Helical CT in Pancreatic Masses

ESSAY
Submitted for partial fulfillment
of
The Master Degree in
RADIODIAGNOSIS

By

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(1998)

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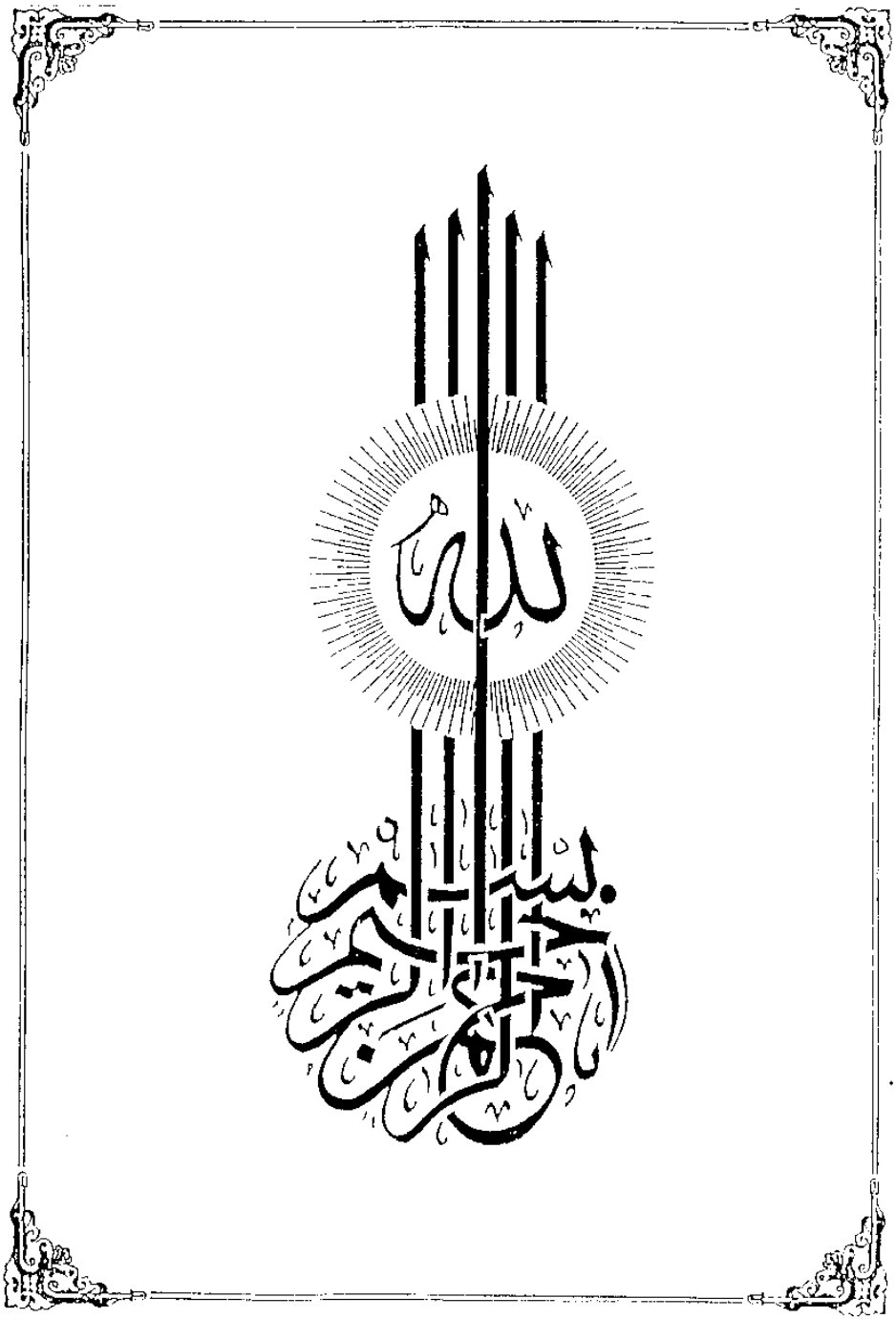

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Introduction

CT is the most useful imaging technique for the evaluation of pancreatic carcinoma: CT is used both in diagnosis and in preoperative selection of patients for radical pancreatoduodenectomy.

Helical CT has clear advantages over conventional scanning for evaluation of the pancreas and results in high-quality images. During helical scanning the acquisition is volumetric; the patient hold his or her breath during the entire acquisition of scan data. This reduces misregistration artifacts that occur when using a non-helical scanner which may hinder the identification of small pancreatic tumors.

Spacing of interval between reconstructed sections may vary and be selected by the user even after the scan acquisition is completed in a way that thin overlapped images are made to identify very small lesions.

All the above advantages make helical CT the method of choice in imaging pancreatic masses.

Aim of the work:

To emphasize the role of helical CT in diagnosis of pancreatic masses.

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Anatomy

of

the

Pancreas

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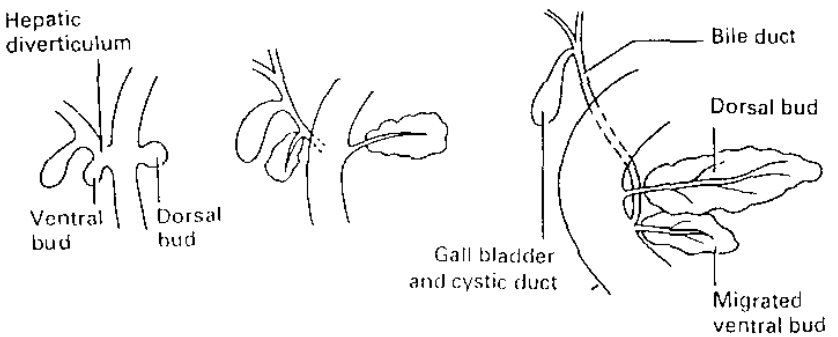
Anatomy of the pancreas

Embryology:

The pancreas develops as two buds from the endodermal lining of the gut at about 26^{th} –27^{th} day after fertilization **(Larson, 1993).**

One from the dorsal wall just opposite and cranial to the hepatic diverticulum [dorsal pancreas] and the other appears ventrally in the caudal angle between the gut and hepatic diverticulum [ventral pancreas] *(figure 1 A)*. **(Donavan, 1983).**



(A) *(B)*

Figure 1 : Development of the pancreas
(Quoted from Last's, 1994)

Both pancreatic buds have an axial duct, the dorsal one arises directly from the duodenal wall, while the base of ventral duct is carried upwards onto the elongating common bile duct and shares a common stem with it. *(figure 1B)*. **(Agur and Lee, 1991)**

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The second or descending part of the duodenum rotates 90 on its long axis thus bringing the two pancreatic primordia side by side with the short ventral bud and the bile duct being posterior to the dorsal bud. Later on a connecting segment unites the dorsal duct to the ventral duct. **(Agura and Lee, 1991)**

Thus the long distal segment of the dorsal duct plus the entire ventral duct will serve as a chief line of drainage known in adult anatomy as "the duct of Wirsung" while the proximal stem segment of the dorsal duct which usually persists constitutes what's known as "the accessory duct of Santorini". **(Decker and du plessis, 1996)**

Pancreatic secretory acini begin to develop at the third month as terminal and side buds from the primitive duct. At the same time the islet cells of Langerhans appears to have identical origin but become separated from their parent ducts and undergo a complete change of secretory functions. **(Mc Minn, 1993)**

Gross anatomy of the pancreas:

The pancreas is located in the most ventral part of the three retroperitoneal compartments, the anterior pararenal space. *(figure 2)*. **(Meyers, 1976)**

The weight and length of the adult pancreas range from 60-100gm and 12-15cm respectively. On C.T scan the pancreas stops slightly upward from the splenic hilum, crossing the abdominal aorta and vena cava extending to the right. Therefore the pancreas can be demonstrated on CT scans only in horizontal sections. **(Baker, 1990)**

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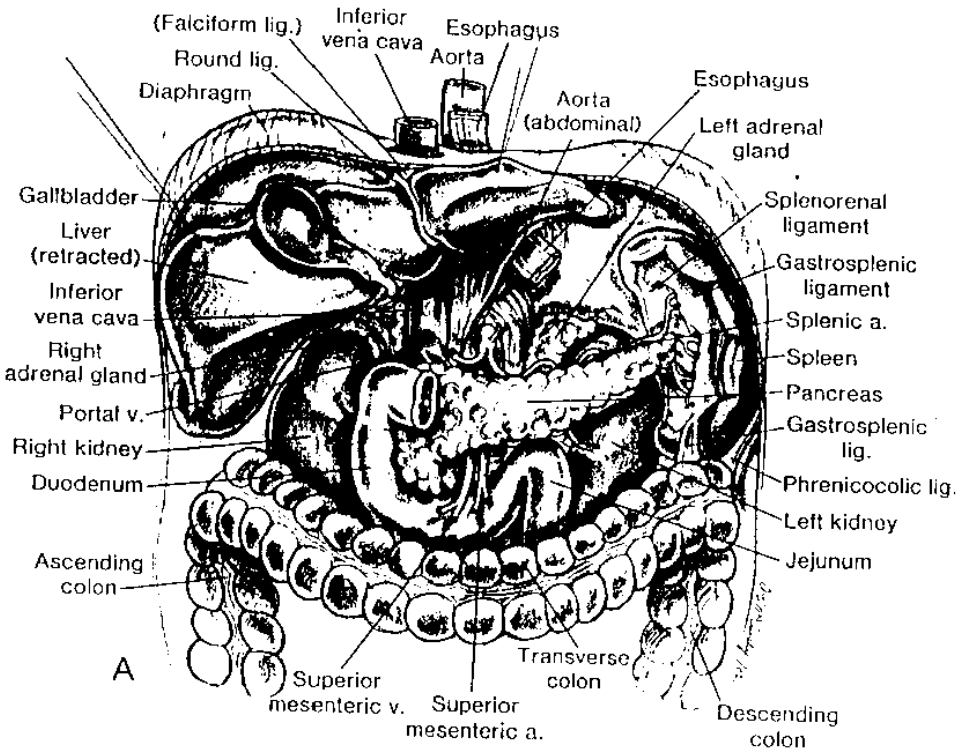

Figure 2 : The pancreas extends nearly transversely across the posterior abdominal wall from the duodenum to the spleen, behind the stomach
(Quoted from Gray's, 1995)

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The pancreas is surrounded by fat that clearly define its margins .In asthenic individuals and young children, peripancreatic fat is often minimal, making the markings difficult to discern, especially along the anterior margin of the pancreas. I.V. contrast medium must then be administrated to demarcate the pancreatic borders. The margins of the pancreas are smooth in adolescents but become lobulated with increasing age or obesity as more fat accumulates. **(Meyers, 1976)**

Parts of the pancreas:

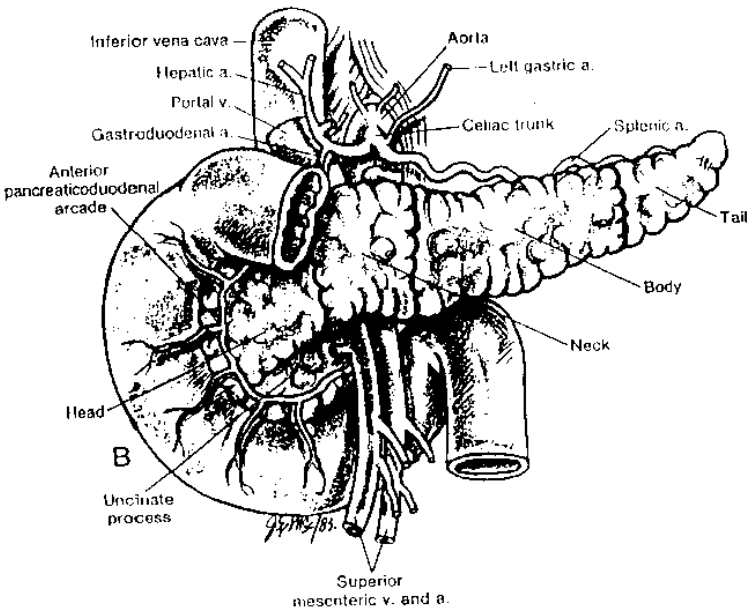

Figure 3 : Parts of the pancreas
(Quoted from Gray's, 1995)

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