COMPARISON BETWEEN THE ROLE OF SURGERY AND ENDOSCOPIC SPHINCTEROTOMY IN MANAGEMENT OF CALCULAR OBSTRUCTIVE JAUNDICE

A Thesis Submitted in Partial Fulfillment of
M.D. Degree in General Surgery

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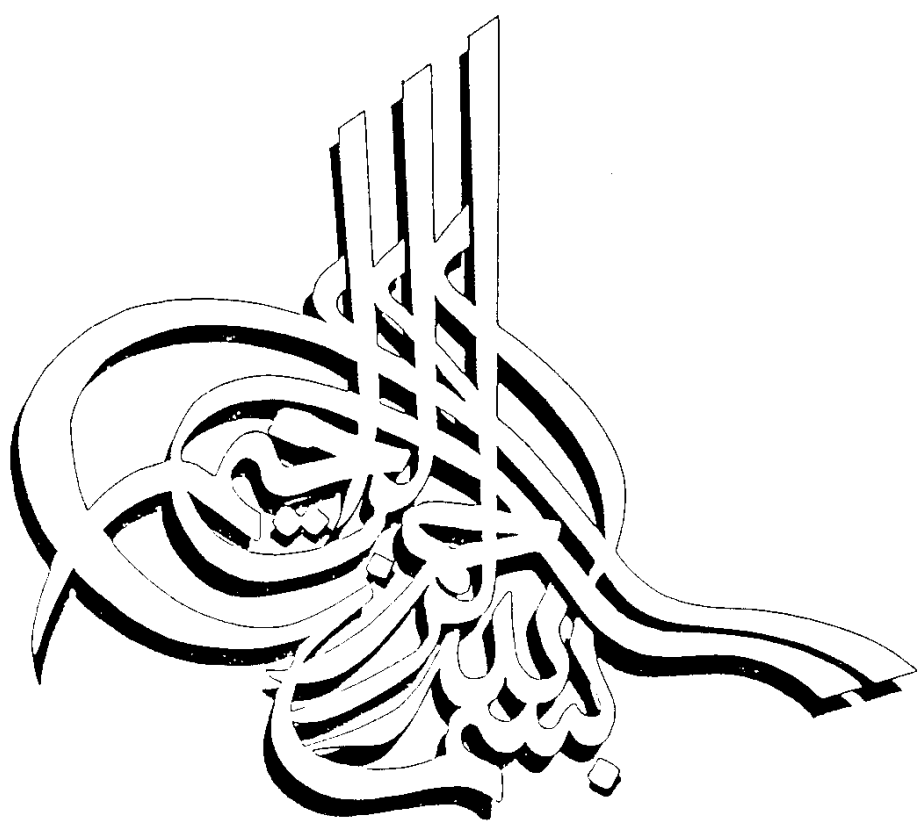

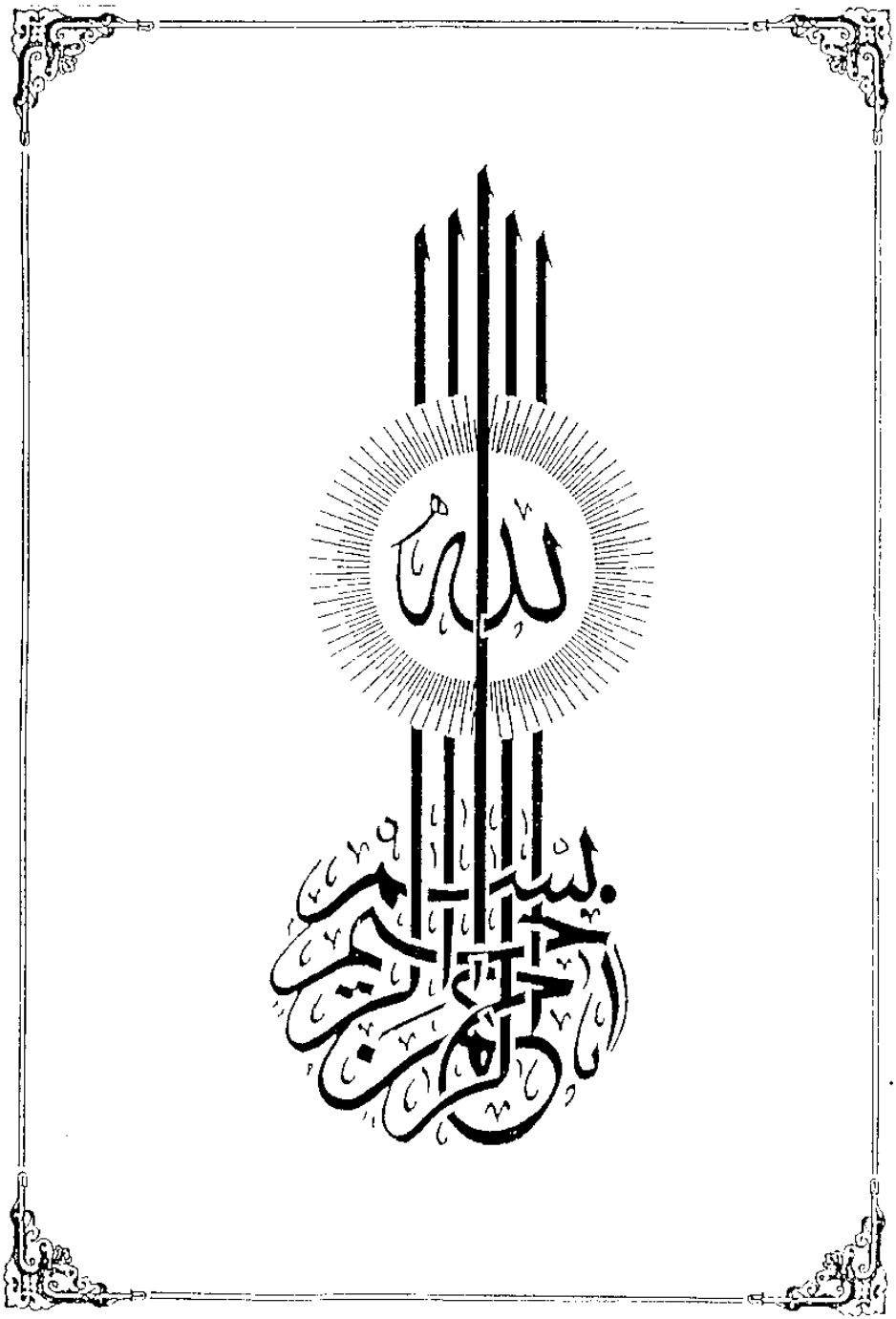

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CONTENTS

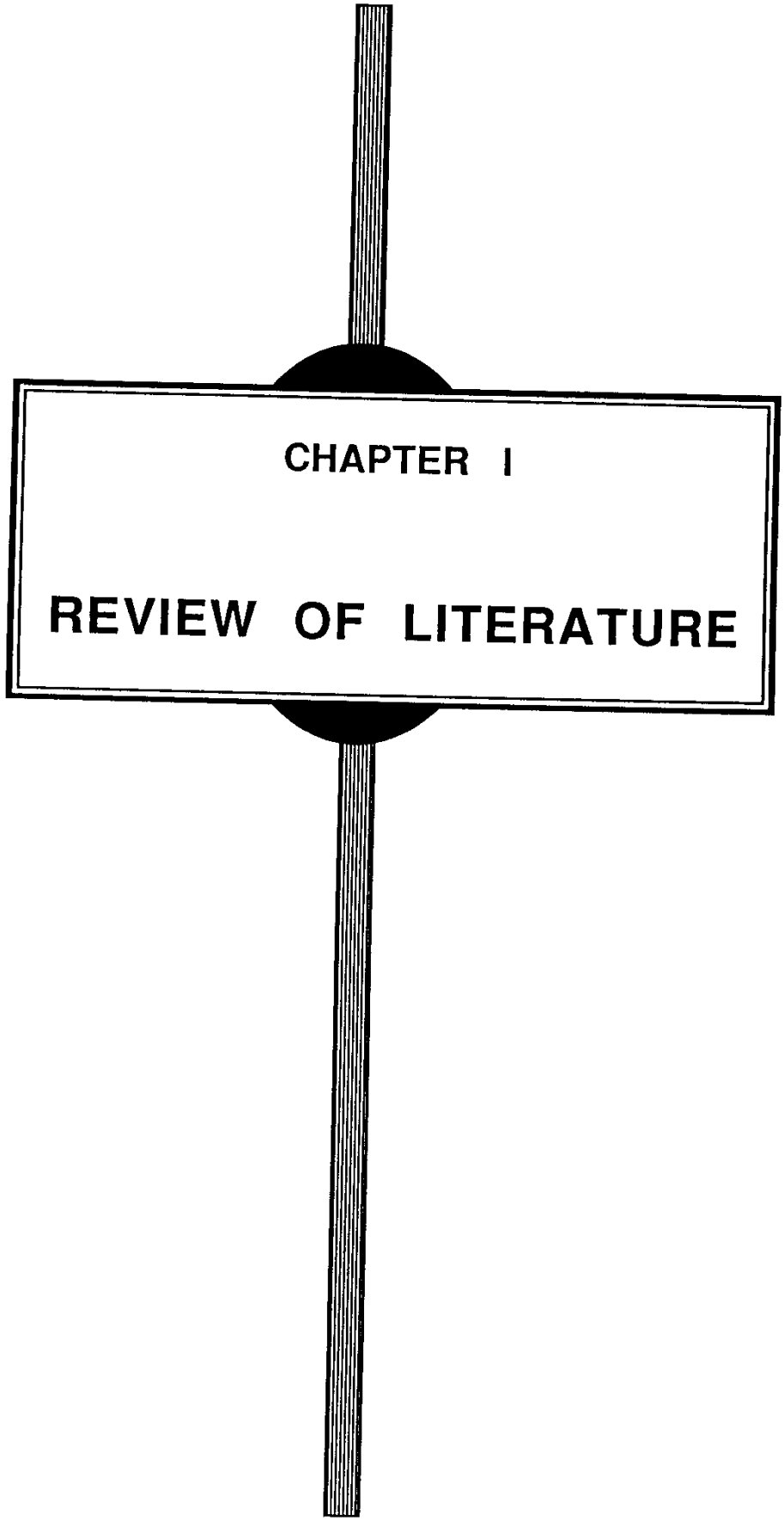
INTRODUCTION

An obstructing stone in the common bile duct is one of the most common and serious complications of cholelithiasis.

The great majority of cases are associated with calculi in the gall bladder, as residual or recurrent stones following cholecystectomy. Stones can be formed, less common, primarily in the common bile duct ***(Ellis, 1986)***. Stones in the common bile duct may remain asymptomatic for long periods of time, but acute pancreatitis, cholangitis, obstructive jaundice, biliary fibrosis and choledochoduodenal fistulae may develop ***(Blumgart, 1986)***. The management of bile duct stones may be operative or non-operative. The surgical management of common bile duct stones was considered the only line of treatment till 1973 when endoscopic sphincterotomy was introduced by ***Kawai et al.*** The use of endoscopic sphincterotomy minimises mortality and morbidity much less than the operative techniques especially in the high risk group. The indications of its use include extraction of retained or recurrent stones in the common bile duct after cholecystectomy, management of acutely ill patients with suppurative cholangitis and severe gall stone pancreatitis ***(Goodale, 1986)***. Surgical exploration of the common bile duct is carried out if initial endoscopic papillotomy fails to treat the condition ***(Himal, 1991)***. However, endoscopic sphincterotomy is recently used as the primary line of treatment in some cases of cholelithiasis accompanied with common bile duct stones so as cholecystectomy can be performed with the patient in the ajaundiced state with less chance for morbidity and mortality

(Blumgart, 1986). Endoscopic sphincterotomy still carries the incidence of some complications as perforation at the sphincterotomy site, hemorrhage, pancreatitis and cholangitis. Perforation is the most devastating complication with an associated mortality of 25%.

These complications should be considered in evaluating the techniques and compared to those of open surgery *(Reginald et al., 1991).*



THE GALL BLADDER

The gall blader lies partly in a fossa on the inferior surface of the right hepatic lobe. It is from 7-10 cm long, 3 cm broad at its widest part and from 30-50 ml in capacity. The hepatic surface is attached to the liver by connective tissue of the liver capsule. The antehepatic surface is covered with peritoneum *(Warwick and Williams, 1973)* . Gall bladder is divided into 4 anatomic portions: The fundus, body, infundibulum and neck. The fundus may or may not project below the inferior border of the liver in the region of the right ninth costal margin *(Mc Minn, 1981).* The body which is the major storage area and contain the most of the elastic tissues, is closely related to the transverse colon and to the first and proximal part of the second portions of the duodenum *(Skandalakis et al., 1983)* . The neck is attached to the liver by areolar tissues in which the cystic artery is embedded. From right wall of the neck a small pouch may project, which is termed "Hartmann's pouch", some authors does not consider it as a constant feature of normal gall bladder, but associated with pathological conditions *(Warwick and Williams, 1973)* . The mucous membrane of the gall bladder is projecting into Folds and arranged in a more or less spiral manner in the neck (the spiral valve or valve of Heister), just short of the cystic duct *(Last, 1986).*

ANOMALIES OF THE GALL BLADDER

A) Anomalies of number:

- Absence of the gall bladder:

Agenesis of the gall bladder is very rare, with an estimated incidence of 0.02% of the population *(Knight, 1981)* . Before the diagnosis is made,

the presence of an intrahepatic vesicle or organ on the left side must be ruled out *(Schwartz, 1990).*

- **Multiple gall bladder**

If the duplication of the gall bladder is drained by a single cystic duct the anomaly is known as a cleft or bilobed gall bladder. If the anomaly is drained by a separate cystic duct, it is known as a true double gall bladder *(Lindner, 1987).*

B) Anomalies of Form of gall bladder:

- **Diverticulum of the gall bladder:**

The most common site of which is in Hartmann's pouch. It varies in diameter From 0.6 to 9.0 cm, present in 0.2% of surgically removed gall bladders. Cholecystectomy is indicated when this abnormality produces symptoms or harbors calculi.

- **Hourglass gall bladder:**

which may be congenital or acquired by makred kinking between the body and Fundus *(Schwartz, 1990).*

- **Phrygian Cap:**

The Fundus will occasionally Fold on itself and form a "phrygian cap", this has no clinical significance *(Hermann, 1979).*

C) Anomalies of position of gall bladder:

- Floating gall bladder:

The so-called floating gall bladder is one in which the organ is completely covered by peritoneum. It is usually suspended from the liver by a mesentery. If a mesentery is absent, the only connection of the gall bladder to the liver may be by a cystic duct mesentery. Both types of floating gall blader predispose to gall bladder torsion *(Lindner, 1987)* .

- Intrahepatic gall bladder

It is rare anomaly. When present, it is usually close to the visceral surface of the right lobe of the liver, when inflammed, it may be mistaken for an intrahepatic abscess *(Lindner, 1987)*. Left-sided intrahepatic gall bladder can occur without situs inversus and can cause great diagnostic difficulties *(Knight, 1981)*.

- mesentery of g bl might contain Rt hepatic...

CYSTIC DUCT

The cystic duct varies in length from 2 to 4 cm (Hermann, 1979). It is about 3 mm indiameter *(Skandalakis et al., 1983)* .

Anomalies of the cystic duct

A. Long cystic duct with low fusion with common hepatic duct

It is the commonest duct anomaly, occurring in 8.6 percent of cholecystectomies. Under these circumstances the cystic duct is invariably longer than normal, it may run alongside and parallel with the common hepatic duct before joining it, or twist around the common hepatic duct, fusing with it either anteriorly or at its left hand border. In this case a

variable length of cystic duct is always tightly bound down to the common hepatic duct before the two actually fuse. This vigorous traction on the cystic duct may produce marked angulation and tenting of the common hepatic and bile ducts which may then be caught in a clamp. Furthermore, meticulous dissection of the ducts to put a "Flush-tie" on the common hepatic duct could well result in either immediate direct injury to the common hepatic duct or delayed damage if a length of this duct is devascularized *(Benson and Page, 1976).*

B. Abnormal fusion of the right and left hepatic ducts with the cystic duct

This abnormal fusion form a virtual trifurcation, in which the hepatic ducts are at risk from operative injury if the anomaly is not appreciated *(Knight, 1981).*

C. Cystic duct entering the right hepatic duct:

The danger here is that the right hepatic duct is mistaken for the cystic duct (particularly if the upper reaches of the right hepatic duct are not clearly seen) and is tied off and divided where it joins the left hepatic duct *(Benson and Page, 1976).*

D. Absence of the cystic duct:

The congenital absence of the cystic duct is rare, but occurs as an acquired defect due to pressure necrosis by a large stone, so that the gall bladder empties directly into the common duct, a potentially reacherous anomaly for the unwary surgeon *(Hermann, 1979).*

HEPATIC DUCTS

The confluence of the right and left hepatic ducts almost always occurs outside the liver. In dissections in this area it may be necessary to push liver substance away to display the confluence completely. The length of the common hepatic duct is about 3 cm. It's joined on its right side and at an acute angle by the cystic duct to form the common bile duct *(McGregor' 1986).*

Anomalies of hepatic ducts:

- Accessory hepatic ducts:

Accessory ducts are much more common on the right side of the biliary tree than on the left. They may run directly from the liver into the gall bladder, the right or left hepatic duct, the common hepatic duct, the common bile duct, or the cystic duct *(Lindner, 1987).* The inadverent division of small accessory duct will, if unrecognized, result in bile leakage, biliary peritonitis, biliary fistula and possibly, late stricture of the common duct duct to sclerosing action of the leaking bile. Ligation of an accessory duct similar in size to the cystic duct could cause significant segmental biliary obstruction. Therefore, at operation it is essential that larger accessory ducts be preserved intact. If divided or ligated, drainage should be reestablished by anastomosis to a jejunal Roux-en Y. *(Knight, 1981).* Occasionally, the right, left, or even both hepatic ducts enter the gall bladder. Such a variation could lead to a surgical catastrophe if a major duct is ligated. this is an argument in favor of removing the gall bladder at the fundus *(Skandalakis et al., 1983).*

COMMON BILE DUCT

The length of the common bile duct varies from 5 to 15 cm depending on the position of the entering of the cystic duct *(Skandalakis et al., 1983)* . Leslie in a work in 1968, measured the width of the common bile duct in 202 operations on the biliary tract, and he attempted to correlate the measured width of the duct with the presence or absence of disease within it, as the following: ducts which are less than 9 mm wide contain no disease in the distal portion of the duct. Those ducts which are greater than 17 mm wide always contain disease. Ducts measuring between 9 to 17 mm may or may not contain disease in the distal portion, but the probability of such increases rapidly in ducts which are greater than 14 mm wide (so exploration will be required).

The diameter of the common bile duct differs when measured by different imaging techniques *(Niederau et al., 1984)* . the common duct is bigger in radiographic studies because of magnification, the degree of magnification depending on the distance between the x-ray tube, the common bile duct and the x-ray plate *(Chung et al., 1990).* Techniques which involve direct introduction of contrast material into the common bile duct (percutaneous transhepatic cholangiography, operative cholangiography, endoscopic retrograde cholangiopancreatography, T-tube cholangiography) may increase the diameter of the bile duct due to distension by the injected material under pressure *(Sauerbrei et al., 1980).* In intravenous cholangiography the chloretic effect of the intravenous contrast may also cause distension *(Niederau et al., 1984)* The upper limit of normal common bile duct diameteris 1.0 - 1.1 cm for both percutaneous

transhepatic cholangiography and endoscopic retrograde cholangio-pancreatography. Ultrasonography may represent an under- estimate of the bile duct size as the echoes reflected from the duct wall may decrease the measurement of the lumen. The mean diameter of the common bile duct, as measured by ultrasonography, is 0.41 cm *(Chung et al., 1990).*

The common bile duct can be divided into 4 parts:

- Supraduodenal part:

It runs anterior to the epiploic foramen, here it lies in the right border of the lesser omentum, in front of the right edge of portal vein, and on the right of hepatic artery proper *(Warwick and Williams, 1973).* The supraduodenal portion may be crossed anteriorly by one or more of the following: right gastric, right hepatic, supraduodenal or even gastroduodenal artery *(Skandalakis et al., 1983).*

- Retroduodenal part:

It passes behind the superior part of the duodenum with the gastroduodenal artery on its left *(Mc Minn, 1981).* the surgeon must remember that the middle colic artery is also in this neighborhood *(Skandalakis et al., 1983).*

- Paraduodenal part:

It runs in a groove on the upper lateral part of the posterior surface of the head of the pancreas, here it is situated in front of the inferior vena cava, and is sometimes, completely embedded in the pancreatic tissue. It has been pointed that the bile duct may lie close to the left border of the descending part of the duodenum or lie as far away as 2 cm from the