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LIVER TRANSPLANTATION TOTAL AND PARTIAL

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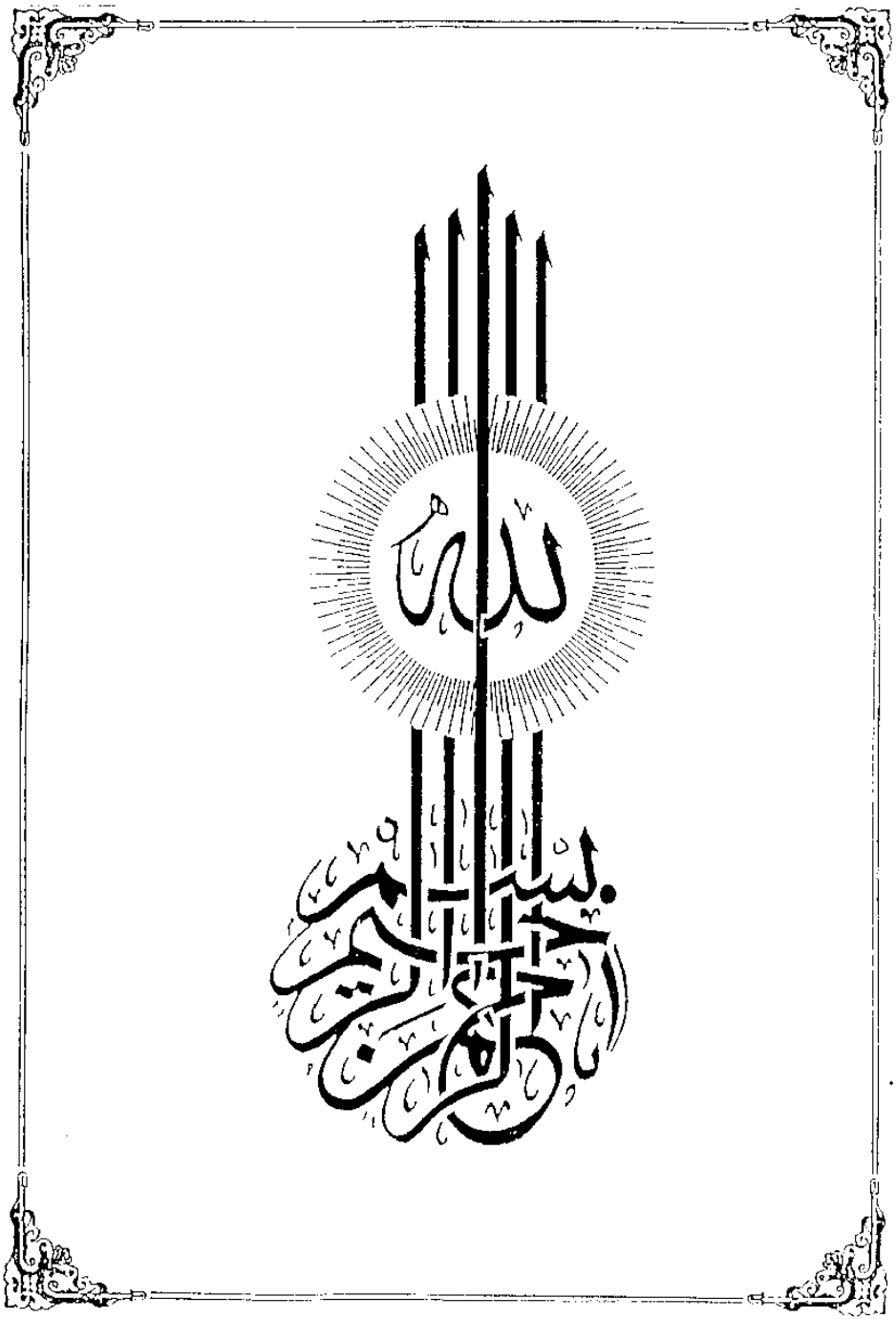

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Introduction

INTRODUCTION

The history of liver transplantation dates back to the immediate post-World War II years when early experiments, which were performed primarily in dogs, showed the technical feasibility of transplanting a new functioning liver into a recipient, either heterotopically as an accessory organ or orthotopically, i.e., by complete replacement of the original organ.

The first human orthotopic liver transplantation was performed in 1963 by Starzl and his associates at the University of Colorado in Denver, but the first and several subsequent patients survived for only a short time. The 1-year survival reported by the Starzl team in precyclosporin era, i.e., from '963 to the late 1970's, ranged from only 24% in adults to 33% in children. Because of these relatively discouraging results, liver transplantation during the first decade performed almost exclusively by the Denver Center, although in 1968 Calne at the University Hospital of Cambridge and Williams at the Kings College Hospital in London had set up antoher center. In the late 1970's, several other centers were established, (Rudi Schmid, 1984).

Nearly 2000 liver transplants have been performed in the United States alone, probably another 1000 have been performed inother parts of the world. In this decade liver transplantation has been established as the preferred treatment for children treatment for children and adults with irreversible end-stage liver disease (Van Thiel, 1988).

In Egypt there are a considerable number of patients with end-stage liver disease, with no hope for their survival, except for setting up a program for liver transplantation in our country.

Surgical Anatomy of Liver

SURGICAL ANATOMY OF LIVER

General Description:

Liver is the largest gland in the body, weighting approximately 1500 gm. in the adult. Liver is covered by a fibrous capsule (Glisson's capsule) that extend into the parenchyma along the blood vessels and bile ducts. Its superior surface conforms to the under surface of the diaphragm, and its inferior surface is in contact with the duodenum, colon, kidney, adrenal gland, esophagus, and stomach.

The entire liver is invested by peritoneum except for the "bare" area on the posterior superior surface adjacent to inferior vena cava where Glisson's capsule is in direct contact with the diaphragm.

Reflections of peritoneum attach the liver to the abdominal wall, diaphragm, and abdominal viscera.
These ligaments are:

(1) The falciform ligament, which attaches the liver to the anterior abdominal wall from the diaphragm to the umbilicus and incorporates in its deep border the ligamentum teres hepatis with the obliterated umbilical vein. This venous system is usually atrophied in the adult life but may remain patent, connecting the peri-umbilical superficial venous system to portal system, particularly in patient with cirrhosis.

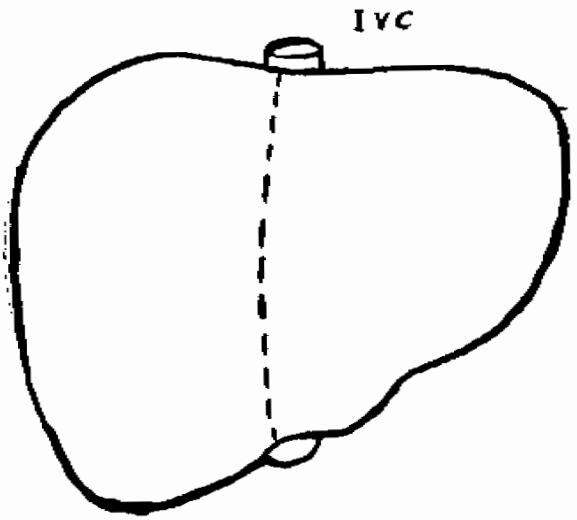
(2) The anterior and posterior right and left coronary ligaments, which are continuous with the falciform ligament connecting the diaphragm to the liver.

(3) The anterior layer of lesser omentum or gastro-hepatic and gastroduodenal ligament, which is continuous with the left triangular ligament and contains the hepatic artery, portal vein, and common bile duct. The hepato-duodenal ligament is the anterior boundary of the epiploic foramen of Winslow. The two major hepatic veins that return the blood to the systemic circulation into inferior vena cava posterior to the liver.

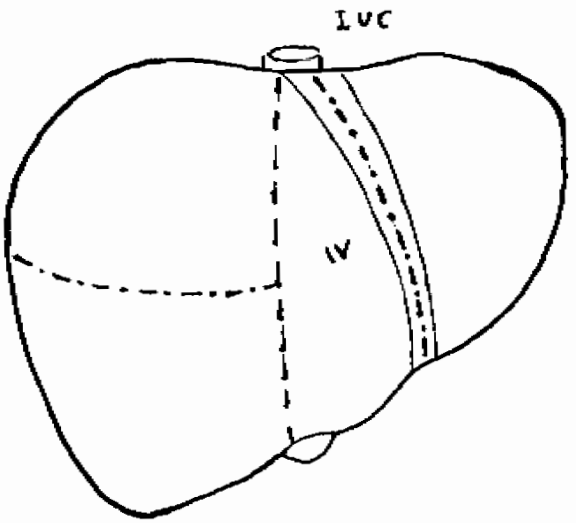
Lober Anatomy:

the best for determining the lobar anatomy of the liver has been by direct injection of its blood supply with substance such as methylene blue or colored cellcidin. The liver can be divided into two parts, or lobes which donot coincide with the topographic anatomy suggested by the falciform ligament. Knowledge of this anatomy has enabled surgeons to resect large portions of liver with more success. The line of division between the right and left lobes of liver follows a plane connecting the gall-bladder fossa and inferior vena cava below.

The left lobe consist of a medial segment lying to the right of the falciform ligament and a lateral



Right Lobe Left Lobe



The left lobe is divided into medial and lateral segments by the falciform ligament, while the right lobe has an anterior and a posterior segment.

segment to the left of the falciform ligament. This definition of the lateral segment of the left lobe of liver corresponding to the old definition of the entire lobe.

The right lobe consists of an anterior and a posterior segment and does not have an obvious line of segmental separation on its surface.

The lobes has been further divided into eight subsegments that have some consistant pattern, although many variations exist.

The division of the liver into right and left lobes follows a line projected through a plane (the principal plane) from the medial margin of the gall-bladder bed to inferior vena cava posteriorly. This main portal fissure, which is also called Cantie's line, describes a 75 degree angle with a horizontal plane and extend from the antro - inferior gall-bladder fossa postro-superiorly to the left side of the inferior vena cava.
On each side of the main protal fissure, the organization of the right and left lobes of liver is identical.

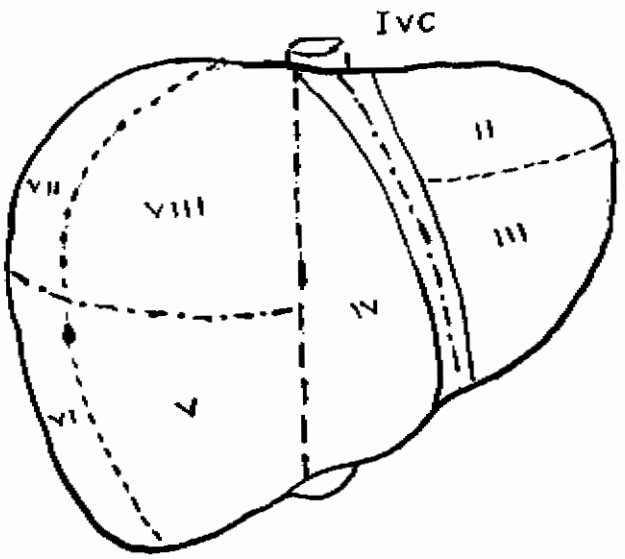
The left lobe of liver consists of the hepatic tissue to the left of the falciform ligament, plus the quadrate lobe and coudate lobe of the old anatomic nomenclature. The right hepatic lobe consists of the remaining hepatic tissue.

The right portal fissure divides the right lobe into antromedial and postrolateral sector. the right hepatic vein courses along this fissure. There is no external landmark to define this fissure. The right portal fissure extends from the anterior surface of liver mid way between the right angle of liver and the right side of gall-bladder to confluence between the inferior vena cava and the right hepatic vein posteriorly, describing an angle of 40 degree with the transverse plane.

The left portal fissure divides the left lobe into an anterior and posterior sector, and it is in this fissure that left hepatic vein courses. The left portal fissure is located posteriorly in relation to the ligamentum teres.

The liver is further subdivided into segments that, (according to Couinaud, 1954), represent the smallest anatomic unit of the organ. In the right lobe each of the two sectors is further subdivided into two segments: The antromedial sector is divided into two segments, segment V anteriorly and segment VIII posteriorly, while the postrolateral sector is divided into segment VI anteriorly and segment VII posteriorly.

In the left lobe, the anterior sector is divided by the umbilical fissure into segment IV, the anterior part of which is the quadrate lobe, and segment III, which



Subsegmental anatomy as defined by Couinaud. Except for the falciform ligament, there are few topographic landmarks, and the subsegmental anatomy is generally not helpful surgically, using the present techniques. The caudate lobe according to this scheme is subsegment I and is not shown. The left lobe is divided into two segments, medial and lateral by the falciform ligament while the right lobe has anterior and posterior segment.