Management of Benign Biliary Strictures

Essay

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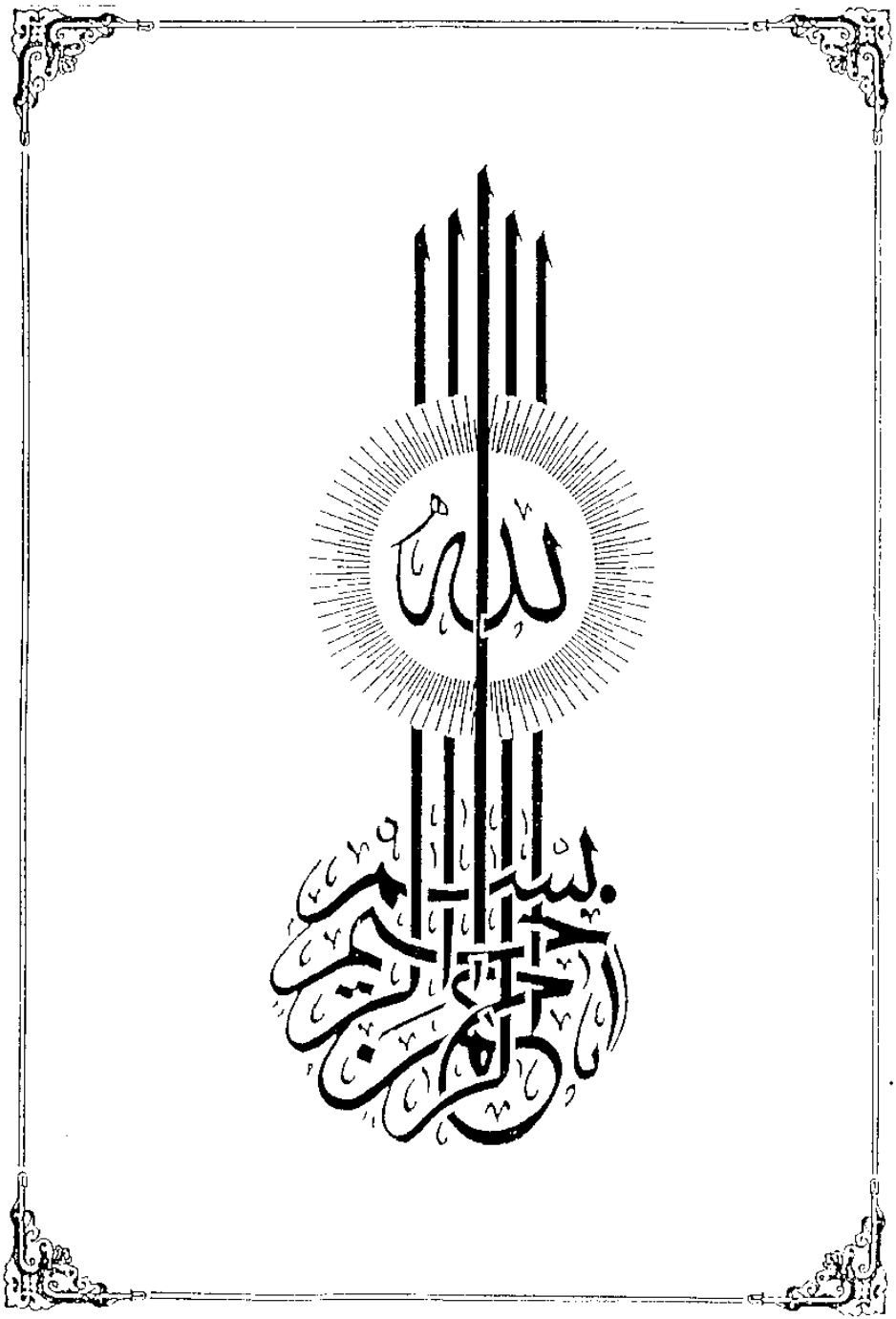
To my Parents



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CONTENTS

	Page
* Introduction	1
* Aim of the Work	2
* Historical Background	3
* Embryology of the biliary system	5
* Anatomy of the biliary system	6
* Physiology of the biliary system	10
* Classification of bile duct strictures	14
* Causes of Benign biliary strictures	14
* Diagnosis of Benign biliary strictures	21
* Pre-operative preparation	30
* Treatment of Benign biliary strictures	34
* Surgical procedures for Benign biliary strictures	39
* Prognosis	51
* Summary	56
* References	59
* Arabic Summary	

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Introduction & Aim of the Work

INTRODUCTION

* Benign biliary strictures occur in a number of conditions and may affect the intra-hepatic or extra-hepatic biliary tree.

* Benign biliary strictures most often follow intra-operative injury recognised later,

Prevention of operative injuries by the use of cholangiography, careful dissection and removal of the gall bladder from the fundus downward is the best treatment

(Roslyn J. J., 1992)

Although, great majority of injuries to bile ducts occur during cholecystectomy, with or without exploration of the common bile duct, a number also occur in association with other operations either on the stomach, the pancreas, or the liver, or during surgery for portal hypertension

(Kune and Sali, 1980).

Biliary strictures usually present a complex problem in diagnosis and management. As such, it is a special abnormality demanding an experianced surgical team working in close collaboration with others, and, in particular having excellent diagnostic and interventional radiologic backup and facilities for endoscopic diagnosis and operative endoscopy when indicated. Treatment decisions should be taken in consultation.

Bile duct stricture, and in particular high stricture and stenosis extending to the confluence of the bile ducts, should not be treated by the occasional operator.

Aim of the work:

Study of benign biliary strictures as regard as:

1. Anatomy and embryology of the biliary system.
2. Congenital anomalies of the biliary system.
3. Causes of benign biliary strictures.
4. Diagnosis and treatment of benign biliary strictures.

Historical Background

HISTORICAL BACKGROUND

The biliary system was first recognized in early medical writing in about 2000 B.C. when the *Babylonians* described the gall bladder and extra-hepatic bile ducts.

For several centuries thereafter, the liver was believed to be the seat of the soul, and the four humors; blood, phlegm, yellow bile and black bile, were considered the basis of most diseases.

In the second century AD, *Galen* was the first to write about the storage functions of the gall bladder and he appeared to be familiar with gall stones and jaundice.

In 1341, *Gentile da Foligno in Padua* first described finding a human gall stone during an autopsy.

In the fifteenth and sixteenth centuries, clinical descriptions of cholecystitis, gallstone and obstructive jaundice began to appear in medical writing.

In 1420, *Antonia Benivieni*, a florentine pathologist, described the first case of gallstone in humans causing colic.

In sixteenth century, *Fallopins* defined the anatomy of the liver and made the first attempt to correlated its function with that of the biliary system.

In 1609, *Schenk* clearly described biliary colic and obstructive jaundice, as well as the fever of cholangitis. In 1687, *Vonder Wiell* reported the evacuation of a gallstone from an abcess of the abdominal wall.

In 1630 *Zambecarri* performed experimental cholecytectomies on animals to demonstrate that the presence of the gallbladder was not essential to the good health of the animal

Surgical procedure to relieve biliary colic, acute cholecystitis, and peri-cholecystic abcesses were described by *Jean Louis Petit* in Paris in 1733, for

the drainage of pus and stones, he advocated direct incision into the inflammed gall bladder if it was adherent to the abdominal wall. However, the fear of opening into the peritoneal cavity was so great that two-stage operations were proposed for gall stone; the first stage was to produce adhesions between the gall bladder and the anterior abdominal wall, and the second stage was to open the gall bladder for drainage.

With the development of anaesthesia in 1846, planned operations for acute cholecystitis began. In 1867, *John Bobbs* of Indianapolis performed the first cholecystostomy for the treatment of acute cholecystitis.

In England, *Lawson Tail* reported the first series of cholacystostomies in the late 1800's; 14 patients were operated on, with 1 death.

In 1882 in Berlin, *Carl Langenbouch* performed the first cholecystostomy for acute cholecystitis.

In 1887, *Justus Ohage* of st. paul performed the first cholecystectomy in U.S.A.

The recurrence rate of gall stones and further episodes of cholecystitis in patient who had only cholecystostomy, as these were followed through the years, was sufficiently high so that the cholecystectomy in the early 1900s gradually came to be recognized as the treatment of choice for acute and chronic cholecystitis. The refinement and development of present operative techniques for both cholecystostomy and cholecystectomy have been perfected during the past 80 to 100 years by many surgeons.

Embryology & Anatomy & Physiology of the Biliary System

EMBRYOLOGY OF THE BILIARY SYSTEM

The biliary system develops from an embryonic hepatic diverticulum during the fourth week of fetal development.

Canaliculization of the bile duct from a solid cord of cells begins about the sixth week. Anomalies of the biliary system are suid to occur in approximately 15% of persons. Most of these anomalies consists of variations in the number or arrangement of the intrahepatic ducts, in the length or junction of the cystic duct with the hepetic, in the insertion of the distal common bile duct into the duodenum and its junction with pancreatic duct, or in the arterial blood supply to the hepatic ducts and gall-bladder. These anomalies do not affect biliary function and are of importance to surgeons only because they are recognized variations and should be identified during operation on the biliary system.

Severe congenital anomalies or alteration in embryologic development are rare and include atresia or duplication of the gall-bladder and bile ducts, absence of gall-bladder, intra-hepatic gall=bladder and bile ducts, absence of gall-bladder, intra-hepatic gall-bladder, and congenital cystic dilatation of the bile ducts.

For unexplained reasons, the incidence of these anomalies is higher in Japan than on other areas of the world.

The two types of congenital anomalies of greatest importance to surgeons are those that affect bile excretion and cause jaundice, these are biliary atresia and bile duct cysts.

ANATOMY OF THE EXTRA-HEPATIC BILIARY TRACT

Normal Anatomy:

Hepatic Ducts:

The intra-hepatic segmental bile ducts unite to form lobar ducts; which in turn coalesce to form the right and left hepatic ducts that represent the begining of the extra-hepatic biliary system.

The right hepatic duct is formed by the intra-hepatic confluence of dorso-caudal and ventro-cranial branches. It enters the left duct with a sharp curve, which account for the fact that the extra-hepatic biliary calculi are less commonly found in this segment.

The left hepatic duct is longer than the right and has a greater propensity for dilatation as a consequence of distal obstruction.

The common hepatic duct, which begins at the confluence of the right and left hepatic ducts, is 3-4cm in length, it is joined by the cystic duct to form the common bile duct.

Common Bile duct:

The common bile duct is approximately 8.5cm in length.

The normal external diameter ranges between 4 and 10mm.

Blumgart L.H. 1990, has shown that at diameter of 10.2mm or above, the probability of obstructive pathology is 50 percent.

The upper portion is situated in the free edge of the lesser omentum, to the right of the hepatic artery and anterior to the portal vein.

The middle third of the common duct curves to the right behind the first portion of the duodenum, where it diverges from the portal vein and hepatic arteries.

The lower third of the common duct curves more to the right beyond the head of the pancreas, which it grooves, and enters the ampulla of Vater, where it is frequently joined by the pancreatic duct.

The portion of the duct have been named according to their relationship to the intestinal viscera; supra-duodenal, retro-duodenal, intra-pancreatic, and intra-duodenal.

The averge length of each of these segments is 2, 1.5, 3 and 1 cm respectively.

The pancreatic portion of the common duct is partially covered by pancreatic tissue in about 45 per cent of cases.

The intra-duodenal portion of the common bile duct passes obliquely through the duodenal wall with the main pancreatic duct and follows one of three patterns;.

The structure may unite outside the duodenum and traverses the duodenal wall and papilla, they may join within the duodenal wall and have a common short, terminal portion, or they may exit independently into the duodenum.

Separate orifices have been demonstrated in some autopsy specimens, whereas injection into cadavers reveals reflux from the common duct into the pancreatic duct.

The distal common bile duct at the papilla of Vater is regulated by a sphincteric mechanism that originally was named the sphincter of Oddi but more accurately has been described by Boyden, who has defined a complex of four sphincters composed of circular or spiral smooth muscle fibres surrounding the intra-mural portion of the common bile duct and pancreatic ducts.