COMPUTED TOMOGRAPHY

OF

PANCREATIC TUMORS

ESSAY

SUBMITTED IN PARTIAL FULLFILMENT

FOR THE MASTER DEGREE OF RADIODIAGNOSIS

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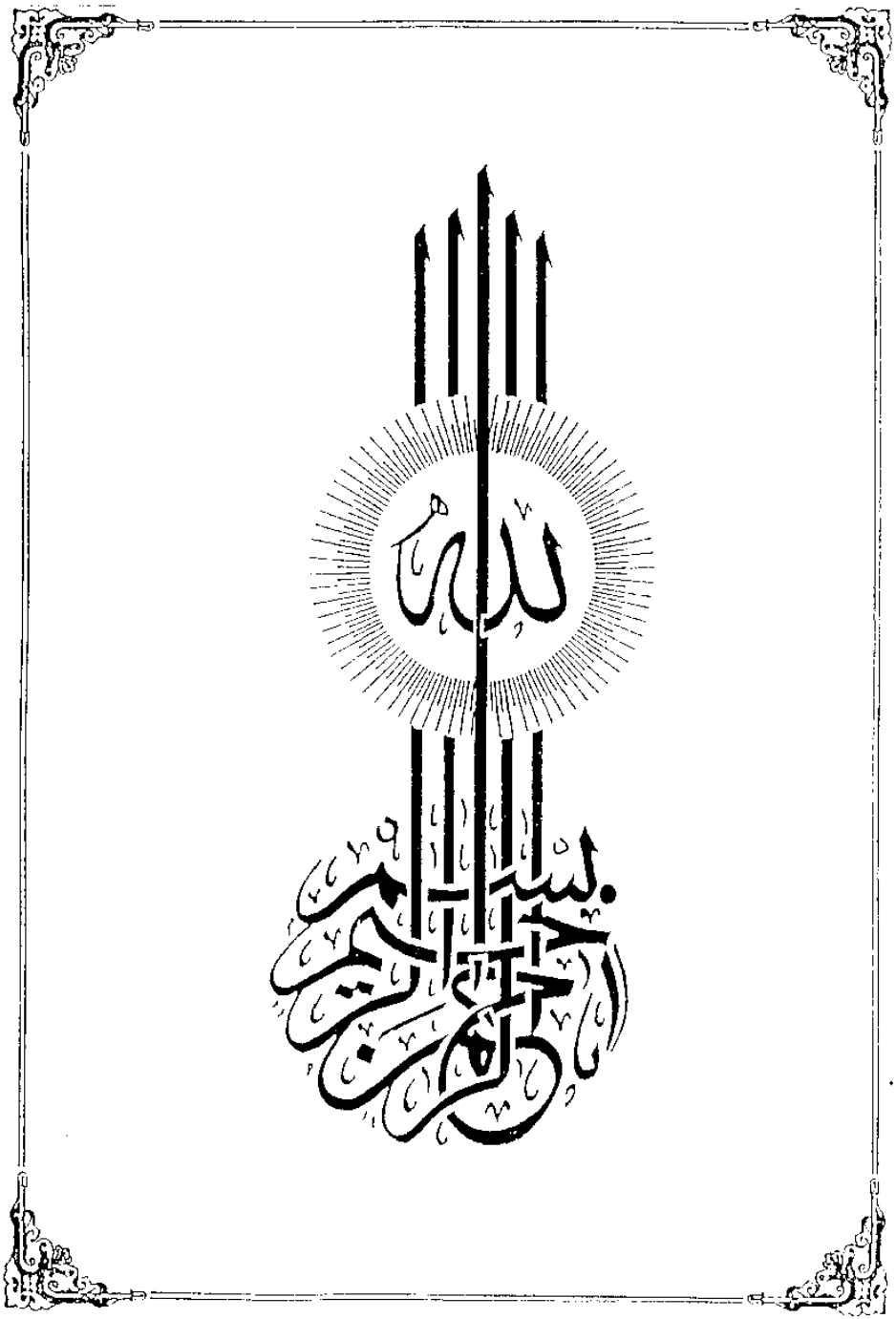

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I N D E X

INTRODUCTION

Diagnostic imaging of the pancreas has always posed a difficult problem.

Barium studies, angiography, radionuclide scanning, endoscopic retrograde cholangiopancreatography, thin needle biopsy and ultrasonography have all been used with varying degrees of success.

In the past few years,C.T. has been available for pancreatic imaging and many reports have dealt with the usefullness of C.T. in diagnosing pancreatic disease.

Some reports have also compared the diagnostic value of C.T. with that of other methods in diagnosing pancreatic neoplasms.

In this essay,the value of C.T. in diagnosis,differential diagnosis and its ability in detection of pancreatic neoplasms compared with other methods are discussed.

ANATOMY

ANATOMY

Gross Anatomy:

The pancreas is soft, lobulated, greyish-pink gland, extending nearly transversely across the posterior abdominal wall, behind the stomach, from the duodenum to the spleen. Its broad, right extremity is called the head, and is connected to the main portion, or body, by a slight constricted neck; its narrow, left extremity forms the tail. It passes obliquly to the left and slightly upwards, across the posterior wall of the abdomen, in the epigasteric and left hypochondriac regions. (Davies, D. & V., Davies, F., 1964).

The length of the gland ranges from 10 to 20 cm and it is 3-5 cm in width. The head measures about 2-3 cm. The average weight of the pancreas approaches 100 gm. (Edward Bradley & Robert Zeppa., 1981).

The head, flattened from before backwards; is lodged within the curve of the duodenum. Its upper border is overlapped by the superior part of the duodenum; the other borders are grooved to receive the adjacent margin of the duodenum, which they overlap in front and behind to a variable extent. Sometimes a small part of the head of the pancreas is actually ambedded in the wall of the descending part of the duodenum. In or near the groove between the duodenum and the right lateral and lower borders of the head are the anastomosing superior and inferior pancreaticoduodenal arteries.(Daviss,

D., V. & Davies, F. 1964).

It lies over the inferior vena cava and the right and left renal veins. The lower part of the posterior surface is prolonged, wedge shaped to the left, behind the superior mesenteric vein and artery, in front of the aorta. This is the uncinate process. The anterior surface of the head lies in both supracolic and infracolic compartments; some of this surface is base, for the leaves of the greate omentum and of the transverse mesocolon are here wide apar at their attachments. (Last., 1978).

The neck of the pancreas is prolonged to the left from the upper part of the anterior portion of the head - be continued into the body. (Last., 1978).

The boundary between the head and neck, on the right side (and in front); is a groove for the gastroduodenal artery; on the left side (and behind) a deep notch intervenes between the head and neck, and in it th superior mesenteric and splenic veins unite to form the portal vein. (Davies, D, V, and Davies F., 1964).

The neck has a slight convexity to its left, the tuber omentale. Above the lesser curvature this touches the tuber omentale of the left lobe of the liver, the lesser (gastrohepatic) omentum intervening. The transverse mesodcolon is attached towards the lower border of

the neck, which lies in the stomach bed of the lesser Sac. (Last., 1978).

The body: It is nearly triangular in shape and has three surfaces: Anterior, posterior and inferior. The anterior surface is covered with peritoneum and separated from the stomach by the omental bursa.

The posterior surface is devoid of peritoneum and is in contact with the aorta and origin of the superior mesenteric artery, the left crus of diaphragm, left supra renal gland and left kidney and its vessels. All these structures are separated from the body by the splenic vein. The inferior surface becomes broader as we go from right to the left. It is covered with peritoneum from the transverse mesocolon. This surface lies on duodeno-jejunal flexure, coils of jejunum and left colic flexure.

The body has three borders; superior, anterior and inferior. The superior border is blunt and flat to the right and narrow and sharp to the left. The splenic artery runs towards the left along this border. The anterior border lies between the anterior and inferior surfaces. The two layers of the transverse mesocolon diverge along this border. One layer covers the anterior surface and the other covers the inferior surface. The inferior border separates the posterior and inferior surfaces. The superior

mesenteric vessels emerge under its right extremity.

(GRAY's anatomy 1973)

The tail of the pancreas passes forward from the anterior surface of the left kidney at the level of the hilum.

Accompanied by the splenic artery, vein and Lymphatics, it lies within the two layers of the lieno-renal ligament and thus touches the hilum of the spleen.

(Last., 1978)

The arterial supply of the pancreas is mainly from the splenic artery, which supplies the neck, body and tail. One large branch is named the arteria pancreatica magna. The head is supplied by the superior and inferior pancreaticoduodenal arteries.

The venous drainage of the pancreas is mainly through numerous small veins into the splenic vein and, in case of the head, by the superior panoreatico-duodenal vein into the portal vein and by the inferior pancreatico-duodenal into the superior mesenteric vein.

The lymphatic drainage of the pancreas is to the left of the neck of the pancreas drains into the retropancreatic nodes. The head drains from its upper part into the caeliac group and from its lower part and uncinate

process into the superior mesenteric group of pre-aortic lymph nodes. (Last., 1978).

The innervation of the pancreas is derived from the vagal and splanchnic nerves. The efferent fibers pass through the caeliac plexus from the caeliac branch of the right vagal nerve to terminate in ganglia located in the intralobular septa of the pancreas. Post ganglionic fibers from these synapses innervate the acini, the islets and the ducts. The visceral afferent fibers from the pancreas also travel in the vagal and splanchnic nerves, but those that mediate pain are confined to the latter, sympathetic fibers to the pancreas pass from the splanchnic nerves through the caeliac plexus and innervate the pancreatic vasculature (Silen W., 1964).

The pancreatic duct traverses the pancreas from left to right, lying nearer its posterior than its anterior surface. It begins by the junction of the small ducts of the lobules situated in the tail of the pancreas and running from left to right through the body, receives the ducts of the various lobules composing the gland, the latter joining the main duct almost at right angles (herring-bone pattern). Considerably augmental in size, it reaches the neck of the pancreas, and turning downwards, backwards and to the right, comes into relation with the bile duct,

which lies to its right side. Together the two ducts pass obliquely into the wall of the descending part of the duodenum, and there unite to form a short dilated duct, named the hepatopancreatic ampulla (or ampulla of the bile duct). The constricted distal end of this ampulla opens on the summit of the major duodenal papilla, which is situated within this part of the duodenum at the junction of its medial and posterior wall from 8 cm to 10 cm distal to the pylorus. As a rule the two ducts do not unite until they approach very close to the opening on the major duodenal papilla. Sometimes the pancreatic and bile duct open separately into the duodenum. (Davies, D.V., and Davies, F. 1964).

The accessory pancreatic duct drains the uncinate process and lower part of the head and crosses the main pancreatic duct to open in the duodenum at a small papilla situated 2 cm proximal to the duodenal papilla. The two ducts frequently communicate with each other. (Last, 1978).

PATHOLOGY