MANAGEMENT OF HEPATOCELLULAR CARCINOMA

THESIS

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in
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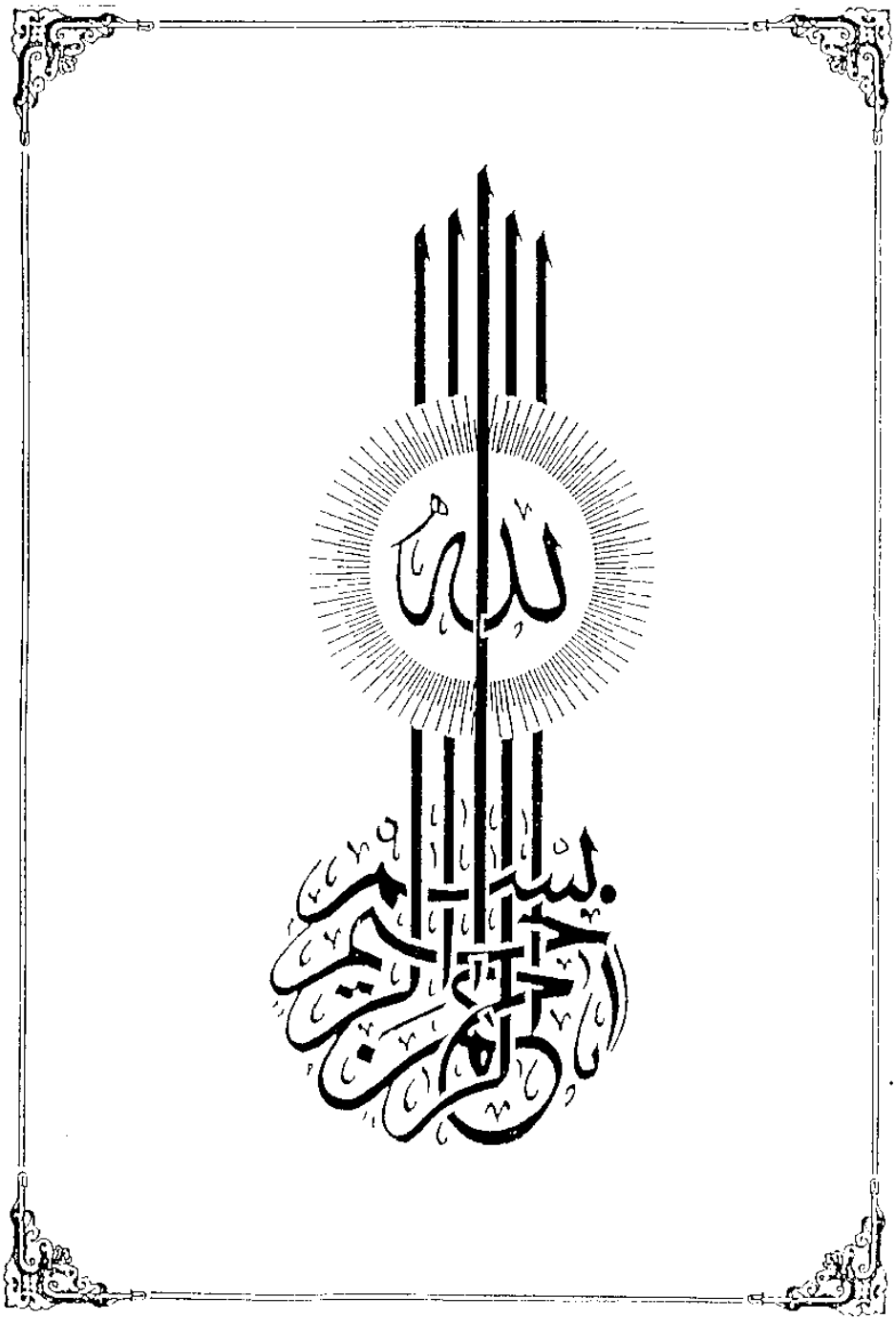
1990

TO THE MEMORY OF

MY FATHER

MAY GOD BLESS HIS SOUL



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- Introduction:

Patients with malignant liver tumors usually have poor prognosis (Carter, 1982). The 3rd National Cancer Survey (1969-1971) revealed that primary liver cancer constituted only 0.7 % of all cancer in man in the United States (Ackerman and del Regato, 1977). However, it is among the most common visceral cancers affecting males in many regions of Africa and the Far East (Haskell, 1982).

In Egypt, liver neoplasms represent 1.5 % in males, and 1.6 % of all cancer in females (Cancer Registry of the Metropolitan Cairo Area, 1970-1985).

The management of hepatocellular carcinoma by the delivery of chemotherapeutic agents directly to the liver was pioneered by Klopp (1985) and later popularized by Sullivan and Zurek (1965). Anderson et al (1972) reported complete disappearance of hepatic malignancy with this regional therapy. Hepatic artery infusion affords a high concentration of the drug in the tumor estimated to be 5 to 20 times greater than that in the surrounding normal hepatic tissue (Haskell, 1982).

Another new approach to the treatment of hepatocellular carcinoma by US guided percutaneous injection of ethanol

into the tumor, has been reported by Livraghi et al (1988). The results have been good with this approach especially in lesions smaller than 3 cm (Livraghi et al. 1986).

- Aim of The Work:

The aim of the work is to study the control rate of hepatocellular carcinoma by the delivery of ethanol and chemotherapeutic agents (Doxorubicin) directly to the liver compared to control rate obtained by systemic chemotherapy and radiotherapy.

REVIEW OF LITERATURE

ANATOMY

The liver is the largest gland in the body. It has two important functions:

A) The metabolic function is concerned with the metabolism of the products of digestion especially proteins and carbohydrates, storage and release of substances (principally glucose) and the synthesis and transformation of other various substances (Romanes, 1986).

B) The exocrine or secretory function i.e. the formation of bile which is important in digestion, especially of fats.

The liver anatomy can be described according to different aspects: namely the morphological, the functional, the real and the microscopical anatomy (Bismuth, 1986).

I- Morphological Anatomy:

The liver is a large solid organ which normally weighs about 1500 gm. It is roughly wedge-shaped and mostly lies in the upper right portion of the abdominal cavity although the thin end of the wedge extends across to the left (Hall-Craggs, 1985).

The greater part of the liver is situated under cover of the ribs and costal cartilages and is in contact with the diaphragm which separates it from the pleura, lungs, peri-

cardium and heart. The convex upper surface of the liver is molded to the under surface of the domes of the diaphragm (Snell, 1981).

- Surfaces:

The liver presents diaphragmatic and visceral surfaces. The diaphragmatic surface, smooth and convex, is separated infront and below from the visceral surface by the sharp inferior border. The visceral surface faces downwards, backwards and to the left. It is related to the right colic flexure, right kidney, duodenum and stomach. The visceral surface presents an H-shaped series of grooves. The limbs of the H are: (1) the fissure for ligamentum teres, which contains that ligament (obliterated left umbilical vein), (2) the fissure for ligamentum venosum, which contains that ligament (obliterated ductus venosus), (3) the fossa for gall bladder, which contains that organ, and (4) the sulcus for the vena cava, which lodges the inferior vena cava. The cross-bar of the H is the porta hepatis (O'Rahilly, 1983).

- The Porta Hepatis:

The porta hepatis is a deep fissure on the visceral surface of the liver. It is here that the left and the right branches of the hepatic artery and portal vein enter the liver and the right and left hepatic ducts leave to form the

common hepatic duct. The anterior and posterior layers of the lesser omentum are reflected around the lips of the fissure and it is in the free border of this ligament that these vessels and duct travel (Hall-Craggs, 1985).

- Lobes of The Liver:

The liver can be divided into right and left lobes along the left-hand limb of the H and by the attachment of the falciform ligament on the diaphragmatic surface (O'Rahilly, 1983). The visceral surface from the sharp lower border to the porta hepatis, between ligamentum teres and gall bladder, is named the quadrate lobe. The visceral surface behind the porta hepatis, enclosed by the ligamentum venosum and its attached lesser omentum, is named the caudate lobe. It is joined by an ismuth of liver surface to the right lobe. The ismuth is called the caudate process, it lies at the upper limit of the epiploic foramen, between the porta hepatis and the groove for inferior vena cava (Last, 1984). (Fig. 1).

- Ligaments of The Liver:

The falciform ligament is a thin, sickle-shaped antero-posterior fold consisting of two opposing layers of peritoneum. One of its three borders is attached to, and reflected over the anterior surface of the liver. Another

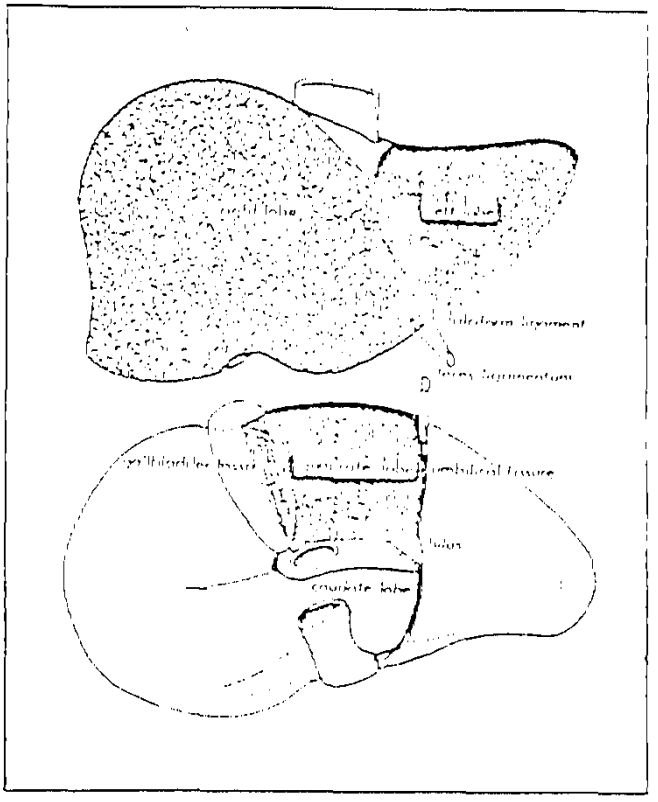

Figure (1) Morphologic aspect of the liver.

border is attached to, and reflected over the diaphragm and the anterior abdominal wall to the level of the umbilicus, while the third inferior border is free and encloses the ligamentum teres. At the upper extent of the border of the falciform ligament attaching to the anterior surface of the liver, the peritoneal layers diverge laterally and reflect onto the diphragm. The right reflection forms the anterior layer of the coronary ligament, which passes laterally to bend at the right triangular ligament, where it becomes the posterior layer of the coronary ligament. The peritoneum forming the coronary ligament reflects from the liver onto the diphragm to enclose an area devoid of peritoneum. Here the liver is in direct contact with the diphragm and is designated as the "bare area". The left divergence of the falciform ligament, the left triangular ligament, reflects onto the left lobe corresponding to, and continuous posteriorly with the posterior layer of the coronary ligament. The two folds of peritoneum composing this left divergence are not widely separated (Christensen and Telford, 1982).

II- Functional Anatomy:

The study of the functional anatomy of the liver permits the representation of a hepatic segmentation based upon the distribution of the hepatic pedicles and the