MRI	Magnitic resonance image
NPV	Negative predictive value
Pan IN	Pancreatic intraepithelial neoplasia
PET	Positron emission tomography
POA	Pancreatic oncofetal antigen
RNA	Ribonucleic acid

LIST OF ABBREVIATIONS

SCA	Serous cystadenoma
SMA	Superior mesenteric artery
SPT	Solid-pseudopapillary tumor
US	Ultrasonography
USA	United state of america
VHL	Von Hippel-Lindau
VIP	Vasoactive intestinal peptide
WHO	World health organization

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AIM OF THE ESSAY

The aim of the essay is to study different types of pancreatic cysts as regards pathology, clinical presentation and the recent trends in diagnosis and treatment.

Introduction

Cystic lesions of the pancreas consist of a spectrum of benign, pre-malignant, and malignant lesions. In the past, cystic neoplasms of the pancreas were thought to be relatively rare, but the widespread use of cross sectional imaging has dramatically increased ability to detect these lesions. Although the vast majority of pancreatic cysts are discovered incidentally, large or invasive lesions may produce sufficient symptoms to cause the patient to seek medical attention. Cystic neoplasms are often confused or misdiagnosed as pseudocysts or peripancreatic collections of inflammatory fluid that may morphologically mimic cystic neoplasms. Furthermore, the presenting symptoms of pseudocysts may be identical to the symptoms associated with cystic neoplasms (**Brugge et al.,2004b)**.

The prevalence of pancreatic cysts has been examined with autopsy examinations of the pancreas in adults without known pancreatic disease. The prevalence of pancreatic cysts found at autopsies in Japan was approximately 73 of 300 autopsies (24.3 %) cases (**Kimura et al.,1995)**, cysts were located throughout the pancreatic parenchyma and were not related to chronic pancreatitis **(Compton , 2000).**

Most patients with a pancreatic cystic lesion have non-specific symptoms. The cystic lesion is usually found with computed tomography(CT) or ultrasonography(US) imaging performed for the evaluation of another condition. When symptoms are present, the most common presentation is recurrent abdominal pain, nausea, and vomiting as result of mild pancreatitis **(Wiesenauer et al.,2003**). Cystic lesions that cause duct compression or involvement of the main pancreatic duct are prone to cause pancreatitis. Chronic abdominal pain and jaundice are a rare presentation of a cystic lesion and

suggests a malignancy or a pseudocyst. Patients with a cystic malignancy will present with symptoms and signs similar to pancreatic cancer, i. e. pain, weight loss, and jaundice **(Holly et al.,2004)**. Pseudocysts may arise after an episode of acute pancreatitis or insidiously in the setting of chronic pancreatitis and are associated with chronic abdominal pain. It is common for cystic lesions associated with pancreatitis to be diagnosed as pseudocysts and be confused with cystic neoplasms that also cause pancreatitis **(Sand and Nordback .,2005**).

The differential diagnosis of a cystic lesion of pancreas is very wide and often causes confusion. Since the treatment of a pseudocyst and cystic neoplasm are so different, it is incumbent on the clinician to first differentiate between these major categories of lesions **(Caillot et al.,2000).**

CT is an excellent test for cystic lesions of the pancreas because of its widespread availability and ability to detect cysts **(Curry et al.,2000).**

Magnetic Resonance(MR) imaging is used increasingly because of its ability to determine if there is involvement of the main pancreatic duct with high resolusion **(Fukukura et al.,2003)**. Ultrasonography whether performed transabdominally or intraoperatively is generally not helpful (**Kubota et al.,1997)**. Endoscopic ultrasound (EUS) has been used to diagnose cystic lesions of the pancreas and guide fine needle aspiration (FNA) (**Brugge ,2004a).**

Surgical resection is the treatment of choice for pre-malignant cystic neoplasms. The decision to resect a lesion, however, is based on the presence or absence of symptoms, the risk of malignancy, and the surgical risk of the patient. High risk patients with low grade cystic neoplasms may be monitored with periodic CT/MRI scanning or EUS-FNA **(Irie et al.,2004)**. The increasing safety of surgical resection has prompted the use of surgery for a wider range of lesions (**Fernandez del Castillo et al., 2003)**.

Cystic neoplasms are slow growing and 19 % will demonstrate an increase in diameter at 16 months **(Spinelli et al.,2004)**. Surgical resection is associated with a morbidity of 27.9 %, with a reoperation rate of 7.3 % and a very low mortality rate (**Bassi et al., 2003)**. The overall 5-year survival for patients having intra-ductal papillary mucinous neoplasms (IPMNs) without invasive cancer was 77 %, compared with 43 % in those patients with an invasive component **(Sohn et al., 2004)**.

Anatomy of the pancreas

Embryology of the pancreas:-

The pancreas begins development during the 4th week of gestation, when the embryo is 3-4 mm, in size, Pancreatic tissue originates from the endodermal lining of the duodenum, from which form two pouches that develop into a large dorsal and a smaller ventral pancreas (Fig. 1) **(Warren and Lewis,2000).**

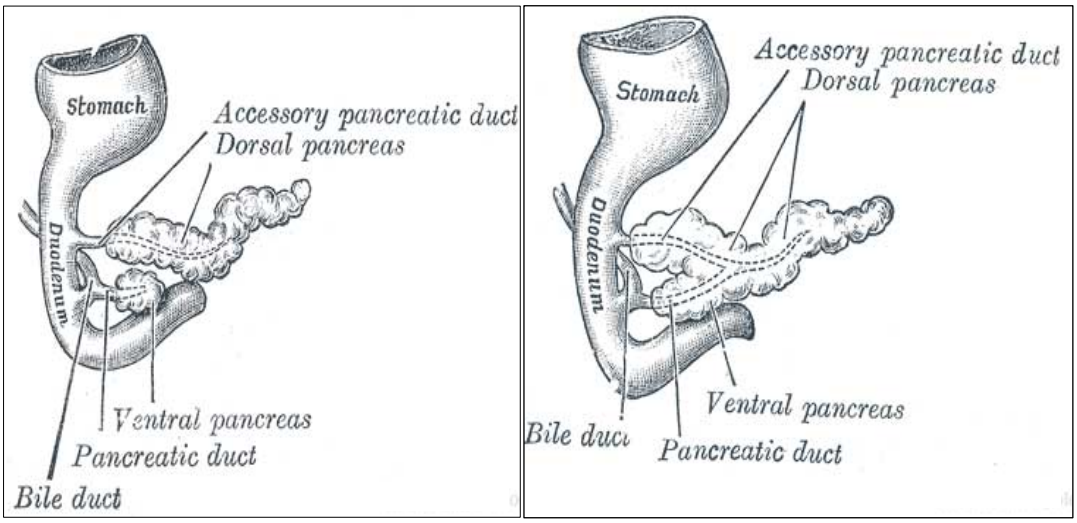

Fig. 1: Embryological development of the pancreas**(Warren and Lewis,2000).**

The dorsal pouch arises first, directly from the duodenal endoderm, and normally forms the bulk of adult pancreatic tissue. The ventral pouch form from the endoderm of the hepatic diverticulum, and it maintains a close association with the common bile duct throughout development **(Warren and Lewis,2000**).

The duct of the dorsal part "The accessory pancreatic duct" therefore opens directly into the duodenum. While the duct of the ventral part "The main pancreatic duct" opens with the bile duct. Early in the seventh week, the two parts of the pancreas meet and fuse as a continuation is established between their ducts til rough postero-medial rotation of the ventral part associated with the bile duct and the gall bladder. After this had occurred, the terminal part of the accessory duct undergoes little or no enlargement while the duct of the ventral

part increases in size form the terminal part of the main pancreatic duct **(Moore et al., 1998).**

The parenchyma of the pancreas is derived from the endoderm of the pancreatic buds which form a network of tubules. Early in the fetal period, acini begin to develop from cell clusters around the ends of these tubules "primordial ducts". The pancreatic islets develop from groups of cells that separate from the tubules and soon come to lie between the acini **(Moore et al., 1998).**

Parts of the pancreas:

Head :

The head of the pancreas is flattened and has an anterior and a posterior surface (Fig.2). The anterior surface is adjacent to the pylorus and the transverse colon. The anterior pancreatico-duodcnal arcade can be seen on the anterior surface of the head of the pancreas coursing roughly parallel to the duodenal curvature **(Skandaldkis et al., 2004).**

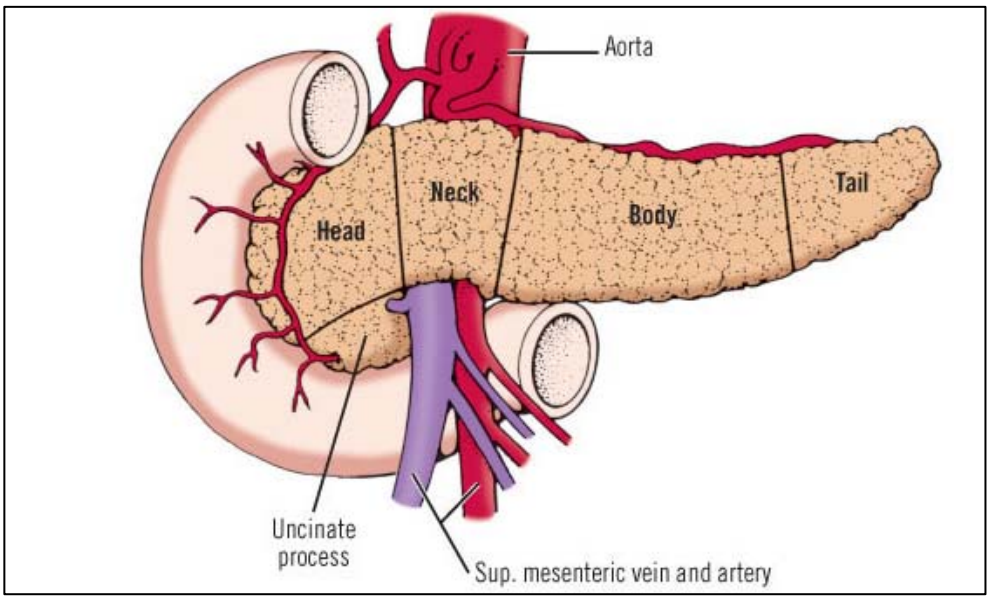

Fig. 2: The main subdivisions of the pancreas **(Skandalakis et at., 2004).**

The posterior surface is close to the hilus and medial border of the right kidney, the right renal vessels and the inferior vena cava, the right crus of the diaphragm, the posterior pancreatico-duodenal arcade, and the right gonadal vein. The distal portion of the common bile duct (CBD) may lie behind the pancreatic head in a groove (16.5%), or it may be partially or totally embedded in the pancreatic substance (83%) **(Skandalakis et at., 2004).**

Uncinate process:

An extension of the head of the pancreas(which is variable in size and shape) passes downward and slightly to the left, forming the uncinate process. It passes behind the superior mesenteric vessels and in front of the aorta and inferior vena cava. In saggittal section, the uncinate process lies between the aorta and the superior mesenteric artery (SMA), having the left renal vein above and the duodenum below (Fig. 3). The uncinate process may be absent, or it may completely encircle the superior mesenteric vessels. An anomalous right hepatic artery may pass through the uncinate process **(Skandalakis el al 2004).**

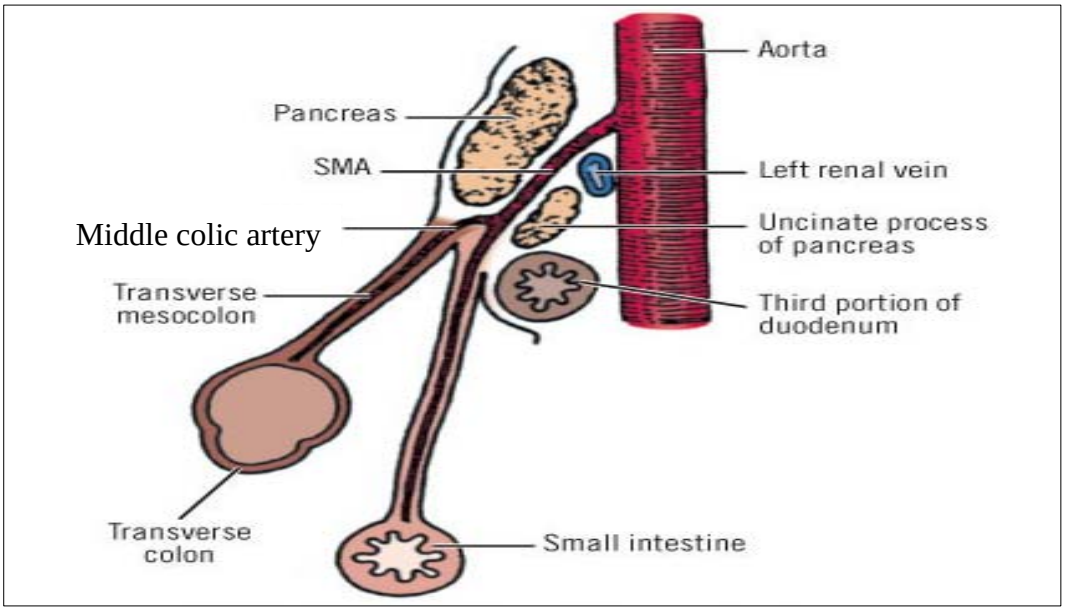

Fig. 3: Saggital section of the pancreas at the level of the SMA**(Skandalakis et at., 2004).**