Pancreatic Cancer And Periampullary Carcinoma

Essay

Submitted for Partial Fulfillment of Master Degree in
General Surgery

By

Adel Abbas Mohammed
(M.B.,B.Ch. Ain Shams University)

Supervised By

Prof. Dr. Madbouli Emam Abdel-Aziz
Professor of General Surgery
Faculty of Medicine
Ain Shams University

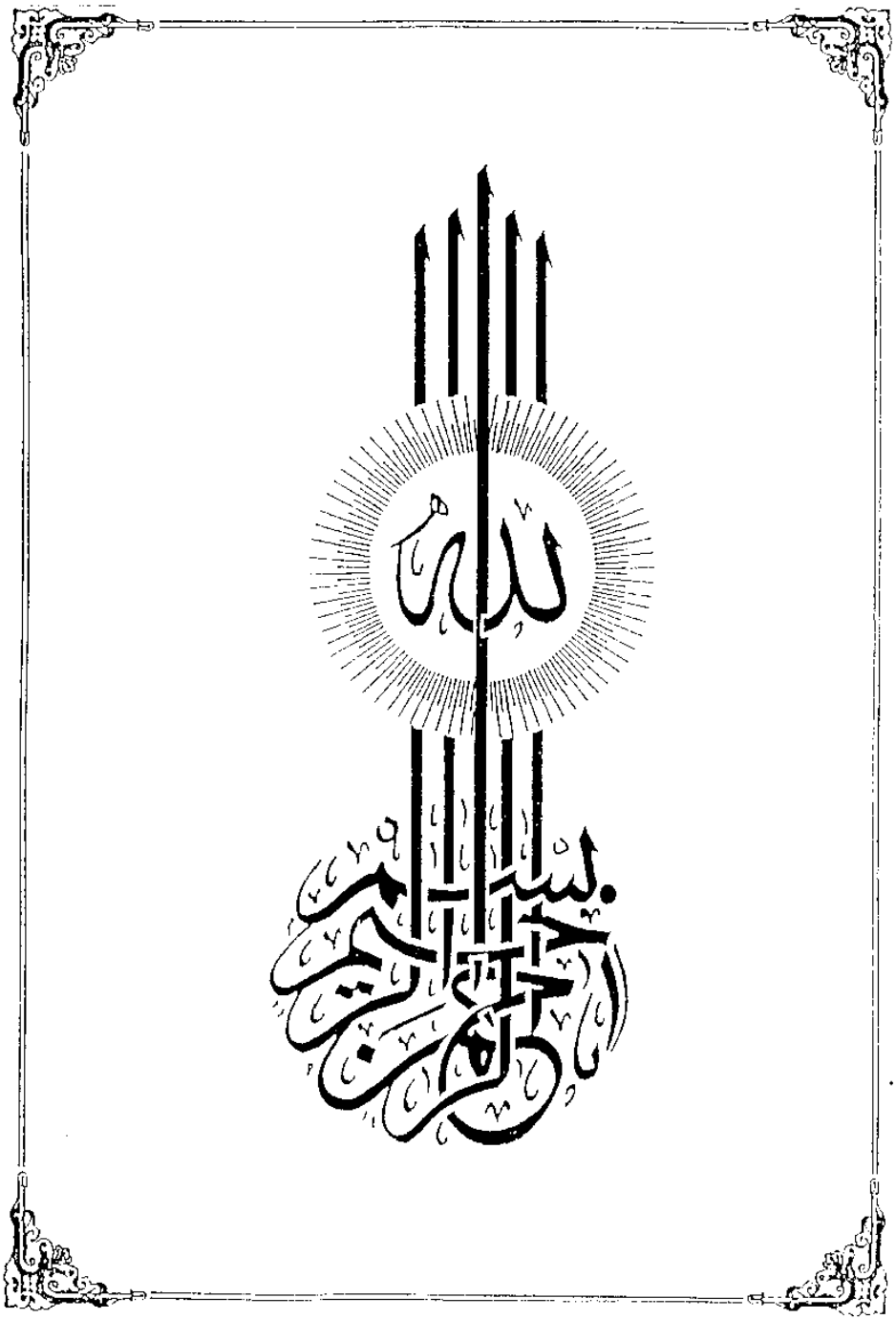
And
Assisted in supervision by

Dr. Emad-Eldin Farid Ibrahim
Lecturer of General Surgery
Faculty of Medicine
Ain Shams University

Faculty of Medicine
Ain Shams University
1995

وقل اعملوا فسيرى الله عملكم ورسوله والمؤمنون

صدق الله العظيم



ACKNOWLEDGEMENT

To start with, I would to express my thanks to ***Prof. Dr. Madbouli Emam Abdel-Aziz,*** **Prof. of General Surgery, Faculty of Medicine, Ain Shams University,** who has been a great source of ideas, support and valuable advise at every stage of the development of this essay.

I would like also to acknowledge the considerable contributions of ***Dr. Emad-Eldin Farid Ibrahim,*** **Lecturer of General Surgery, Faculty of Medicine, Ain Shams University,** for his help by giving detailed and precious ideas.

Adel Abbas.

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INTRODUCTION

Pancreatic cancer is the fifth common cause of death among the gastrointestinal neoplasms.

Although new imaging techniques have developed recently still early detection of pancreatic cancer and periampullary carcinoma is difficult.

This has been reflected on the radical surgical treatment and the survival rate.

At the same time the opinion ranged from minimal procedures as palliative by-pass operations to a radical one ex. total pancreatico-duodenectomy.

Embryology and Anatomy of Pancreas

And

Periampullary Region

DEVELOPMENT OF THE PANCREAS

The pancreas develops as two separate buds, each as an outgrowth of the duodenum at the junction of foregut and midgut **(Last, 1986)**.

The dorsal part arises in the latter half of the fourth week as a diverticulum from the dorsal wall of the duodenum; a short distance cranial to the hepatic diverticulum; growing craniodorsally in the mesogastrium. It enters that part of the dorsal mesogastrium which forms the dorsal wall of the bursa omentalis. It forms the whole of the neck, body and tail of the pancreas and a part of the head. The ventral part grows outwards from the primitive bile duct at the point where the latter opens into the duodenum. This outgrowth is at first double, but the two soon fuse, and the resulting single mass grows round the gut into the mesoduodenum, where it enlarges to form the remainder of the head of the gland (Fig. 1) **(Williams and Warwick, 1980)**.

Early in the seventh week the two parts of the pancreas meet and fuse together, and their ducts communicate. The terminal part of the accessory duct (i.e the part between the duodenum and the point of meeting of the two ducts) undergoes no or little enlargement, while the duct of the ventral part increases in size forming the terminal part of

the main duct of the gland. The ventral rudiment which produced the lower part of the head and the uncinate process and were connected at first with the bile duct, in adults drained separately by the accessory pancreatic duct. The remainder of the pancreas (upper part of the head, neck, body and tail) which was drained from an independent duct, in adults drained by the main pancreatic duct with the bile duct (Fig. 2) **(Last, 1986).**

The opening of the accessory duct into the duodenum is obliterated in 48%, and, even if it remains patent, it is probable that almost the whole of the pancreatic secretion is conveyed through the main duct **(Williams and Warwick, 1980).**

The duodenal wall grows asymmetrically; so the opening of the two ducts, originally diametrically opposite, carried around a line with each other **(Last, 1986).**

At first the body of the pancreas grows craniodorsally between the layers of the dorsal mesogastrium, in the dorsal wall of bursa omentalis. When this wall fuses with the dorsal parietal peritoneum, the gland becomes sessile on the dorsal wall of the abdomen **(Williams and Warwick, 1980).**

- **Development of alveoli and islet cells:**

First theory: The pancreatic alveoli develop by growth of cells from the terminal parts of the branching ducts. The islet cells appear to have an identical origin, but become separated from their parent ducts and undergo a complete change of secretory function **(Last, 1986)**.

Second theory: The pancreatic endocrinal cells are derived from the neural crest. Pearse's evidence for the neural crest origin of the rare tumours (pancreatic islet cell tumour) is elegant. Embryologically cells with the requisite specific immunofluorescence for vasoactive intestinal peptide, gastric inhibitory peptide, somatostatin and pancreatic polypeptide can be found in the neural crest and their migration followed their definitive location in the pancreas **(Pearse and Polak, 1971)**.

- **Congenital anomalies of the pancreas:**

There are three of the potential surgical importance:

1- Ectopic pancreas. 2- Annular pancreas.

3- Pancreas divisum.

Ectopic (Heterotropic, Dystopic, Aberrant) Pancreas:

The most common sites for nodules of aberrant pancreatic rest are on the wall of the stomach, duodenum or jejunum, 75% of nodules are in the submucosa, and the remainder are in the musculosa and subserous coat. Scattered pancreatic tissue found in Meckel's diverticulum, gallbladder, colon, spleen, liver, bile ducts, mesentery or even omentum. The pathognomonic radiological finding is a smooth, rounded or tiny umbilication even small duct may be outlined by barium. Symptoms may be abdominal pains suggesting peptic ulcer, delayed gastric emptying by pyloric lesions, gastro-intestinal haemorrhage, intussusception, and benign or malignant transformation may occur **(Moossa and Stabile, 1992)**.

Annular Pancreas:

it is a ring of pancreatic tissue, continuous with the head of the pancreas, surrounding the second part of the duodenum proximal to the ampulla of Vater. 85% of cases around 2nd part of the duodenum and the remaining 15% are scattered around the first or third part of the duodenum. The pancreatic tissue is generally attached firmly and embedded into the duodenal musculature,the proximal duodenal wall shows variable amount of hypertrophy. 50% of reported cases have manifestation in the first year of life. 60-70% shows other anomalies in association as Down's syndrome, non

rotation and incomplete rotation of the mesentery and others. Vomiting is the main symptom, may begin as soon as oral feeding started or several days later. Jaundice may be present either due to back pressure of distended duodenum on the C.B.D. or involved ampulla of Vater by oedema at level of stenosis. Radiologically, distended stomach and a "double bubble" sign at the level of duodenum may be present. About 50% presented late between age of 21 and 70, and explained due to inflammatory pancreatic disorders. The operation of choice is either duodeno-duodenostomy or duodenojejunostomy performed through the retrocolic route **(Moossa and Stabile, 1992)**.

Pancreas divisum:

The most common type of ductal anomalies. After rotation of the ventral analgen to join the main body of the pancreas, there is nonunion of the dorsal and ventral pancreatic ducts. The major ductal system of the pancreas drains into the duodenum through the minor papilla of Santorini, and the major papilla of Wirsung drains only a small portion of the pancreas (inferior part of the head and the uncinate process). It has been postulated that recurrent pancreatitis is common with pancreas divisum, especially with stenosis of the papilla of Santorini. Symptoms may be relieved when patient underwent sphinetroplasty of papilla **(Cooperman and Fromkes, 1982)**.

ANATOMY

The pancreas is a soft, lobulated, grayish-pink gland, 12-15 cm. long, extending nearly transversely across the posterior abdominal wall, behind the stomach, from the duodenum to the spleen. It passes obliquely to the left and slightly upwards in the epigastric and left hypochondrial regions **(Williams and Warwick, 1980)**.

The pancreas lies immediately behind the posterior abdominal wall peritoneum. The transverse mesocolon is attached to its anterior surface just above the inferior border, so most of gland lies in the supracolic compartment (in the lesser sac; as part of the stomach bed), with a narrow strip of its inferior border lies in the infracolic compartment **(Last, 1986)**.

The deep location explains the difficult clinical differentiation between inflammatory and tumours of the pancreas from other lesions of the stomach, transverse colon and omentum. The prevention of pancreatic lesions from extension posteriorly by resistant abdominal wall and easy extension forwards into the lesser sac makes acute inflammation of the pancreas to cause peritonitis with effusion which is at first confined to lesser sac and

if blockage of epiploic foramen occurs by inflammatory adhesions the lesion gives the picture (physical signs) of tumour **(McVay, 1984)**.

Surface anatomy; the head of the pancreas lies within the curve of the duodenum. The neck lies in the transpyloric plane, behind the pylorus. The body passes oblique to the left and slightly upwards for about 10 cm; a little above the transpyloric plane. The tail extends to the hilum of the spleen **(Williams and Warwick, 1980)**.

The pancreas consists of head, neck, body and tail, the head and tail lie back in the paravertebral gutters, while the neck and body are curved over the inferior vena cava and aorta in front of the first lumbar vertebra **(Last, 1986)**.

Relations of surgical importance:

The head: lies within the concavity of the duodenum and tends little to overlap the duodenum anteriorly and posteriorly, so the duodenum makes a gutter within the substance of the pancreas. It is relatively flat and only 2-3 cm. thick. It sends a projection from the left inferior margin behind the superior mesenteric vessels which is the *uncinate process*. It is reasonable to consider it separated from the rest of the gland as it may be removed alone in most of cases of pancreatico-duodenectomy **(Jamieson et al., 1992)**.

The posterior surface of the head is related to the inferior vena cava, terminal parts of the renal veins, right renal artery, right crus of the diaphragm, second and third lumbar vertebrae. The uncinate process passes in front of the aorta and behind the origin of the superior mesenteric vessels **(Williams and Warwick, 1980)**.

The common bile duct lies either in a groove on the upper and lateral part of the posterior surface and completely uncovered by the pancreas in 15%, but in 85% embedded completely or part of it in the pancreatic tissue. The posterior superior pancreaticoduodenal artery crosses it posteriorly. The portal vein and its formation lies posteriorly and to the left **(Jamieson et al., 1992)**.

Anteriorly; from the anterosuperior aspect, the neck jets forwards, upwards and to the left, at which a groove for the gastroduodenal artery exists. Below it is in contact with the transverse colon, only areolar tissue intervening, still lower it is covered by peritoneum continuous with the inferior layer of the transverse mesocolon and it is in contact with a coil of the jejunum **(Williams and Warwick, 1980)**.

The neck: is continuous with the upper left portion of the head overlaying the body of the second lumber vertebra.