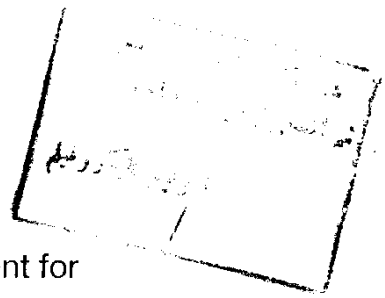
STRICTURE OF THE COMMON BILE DUCT



ESSAY

Submitted in Partial Fulfilment for
Master Degree in **General Surgery**

By

Essam Mohamed Rashad Abd El Mawla

(M.B.,B.Ch. Ain Shams)

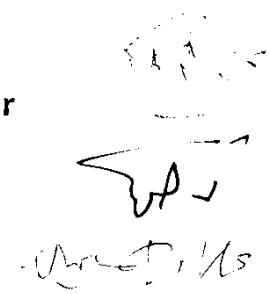
Supervised By

Prof. Dr. Alaa El-Din Ismail

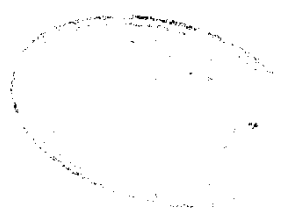
Professor of General Surgery
Faculty of Medicine
Ain Shams University

Dr. Khaled Zaki Mansour

Lecturer of General Surgery
Faculty of Medicine
Ain Shams University



FACULTY OF MEDICINE
AIN SHAMS UNIVERSITY
1992

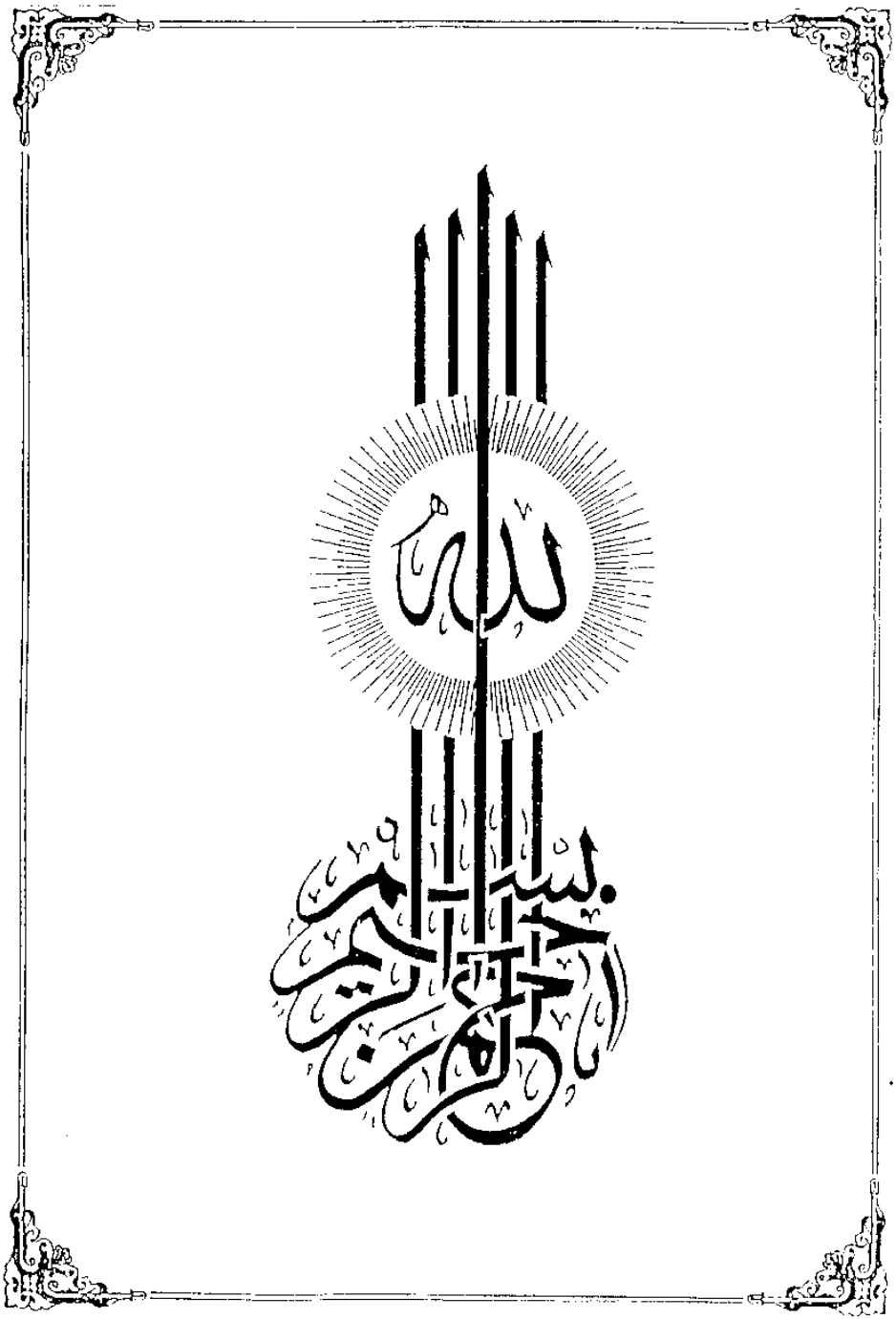


بسم الله الرحمن الرحيم

نرفع درجات من نشاء
وفوق كل ذى علم عليم

صدق الله العظيم

يوسف آية ٧٦



CONTENTS

ACKNOWLEDGEMENT

I am greatfy honoured to express my supreme gratitude to ***Prof. Dr. Alaa El-Din Ismail,*** Professor of General Surgery, Ain Shams University, for his most valuable guidance supervision and great encouragement.

My deep appreciation to ***Dr. Khaled Zaki Mansour,*** Lecturer of General Surgery, Ain Shams University, for his valuable aid and advice.

INTRODUCTION

INTRODUCTION

Stricture of the bile ducts, particularly those at the hilum of the liver present a challenge to the skill of any hepatobiliary surgeon. The continuing incidence of iatrogenic bile duct injury during operation on the biliary tract, and the more frequent preoperative recognition of primary bile duct cancers, have resulted in an increasing number of patients with high biliary strictures *(Blumgart and Thompson, 1987).*

There are two type of biliary strictures: benign and malignant strictures.

Biliary stricture usually presents a complex problem in diagnosis and management. As such it is a specialized subject demanding an experienced surgical team working in close collaboration with others and, in particular excellent diagnostic and interventional radiological backup and facilities for endoscopic diagnosis and operative endoscopy when indicated. Treatment decisions should be taken in consultation. Bile duct stricture, and in particular high strictures and stenoses extending to the confluence of the bile ducts, should not be treated by the occasional operator *(Blumgart, 1988).*

ANATOMY

ANATOMY OF THE BILIARY SYSTEM

Biliary anatomy first became of practical importance to surgeons towards the end of the last century following the first cholecystectomy by carl langenbuch in 1882. In 1900 George Emerson Brewer of the mount Sinai Hospital, produced one of the first practical guides to the surgical anatomy of this region. Confronted with developing surgical challenge, he performed 160 dissection to educate his tactile sense for recognition of structures which during operation are often concealed from view or rendered visible only with difficulty *(Northover and Terblanche, 1982).*

Bile is manufactured by the liver cells. It is collected in bile cnaliculi in the lobules flows along the portal canal in the bile duct tributaries and so reaches the right and left hepatic ducts (Last, 1984). The confluence of the right and left hepatic duct almost always occurs outside the liver. the common hepatic duct arises from the confluence of the ducts and by definition becomes the common bile duct where it is joined by the cystic duct *(McGregor, 1986).*

Emberyology of the biliary tree:

At about the 3 mm stage (fifth week of intrauterine life) the embryo shows the begining of an outpouching from the ventral surface of the primitive gastrointestinal tract just distal to the junction of the foregut and midgut. The outpouching penetrates the primitive ventral mesogastrium and ultimately results in the formation of the two lobes of the liver, the intra and extrahepatic biliary tree, the gallbladder and cystic duct and the dorsal posterior half of the head of the pancreas and the uncinate process. Also at this time a dorsal sacculation leaves the primitive bowel tube at a slightly more superior level to become the anlage of the remainder of the pancreatic head as well as the neck, the body, and the tail of the pancreas.

As the ventral sacculation pushes its way ventrally and superiorly between the two leaves of the ventral mesogastrium, its distal or advancing tip divides into a superior and an inferior bud. Growing from the inferior surface of the biliary diverticulum, proximal to its enlarging terminal sacculations and lying quite close to the ventral wall of the gut, a third bud, the ventral pancreatic bud appeares *(Lindner, 1987).*

The superior bud of the ventral sacculation gives rise to the liver and biliary tree, and as it advances superiorly, is composed of a solid cord of entodermal cells and contains no

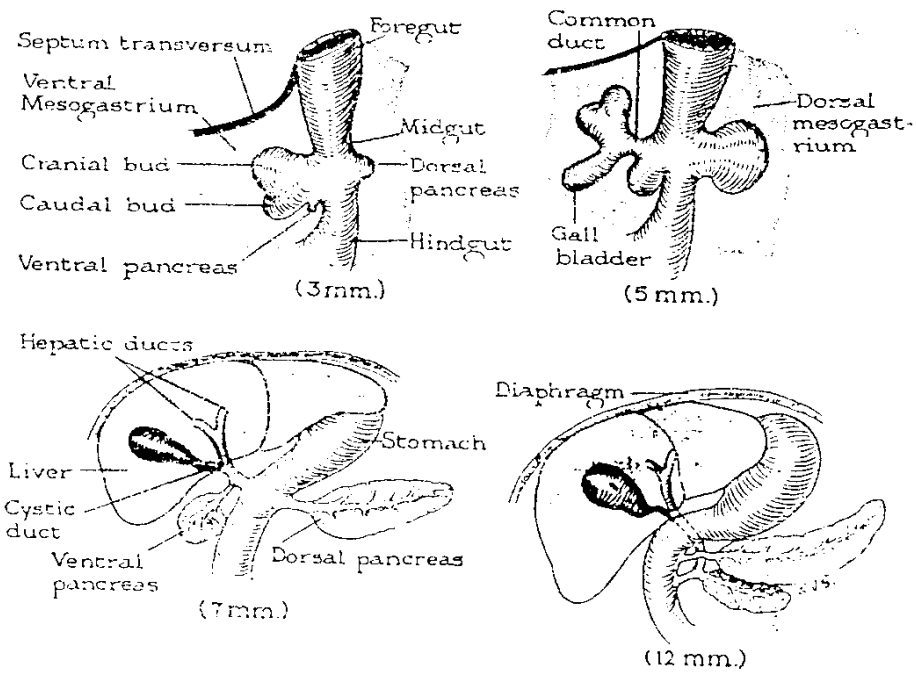


Fig. 1: Development of extrahepatic biliary tract in the embryo from the 3 mm to the 12 mm stage *(Lindner, 1987)*.

lumen. This bud finally reaches the septum transversum. Just before it reaches the septum transversum, the advancing superior bud divides into a right and a left cellular column, each of which will form one of the lobes of the liver.

The inferior bud of the divided ventral sacculation is carried superiorly by the growth of the superior bud to which it is attached. The advance of the inferior bud stops just below the visceral surface of the liver, at which point it develops into the gallbladder and the cystic duct. On this rare occasions when the inferior bud advances too far superiorly, an intrahepatic gallbladder will result, nearly always within the right lobe of the liver. The growth superiorly of the superior bud of the biliary diverticulum is the mechanism by which the hepatic ducts,the common hepatic duct, and the common bile duct are formed.

With the embryo at the 7mm stage, the common bile duct is seen to be still attached to the ventral surface of the duodenum, with the ventral pancreatic bud attached to its inferior wall. The rotation of the ventral pancreatic bud is to the left and dorsalward and encompasses an are of about 180 degrees. This rotation allows the ventral pancreatic bud to fuse with the dorsal pancreatic bud to form the complete pancreas. Since the most proximal segment of common bile duct is

attached to the ventral pancreatic head, the combined rotation of the duodenum and the ventral pancreatic anlage serves finally to place the junction of the common bile duct and the duodenum on the posteromedial duodenal wall.

By the begining of the seventh week of intrauterine life, vacuolization starts to take place within the future biliary tree. Within a week, a completely open lumen has formed within the gallbladder, the cystic duct, the hepatic duct, and the common bile duct. By the end of the third month of foetal life, the liver begins to secrete bile, and it flows into the duodenum via the recently canalized extrahepatic biliary tree *(Lindner, 1987).*

ANATOMY OF THE BILIARY TREE

Normality in the sense of an anatomical pattern which is repeated in the majority of individuals is a term which can not be used in relation to the biliary tree *(Benson and Page, 1976)*. It has been found that less than 50% of individuals exhibit a pattern common in even major details. Any attempt to define the "normal anatomy of the biliary tree, therefore, would be artificial and misleading. So each major area of the extrahepatic biliary tree and its related vessels will be considered separately and the more important variational groups described *(Benson and Page, 1976)*.

Anatomy of the bile duct at the liver hilum:

Kune and sali in (1980) stated that some portion of both the right and left hepatic ducts and hence their confluence are always extrahepatic and therefore accessible at the portahepatis. In some cases portions of the major tributaries of the right and left ducts are also outside the liver.

The right hepatic duct:

The right hepatic duct drains segments V, VI, VII, VIII (Fig. 2.1, 2.2) and arises from the junction of two main sectoral tributaries. The posterior or lateral duct and the anterior or medial duct, each a satellite of its corresponding vein. The right

posterior sectoral duct has an almost horizontal course and is constituted by the confluence of the ducts of segment VI, VII. the duct then runs to join the right anterior sectoral duct as it descends in a vertical manner *(Tung, 1979)*. 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 the 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 *(Couinaud, 1957)*. The right hepatic duct is short and joins the left hepatic duct to constitute the confluence lying infront of the right portal vein and forming the common hepatic duct *(Smadja and Blumgart, 1988)*. The right hepatic duct is readily approached by dividing the peritoneum and fat overlying it in the porta hepatis. The right hepatic artery runs inferior to it, while the right branch of the portal vein lies posterior to these two structures *(Schwartz, 1985)*.

The left hepatic duct:

The left hepatic duct drains the three segment (II, III, IV) which constitute the left liver (Fig 2.1, Fig. 2.2). The duct draining segment III is located slightly behind the left horn of the umbilical recessus, running backwards to join the duct of segment II to the left of the main portal brnach to segment II at the point where left branch of the portal vein turns forward and