

Essay on :

**RECENT ADVANCES
IN
DIAGNOSIS OF CHOLELITHIASIS**

Submitted For Partial Fulfilment Of
Master Degree
(GENERAL SURGERY)

BY

Gamal El - Din Mahmoud Khalil Gindia
M. B. B. Ch.

Supervised By

PROFESSOR DR. MOHEY EL - DIN SEDKY
Prof Of General Surgery

*Faculty Of Medicine
Ain Shams University*

1983

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

وَقُلْ رَبِّ زِدْنِي مِلًّا

صدق الله العظيم



TO MY PARENTS.

ACKNOWLEDGEMENT

I would like to express my utmost gratitude, thankfulness and deepest appreciation to Professor Dr. Mohey El-din Sedky, Professor of General Surgery; for his constant encouragment, kind guidance , supervision and revision of this work.

Also, my greatest thanks to all my colleagues who share in this work by good effort and continuous advice.

G.M. Gindia

C O N T E N T S

	Page
INTRODUCTION.....	1
REVIEW OF LITERATURE	
. Anatomical considerations.....	2
. Physiological considerations.....	8
. Pathology of cholelithiasis.....	12
. Diagnostic procedures for gall-stones:	
I. Clinical diagnosis.....	20
II. Plain radiology of biliary system.....	26
III. Oral cholecystography.....	32
IV. I.V. cholecystography & cholangiography..	45
V. Ultrasonography.....	55
VI. Computed tomographic scanning.....	70
VII. Cholescintigraphy.....	73
VIII. Other types of cholangiography.....	78
IX. Other related diagnostic procedures.....	88
. Evaluation & Choice of various diagnostic procedures.....	93
SUMMARY.....	100
REFERENCES.....	103
ARABIC SUMMARY.	

INTRODUCTION

I N T R O D U C T I O N

Cholelithiasis is one of the most common health disorders of the adult life, and it represents the commonest disease of the biliary system.

The early diagnosis of gallstone disease, as well as its complications is important task for the surgeon. It is essential for the successful planning of the therapeutic approach.

Every available method should be made use of to achieve a correct diagnosis, that is reached through clinical data, various radiological techniques, laboratory studies, and other related diagnostic methods. Most of these investigations have its hazards, percentage error and need special preparation.

Recently, the diagnosis of cholelithiasis has become much more accurate because of both changes in the conventional methods and in the introduction of new non-invasive methods, namely: grey-scale and real-time ultrasonography, computed abdominal tomography and scintigraphy.

So, diagnostic techniques have multiplied, however, it is quite clearly, the least traumatic, least expensive and most specific methods should be used initially.

**REVIEW
OF
LITERATURE**

ANATOMICAL CONSIDERATIONS

I) Gross (Surgical) Anatomy:

* Gall bladder: it is a pear-shaped musculo-membranous distensible sac, lying in a fossa on the inferior surface of the right hepatic lobe. Normally, it is 7 to 10 cm. long and 3 to 5 cm. in diameter and has a capacity of 30 to 60 ml. Anatomically, it is divided into a fundus (or tip), a body (or corpus), an infundibulum-called Hartmann's pouch and a narrow neck which leads into the cystic duct. The fundus projects inferolaterally beyond the liver edge behind the tip of the right 9th costal cartilage, and it may come in contact with the anterior abdominal wall. The anterior surface of the gall bladder is adherent to the liver and its posterior surface lies against the beginning of transverse colon below , and the second part of the duodenum above.

The fundus and the body are firmly bound to the under surface of the liver by connective tissue and many small cystic veins. The peritoneum covering the liver passing smoothly over the gallbladder, Occasionally, the gall-bladder hangs free on a narrow "mesentery" from the under-surface of the liver (Dean, 1975; Duplessis, 1977; Last, 1979; and Orloff, 1981).

✧ Duct system : (Fig. 1)

The cystic duct from the neck of gallbladder is about 2 to 4 cm. long with an internal diameter of 2 - 3 mm, it contains prominent mucosal folds called spiral folds or valves of Heister. The cystic duct joins the right lateral aspect of the common hepatic duct, about 3 cm below the porta and 1 cm. above the duodenum, so forming the common bile duct. The cystic artery commonly runs behind the cystic duct and lies in the triangle (of Calot) bounded by the common hepatic and cystic ducts and the Liver (McMinn, 1981, and Orloff, 1981).

The extrahepatic bile duct system originates from the liver as the right and left hepatic ducts, each of which is 1 to 2 cm long and about 3 mm. in diameter. The two join about 1-2 cm below the porta to form common hepatic duct which is 3 to 4 cm in length with an internal diameter of about 8 mm, and is joined by the cystic duct to form the common bile duct (Dean, 1975; Schwartz, 1979; and McMinn, 1981).

The bile duct (formerly the common bile duct) is 8 to 15 cm long and 5 to 10 mm in outside diameter (Orloff, 1981).

It is helpful to describe it, as having 3 main parts each about 2.5 cm. long, namely supraduodenal, retroduodenal and paraduodenal, with a terminal and shorter fourth or intraduodenal part.

Supraduodenal part ; at its upper end, it lies above the duodenum in the right free border of the lesser omentum with the portal vein behind it and the hepatic artery on its left side.

Retroduodenal Part; leaving its peritoneal covering, it passes downwards behind the superior (first) part of the duodenum, with the inferior vena cava behind it and the gastroduodenal artery and portal vein on its left side.

Paraduodenal part; continuing a downward course, it bends to the right, approaching the descending (second) part of the duodenum behind or within the substance of the head of the pancreas. In its lower part, the lumen becomes reduced in diameter (as readily visualized radiologically) owing to increased thickness of the wall because of the presence of muscle fibres (sphincter of Boyden). (Fig. 2).

Intraduodenal part; finally the duct pierces the posteromedial wall of the descending part of the duodenum and runs through the wall for a few millimeters, usually joining the main pancreatic duct in the ampulla (of Vater). The ampulla opens into the gut lumen on a papilla situated on the posteromedial wall of the duodenum 8 -10 cm from the pylorus (McMinn, 1981).

* Arterial Supply:

The gallbladder is supplied by the cystic artery, a branch of right hepatic artery. It may arise from the main hepatic trunk or its left branch (Last, 1979). Occasionally, an accessory cystic artery arises from the gastroduodenal artery (Bailey & Love, 1983).

* Venous drainage:

The gall bladder drains by multiple small veins into the substance of the liver and so to the hepatic veins. A cystic vein running from the neck of the gall bladder into the portal vein is also usually present (Last, 1979).

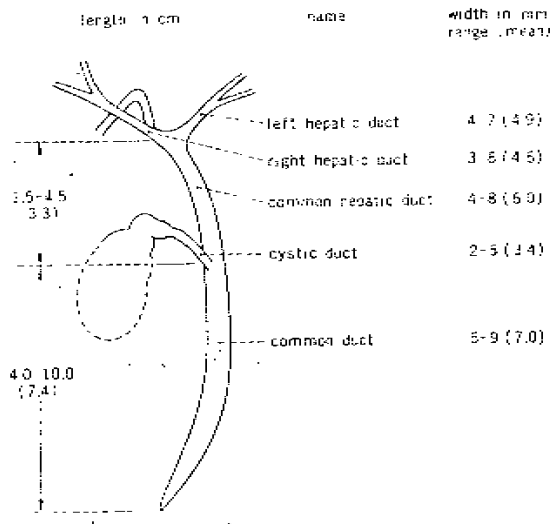


Fig.1: The normal ranges and averages of the diameter of major bile ducts, and of distances between the principle junction the attachment of the cystic duct, and the end of the common duct on the cholangiogram (After Okuda,1975).

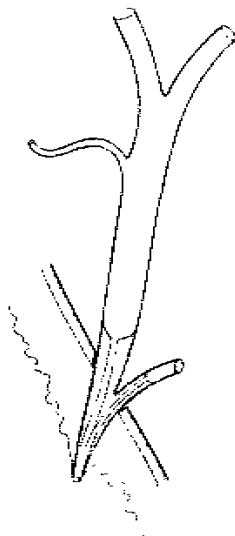


Fig. 2: Lower end of normal common duct to show terminal narrow segment and thickened wall. The shaded portions represent muscle (After: Sutton, 1980).

× Lymphatic drainage:

The subserosal and submucous lymph vessels drain into the cystic lymph node of Lund (the sentinel L.N.) which lies at the junction of the cystic and common bile ducts (Bailey & Love, 1983).

This node drains into the lymph nodes in the porta hepatis and then to the coeliac group of pre-aortic lymph nodes (Last, 1979). The subserosal lymph vessels connect with the subcapsular lymph channels of the liver (Bailey & Love, 1983).

× Nerve Supply:

Gall bladder is supplied by sympathetic nerves, along the hepatic artery, and parasympathetic branches along left vagal trunk (Last, 1979). Vagal fibres (from the dorsal nucleus of the vagus) reach the biliary tract mainly by the hepatic branch of the anterior vagal trunk (McMinn, 1981).

The afferent sympathetic fibres mediate the pain of biliary colic, while the parasympathetic branches contain motor fibres to gall bladder and secretory fibres to the ductal epithelium (Way and Dunphy, 1981).