MALIGNANT TUMOURS OF THE LIVER

Essay

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BY

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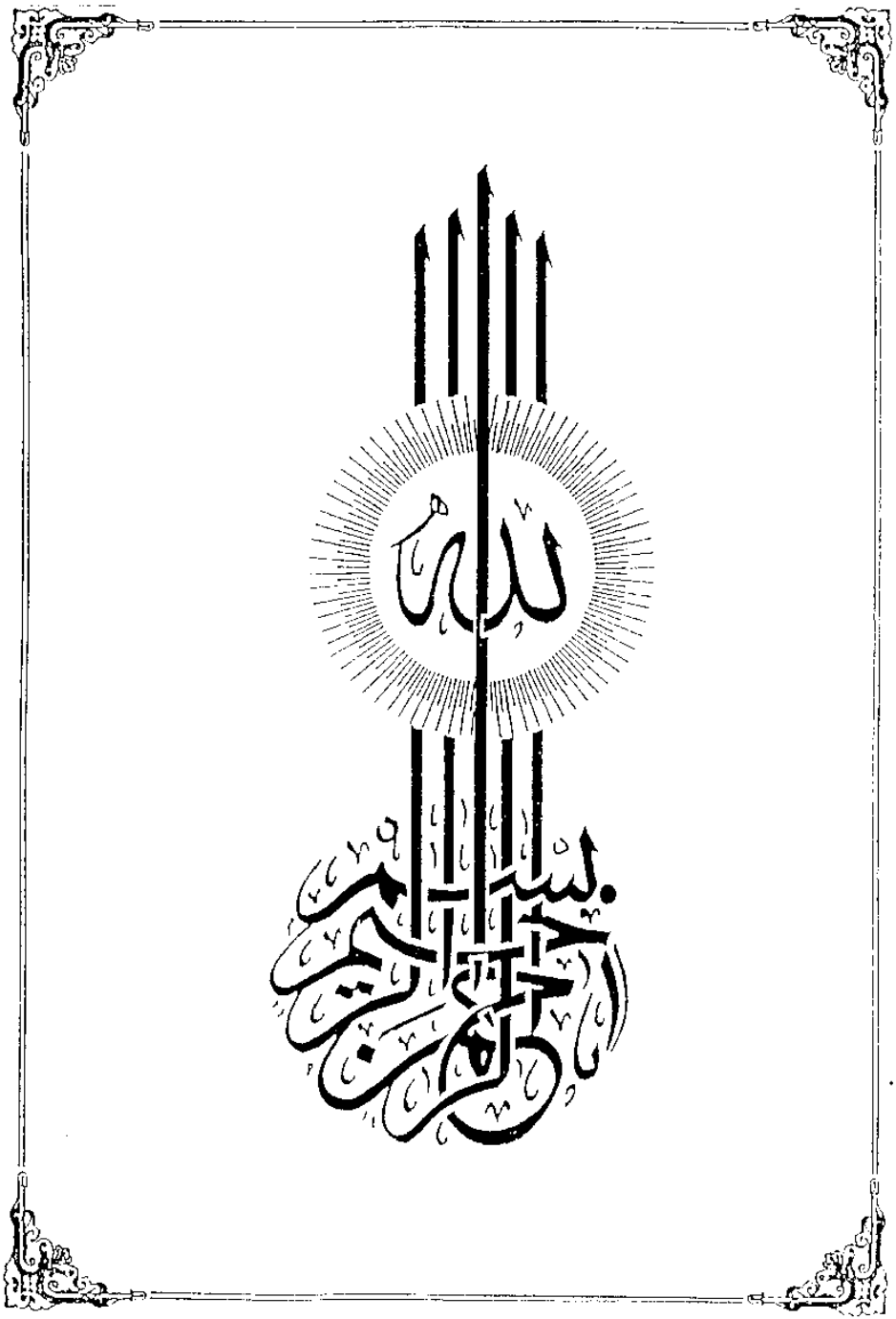

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INTRODUCTION

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Malignant tumors of the liver is a common problem, and still a major challenge for the surgeon. It's incidence of recognition is relatively increased.

Recently it was found that the liver is the seat of many primary malignant tumor and that it is the main organ in which metastases are deposited.

In this review surgical anatomy of the liver and normal physiology will be discussed. The aetiology, predisposing factors, clinical picture and the diagnostic tools of investigation will be reviewed. In addition treatment of malignant tumor of the liver will be discussed.

REVIEW OF SURGICAL ANATOMY AND PHYSIOLOGY

Development of The Liver:

The liver devlops by proliferation of cells from the blind ends of a Y shaped diverticulum which grows from the ventral surface of the foregut into the septum transversium. The cranial part of the septum transversium become the pericardium and diaphragm. The caudal part becomes the ventral mesogastrium, and it is into this that the liver grows. At this stage the caudal part of the septum transversium transmits the vitelline veins which, by numerous anastmosis, form a rich venous plexus there (Last, 1984).

Gross Anatomy of The Liver:

The liver (Hepar), the largest gland in the body, is situated in upper and right parts of the abdominal cavity, occupying almost the whole of the right hypochondrium, the greater part of epigastrium, and extending in left hypochondrium as for as the left lateral line (Rouiller, 1963). The liver is sheltered by the ribs in right upper quadrant. It is shaped like a pyramid whose apex reach the xiphsternum. The upper border lies approximately at the level of the nipple (Sherlock, 1985).

Peritoneal Connection of The Liver :

With the exception of an extensive, triangular area on the posterior surface of the right lobe, the fossa for the inferior vena cava and the fossa for the gall bladder, the

liver is almost completely invested with peritonium. It is connected to the stomach, the duodenum, the diaphragm and to the anterior abdominal wall by a number of peritoneal folds, and the lines along which they meet the organ are also necessarily devoid of peritoneal covering. These folds include the falciform ligament, the right and left triangular ligament, the coronary ligament and the lesser omentum (Gray's 1973).

The falciform ligament which attaches the liver to the anterior abdominal wall from the diaphragm to the umbilicus and incorporates in its deep border the ligamentum teres hepatis with the obliterated umbilical vein. The anterior and posterior right and left coronary ligaments are contineous with the falciform ligament, connecting the diaphragm to the liver. The lateral aspect of the anterior and posterior coronary ligament form the triangular ligament (Meyers, 1986a).

The lesser omentum arises from the edges of porta hepatis and fissure for ligamentum venosum and passes to the lesser curvature of the stomach (Snell, 1981).

The ligamentum venosum, a slender remnant of the ductus venosus of the foetus, arises from the left branch of the portal vein and fuses with the inferior vena cava at the enterance of the left hepatic vein.

The ligamentum teres, a remnant of umbilical vein of the foetus, runs in the free edge of the falciform ligament from the umbilicus to the inferior border of the liver and joins the left branch of the portal vein, Small veins accompanying it connect the portal vein with veins around the umblicus. These become prominent when the portal system is obstructed in side the liver (Sherlock, 1985).

Lobes and Surfaces of The Liver :

There are two anatomical lobes. The right being about six times the size of the left. Lesser segments of the right lobes are the Quadrate lobe, on its inferior surface, and caudate lobe on the posterior surface. The right and left lobes are separted anteriorly by the falciform ligament, inferiorly by the fissure for ligamentum teres, and posteriorly by the fissure for ligamentum venosum (Sherlock, 1985).

The liver has only two surfaces, diaphragmatic and visceral.

The visceral surface flat, slopes down to the right and forwards.

The diaphragmatic surface is boldly convex, moulded to the diaphragm (Last, 1984). The greater part of this surface lies under cover of the ribs and costal cartilags and is in contact with the diaphragm which seperate it from the pleura, lungs, pericardium and heart (Snell, 1981).

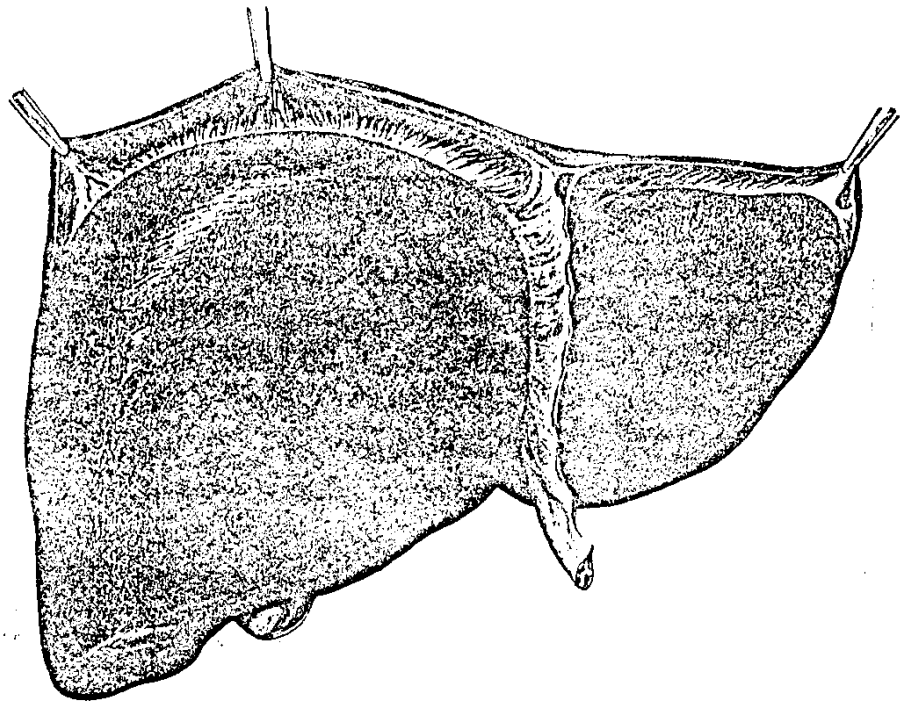

Fig. (1): Ligaments of the liver viewed antieriorly. On the right is the upper layer of the right coronary ligament. On the left is the left coronary ligament, which ends as the left triangular ligament. In the midline lies the falciform ligament, the free margin of which contains the ligamentum teres. Most of convex superior surface is illustrated ending in a sharp inferior margin. (Gray, 1973).

Relation :

The visceral surface is moulded to the adjacent viscera, and is therefore irregular in shape. It lies in contact with the duodenum, right colic flexure, right kidney, right adrenal gland and gall bladder (Snell, 1981).

The left labe show anteriorly a concavity imprented by the anterior wall of the stomach, while behind and above there is a convexity called the tuber omentale. This, above the lesser curvature, touch through lesser omentum a similar convexity on the neck of the pancreas. To the left of the tuber omentale above the gastric area the oesophagus sometimes leaves a shallow groove. The quadrate lobe slopes down in contact with the lesser omentum, the pyloric end of the stomach and, below this, the gastro-Colic omentum. The caudate lobe lies at the upper limit of the lesser sac, not of the visceral surface but in contact with the peritoneum on the diaphragm immediately above the aortic orifice (in front of thoracic aorta, to the left of the abdominal inferior vena cava). The right lobe is indented posteriorly by the upper pole of the right kidney, and in front of this lies in contact with the right colic (hepatic) flexure (Last 1984).

The quadrate lobe is the rectangular projection on the visceral surface of the liver bounded by the fissure of

ligamentum teres on the left, the gall bladder fossa on the right and the portal triad posteriorly. The caudate lobe is the posterior projection of the liver, bounded on the left by the fissure of the posterior extension of the falciform ligament, the ligamentum venosum, and on the right, by the groove for the inferior vena cava (Meyers, 1986a).

The caudate lobe lies on the diaphragmatic surface and is joined by an isthmus of the liver to the right lobe. The isthmus is called the candate process; it lies at the upper limit of the epiploic foramen, between the porta hepatis and the groove for the inferior vena cava (Last, 1984).

The porta hepatis is found on this surface between the quadrate lobe in front and the caudate process behind. It is a deep fissure rans transversely between the upper ends of the fissure for the ligamentum teres and the fossa for the gall bladder. Through the porta hepatis the portal vein the hepatic artery proper and the hepatic plexus of nerves enter the liver, and the right and left hepatic ducts and some lymph ressels emerge. The hepatic ducts are situated anteriorly, the portal vein and its right and left branches posteriorly and the hepatic artery proper and its right and left branches are intermediate in position (Gray, 1973).

Bile Ducts :

The intrahepatic distribution of the bile ducts closely follows the hepatic arterioles and the portal venules in the portal trids. The small ducts unite to form segmental ducts which join to form the lober ducts. The right hepatic duct formed by the union of the anterior and posterior segmental ducts near the hilus is about 0.9 cm long. The confluence of the ducts from segment II, III and IV forms the left hepatic duct, which courses from the left to right over the base of the quadrate lobe superior to the left branch of the portal vein but covered with hilar peritoneum. The left and right lobar ducts join in the transverse fissure to form the common hepatic duct, which is very variable in lenght but average 2.5 cm. There are many variations in the anatomy of the extra hepatic bile ducts (Moody et al., 1986). The right and left hepatic ducts form the common hepatic duct in the porta hepatis, where the latter lies anteriorly in relation to other structure in this area. The common hepatic duct then descends a variable distance in the lateral portion of the hepatoduodenal ligament and is joined by the cystic duct coming in from the right side at a variable angle. These two ducts (the common hepatic on the left and the cystic to the right) and the liver above form the cystohepatic triangle of Calot, where the cystic and right hepatic arteries as well as aberrant segmental right hepatic ducts

and arteries, are frequently found. The common hepatic duct avarages about 4 cm in length but varies considerably, depending upon the point of union with the cystic duct, which usually occurs 2.5 cm above the upper border of the duodenum. The common bile duct descends along the right margin of the hepatoduodenal ligament to the right of hepatic artery and anterior to the portal vein. This supraduodenal portion continues beyond the first portion of the duodenum as a retroperitoneal portion (Schwartz, 1985). At the left side of the second part of the duodenum the bile duct comes into contact with pancreatic duct and accompanies it into the wall of this part of the gut, and there the two ducts usually unite to form the hepatopancreatic ampulla; the distal, constricted end of this ampulla opens into the descending part of the duodenum on the summit of the major duodenal papilla situated about 8-10 cm from the pylorus (Gray's 1973).

Nerve Sapply :

The nerve supply of the liver is derived from the sympathetic and vagus nerves by way of the coeliac plexus. The left vagus gives rise to a large hepatic branch which passes directly to the liver (Snell, 1981).

Lymphatic drainage :

Between the liver cell plates and the sinusoid, tissues spases (Peri sinusoidal space of Disse) through which fluid