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C.T. IN LIVER DISEASES OF ADULTS

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INTRODUCTION
AND
AIM OF WORK

INTRODUCTION AND AIM OF THE WORK
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Liver troubles are usually more or less, common complaint among the Egyptians. So the accurate diagnosis of liver diseases is very essential for the strategy of the treatment.

Since the introduction of computed tomography in the early 70'S, it has become the diagnostic procedure of choice for hepatic diseases as it can detect early and small lesions of the liver up to 0.5 cm in diameter.

The aim of the work is to study the role of C.T. in detection of various diseases of the liver of adults. All of the cases included in this study are examined clinically and radiologically by plain X-ray and ultrasound and also subjected for laboratory investigations. Ultrasonography of the liver is of good value in diagnosis of liver diseases but it may show some fallacies especially in cases where the lesions are smaller in size, deeply seated or retrocostal in position.

Hence, C.T. is co-helpfull in accurate diagnosis of liver diseases side-by side with the clinical and laboratory investigations.

EMBRYOLOGY

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EMBRYOLOGY OF THE LIVER

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The premordium of the liver is first visible as a ~~flat plate of endodermal cells~~ early in the fourth week of foetal life.

Firstly, the hepatic bud begins to grow into the hepatic mesenchyme which stimulates the developing endodermal cords to form the hepatic cells. At the same time, the mesenchymal cells stimulated by the endodermal hepatocytes differentiate into the endothelial cells of the liver sinusoids.

The original diverticulum arises from the ventral side of the archentron. The diverticulum itself produces two outpocketings, one for the pancreas while the other forms the cystic duct and the gall bladder. The unexpanded portion of the diverticulum becomes the extrahepatic portion of the hepatic duct. From this terminal portion continued cell proliferation produces masses of cells that constitutes the premordium of liver parenchyma. (Gray and Skandalakis, 1972).

At the fifth week of foetal life, the liver begins to bulge out and becomes a true abdominal organ lying within the mesentery. Although intrahepatic ducts have been said to form from extensions of extrahepatic duct epithelium (Bloom, 1926), the present view is that they differentiate from hepatic cells and subsequently

join the extrahepatic duct system. The intrahepatic ducts begin to appear in the region of the hilus and spread peripherally. The duct system is essentially complete by the tenth week. By the ninth week, the liver represents 10 percent of the body volume, it subsequently decreases in size especially during the last two months of gestation, until at birth it represents only 5 percent of body volume. (Elias, 1955).

ANATOMY

ANATOMY OF THE LIVER =====

The liver is the largest organ in the body. It is a dark brown, highly vascular soft organ which is easily torn in abdominal injuries.

It normally occupies the right hypochondrium, most of the epigastrium and part of the left hypochondrium. It weighs approximately 1.0 - 2.0 Kilograms and about one-fiftieth of the total body weight in the adults, it is usually larger in males than in females.

Its antero-posterior diameter averages 10 - 12.5 cm, from the area adjacent to the anterior abdominal wall to its rounded posterior surface. Its transverse diameter measures 20 - 22.5 cm, from the right pericolic gutter to the midportion of the left leaf of the diaphragm. The vertical measurement of the liver averages 14.5 - 17.5 cm, taken from the anterior-inferior edge to the top of the dome of the right lobe of the liver.

The right and left lobes are distinctly unequal in size, the right lobe normally being approximately six times the size of the left. However, considerable variation does exist, the most important variation being an unusual small or absent left lobe.

The greater part of the liver lies under cover of the ribs and costal cartilages, and in contact with the diaphragm which separates it from the pleural cavity and lungs.

The liver ascends to the level of the fifth rib in the midclavicular line, filling the right ~~dome~~ of the diaphragm and part of the left dome (Glefand, 1980).

Fissures of the liver:

On the visceral and posterior parts of the diaphragmatic surface, a deep fissure extends almost vertically from the attachment of the falciform ligament at the inferior margin, to the groove for the oesophagus at the junction of the posterior and superior parts of the diaphragmatic surface(Fig.1).

The fissure lodges the ligamentum teres of the liver to the left of the quadrate lobe; the superior part contains the ligamentum venosum, has the upper part of the lesser omentum attached in its depth and lies to the left of the quadrate lobe. This fissure marks the separation of the liver into right and left lobes. It passes through the left extremity of a short transverse fissure, the porta hepatis.

At the porta hepatis the two layers of the peritoneum of the lesser omentum leave the fissure and pass to the right around the structures in the porta hepatis - branches of the hepatic artery and portal veins, the hepatic ducts, nerves and lymph nodes and vessels -, to meet in the free edge at the neck of the gall bladder.

The porta hepatis separates the quadrate lobe antero-inferiorly from the quadrate lobe superiorly, and the right border of these two lobes are formed, respectively, by the gall bladder in its fossa, and the inferior vena cava in its sulcus. The latter doesn't form a complete right margin to

the quadrate lobe, a small strip of which extends to the right between the inferior vena cava and the porta hepatis, the quadrate process.

The ligamentum teres and the ligamentum venosum are remnants of the left umbilical vein and the ductus venosus of the foetus respectively, and both join the left branch of the portal vein at the porta hepatis (Cunningham's, 1975).

Surfaces of the liver:

The liver basically has two surfaces, the superior or diaphragmatic surface and the inferior or the visceral surface. The superior surface forms a broad dome which is anatomically rather simple. The inferior surface is relatively flat or slightly concave, with complete anatomic features. It also has ridges and indentations caused by the imprints of adjacent abdominal organs.

The superior surface of the liver is rather uniformly convex, generally conforming to the shape of the inferior surface of the diaphragm. The major landmark of the superior surface is the falciform ligament.

All of the liver to the right of the falciform ligament constitutes the right lobe, which contains the vast majority of liver substances. The smaller left lobe lies to the left of the falciform ligament.

The inferior surface is most often slightly concave,

facing downwards, posteriorly and to the left. It is divided into several distinct areas. The major portion of the inferior surface is comprised of the right lobe, which is that portion lying to the right of the fissures of the ligamentum teres and the ligamentum venosum, which in combination, are known as the sagittal groove. There are two smaller subdivisions on the inferior surface of the right lobe referred to as lobes, the quadrate lobe lies anteriorly and centrally between the fissure of ligamentum teres, the fossa of the gall bladder, and the portal structures. The quadrate lobe lies posteriorly between the inferior vena cava and the fissure for the ligamentum venosum. The remaining largest portion of the inferior surface of the right lobe lies to the right of the gall bladder and inferior vena cava. The left lobe consists of all the inferior surface lying to the left of the fissures of ligamentum teres and ligamentum venosum (Glefand, 1980).

Organs related to the liver:

Most of the important organs lying in relation to the liver are adjacent to its inferior surface. These produce impressions or shallow fossae on the inferior surface.

Anteriorly beneath the right lobe, lies the hepatic flexure of the colon. Directly posterior to the hepatic flexure lies the right kidney, which forms a prominent impression on the posterior aspect of the inferior surface.

Medial to these two large structures lie the gall bladder anteriorly and the duodenum in a slightly more posterior position.