

**ROLE OF ULTRASONOGRAPHY IN
THE DIAGNOSIS OF BILHARZIAL HEPATIC LESIONS**

Thesis

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TO MY PARENTS



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Introduction and aim of work

Introduction And Aim Of Work :

The introduction of ultrasound as a non invasive diagnostic technique was a revolutionary step in soft tissue imaging as it gives information that were unobtainable by the conventional non invasivs radiological techeniques. Ultrasound also adds information about a lesion that has already been detected by palpation, radiographic or other imaging techeniques. Ultrasound has the advantages of differentiating between solid and cystic masses,determination of the depth of a lesion from the surface, and giving the dimensions of a space occupying lesion.

There is no organ so easily accesible to sonographic examination as the liver. Ultrasonography of the liver has gained a great deal of interest owing to the ease, simplicity and low cost of such techenique. Conventional readiography is not the right investigation for the liver owing to the poor resolution and inability to study the liver substance itself.

C.T scanning gives excellent anatomic resolution and tissue characterization of the liver ,while radionuclide imaging provides functional images and related quantitative informations .

However ,both techeniques are more expensive than ultrasonography.

P.T.C.,ERCP and hepatic or portal angiography are more invasive techeniques.Accordingly,ultrasonography is becoming the imaging investigation of first choice due to the facts that it is the least invasive,easiest and least expensive. The need for further investigations comes as a second step following liver sonography,and such

imaging studies may be extended up to liver biopsy which can be done under sonographic guidance .

Many works have been published to show up the value of ultrasonography in various focal or diffuse liver diseases . However hepatic schistosomiasis , a national problem in Egypt ,still needs extended researchs to evaluate the role of ultrasonography in the detection, staging or predicting the disease prognosis and perhaps also monitoring the response to various modes of therapy. Therefore, the aim of this work is to try to highlight the role of ultrasonography in patients with hepatic schistosomiasis as well as to study the limitation of the technique.

Anatomy

Gross Anatomy Of The Liver

The liver is the largest organ in the body. It lies mostly within the right hypochondrium but also occupies part of the epigastrium and often extends into the left hypochondrium. The organ has the shape of an irregular hemisphere. Its convex parietal surface is directed superiorly, anteriorly, and to the right.

The somewhat concave visceral surface faces inferiorly, posteriorly, and to the left. The parietal surface of the liver is closely related to the diaphragm and ribs, which occasionally produce shallow indentations in the hepatic contour. A slight depression on the superior surface corresponds to the diaphragmatic aspect of the heart.

Anteriorly the parietal surface is penetrated by a vertical fissure that contains the falciform ligament (Fig.1). The round ligament of the liver, which represents the remains of the umbilical vein, lies in the free edge of the falciform ligament.

There are several features of anatomical interest on the visceral surface of the liver. The porta hepatis is a transverse fissure through which the major branches of the portal veins, hepatic artery, and bile duct enter or leave the liver. Longitudinal fissures or fossae are located to either side of the porta hepatis (Fig.1). On the left the fissure for the round ligament extends from the anterior surface of the liver to the porta hepatis. This

cleft continues posteriorly as a fissure for the venous ligament . on the right the gallbladder lies in an anterior fossa , and the inferior vena cava is deeply embedded in a posterior fossa . Other impressions on the visceral surface of the liver accommodate the upper pole of the right kidney , the hepatic flexure of the colon , and the fundus of the stomach .

(Fig.2) (Deimer ,E, 1979.)

LOBAR ANATOMY :

According to the traditional anatomical system , which is based on external landmarks , the liver is considered to have four lobes : right , left , quadrate and caudate .

1. Right lobe :

The right lobe is the largest of the four lobes . It is larger than the left lobe by the ratio 6:1 .It occupies the right hypochondrium and is bordered on its upper surface by the falciform ligament On its posterior by the left sagittal fossa, and in front by the umbilical notch . Its inferior and posterior surface are marked by three fossae , the porta hepatis, the gall bladder fossa and inferior vena cava fossa. A congenital anomaly, Riedl's lobe can sometimes be seen as an anterior downwards projection of the right lobe and may extend to the iliac crest (hagen- Ansert, 1983.)

2. Left lobe :

This lobe lies in the epigastric and left hypochondrium .its upper

surface is convex and molded onto the diaphragm . Its undersurface includes the gastric impression and omental tuberosity.

3. Caudate lobe :

This small lobe is situated in the postero superior surface of right lobe opposite the tenth and eleventh thoracic vertebrae.

It is bounded below by the porta hepatis, on the right by the fossa for the inferior vena cava , and on the left by the fossa for the venous duct .

4. Quadrate lobe :

This lobe is oblong and situated in the postero inferior surface of the right lobe. In front it is bounded by the anterior margin of the liver, behind by the porta hepatis, on the right by the fossa for gall bladder ,and on the left by fossa for the umbilical vein .
(Hagen- Ansert 1983).

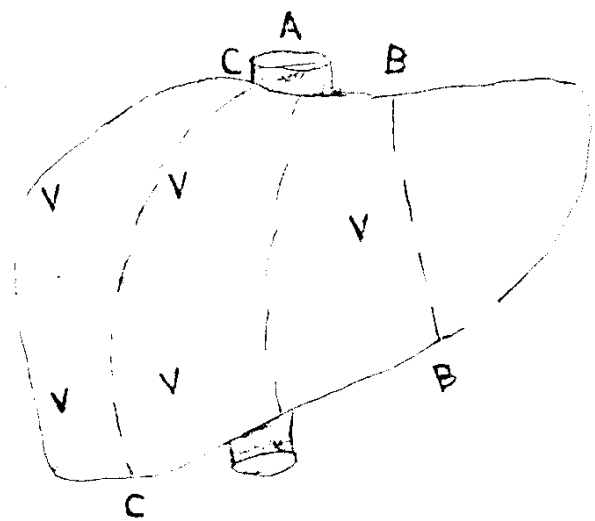
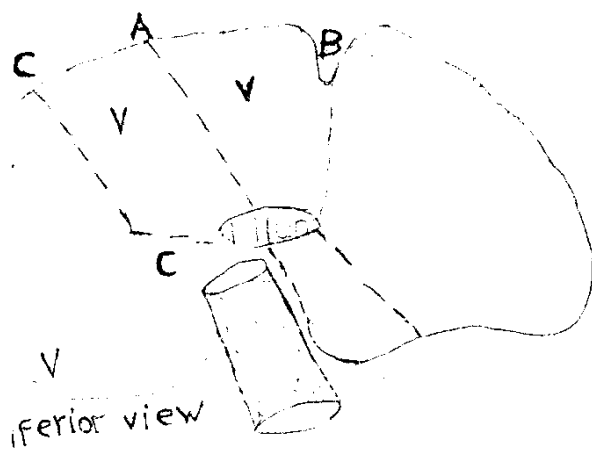
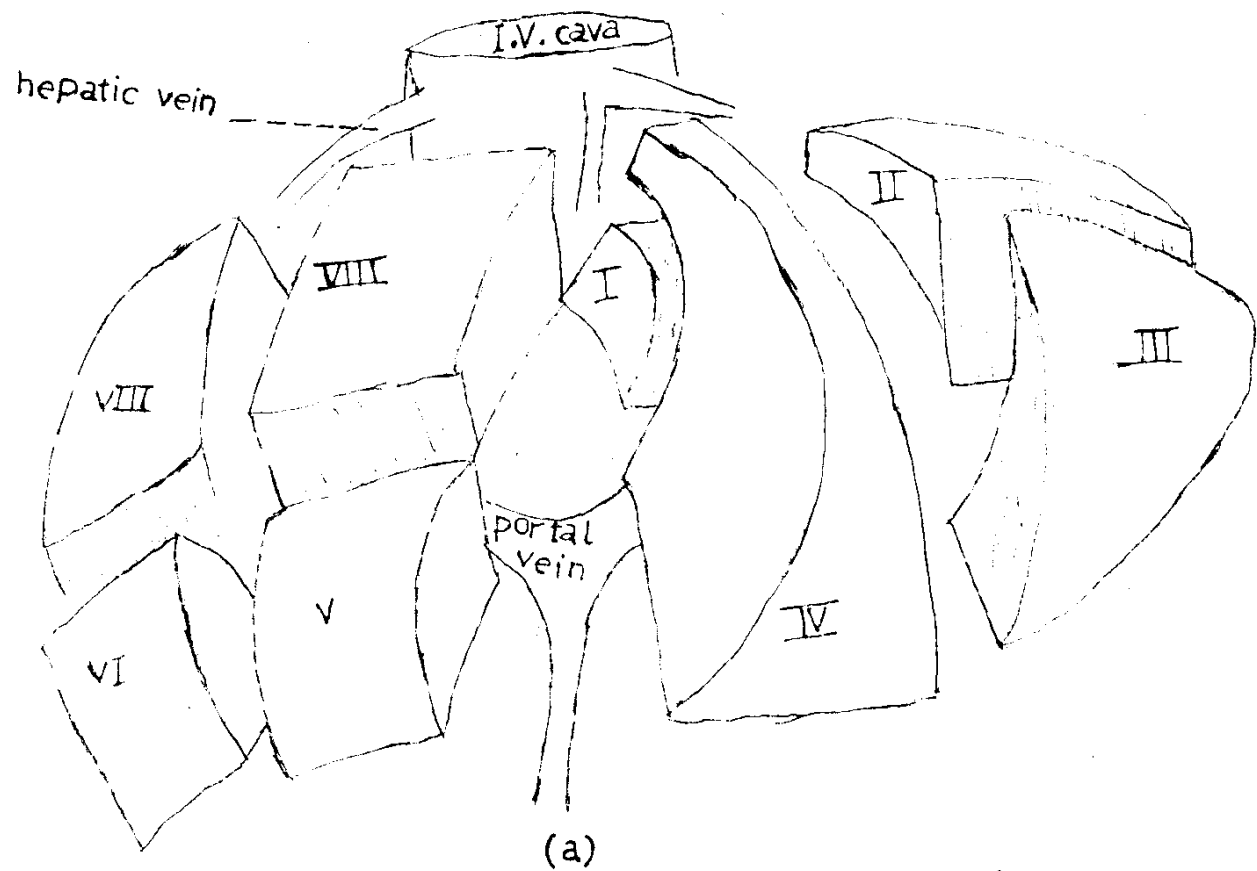
S E G M E N T A L A N A T O M Y

Because of the surgical and angiographic importance of the vascular and ductal anatomy of the liver ,A newer system of lobar designation based on the intra hepatic distribution of vessels and ducts . has gained wide acceptance (Michels , 1966- Kidd ,1979.)

Physiological lobes , are also recognised as right and left lobes separated by a physiological fissure that extends in an oblique plan from the gall bladder fossa posteriorly to the groove of the inferior vena cava superiory. No surface markings indicate the physiological fissure (Michels ,1986- Kidd ,1979.)

The physiological divisions of the liver follow the anatomical distribution of the hepatic arteries ,bile ducts ,and portal vein. The physiological fissure is occupied by the middle hepatic vein ,no significant branches of the bile ducts, hepatic arteries, or portal vein cross the main lobar fissure, hence it is relatively safe plane for surgical resection of the liver. The physiological or surgical right and left lobes are each subdivided by fissures into 2 segment as indiceted in Fig ---> 3.

An oblique right segmental fissure divides the right lobe into an anterior, and a posterior segments.It runs from a posterior superior position inferiorly and anteriorly to the hilum . A left segmental fissure divides the left lobe into a medial and lateral segments the left segmental fissure lies in the plane where the falciform ligament is attached to the pareital surface and is in line with the ligamentum venosus on the visceral surface.



C. Antero-superior view.

A...A =Main lobar fissure.
 B...B =segmental fissure .
 C...C =segmental fissure .

Fig 3 a,b,c: Hepatic segmentation (After PALAU,1980.)