MANAGEMENT OF POST OPERATIVE BENIGN HIGH BILE DUCT STRICTURES

ESSAY

SUBMITTED FOR PARTIAL FULFILMENT OF MASTER DEGREE IN GENERAL SURGERY

BY

ASHRAF MOHAMMED FAWZI MAHMOUD
Under The Supervision Of

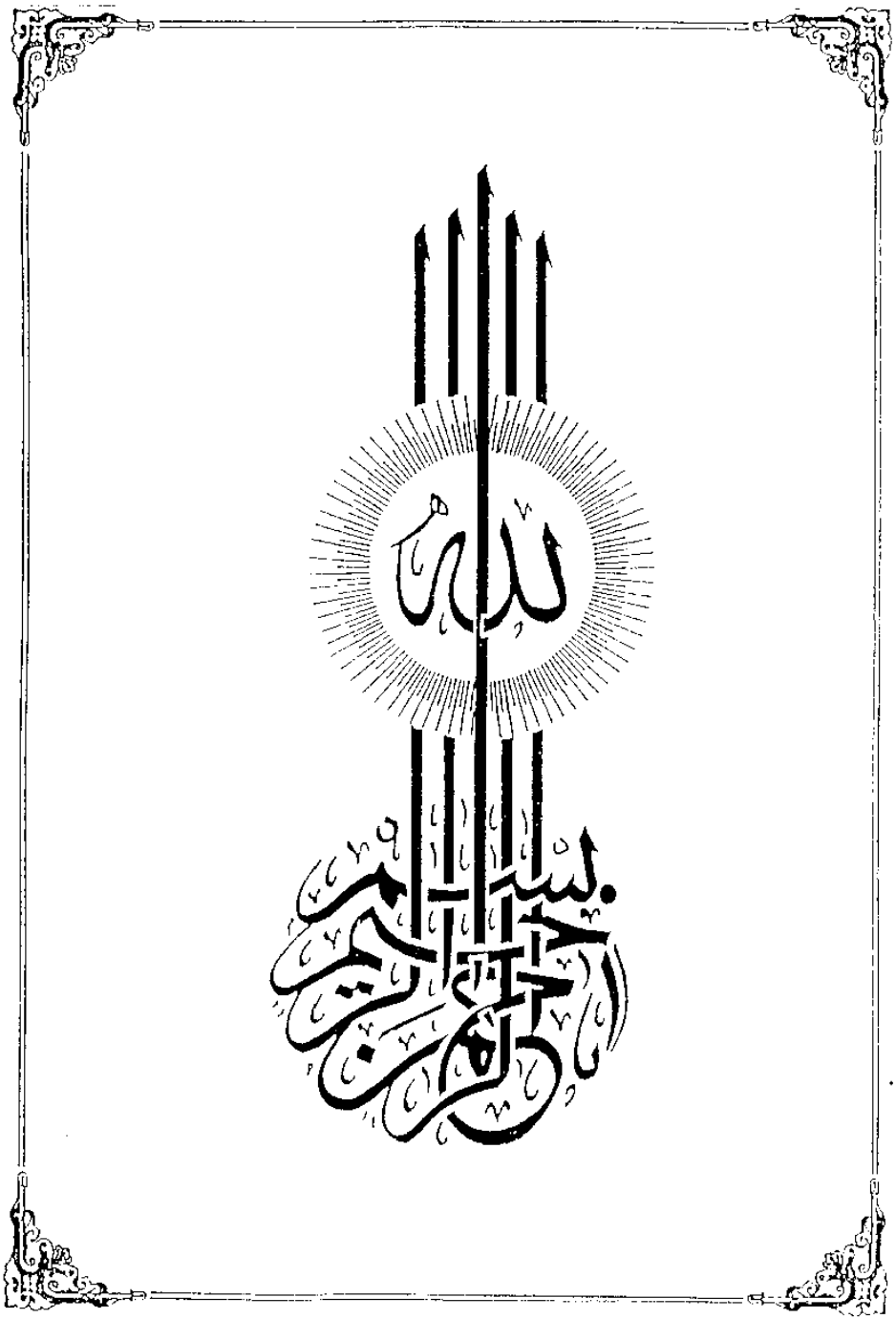
PROF. IBRAHIM ABDEL NABY
Surgeon And Endoscopist
Ain Shams University Hospitals

DR. SAID ABDEL BAKY
Assist Prof Of General Surgery
Ain Shams University Hospitals

Faculty Of Medicine
Ain Shams University
1992 - 1993

AIM OF THE WORK

This work aims at discussion of the different methods of management of postoperative benign high bile duct strictures as regard methods of investigations, different surgical procedures of biliary enteric anastomosis together with evaluation of each method.



ACKNOWLEDGEMENT

No words can describe my heavy debt of gratitude to Dr. *Ibrahim Abdel Naby* for his continuous support, kind supervision and generous guidance, without which, this essay would have not been delivered in this form.

To Dr. *Said Abdel Baky*, I am deeply greateful, for his superb guidance, remarkable care and unfailing helpfullness.

Ashraf M.F.

CONTENTS

SURGICAL ANATOMY OF INTRAHEPATIC AND EXTRAHEPATIC BILIARY TRACT

Surgical anatomy of intrahepatic biliary tract:

The Liver is divided into two major portions and a dorsal (Caudate) lobe *(Fig. 1)*. The right liver is formed of four segments; antero-inferior (segment V), Postero - inferior (segment VI), postero-superior (segment VII and antero superior (segment VIII). The left liver is formed of three segments; lateral superior (segment II), lateral inferior (segment III) and medial segment (segment IV). The dorsal (Caudate) lobe constitutes segment I (Bismuth, 1982).

The right and left lobes are drained by the right and left hepatic ducts respectively, whereas the dorsal lobe is drained by several ducts joining both the right and left hepatic ducts (Last, 1986).

The intrahepatic ducts are tributaries of the corresponding hepatic ducts which penetrate the liver invaginating the Glisson's Capsule at the hilus.

The right hepatic duct *(Fig. 2)* :

It drains segments V, VI, VII and VIII. It is formed by union of two main sectoral ductal tributaries; the posterior and anterior ducts. The right posterior sectoral duct has almost horizontal course (Blumgart, 1984) and is formed by the confluence of the ducts of segments VI and VII. The duct then run to join the right anterior sectoral duct as it descends in a vertical manner. The right anterior sectoral duct is formed by the confluence of the ducts draining segment V and segment VIII. Its main trunk is located to the left of the right anterior sectoral branch of portal vein which pursues an ascending course. The junction of these two main right biliary channels usually takes place above the right branch of the portal vein (Blumgart, 1984).

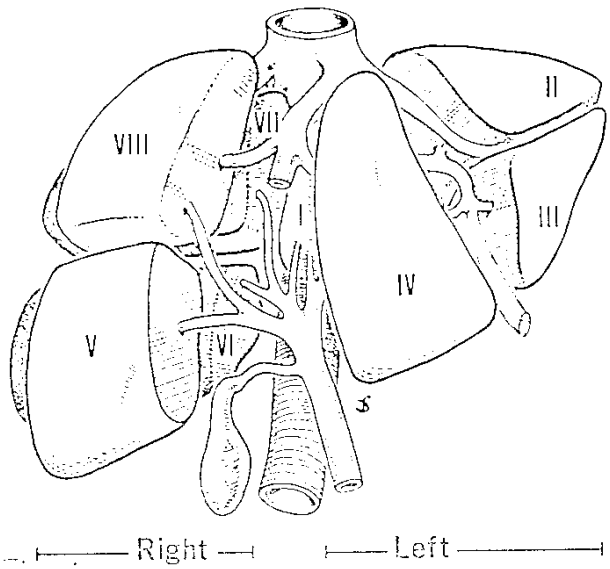


Fig. 1: Diagram showing the biliary drainage of the two functional hemilivers. Note the position of the right anterior and right posterior sectors. The caudate lobe drains into the right and left ductal system. (Blumgart, 1988).

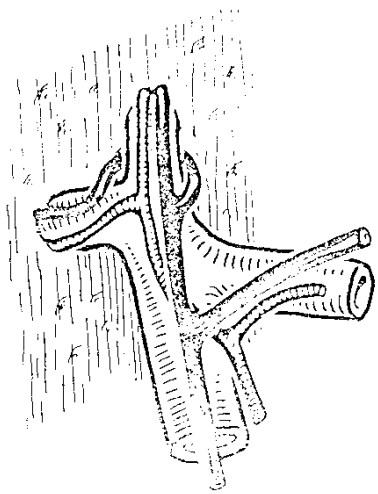


Fig. 2: Biliary vascular anatomy of the right liver. Note the horizontal course of the posterior sectoral duct and the vertical course of the anterior sectoral duct (Bulmgart, 1988).

The left hepatic duct *(Fig. 3)* :

It drains segments II, III and IV. The duct draining segment III is located slightly behind the left horn of the umblical recessus. It runs backwards to join the duct of segment II to the left of the main portal branch to segment II. The left hepatic duct trverses beneath the left liver at the base of segment IV. In its transverse portion, it recieves one to three small branches from segment IV.

The dorsal (Caudate) lobe *(Fig. 4)* :

It constitutes segment I. It has its own biliary drainage. The caudate lobe is divided into caudate lobe proper which is divided into right and left portions and a caudate process that joins the caudate lobe proper with the right lobe behind the portal structures. In 44% of cadevers, three separate ducts drain these three parts while in 26%, the right portion of the caudate lobe proper and the caudate process open into a common duct and the left portion into another one. (Skandalakis, 1983). The site of drainage of these ducts is variable. In 78 % of cases, drainage of the caudate lobe is into both right and left hepatic ducts but in 15 % drainage is by the left hepatic ductal system only. In about 7%, drainage is into the right hepatic duct system.

Surgical anatomy of extrahepatic biliary tract *(Fig. 5)* :

The extrahepatic bile ducts are represented by the extrahepatic segments of the right and left hepatic ducts, the common hepatic duct, the gallbladder, the cystic duct and the common bile duct.

A- **The extrahepatic segments of the hepatic ducts**:

1- **The right hepatic duct**: It is much shorter than the left hepatic

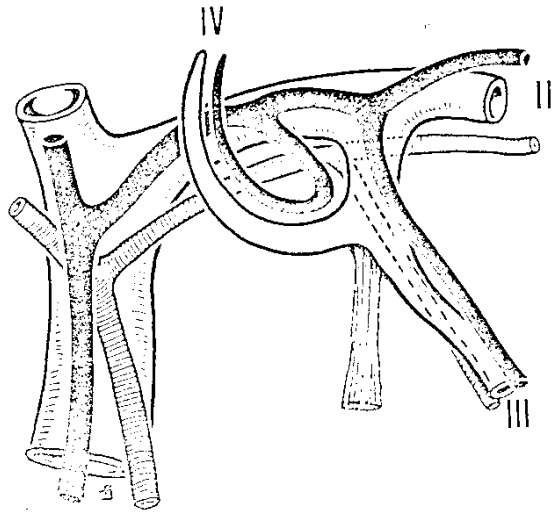


Fig. 3: Biliary and vascular anatomy of the liver. Note the location of the segment III duct above the corresponding vein and its relationship to the recessus of Rex. The anterior branch of the segment IV duct is not representeed (Blumgart, 1988)

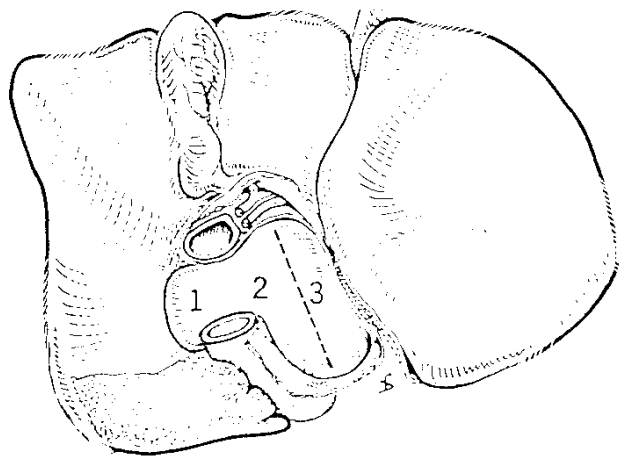


Fig. 4: Diagram showing the anatomy of the caudate lobe which is divided into a caudate process (1) and a caudate lobe proper which is itself sub-divided into a right (2) and left (3) portion. Note the relationship of the caudate process to the inferior vena cava and the portal triad (Blumgart, 1988)

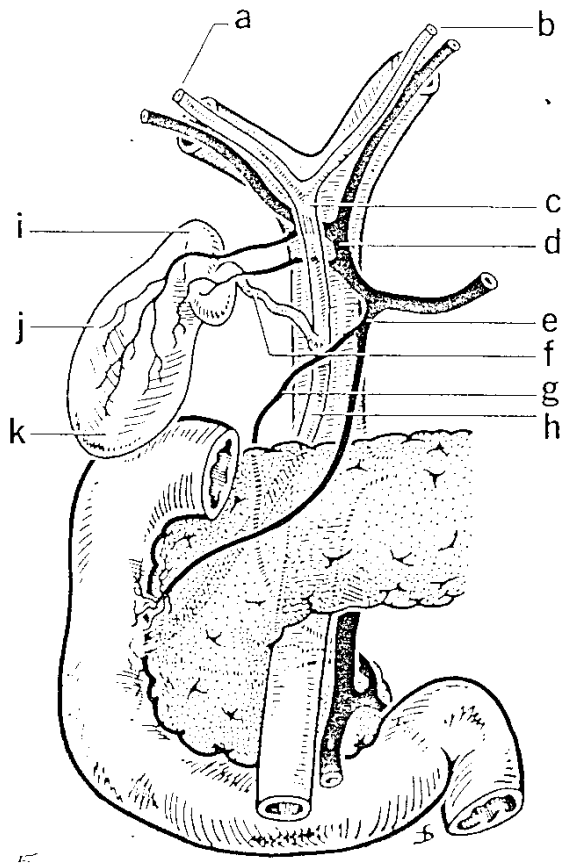


Fig. 5: Anterior aspect of the biliary anatomy: (a) right hepatic duct, (b) left hepatic duct, (c) common hepatic duct, (d) hepatic artery, (e) gastroduodenal artery, (f) cystic duct, (g) retroduodental artery, (h) common bile duct, (i) neck of the gallbladder, (j) body of the gallbladder. (k) fundus of the gallbladder.

Note particularly the situation of the hepatic bile duct confluence anterior to the right branch of the portal vein, the posterior course of the cystic artery behind the common hepatic duct and the relationship of the neck of the gallbladder to the right branch of the hepatic artery. (Blumgart, 1988).

duct. Its average length is 0.9 cm. It may be absent when the right anterior and right posterior sectoral ducts enter the left hepatic duct.

2- **The left hepatic duct**: It is much longer than the right hepatic duct. Its average length is 1.7 cm. Normally, the right and left hepatic ducts are of equal size, although in chronic obstructive biliary disease, the left duct for unknown reasons, is larger than the right hepatic duct.

B- **The common hepatic duct**:

It is formed by the confluence of the right and left hepatic ducts which takes place at the hilus of the liver anterior to the portal venous bifuraction and overlying the origin of the right branch of the portal vein. The biliary confluence is separated from the posterior aspect of the quadrate lobe (segment IV) of the liver by the hilar plate which is the fusion of connective tissue enclosing the biliary and vascular elements with the Glisson's Capsule. Because of the absence of any vascular interposition it is possible to open the connective tissue constituting the hilar plate at the inferior border of the quadrate lobe (segment IV) and by elevating it to display the biliary confluence and the left hepatic duct. *(Fig. 6)*. The lower end of the common hepatic duct is defined by its junction with the cystic duct. It length varies from 1.0 to 7.5 cm. The diameter of the duct is about 0.4 cm.

C- **The gallbladder**:

The gallbladder is located on the visceral surface of the right lobe of the liver within the cystic fossa and separated from the hepatic parenchy-

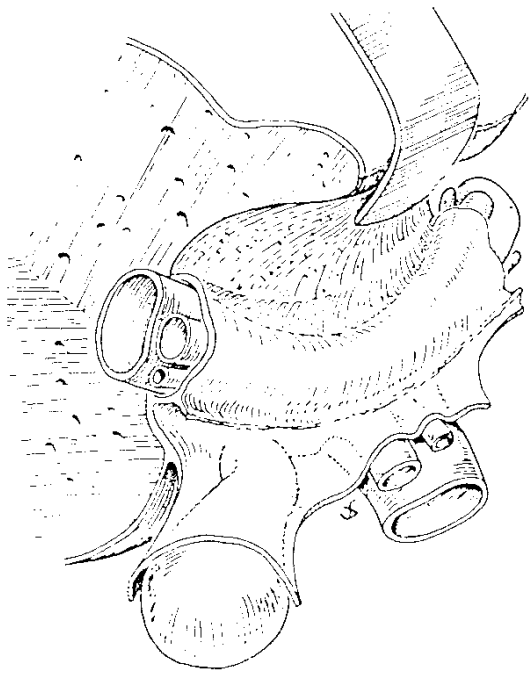


Fig. 6: Diagram showing the biliary confluence and left hepatic duct exposed by lifting the quadrate lobe upward after incision of Glisson's Capsule at its base. (Blumgart, 1988).

ma by the cystic plate, which is constituted of connective tissue closely applied to Glisson's Capsule and Continuous with the hilar plate *(Fig. 7)*. Sometimes the gallbladder is deeply embedded in the liver but occasionally, it has mesenteric attachment which may be liable to volvulus. The gallbladder is 7 to 10 cm long with a capacity of 30 to 50 ml. It is pear shaped organ that can be arbitrarily divided into four portions: Fundus, body, infundilulum and neck. *(Fig. 8)*

The fundus is usually located at the angle of the ninth costal cortilage with the right border of the rectus sheath (Last 1990). It is completely covered by peritoneum because it projects beyond the lower border of the liver.

The body (Corpus) occupies the gallbladder fossa and is in contact with the first part of the duodenum. It is also related to the transverce colon. Its lower surface is covered by peritoneum. On rare occasions, it is completely covered by peritoneum which is liable for torsion.

The infundibulum is the angulated porterior portion of the body between the neck and the point of entrance of the cystic artery. When this portion is dilated with eccentric bulging of its medial aspect, it is called Hartmann pouch which is probably acquired from prolonged resistance to gallbladder emptying (Skandalakis 1972).

The neck formes an S-shaped curve and its mucosa is thrown in spiral ridges. The neck is separated arbitrarily from the body by the highest of these ridges. It lies in the free border of hepatoduodenal ligament. The junction of the neck and the cystic duct is said to be indicated by a constriction.

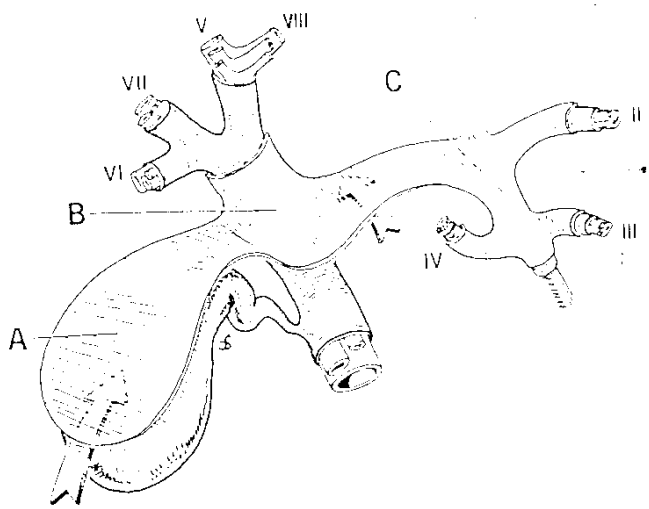


Fig. 7: Sketch of the anatomy of the plate system. Note the cystic plate (a) above the gallbladder, the hilar plate (b) above the biliary confluence and at the base of the quadrate lobe and the umbilical plate (c) above the umbilical portion of the portal vein. Large curving arrows indicate the plane of dissection of the cystic plate during cholecystectomy and of the hilar plate and approaches to the left hepatic duct. (Bulmgart, 1988).

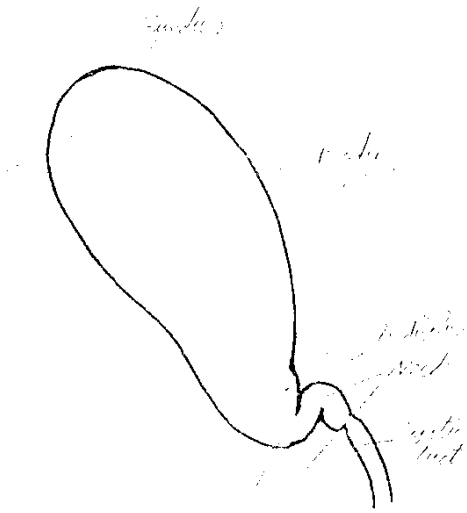


Fig. 8: Arbitrary regions of the gallbladder.