HEPATOBILIARY INJURIES

ESSAY

SUBMITTED FOR PARTIAL FULFILMENT

OF THE MASTER DEGREE

IN GENERAL SURGERY

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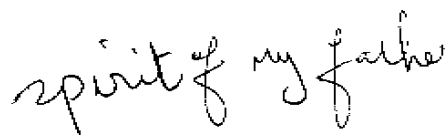
AIN SHAMS UNIVERSITY

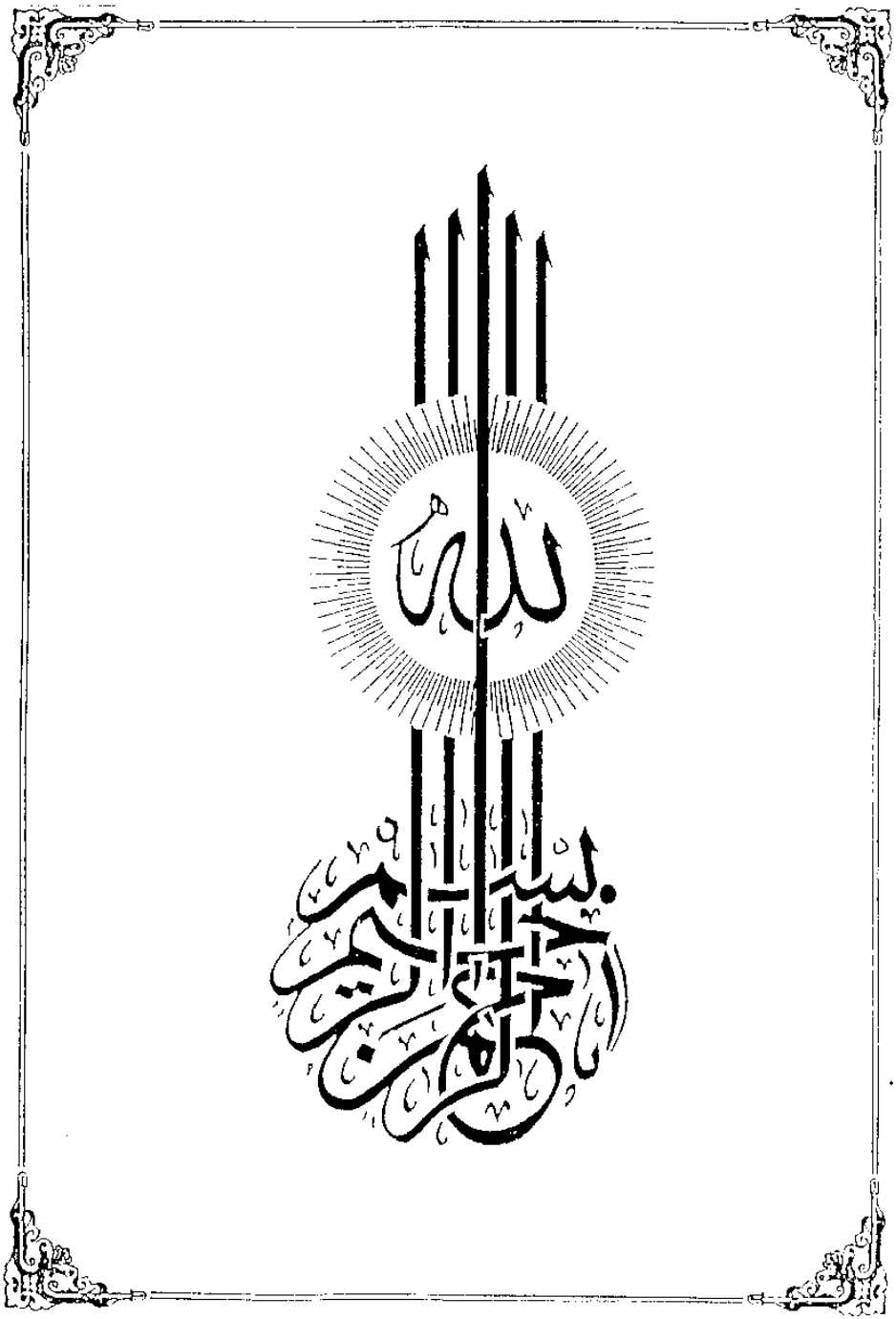
1992

TO MY MOTHER

AND

SPIRIT OF MY FATHER





ACKNOWLEDGEMENT

THANKS GOD.

I would like to express my sincere gratitude and heart-falt thanks to Prof. Dr. RAFIK RAMSIS MORCOS, Professor of Surgery, Ain Shams University, to whom I am greately indebted for his valuable guidance, expert assistance and fruitful criticism. This study could not have been done without his constant help.

I wish thank Dr. SALAH MOHAMED EL KORDY, consultant and head of department of surgery, Matariah teaching Hospital, for his valuable guidance and endless encouragement for performing and completing this work.

Words are not enough to express my profound thanks to Dr. AHMED ABD EL AZIZ ABOU ZEID, lecturer in surgery, Ain Shams University, for his continuous supervision and advice. His knowledge and perception have a significant impact on the work.

A. SAEB

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Hepatic injuries are commonly encountered in patients with abdominal trauma. (Feliciano, 1990).

However, traumatic injuries of the biliary tract are relatively rare, though iatrogenic injuries are possible sequelae of biliary surgery. (Andern-Sandberg et al., 1985).

In recent years, several diagnostic tools are available for diagnosis of hepatobiliary injuries such as computed tomography, radionuclide scanning and magnetic resonance imaging (MRI).

In addition, there has been overwhelming advance in hepatic surgery which enabled the surgeons to deal with the worst injuries (Cue et al., 1990).

So, the aim of this essay is to review the literature pertaining to different methods of resuscitation and evaluation, diagnosis and treatment of hepatobiliary injuries.

SURGICAL ANATOMY OF THE LIVER AND BILIARY SYSTEM

SURGICAL ANATOMY OF THE LIVER AND BILIARY TRACT

THE LIVER

The abdominal surgeon is able and willing to resect almost any structure in the abdomen except the liver. So, the understanding of the surgical anatomy of the liver is essential for successfull mangement of hepatic injuries (Ger,1989).

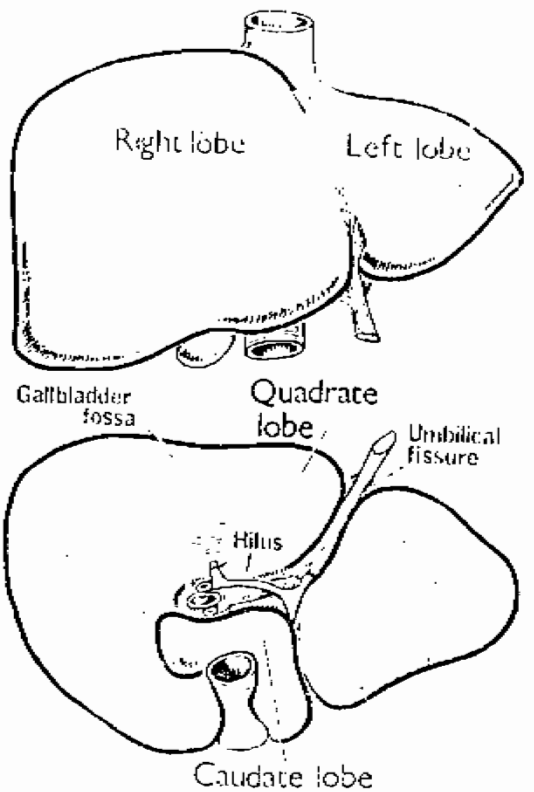
The liver is wedge shaped mass, with the base to the right and the apex to the left. It is covered by fibrous capsule called Glisson's capsule that extends into the parenchyma along the blood vessels and bile ducts (Ger, 1989).

MORPHOLOGICAL ANATOMY

The liver principally shows two main lobes and two main surfaces (Fig. 1).

The Lobes of the Liver :

The liver, as it appears at laparotomy, is divided by the porto-umblical fissure and falicform ligament into two main lobes which are the right (with its caudate and quadrate lobes) and the left (Bismuth, 1982).



(1) : Morphological aspect of the liver

The surfaces of the liver :

(1) The superior surface (diaphragmatic surface): is molded to the diaphragm and reaches to the fifth rib on the right side and the fifth space on the left. Above the diapharagm lie the lung and pleura on each side with the pericardium in between. The right lateral margin is separated by the diaphragm from the right lung and pleura as far as the eighth and tenth ribs respectively.

(2) The posterior and inferior surface (visceral surface) : merge into each other and are seen by elevating the anterior margin. The inferior concave surface present a prominant parta hepatis for the passage of major vessles and bile ducts. This surface is related to the following structure, from the right to the left, upper half of the right kidney and suprarenal gland posteriorly, with the hepatic flexure of the colon and the junction of the first and second parts of the duodenum anteriorly. Passing leftword, the liver is in contact with the inferior vena cava, the oesophagus and proximal stomach. (Ger, 1989).

The posterior surface is largely extraperitoneal and lies in contact with the retrohepatic inferior vena cava, the upper pole of the kidney and right suprarenal gland this bare area is enclosed by the leaves of the coronary ligament

and access of this area only be obtained by division of these ligaments. (Ger, 1989).

Ligaments of the liver :

(1) The falciform ligament, which attaches the liver to the anterior abdominal wall from the diaphragm to the umbilicus and incorporates in its deep boarder the ligamentum teres.

(2) The anterior and posterior right and left coronary ligaments, which are continous with the falciform ligament connecting the diaphragm to the liver. The area encompassed by the falciform, coronary and triangular ligament, inferior vena cava and diaphragm defines the bare area of the liver.

(3) Gastrohepatic and hepatoduodenal ligaments, which are continous with the left triangular ligaments containing the hepatic artery, portal vein and common bile duct. It forms the anterior boundery of the epiploic foramen of winslow (Meyers, 1986).

Four peritoneal folds (the falciform, coronary and two triangular ligaments) suspend the liver from the anterior abdominal wall and the diaphragm. The ligamentum teres (round ligament) is not really a ligament but a fibrous cord resulting from obliteration of the left umbilical vein. Simoilarly, the ligamentum venosum is the firbous remnant of

the ductus venous that connect the left branch of the portal vein and the left hepatic vein near its junction with the inferior vena cava. The position of the liver is maintained by the fibrous fixation of the bare area, and to a major degree, by the attchment of the hepatic veins to the inferior vena cava. (Ger, 1989).

LOBAR AND SEGMENTAL ANATOMY

Lobar anatomy :

The liver is divided into two lobes or hemilivers by the main portal fissure (Scissura), which is also called cantlie's line. The main portal fissure describes a 75 degree angle with a horizontal plane and extends from the anterior - inferior gallbladder fossa postero-superiorly to the left side of the inferior vena cava. Adjacent to the main portal fissure there is a right and left paramedian sectors. Lateral to each of these there is a fissure, which is variable and without antatomical bounderies, separating the paramedian sector from the distal sector known as the right and left larteral sectors (Fig. 2).

The left lobe of the liver consists of hepatic to the left of the falciform ligament plus the quadrate and caudate lobes. The right hepatic lobe consists of the remaining hepatic tissue. (Fig. 3).

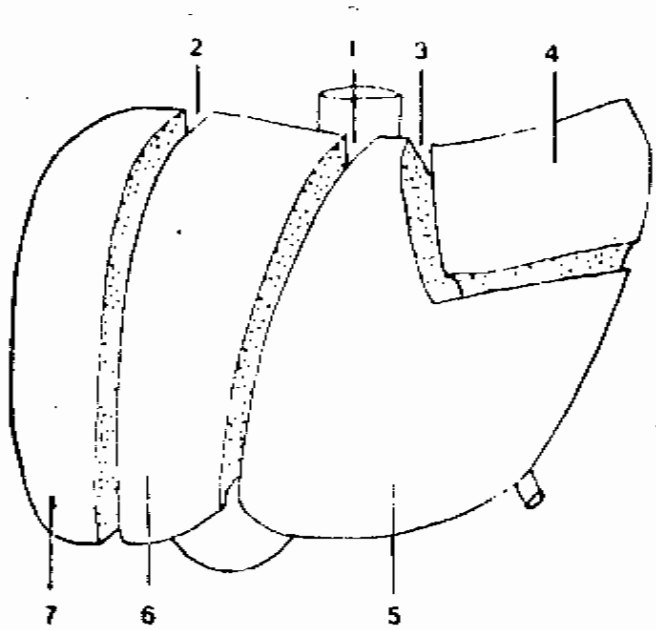


Fig. (2) : Symmetrical organization of the right liver.
1- Main portal fissure, 2- right portal fissure.
3- Left portal fissure, 4- left lateral sector,
5- Left paramedian sector, 6- right paramedian sector, 7- right lateral sector.

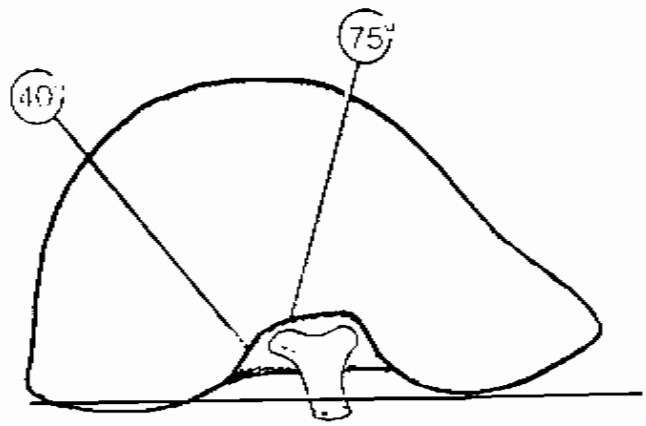


Fig. (3) The obliquity of the middle and of the right portal scissurae.

The right portal fissure divides the right lobe into an anteromedial and posterolateral sectors. The right hepatic vein courses along this fissure. It extends from the anterior surface of the liver midway between the right angle of the liver and the right side of the gallbladder to confluence between the inferior vena cava and the right hepatic vein posteriorly, describe an angle of 40 degree with the trans transverse plane (Fig. 3).

The left portal fissure divides the left lobe into anterior and posterior sectors, the left heaptic vein courses this fissure. It is located posteriorly in relation to the ligamentum teres (Schwartz, 1985).

Segmental Anatomy :

The liver is further subdivided into segments, that represent smallest and anatomic unit of the organ. Knowledge of this anatomy has enabled surgeons to resect large portions of the liver more success (Meyers, 1986). Fig. 4,5.

In the right lobe, each of the two sectors is divided into two segments. The *anteromedial* sector is divided into segment V anteriorly and segment VII posteriorly. While the *posterolateral* sector is divided into segment VI anterionly and segment VII posteriorly.

In the left lobe, the *anterior sector* (left paramediam sector) is divided by the umbilical fissure into segment IV,