Recent Trends in Management of Chronic cholecystitis

An Essay

Submitted for partial fulfillment of M.Sc. Degree in General Surgery

By

Ashraf Abd El-Moghny Moustafa

M.B.,B.Ch.

Supervised by

Prof. Dr. Reda Mahmoud Moustafa

Prof. of General Surgery
Faculty of Medicine
Ain Shams University

Dr. Hassan Zakaria Shaker

Lecturer of General Surgery
Faculty of Medicine
Ain Shams University

Faculty of Medicine

Ain Shams University

1992

ACKNOWLEDGEMENT

I wish to express my utmost gratitude to Professor Dr.Reda Mahmoud Moustafa for his generous advice on various continued guidance and supervision in every section of this essay, his constant encouragement throughout the study and his sincere valuable advice were indispensable.

I am definitely indebted to him than I can express.

I have also had the privilege of working under the expert guidance of Dr. Hassan Zakaria Shaker to him I wish to express my deepest gratitude for his marvelous, inestimable support. In fact without his effort, this work could never have been completed.

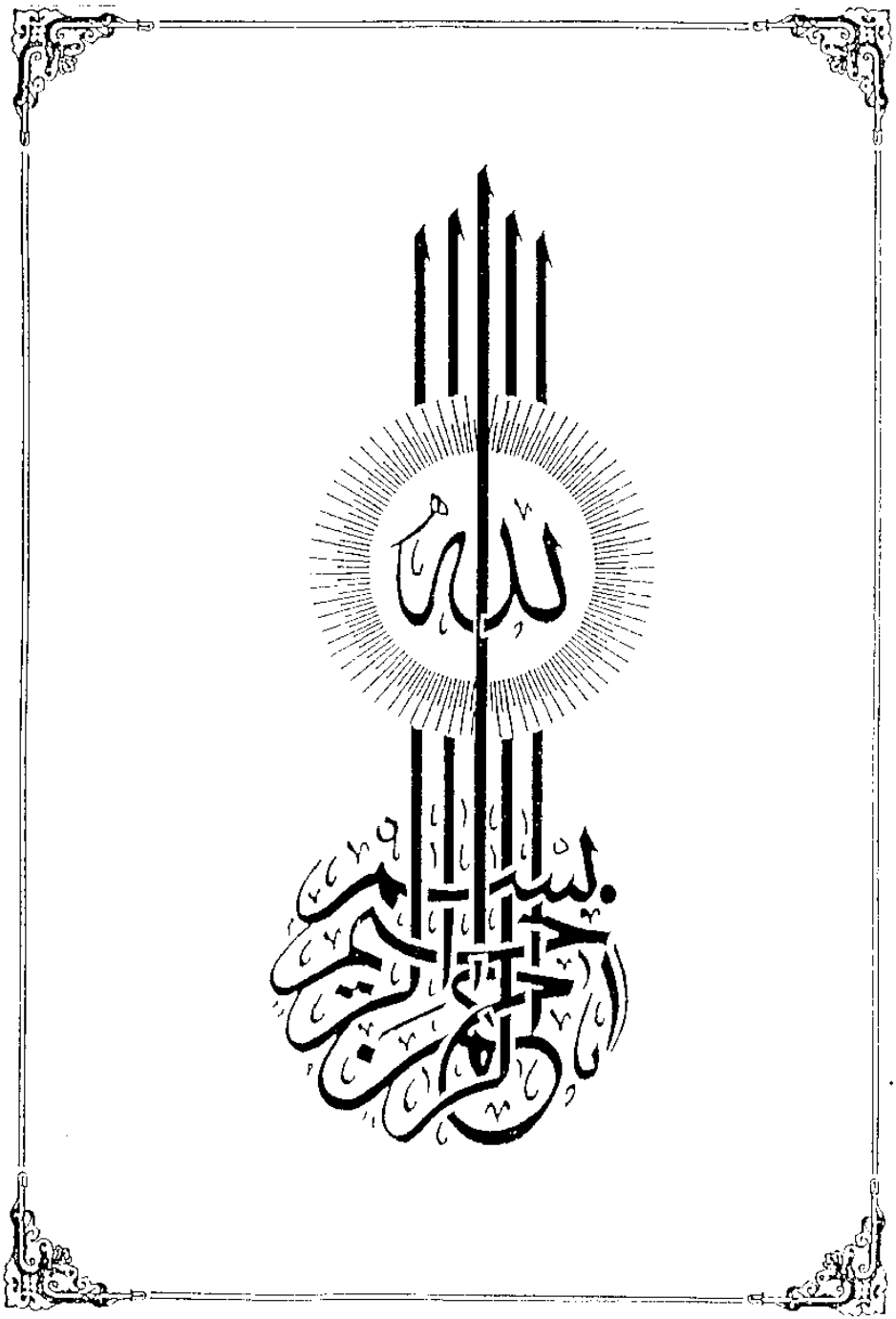

Table of contents

INTRODUCTION

INTRODUCTION

Chronic inflammation of the gallbladder is most commonly due to stones and the term, chronic cholecystitis, should be restricted to gallbladders containing gallstones with varying degrees of inflammation (Cuschieri & Bouchier, 1988). The high prevalence of gallstones has become more apparent since the introduction of ultrasonography, and necessitated recent lines of treatment. Although oral dissolution therapy with bile salts, contact dissolution with methyl tert-butyl ether, and extracorporeal shock-wave lithotripsy have been successfully used to treat patients with gallstones, the primary treatment of gallstone disease remains surgical (Schoenfield et al., 1981). The effort to reduce cholecystectomy to its least invasive form has led to the recent development of laparoscopic cholecystectomy to widen the spectrum of laparoscopic procedures that can now be performed in surgery (Dubios et al., 1990). The aim of this review is to clarify as possible the role of each method as a recent line of management of gallbladder stones.

CHAPTER I

Surgical anatomy

of the biliary tree

CHAPTER I

Surgical anatomy of the biliary tree

The biliary system and liver develop together from a diverticulum that arises in the embryo from the ventral floor of the foregut and extends into the septum transversum. The caudal portion becomes the gall-bladder, cystic duct and the common bile duct whereas, the cranial portion develops into the liver and the hepatic bile ducts (Howell and Packleman, 1976).

GALLBLADDER:

The gallbladder is a pear shaped organ that lies in a depression on the inferior or visceral surface of the right lobe of the liver. It consists of fundus, body, infundibulum, neck and ends by the cystic duct. The fundus projects beyond the liver. The body lies in a fossa on the inferior surface of the liver. The infundibulum is the part of the organ between the body and neck; it sags down as a pouch (Pouch of Hartman) towards the duodenum. The neck leaves the upper part of the infundibulum and soon narrows to form the cystic duct (Decker et al., 1986).

The arterial supply is via the cystic artery, which usually arises from the right hepatic artery in Calot's triangle. Venous drainage is via vessels running directly into the liver and several veins which join the pericholedochal plexus (Northover and Terblanche, 1982).

THE RIGHT AND LEFT HEPATIC DUCTS :

In each individual liver segment, the small bile ducts unite to form a single channel called the segmental bile duct. Rarely do two ducts drain one liver segment. The right and left hepatic ducts are formed by the confluence of the segmental ducts within the substance of the hepatic lobes (Linder, 1987).

In about 95% of cases, the right and left hepatic ducts unit in an extrahepatic position just inferior to porta hepatis. In the remainder, their union is intrahepatic. The usual extrahepatic length of each hepatic lobar duct varies form 0.5 to 1.5 cm (Linder, 1987). The extrahepatic segment of the right duct is short but the left duct has a much longer extrahepatic course; the length of which is reflected by the width of the base of the quadrate lobe. If the quadrate lobe has a broad base then the left hepatic duct has a long and rather transverse course (Blumgart and Thompson, 1987).

The right and left hepatic ducts may join at a wide or an acute angle, or they may descend parallel to each other for a variable distance before joining. Usually, the two ducts unite about 1 cm below the porta hepatis to form the common hepatic duct (Linder, 1987).

THE COMMON HEPATIC DUCT :

It is formed by the confluence of the right and left hepatic ducts. It varies in length from 2 to 6.5 cm. It lies in the right edge of lesser omentum, with the common hepatic artery to its left and portal vein situated posteriorly. In about 90% of cases, the right hepatic artery passes behind the duct, while in the rest it passes in front and hence is more prone to accidental injury (Decker et al., 1986).

THE CYSTIC DUCT:

The gallbladder join the common duct system by means of the cystic duct that has a variable length (depending up on the type of union with the common hepatic duct), averaging 4 cm. It joins the common hepatic duct at an acute angle, and the right branch of the hepatic artery resides immediately behind it. The cystic artery usually runs transversely just superior to the cystic duct (Linder, 1987).

Calot's triangle

The triangle of Calot is bounded on the left by the common hepatic duct, on the right by the cystic duct, and superiorly by the hilum of the liver. The apex of the triangle is the most critical area, since in it are usually the cystic artery, the right hepatic artery, 95% of accessory right hepatic arteries, and 90% accessory bile ducts (Linder, 1987).

THE COMMON BILE DUCT :

The common bile duct is formed by the union of the common hepatic duct with the cystic duct. It may be as short as 5 cm. and as long as 17 cm. Its normal diameter is 9 to 11 mm. (Dowdy et al., 1962). For purposes of description, the common bile duct is divided into four segments :

1 - Supraduodenal segment :

It lies within the right free border of the hepatoduodenal ligament. The ascending hepatic artery lies on the same plane as the duct and slightly to the left of it. The portal vein lies dorsal to the duct, separated from it by a varying amount of loose areolar tissue. Multiple lymph nodes lie close to the supraduodenal portion of the common bile duct and when enlarged they may be mistaken for gallstones when the duct is palpated (Dowdy et al., 1962).

2 - Retroduodenal segment :

It passes behind the first part of the duodenum where the gastroduodenal artery lies to its left and retroduodenal artery lies in front. The retroduodenal artery arises from the gastroduodenal artery which runs parallel to the duct behind the duodenum, about 1 cm to its left or it arises from the inferior pancreaticoduodenal artery. This portion of the common bile duct descends anterior to the inferior vena cava and to the right of the portal vein. (Bernard and Hand, 1987).

3 - Pancreatic segment

It may be entirely retropancreatic, lying between the head of the pancreas and the areolar tissues of the retroperitoneum; or it may lie within the substance of the dorsal portion of pancreatic head. The superior pancreaticoduodenal branch of the gastroduodenal artery crosses the third portion of the common bile duct either ventrally or dorsally. It makes exposure of this portion of the common bile duct hazardous. The large pancreaticoduodenal vein that runs on posterior surface of the pancreatic head is related to the left border of the pancreatic portion of the bile duct just before the vessel joins the portal vein. It is easily torn during surgery on this portion of the duct (Dowdy et al., 1962).

4 - Intraduodenal segment :

It begins when it enters the wall of the duodenum (from its posteromedial aspect at about its middle) obliquely and is joined on the left by the pancreatic duct. However, this junction may be in or outside the duodenal wall. The short common reservoir or channel formed by the two ducts, partly within the duodenal wall, is the ampulla of Vater which becomes constricted and opens into the duodenum on the summit of the major duodenal papilla. However, the common bile and pancreatic ducts may open independently into the duodenum, each on the summit of the major duodenal papilla or in a depth of a slight depression, into the duodenum at separate points. The orifice of the major papilla is round or slit like and between 2 and 5 mm in diameter (Kirk, 1944).

SPHINCTER OF ODDI :

The intraduodenal portion of the common bile duct, including the ampulla of Vater, is surrounded by a sheath of smooth muscle fibres. The entire sphincteric system of the distal biliary tract is commonly referred to as the sphincter of Oddi. The smooth musculature of the sphincter is divided into several sections and contains both circular and longitudinal fibres (Linder, 1987).

The biliary and pancreatic ducts enter the posteromedial surface of the mid-descending duodenum through an elliptical slit in the circular muscle of the duodenum. At their point of entrance, some smooth muscle fibers run to the angles of the opening, others connect the margins of the opening in both the longitudinal and the circular muscle of the duodenum with the major duodenal papilla and with the intraduodenal course of the ducts. These later fibres serve both to erect the papilla and to anchor the duct securely to the aperture in the duodenal musculature. From the time it pierces the duodenal wall until its junction with the major pancreatic duct, the common bile duct is wrapped in a sheath of circular muscle; the sphincter of choledochus (Sphincter of Boyden). This sphincter is responsible for filling of the gallbladder during fasting. The sphincter of choledochus is made up of two consecutive segments, a proximal one that surrounds the bile duct as it enters the duodenal wall and a distal segment that is completely intramural. If the two ducts unit within the duodenal wall to form the ampulla, just before they do so a sheath of muscle fibres encircle both ducts. This marks the site of origin of the sphincter of the ampulla, which extends almost to the tip of the major duodenal papilla. If this sphincter becomes spastic, a common channel will be formed between the biliary and pancreatic ducts. If the two ducts do not join, but proceed distally to empty separately on the ampulla, the sphincter

of the ampulla is replaced by the sphincter of the papilla (Linder, 1987).

BILE DUCT BLOOD SUPPLY :

Northover and Terblanche (1979) divided the bile duct into three segments : hilar, supraduodenal and retropancreatic (Lower common bile duct). The hilar ducts receive a copious arterial blood supply from surrounding vessels forming a rich network on the surface of the ducts in continuity with the plexus around the supraduodenal duct (Smadja and Blumgart, 1988).

The blood supply of supraduodenal duct is essentially axial. Most vessels to the supra-duodenal duct arise from the retro-duodenal artery, the right branch of hepatic artery, the cystic artery, the gastroduodenal artery and the retroportal artery (this artery runs along the posterior surface of the supraduodenal duct, it arises from the coeliac axis or superior mesenteric artery and passes upward behind the portal vein to reach the duct). On average, eight small arteries, measuring each about 0.3 mm diameter, supply the supraduodenal duct. The most important of these vessels run along the lateral borders of the duct and have been called the 3 o'clock and 9 o'clock arteries (Smadja and Blumgart, 1988). Interruption of these two arteries has been reported to result in ductal