

MANAGEMENT OF COMMON BILE DUCT OBSTRUCTION

AN ESSAY

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BY

TAHER ABDEL MONEM MOHAMED ABD ALLA

M.B.,B.Ch.

UNDER SUPERVISION OF

PROF. Dr. ABDEL MEQUID EL-SHINAWY

(FRCS, ENGLAND)

(FRCS, Ed.)

PROF. OF GENERAL SURGERY

FACULTY OF MEDICINE, AIN SHAMS UNIVERSITY.

Dr. HASSAN ZAKARIA SHAKER, M.D.

LECTURER OF GENERAL SURGERY

FACULTY OF MEDICINE, AIN SHAMS UNIVERSITY

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



*To my sons, Mohamed & Ahmed
& to my wife*

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CONTENTS

- ANATOMY OF THE BILE DUCTS.....	1-13
- PHYSIOLOGY OF BILE SECRETION.....	14-25
- AETIO-PATHOLOGY OF THE COMMON BILE DUCT OBSTRUCTION..	26-46
- METHODS OF DIAGNOSIS.....	47-70
- TREATMENT.....	71-99
- SUMMARY.....	100-103
- REFERENCES.....	103-113
- ARABIC SUMMARY	

List of figures

1- Development of hepatic and pancreatic ducts.....	1
2- The gall bladder and extrahepatic biliary tract ducts, and their relations.....	1
3- Anatomical lobes and segments of the liver.....	2
4- Normal vascular anatomy.....	7
5- Split cystic pyri mordium group.....	9
6- Multiple cystic primordia group.....	9
7- Floating gall bladder.....	10
8- Malformed gall bladder.....	10
9- Cystic duct anomalies.....	10
10- Accessory hepatic ducts.....	11
11- Common duct anomalies.....	11
12- accessory cystic arteries.....	13
13- Anterior transposition of the right hepatic and cystic arteries.....	13
14- Recurrent right hepatic artery.....	13
15- Anomalies of the hepatic artery.....	13
16-Choledochoscopic removal of retained stones by a Dormia basket.....	69
17-Method of opening the supraduodenal part of the common bile duct by incision between stay suture.....	71
18- Removal of a calculus in the lower part of the common bile duct using a Fogarty biliary catheter...	72
19- Loop hepatico-jejunostomy with enteroenterostomy.	79
20- Rou -en-Y hepaticojejunostomy.....	79
21- Mucosal graft technique and the use of transhepatic tube	79
22- Choledochoplasty.....	81
23- End-to-end choledocholedostomy.....	81
24- External drainage.....	93
25- External drainage.....	93
26- Combined sensation of stent and nasobiliary catheter...	97

List of tables

	page
1- Solutes in human hepatic bile.....	14
2- The major bile salts in man.....	17
3- Summarizes the comparison between PTC and ERCP.....	58
4- A comparison of US, CT, and radioisotope <i>scanning</i>	62
5- A comparison of operative cholangiography and choledochoscope.....	67
6- Summarizes the different therapeutic options according to the location of the tumour.....	77

Abbreviations

cm	centimeter
CT	Computed Tomography
dl	deciliter = 100 ml.
ERCP	Endoscopic retrograde cholangiopancreatography
gm	gram
I	God no
IDA	Gm. in diabetic load
IVC	Intravenous cholangiography
IU	International unit
KVP	Kilo volt peak
L	liter
mg	milligram
min	minute
ml	milliliter
mm	millimeter
PTC	Peridigestive pancreatography
Tc	Technetium
US	Ultrasonography

INTRODUCTION

Obstruction of the common bile duct is a common serious complication of the benign and malignant biliary disease facing us in surgical practice. Biliary obstruction has its serious effects on the function of the liver, kidney, cardiovascular system, and the immune defence mechanisms, and this may lead to serious complications and sometimes, death of the patient.

So, the diagnosis of common bile duct obstruction should include: clinical evaluation, laboratory tests, and imaging techniques.

The modern investigative technique available for the diagnosis of the biliary tract diseases give the surgeon a clear idea about the condition of the bile ducts as well as the obstructing agent, and thus aid him in taking the suitable decision for each case in the proper time.

This work aimed at evaluating the recent investigative technique as well as the recent trends in treating the condition safely.

Anatomy of the bile ducts

Embryology of the biliary apparatus

The duct system is derived embryologically from the hepatic diverticulum (Figure 1) which buds off from the junction of the fore and midgut at about the eighteenth day of embryonic life (7th somatic stage). At about one month this pouch forms two branches:

1) A cranial branch which develops into the epithelium of the bile duct and the various hepatic ducts whose blind-ending cellular mass becomes hepatocytes.

2) A caudal branch which becomes the cystic duct and gall bladder. At one stage, the epithelium of the duct system proliferates to such an extent that the lumen becomes completely occluded, and is only late restored by canalization and break down of some of this epithelium. It should be noted that the original gut epithelium of the hepatic diverticulum gives rise only to the hepatocytes and ductal epithelium; the connective and other tissues of the liver and biliary apparatus are of mesodermal not epithelial origin (McMinn, 1981).

Anatomy of the normal extrahepatic apparatus:

The extrahepatic apparatus (figure 2) is formed of:

1) The common hepatic duct; formed by junction of the right and left hepatic ducts which leave the liver at the porta hepatis.

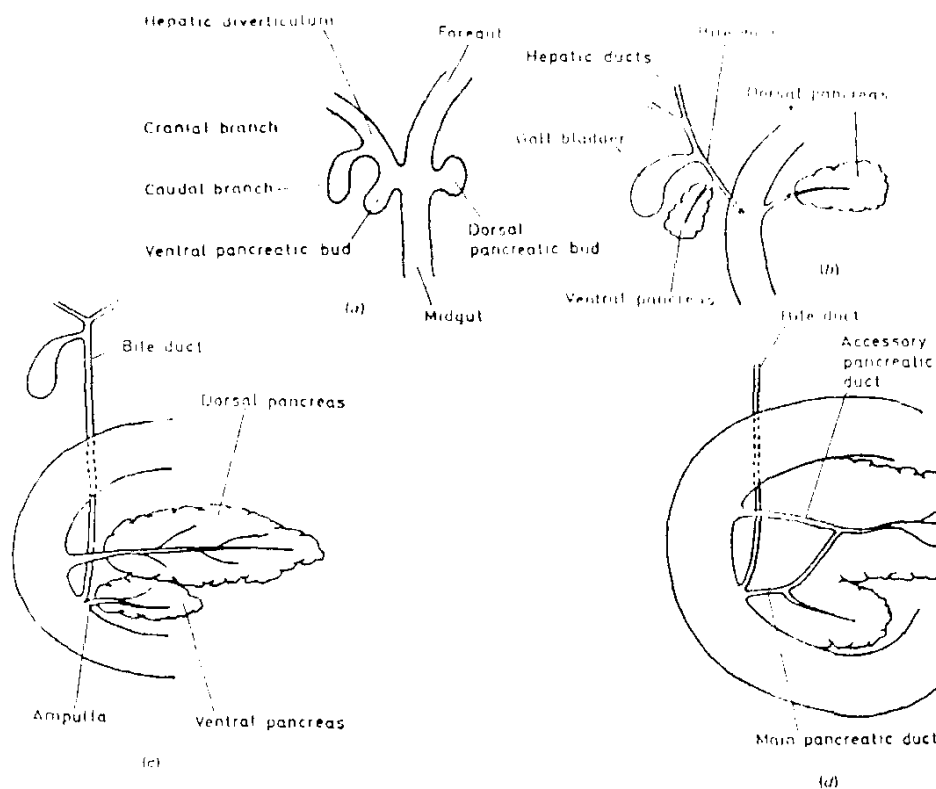


Figure (1): Development of the hepatic and pancreatic diverticulae
a) The hepatic diverticulum divides into cranial and caudal branches.
b) The caudal branch becomes the gall bladder and cystic duct while the cranial branch forms the rest of the duct system, from which hepatocytes differentiate.
c) The site of the original hepatic and ventral pancreatic diverticula migrates dorsally and comes to lie below the opening of the dorsal pancreatic bud.
d) Anastomosis of the duct systems of the pancreatic buds (McMinn, 1981).

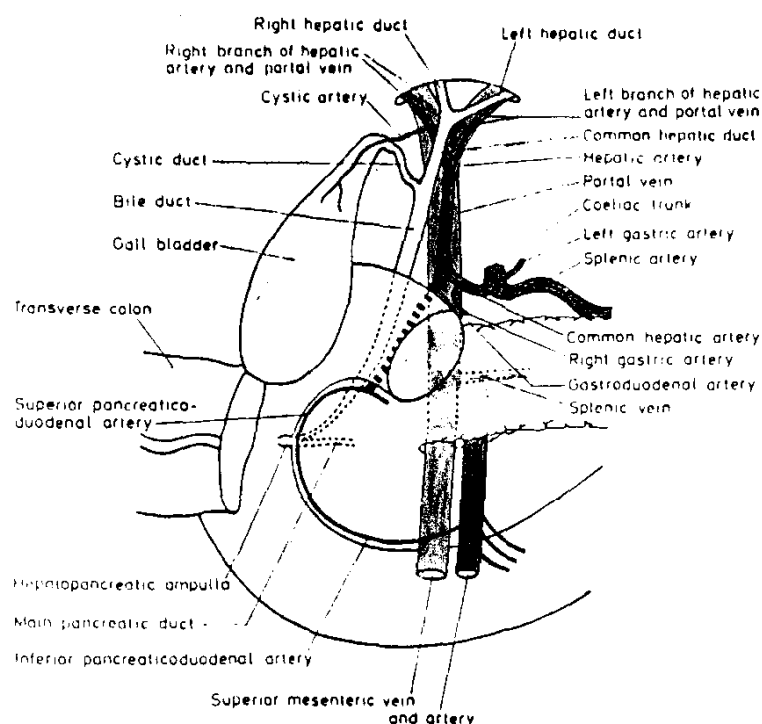


Figure (2): The gall bladder and extrahepatic biliary ducts and their relations (Knight, 1981).

- 2) The gall bladder; which serves as a reservoir for bile.
- 3) The cystic duct, or the duct of the gall bladder.
- 4) The common bile duct; formed by junction of the common hepatic and cystic ducts (Warwick and Williams,1973).

1) Hepatic ducts:

The segmental anatomy of the liver is illustrated in the figure 3a and b (MacLeod,1986).

The right and left hepatic ducts are confluence of the bile canaliculi and ductules within the liver. They unite about 1-2 cm below the portahepatis to form the common hepatic duct. The common hepatic duct, with a length of 2-4 cm and an internal diameter of about 8 mm, lies in the right free margin of the lesser omentum towards the right and in front of portal vein with the hepatic artery proper on its left side. The right branch of the hepatic artery usually passes behind the common hepatic duct (Warwick and Williams,1973).

2) The gall bladder

The gall bladder is a slate-blue pyriform sac, partly contained in a fossa on the inferior surface of the right lobe of the liver, extending from near the right extremity of the portah-epatis, to the inferior border of the liver. Its upper surface is attached to the liver by connective tissue, while its under surface and sides are covered with peritoneum continued from the surface of the liver. Occasionally, it is completely invested with peritoneum

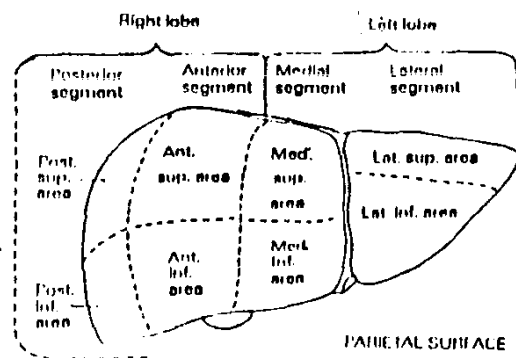


Figure (3a): Anatomical lobes and segments of the liver as seen on parietal surface (Christopher, 1982).

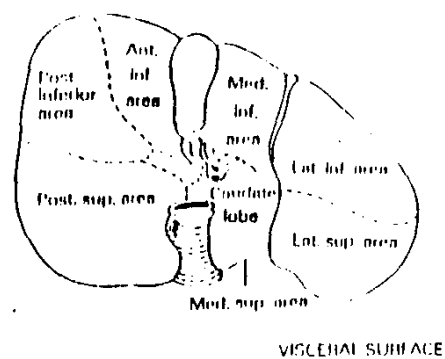


Figure (3b): Segments of liver as seen on the visceral surface (Christopher, 1982).

and may be connected with the liver by a short mesentery through which the right hepatic artery may pass and may be prone to injury during cholecystectomy. The gall bladder is from 7 to 10 cm long, 3 cm broad in its widest part and from 30 to 50 ml in capacity. It is divided into fundus, body and neck (Warwick and Williams, 1973).

The fundus is directed downward, forward, and to the right. It projects beyond the inferior surface of the liver and comes in relation with the posterior surface of the anterior abdominal wall below the ninth costal cartilage, behind the point where the lateral edge of the right rectus abdominis crosses the costal margin. The fundus posteriorly is in relation with the transverse colon, near its commencement, and is completely covered with peritoneum. These relations of the fundus are however, considerably altered when the gall bladder descends lower in the abdomen, as it frequently does, particularly in slender females.

The body of the gall bladder is directed upwards, backwards and to the left. Near the right end of the porta hepatis it is continuous with the neck. The upper surface of the body is in relation to the liver, while the lower surface is related to the right part of the transverse colon and further back with the duodenum.

The neck is attached to the liver by areolar tissue in which the cystic artery is embedded.

Calot's triangle: It is formed by the cystic duct and gall bladder below, the right lobe of the liver above, and the common hepatic duct medially. Over the years, the triangle, described