ROLE OF ULTRASOUND IN DIAGNOSIS OF CYSTIC LIVER DISEASES

Essay

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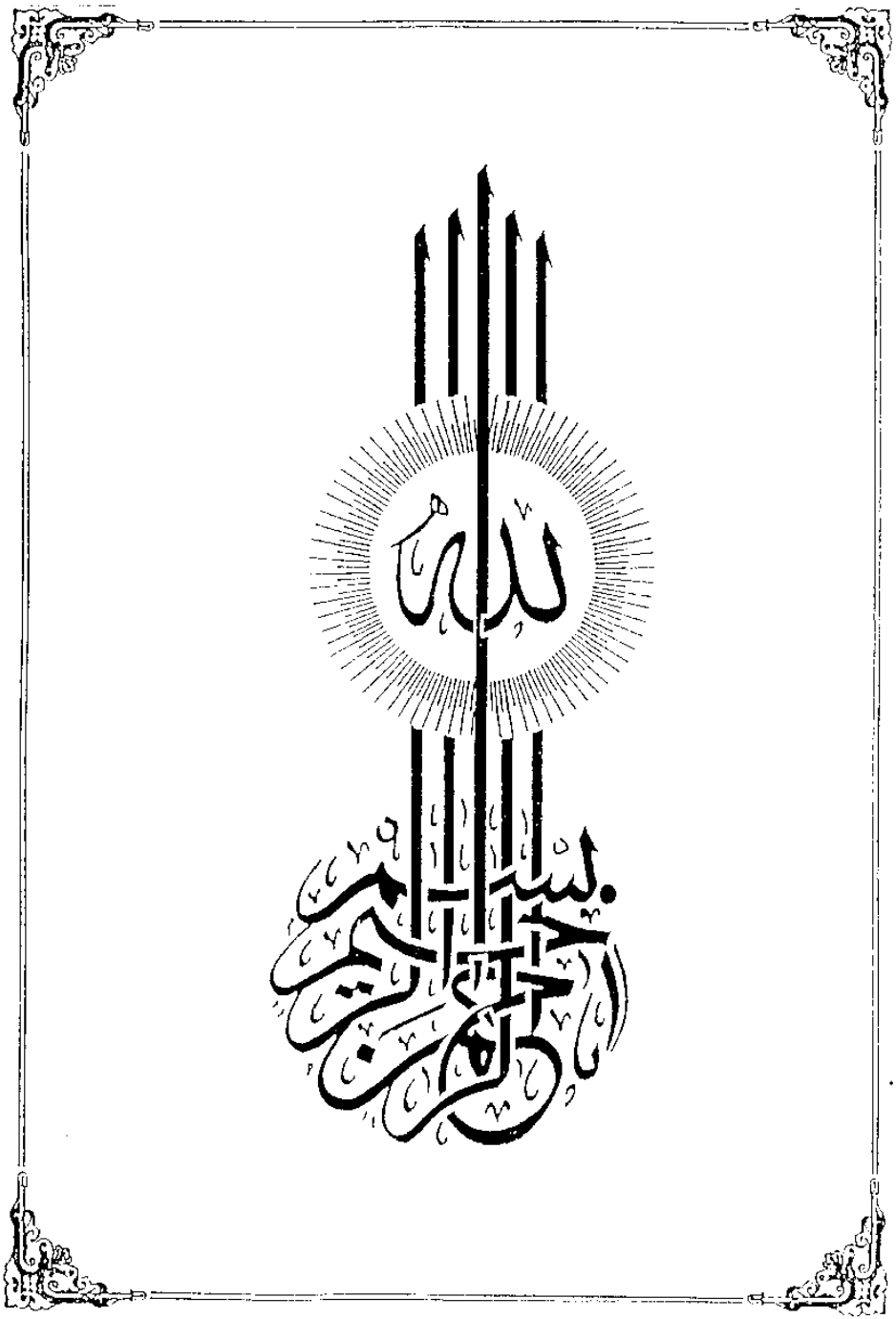
Dedication

I would like to dedicate
this study to
my beloved family especially
my father , my mother ,
my brother and my sister .



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Introduction and Aim of the Work

Cystic liver diseases are either congenital as simple cysts , caroli disease and polycystic hepato renal disease , or Traumatic as Traumatic hepatic haematoma , or Infective as pyogenic liver abscess , amaebic liver abscess and hydatid cyst of the liver , or lastly Malignant as necrosis of liver metastases .

Each one of the previously mentioned cystic liver diseases has its own characters by which we can diagnosis it .

Accordingly the aim of the work is to use ultrasound to diagnose and differentiate between the previously mentioned cystic diseases .

Anatomy of the Liver

Anatomy of the liver

The liver is the largest gland in the body , it is responsible for : -

1) Metabolizing the products of digestion which reach it through the portal vein principally degradation products of proteins and carbohydrates .

2) The storage and release of substances (principally glucose) so as to maintain a constant level in the blood ; and .

3) The synthesis , conjugation and transformation of substances (e.g. formation of proteins , detoxication of poisonous substances , production of carbohydrate from proteins) ***(G.J. Romanes , 1976)*** .

All these are endocrine functions which alter the composition of the blood traversing the liver but it also has exocrine or secretory function which is formation of bile .

Bile is an important agent in digestion , especially of fats . It is secreted into the bile capillaries by the liver cells , and contains many substances , the most obvious of which are the bile pigments . These pigments are formed from the

waste products of red cell destruction which reach the liver from the spleen through the portal vein . Such products accumulate in the blood stream (Jaundice) when the liver cells are damage by disease and can no longer process them or are over whelmed by the amount of them in excessive red cell destruction . Jaundice can also arise from blockage of the biliary tract which prevent , excretion of the liver products .

The greater part of the liver lies under cover of the ribs and costal cartilages , and is in contact with the diaphragm which separates it from the pericardium and from the right pleural cavity and lung . Note that the liver ascends to the level of the fifth rib in the right mid clavicular line , filling this dome of the diaphragm and part of the left dome anterior to the stomach . The right lobe of the liver is separated from the costo.diaphragmatic recess of the pleura by the diaphragm , but posteriorly the upper part of the right kidney and suprarenal gland intervene between the liver and diaphragm .

The liver is a soft , dark brown , highly vascular organ which is readily torn in abdominal injuries . It is approximately 2 percent of the body weight in adults but is proportionately larger (5 % of body weight) in new born .

The shape of the liver is determined by the surrounding organs , but once fixed in situ , it retains the shape of a blunt wedge with its rounded base to the right . The liver has two surfaces .

1) The diaphragmatic surface is divisible into superior , anterior , right and posterior parts , which together form curved surface applied to the diaphragm .

2) The postero-inferior or visceral surface is distinctly separated from the posterior part of the diaphragmatic surface , but slopes down wards , forwards and to the right from it to meet its right and anterior parts at a sharp inferior margin ***(G.J Romanes , 1976) .***

Fissures of the Liver

A deep fissure extends almost vertically across the visceral surface and posterior part of the diaphragmatic surface . This fissure separates the left lobe of the liver from the caudate lobe inferiorly . Near its middle , the fissure is continuous with a short transverse fissure (portahepatis) , which extends to the right between the caudate and quadrate lobes.

The inferior half of the vertical fissure contains the ligamentum teres of the liver (fissure for ligamentum teres) ; the superior half has the upper part of the lesser omentum attached in its depth , where the ligamentum venosum lies (fissure for ligamentum venosum) superiorly . The layers of the peritoneum of the lesser omentum pass from the fissure directly on to the oesophagus which grooves the liver at this point ; inferiorly , they extend to the right to surround the portahepatis and form the free edge of the lesser omentum at the neck of the gall bladder and enclose the branches of the hepatic artery and portal vein and the hepatic and cystic ducts (Fig. 1) ***(Gray's , 1992)*** .

The right margins of the caudate and quadrate lobes are separated from right lobe of the liver respectively by the inferior vena cava in its sulcus and the gall bladder in its fossa . The inferior vena cava does not form a complete right margin for the caudate lobe .

Inferiorly a small strip of the lobe (caudate process) extends to the right between the inferior vena cava and the portal vein in the porta hepatis .
This caudate process forms the upper wall of the epiploic foramen and unites the caudate and right lobes of the liver

(Fig. 1) . The ligamentum teres and the ligamentum venosum are fibrous remenants of the left umbilical vein and the ductus , venosus of the foetus respectively . These are continuous with each other , and unite with the left branch of the portal vein at the porta hepatis .

In the foetus , the ductus venosus is a bypass through which oxygenated umbilical venous blood passes directly to the inferior vena cava and the right atrium without traversing the liver . It curves to the right at the upper border of the caudate lobe to join the inferior vena cava . It is larger in the early foetus , but become relatively smaller in the later stages when more umbilical blood traverses the liver ***(G.J Romanes , 1976)*** .

Surfaces of the Liver

The right part of the diaphragmatic surface lies between the seventh and eleventh ribs in the midaxillary line . The diaphragm separates it from the pleura down to the tenth rib, and from the lung down to the eighth rib in quite respiration .

The anterior part of the diaphragmatic surface is triangular . A considerable part of it is in contact with the anterior abdominal wall between the right and left costal margins ,