POST CHOLECYSTECTOMY BILIARY STRICTURE

ESSAY

Submitted for Partial Fulfilment

Of

Master Degree in General Surgery

Presented By

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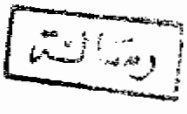
MB. B.CH



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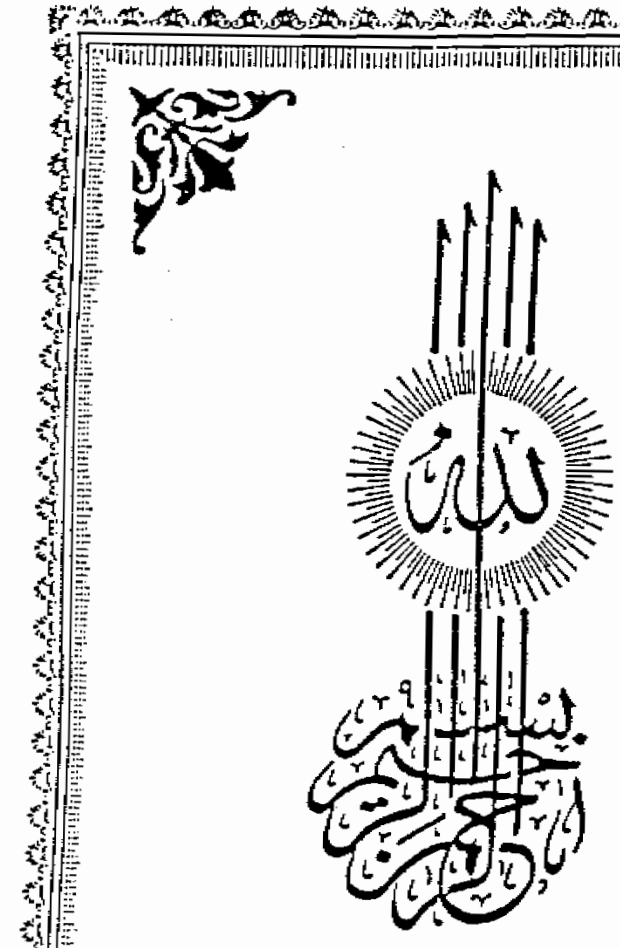

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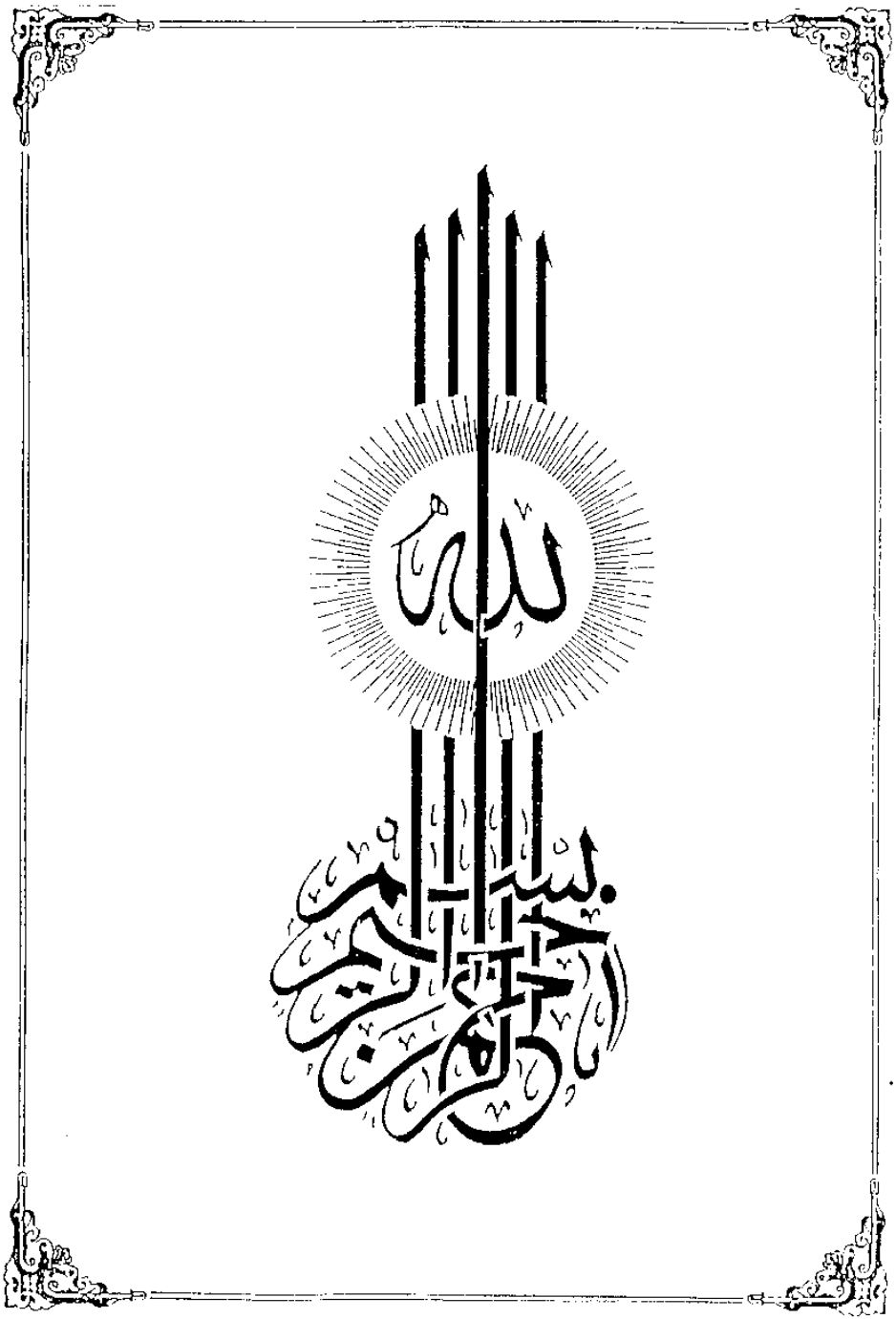

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Post Cholecystectomy Biliary Stricture

Trauma to the extrahepatic biliary tree can result from a number of medical and surgical procedure; but it is the accidental injury arising at cholecystectomy which most frequently result in tragic response for patients, who may be deprived of their most productive years of life. This type of injury may necessitate repeated surgiceal intervention. The morbidity and mortality rates of which far exceeds these of the original procedures. Damage to the bile ducts at operation is preventable because it results from failure of surgical technique (Garden 1991).

There is debate about the exact incidence of bile duct injury at cholecystectomies; the surveys under taken have the figure of one injury per 300-500 open cholecystectomy procedures (Bismuth, 1982) and one injury per 150-200 laparoscpic cholecystectomies (Peters et al., 1991) (Cuschieri et al., 1991).

The aim of this essay is discuss the etiology, pitfalls and management of post choleystectomy biliary stricture.

Anatomy of The Biliary Tree

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Anatomical Normality in The Biliary Tree

Normality, in the sense anatomical pattern which is repeated in the majority of individuals, is a term which can not be used in relation to the biliary tree.

Variation is common in about 50% of individuals **[Benson & Page, 1976]**.

Any attempt to define the normal anatomy of the biliary tree, therefore would be artificial and misleading, so each major area of extrahepatic biliary tree and its related vessels will be considered separately, and the more important variational group described.

The duct system for biliary passage:

The bile secreted by the liver cells passage through these channels: bile canaliculi, canal of Hering and preductules, bile ductules, bile ducts, intrahepatic ducts, extrahepatic ducts and common bile duct.

Extrahepatic Ducts

Left HEPATIC Duct (L.H.D)

the left lobeof the liver is always drained by a single channel, the true left hepatic duct, and in most cases all its tributaries are intrahepatic **[Kune and Sali, 1980]**.

The left hepatic artery usually runs below or behind the

LHD, while the left branch of the portal vein may, unlike the right branch, partly spiral around the upper border of its hepatic duct to form an anterior relation of the latter as the two structure pass into liver substance **[Hobsley, 1958]**.

The left hepatic duct forms in the umbilical fissure from union of ducts from hepatic segment II, III, and IV, then passes to the right across the base of segment IV and unites with the right lobar duct to form the common hepatic duct. The extrahepatic portion of the left lobar duct characteristically is about 2 cm.

Right Hepatic Duct (R.H.D):

The functional right lobe comprises two segments: anterior and posterior (that part of the liver to the right of the lobar fissure, marked by the gall bladder fossa and the inferior vena cava).

In 75% of individuals, the right anterior and posterior segments join to form a true right hepatic duct, i.e. a single channel carrying the whole bile output of the functional right lobe; in the remaining 25% there is no true R.H.D., the segmental ducts emptying into the left hepatic duct separately **[Kune and Sali, 1980]**.

Among these individual (75%), in whom a true RHD is present, it is wholly extrahepatic except a few.

The extrahepatic segment is of variable length, being 1.5 -

2.5 cm long in 80% Of cases, but may be up to 6 cm in length **[Kune and Sali, 1980]**.

The RHD is readily approached by dividing the peritoneum and fat overlaying it in the porta hepatis, the right hepatic artery usually runs inferior to it, while the right branch of the portal vein lies posterior to these two structures.

The right hepatic duct drains segment V to VIII **[Scott, 1990]**.

Accessory Bile Ducts:

Since the first description of the segmental pattern of liver drainage, several authors have shown that accessory bile duct in the groups (approximately 25% of population) in whom no true RHD exists, the extra or accessory duct and what was erroneously thought to have been, the true RHD in these individual are, in fact, the two major segmental ducts from the right lobe draining separately into the LHD **[Kune, 1970]**. Damage to accessory duct will affect the bile drainage of a definite inadvertent, unnoticed division will lead to a sustained bile leak which may threaten the patient's life **[Kune and Sali, 1980]**.

The Confluence of the Hepatic Duct:

The point at which the right and left hepatic ducts join is often known to surgeons as the "bifurcation". From a functional stand point, however the term confluence is more accurate.

The confluence is always accessible in the normal individual, beneath the peritoneum in the porta hepatis; infrequently it is overlaid by the right hepatic artery. Sometimes the right and left hepatic ducts have a long extrahepatic course, so that the confluence may lie well down into the free edge of lesser omentum where it is liable to damage during cholecystectomy **[Northover and Terblanche, 1979]**.

Common Hepatic Duct (C.H.D.)

This bile duct segment of enormous surgical importance, being involved in two thirds of post-operative biliary strictures **[Warren et al., 1971]**. It is formed by final confluence of all ducts issuing from the liver and ends when the lumen of the cystic duct opens into it to form the C.B.D. Its width does not differ significally from the C.B.D. and measuresup to 9 mm.

In most individuals, it is 2.5 - 3.5 cm in length but this is variable. In approximately 2% of cases, the C.H.D. is non existent and the cystic duct opening into the hectic duct confluence **[Benson and Page, 1976]**, while in about 15 - 20% the C.H.D. extends downwards behind the duodenum before the cystic duct opens into it.

The major relations of the common hepatic duct are fairly constant; it lies in the right edge of the lesser omentum with the common hepatic artery (C.H.A.) to its left and the portal vein situated posteriorly.

Its important variable neighbours are right hepatic artery (R.H.A.), cystic artery and cystic duct. As the C.H.A. normally bifurcate below the hepatic bile duct confluence, the R.H.A. has to cross the CHD to reach the liver. In about 90% of cases, the R.H.A. passes behind the C.H.D. while in the rest it passes in front and hence more prone to accidental injury.

The cystic artery usually arises in Calot's triangle and hence is not normally directly related to the C.H.D., in about 22% however, it arises from R.H.A. to the left of the C.H.D. hence crossing it anteriorly in 20% and posteriorly in the remainder.

It is in these individuals that hurried attempts to secure a retracted bleeding cystic artery are especially dangerous **[Schwartz; 1985]**. The cystic duct normally join the C.H.D. at an angle, but in about 30% it is intimally bound to the right, anterior or posterior wall for variable distance before the lumina join. In these situation, the dissection involved in an attempt to remove the whole cystic duct may damage the common hepatic duct or its blood supply.

Gall Bladder:

It lies at the junction of the right lobe and the medial segment of left lobe of the liver. The hepatic surface is attached to the liver by connective tissue of the liver capsule.

It is usually lied at the level of the angle of the 9th right costal cartilage and the lateral border of the rectus sheath to the left hepatic flexure of the colon.

The body of the gall bladder is closely related to the transverse colon, and to the first and proximal part of the second portion of the duodenum. The body is completely covered by peritoneum and has its own mesentry in about 4% of cadavers. Such gall bladder (floating or roving) are subjected to torsion and infarction. Several other anomalous peritoneal folds connect with the body of the gall bladder, the cholecystogastric, cholecystoduodenal and cholecystocolic folds are redundancies of the lesser omentum. The neck of gall bladder is S. shaped and lies in the free border of the lesser omentum.

The Cystic Duct:

It is the continuation of the neck of the gall bladder. It is commonly 3 - 4 cm long, slightly longer in cadaver than in surgical patient. Its internal diameter range from 1 m to 3 m. In most people, the duct follows a straight oblique course to join the common hepatic duct.

The junction is easily seen with minimal dissection in about 65%, while in the remainder, often deceptively, the duct runs a longer course, parallel with or spirally around the CHD, the distal duct in these circumstances is often incorporated into the

wall of the CHD, so that attempt to remove it entirely may lead to duct damage **[Warren et al., 1971 - Kune and Sali, 1980]**. The right branch of the hepatic artery resides immediately behind it.

The cystic duct may be absent or very short, and there may be an extremely high union with the hepatic duct; at times the cystic duct enters the right hepatic duct. In some instances, the cystic duct may spiral either posteriorly or anteriorly in relation to the common hepatic duct and join the C.H.D. from the left side.

Cholecystohepatic Traingle of Calot

This area , bounded by the cystic duct, common hepatic duct and inferior surface of the liver, is the key to cholecystectomy. The traingle includes the various structures to be avoided when isolating the gall bladder. It was reported that, within the traingle and in accidental reach of a clamp placed on the cystic duct are: R.H.A. in 83% of individuals, the aberrant R.H.A., when present in 16% and an accessory bile duct, when present, in 10%.

The R.H.A. is in special danger when it describes a loop to the right (Caterpillar hump) within the traingle, towards the neck of gall bladder, as it does in about 7%, it may be mistaken for cystic artery and divided **[Benson and Page, 1976] (Fig 1)**.