PARASITIC AFFECTION OF THE BILE DUCTS

ESSAY

Submitted in Partial Fulfilment of the Requirement of
M.Sc. Degree
(GENERAL SURGERY)

BY

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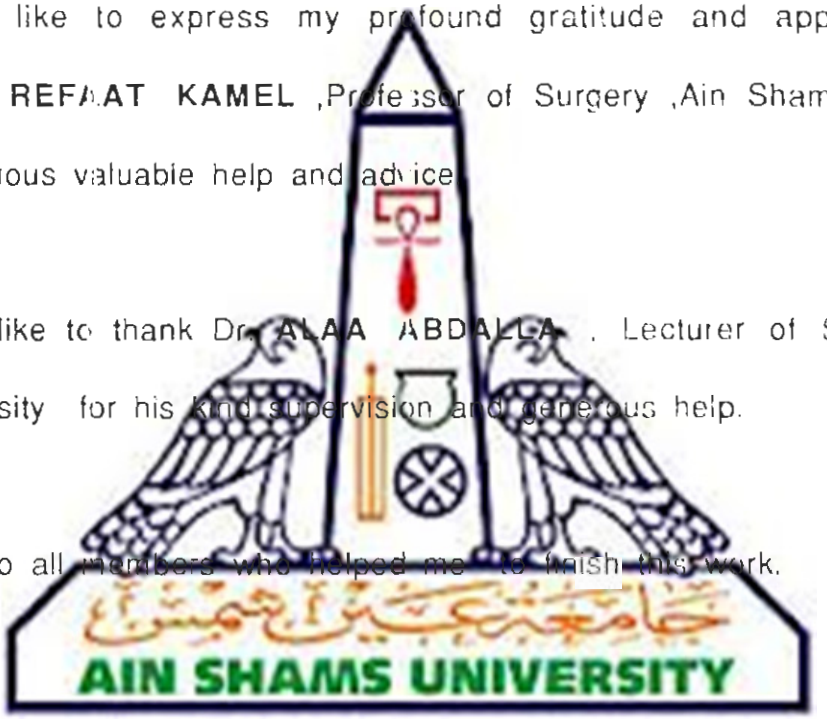
1990

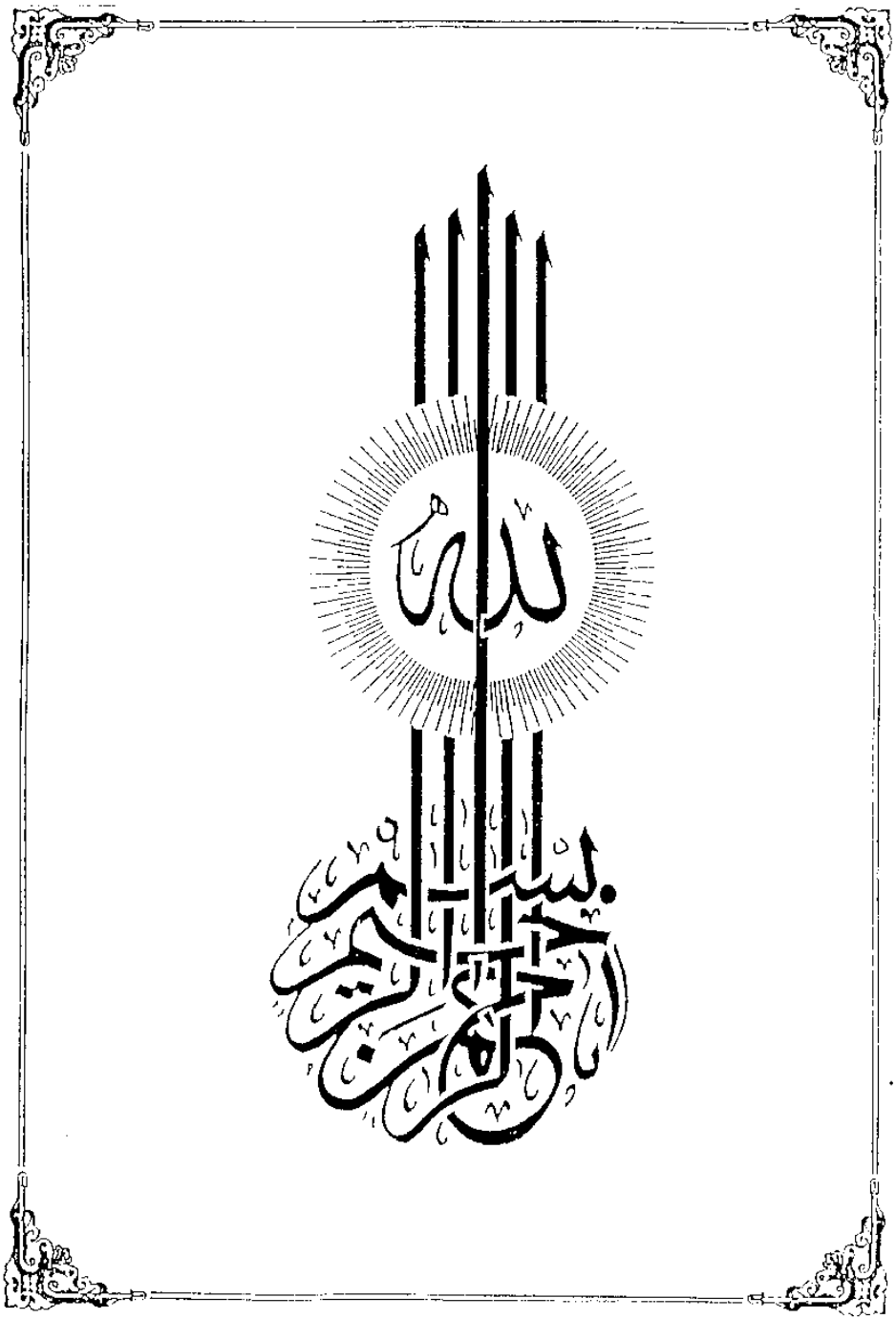
ACKNOWLEDGEMENT

I would like to express my profound gratitude and appreciation to Professor Dr. **REFAAT KAMEL** ,Professor of Surgery ,Ain Shams University for his continuous valuable help and advice.

I would like to thank Dr. **ALAA ABDALLA** , Lecturer of Surgery, Ain Shams University for his kind supervision and generous help.

Thanks to all members who helped me to finish this work.





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INTRODUCTION AND AIM OF THE WORK

Parasites are widely distributed allover the world but with special prefernce to the tropical and subtropical areas in Asia and Africa.

Owing to the increased travelling movements allover the world. Parasites can be met within our country. Egypt shares in being endemic for certain parasites.

Egyptians have been travelling to Arab Afrian and Asian countries for work and other objectives, also Egypt being cosmopolitan receives people from allover the world.

Some parasites have their own predelication to certain organs based on the life cycle of the parasites as well as sites where they found the most suitable medium of growh, any part of the body can be the site of parasitic affection, the bile ducts are not exceptions.

Parasitic affection of bile ducts have a special interst to the surgeon

as they share in the differential diagnosis of bile duct diseases as well as they may need surgical intervention.

The surgeon should be acquainted with parasitic affection and parasites of surgical importance.

The objective of this essay is to study in details parasitic affection of the biliary system.

ANATOMY OF THE BILIARY SYSTEM

Gall bladder:

The gall bladder is a pear shaped sac about 7 cm long with a normal capacity of about 30 - 50 m.L. The main par is the body which adhers to the gall bladder fossa on the visceral surface of the liver, between the quadrate and right anatomical lobes. Its lowest extremity forms an expanded end, the fundus which may or may not project below the inferior border of the liver in the region of the right ninth cortal cartilage where the outer margin of the rectus sheath meets the costal margin. At its upper end the body narrows to form the neck which inturn becomes continuous with the cystic duct. The organ is covered with peritoneum except for the surface that is in direct contact with the liver. The immediate relations of the gall bladder are; in front , the liver and anterior abdominal wall, behind, the junction of the first and second parts of the duodenum, above, the liver, below the transverse colon. The wall of the neck where it becomes the cystic duct may show a small diverticulum called Hartmann's pouch (Fig.) (Last, 1984).

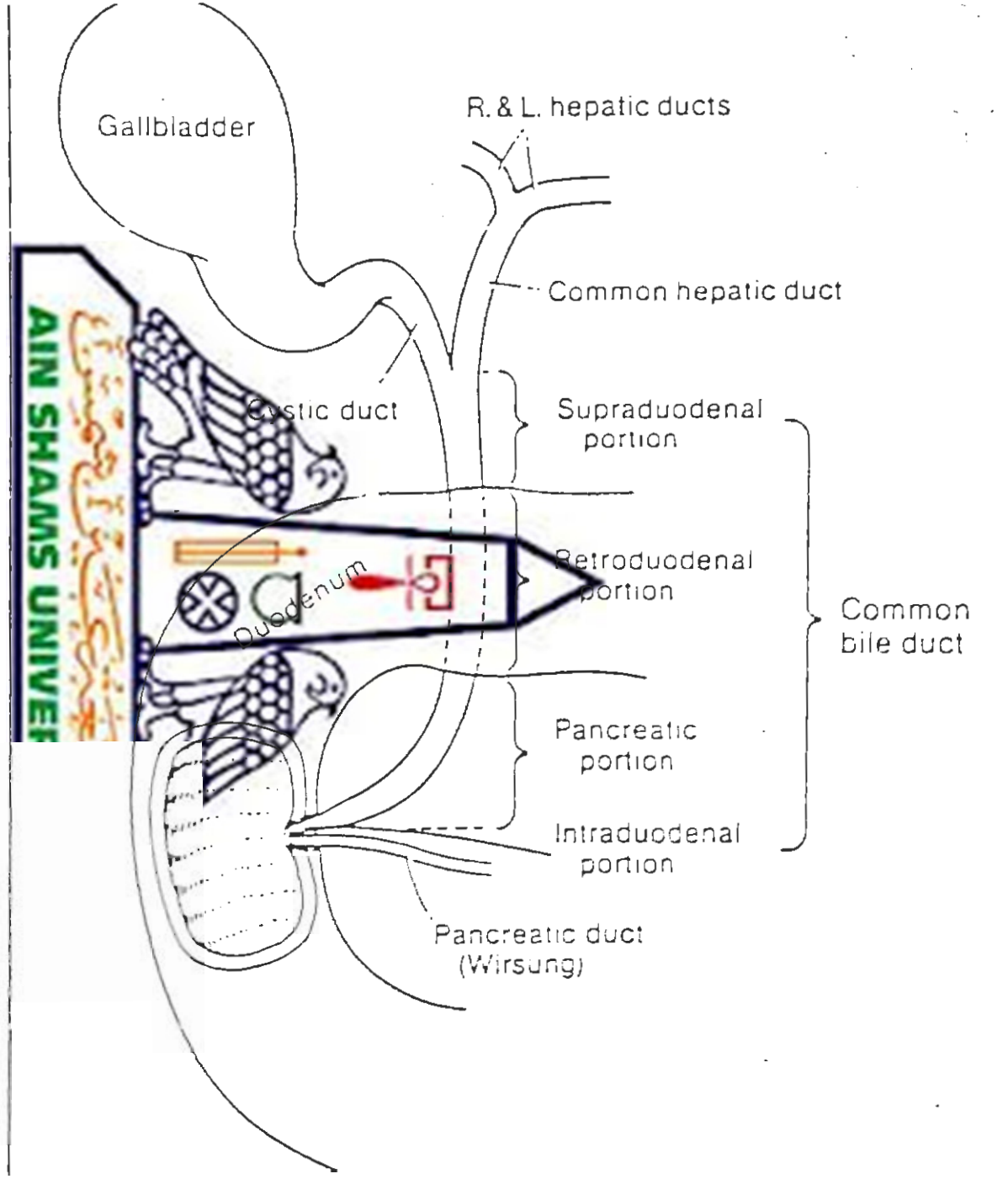


Figure (1) The extrahepatic biliary tract and the four portions of the common bile duct. (*Source: From Skandalakis JE, Gray SW, et al, 1993*)

Hepatic ducts:

The intrahepatic biliary ducts of the two left lobe segments unite to form the left hepatic duct.

The ducts from the two right lobe segments unite to form the right hepatic duct. The right and left hepatic ducts join about 1-2 cm below the porta hepatis to form the common hepatic duct. The common hepatic duct, with a length of 2-4 cm and an internal diameter of about 8 mm (2 times the hepatic duct) lies in the right free margin of the lesser omentum, towards the right and in front of the portal vein and with the hepatic artery proper on its left side (Du Plessis, 1975).

Cystic duct

The cystic duct is the continuation of the neck of the gall bladder. It is commonly about 4 cm long, with an interna diameter of 2-3 mm. It passes upwards and to the left to join the common hepatic duct about 3 cm below the porta hepatis and 1 cm above the duodenum, so forming the common bile duct. The cystic artery commonly runs behind the cystic duct (McMinn, 1981).

Bile duct :

The common bile duct is about 7-8 cm long and 0.8 cm or more wide. It is helpful to describe it as having three parts each about 2.5 cm long which might be named supraduodenal, retroduodenal and paraduodenal with a terminal and shorter fourth or intraduodenal part (McMinn, 1981).

a) Supraduodenal part : The duct lies above the duodenum in the right free border of the lesser omentum. The lesser omentum here forms the anterior boundary of the epiploic foramen. The portal vein lies behind it and the hepatic artery on its left.

b) Retroduodenal part : leaving its peritoneal covering it passes downwards behind the first part of the duodenum, with the inferior vena cava behind it and the gastroduodenal artery and portal vein on its left.

c) Paraduodenal part : continuing a downward course below the superior part of the duodenum it bends to the right, approaching the second part of the duodenum behind or within the substance of the

head of the pancreas. In the lower part of its course here it may come to lie in a groove between the duodenum and pancreas or be embedded in a tunnel of pancreatic tissue (Lytle, 1959).

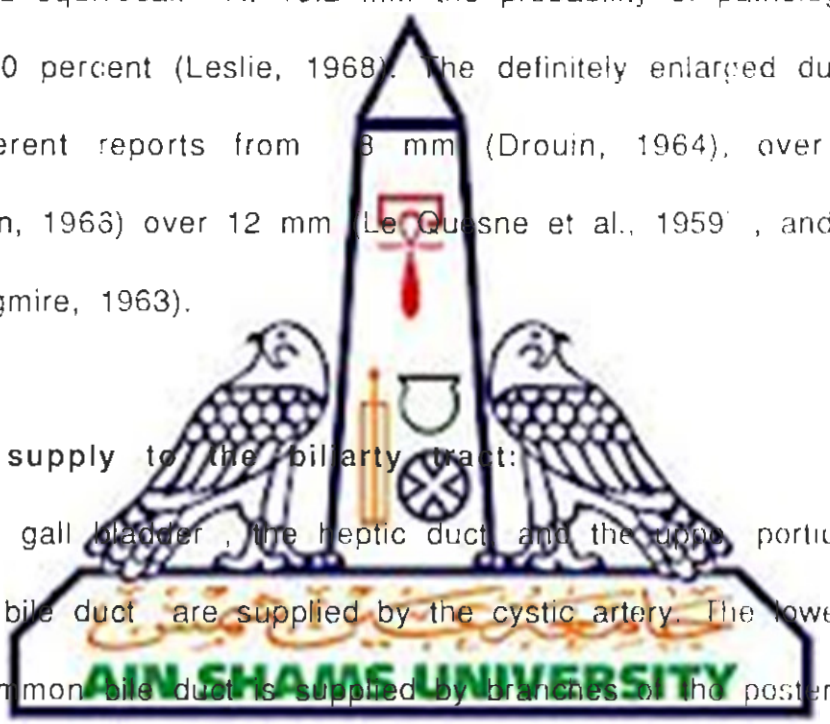
In the tunnel the lumen becomes reduced in its diameter owing to increased thickness of the wall because of the presence of muscle fibres (Sphincter of Boyden), (Hand, 1973). The right renal vein is behind the duct at this level.

d) Intraduodenal part: Finally, the duct pierces the posteromedial wall of the second part of the duodenum and runs through the wall for a few millimeters usually joining the main pancreatic duct in the hepatopancreatic ampulla (of Vater). The ampulla opens into the gut lumen on a papilla situated in the postromedial wall of the duodenum 8-10 cm from the pylorus (Last, 1984).

Diameter of the common bile duct:

Skandalakis et al. (1983,a) reported that the normal outside diameter of the first three regions of the common bile duct varies with the procedures used in measurement and subject. Mahour et al., (1976)

showed that there is slight increase in diameter of the duct with the age. Skandalkis et al. (1983,a) agree with Leslie. (1968) that a common bile duct less than 5.7 mm in diameter is certainly normal and one over 10.8 mm indicates obstruction. Ducts between these values must be considered equivocal. At 10.2 mm the probability of pathology in the duct is 50 percent (Leslie, 1968). The definitely enlarged duct varies with different reports from 8 mm (Drouin, 1964), over 10 mm (Partington, 1963) over 12 mm (Le Quesne et al., 1959) , and over 15 mm (Longmire, 1963).



Arterial supply to the biliarty tract:

The gall bladder , the heptic duct and the upper portion of the common, bile duct are supplied by the cystic artery. The lower portion of the common bile duct is supplied by branches of the posterosuperior pancreatico-duodenl and retroduodenal arteries.

There may be a small contribution from twigs of the right hepatic artery (Shapiro and Robillard, 1948) (Park et al. 1963) have described a subepithelial, an intramural, and an epicholedocal plexus of vessels around the common bile duct these provide collateral circulation between the cystic artery above and the superior pancreatico-duodenal artery below.

Venous drainage of the biliary tract

The cystic veins are numerous and minute. Those from the hepatic surface pass through the gall bladder bed to enter the quadrate lobe of the liver. Veins under the peritoneal surface may reach the neck of the gall bladder and enter the quadrate lobe directly or by way of a plexus around the bile ducts, these veins entering the liver open into the hepatic veins not the portal veins (Parin et al. 1962). Veins from the lower part of the common bile duct drain into the portal vein (Shapiro and Robillard, 1948). A cystic vein running from the neck of the gall bladder into the portal vein is usually present (Last, 1978).

Lymphatic drainage of the biliary tract

Collecting lymphatic trunks from the left side of the gall bladder drain into the cystic node which lies at the junction of the cystic and common hepatic ducts from the right side the collecting ducts enter the node at the hiatus and posterior pancreatico-duodenal nodes. These lymph node, also receive efferent vessels from the cystic lymph node. The pericholdochal nodes receive lymphatic from the extra-hepatic bile ducts and from the right lobe of the liver the drainage from these nodes passes to the preaortic nodes around the coeliac trunk and the origin of the superior mesenteric artery (Skandalakis , 1983,b). Fig (2).

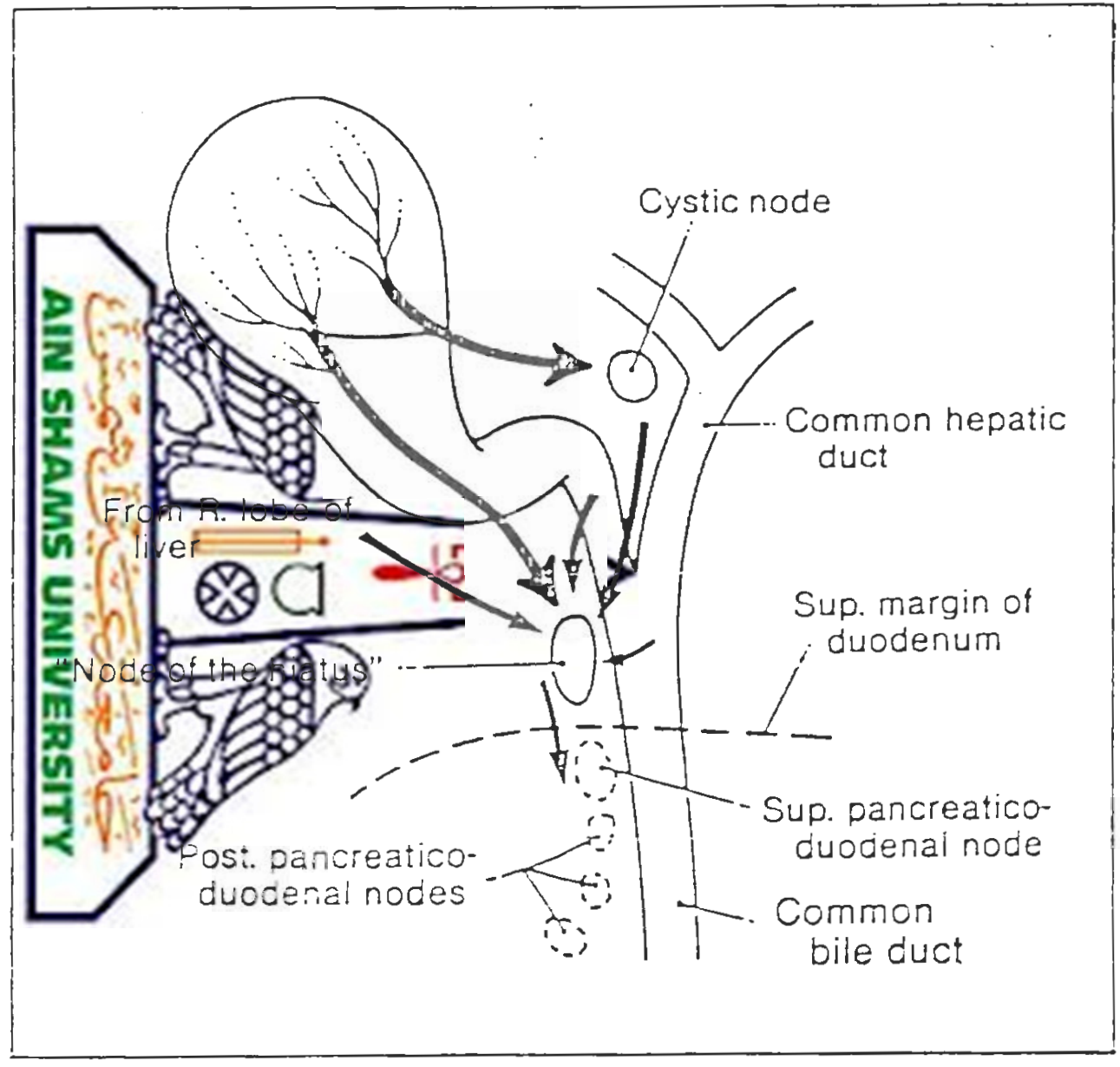


Figure (2). Lymphatic drainage of the biliary tract. The cystic node and the node of the hiatus are relatively constant. Drainage from the gallbladder, the cystic duct, and the right lobe of the liver reaches the posterior pancreaticoduodenal nodes. (*Source: From Skandalakis JE, Gray SW, et al, 1983*)

Nerves of the biliary tree:

Both sympathetic and parasympathetic fibres derived from the coeliac plexus reach the biliary tract, follow the hepatic artery and its branches the action of the sympathetic nerves is probably vasomotor, while that of the parasympathetic is not clear (Skandalakis, 1983,b). Complete vagatomy appears to result in a permanently enlarged gall bladder (Rudick and Hutchinson, 1964).

Burnett et al. (1964) suggested that there is an intrensic innervation containing ganglion cells that responc to humoral stimuli. Pain from the gall bladder may be referred to the right subscapular region by way of the greater splanchnic nerve and the coeliac plexus to the somatic nerves or by way of efferent fibres of the coeliac plexus. The phrenice plexus, and the right phrenic nerve (Skandalakis et al., 1983,b).

The cholecystohepatic triangle:

It is formed by the cystic duct and gall bladder below, the right lobe of the liver above, and the common hepatic duct medially. The triangle (Fig.3) was described by Calot, (1891) and its upper boundary was the cystic artery. But now the lower border of the right lobe of liver forms its upper boundary (Rocko et al., 1981).