Role of Endoscopy in the Management of Obstructive Jaundice

Thesis

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by

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T O M Y

PARENTS

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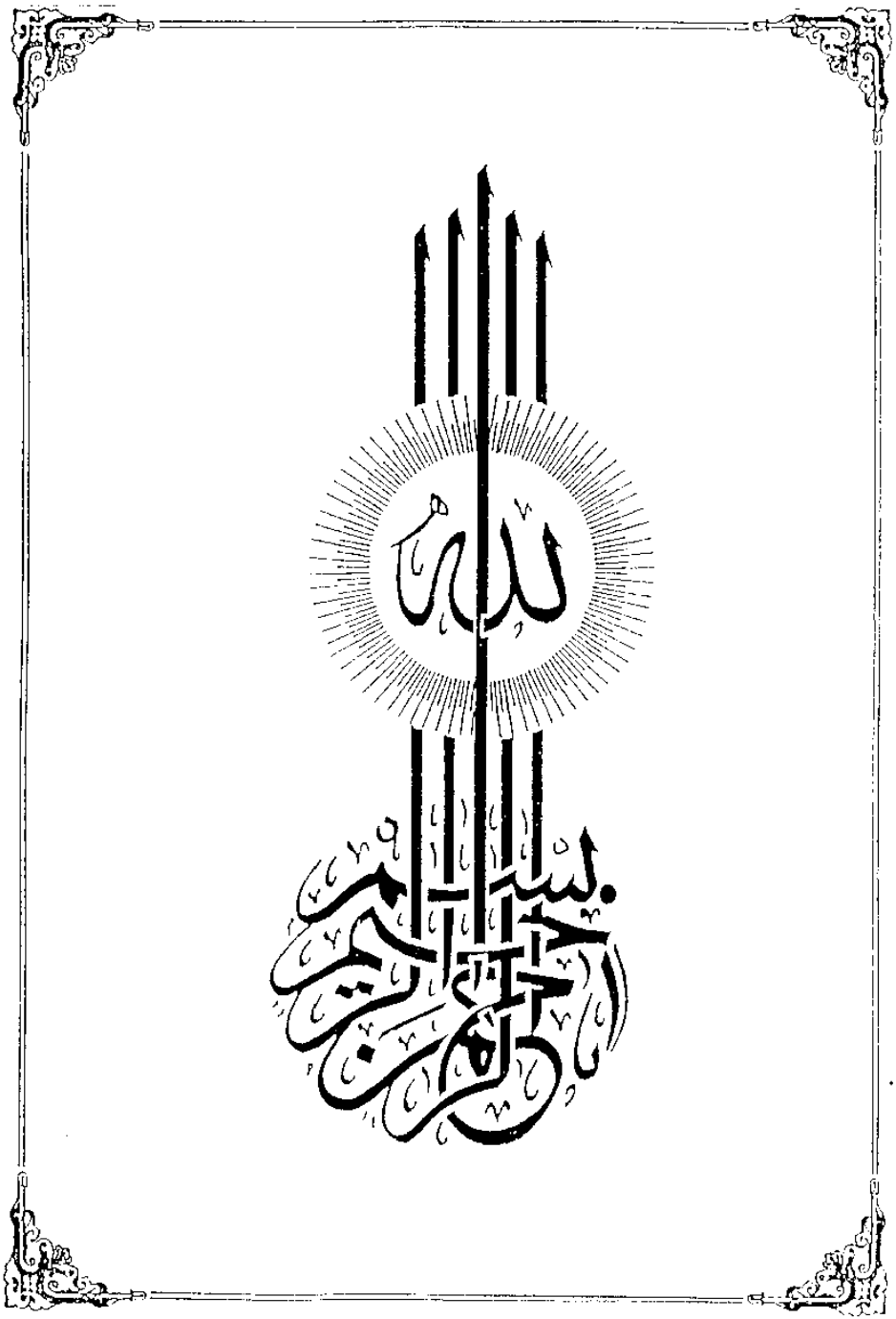

"I seem to have been only a boy
playing on the sea-shore, and
diverting myself in now and then
finding a smother pelle or
a prettier shell than ordinary,
whilst the great ocean of
truth lay all undiscovered
before me"

Sir Isaac Newton 1642-1727
Brewster's Memoirs of Newton
Vol. II Ch. 27

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Contents

Introduction and Aim of the Work 4

Review of Litrature 6

I. Applied Surgical Anatomy of the Biliary Tract 6
II. Bile Physiology and Pathophysiology of Jaundice 25
III. Aetiology of Obstructive Jaundice 34
IV. Diagnostic Approach to Obstructive Jaundice 46
V. Endoscopic Management of Choledocholithiasis 67
VI. Endoscopic Stenting for Malignant Jaundice 88
VII. Endoscopic Management of Benigin Biliary Strictures 96
VIII. Therpeutic Endoscopy of Infectious Diseases 101

Pathients and Methods 103

Results 108

Discussion 119

Conclusion 130

Summary 132

References 135

Arabic Summary .....

Introduction

and

Aim of the Work

Introduction and Aim of the Work

Interventional endoscopy has been one of the most intersting and rapidly advancing fields in gastrointestinal endoscopy since the introduction of endoscopic electrosurgical techniques . Great advances in flexible fiberoptic duodenoscopy , especially the ability to pass instrument through an endoscope into the ampulla of Vater , have also led to the widespread use of ERCP in the diagnosis and management of biliary pancreatic diseases (*Nakajima et al , 1979*).

In 1968 Mc Cune described endoscopic cannulation of the ampulla of Vater , which was made possible for the first time by the development of sideviewing endoscope (*Baddleley , 1980*).

Endoscopic cannulation of the ampulla is now possible in more than 95 % of patients by experienced hands (*Nakajima et al , 1979*).

ERCP now has several therapeutic applications in the management of obstructive jaundice of various aetiology beside its value in diagnosis . Endoscopic papillotomy (EPT) today represents a therapeutic procedure for numerous disorders of the ampulla of Vater , the biliary ducts , and the pancreas (*Classen, 1986*) .

In this procedure , soft tissue and sphincter fibers of the ampulla and of the intraduodenal duct are devided with electrocautary to permit the retreival of common duct stones or to release benign papillary obstruction (*Vennes , 1985*).

Modern endoscopic treatment of biliary calculi began with the development of endoscopic papillotomy. Although introduced for the management of stones present after cholecystectomy , the technique now , has wider indications , including the management of ductal stones in patients who still have gall bladders in place (*Safrany and cotton , 1982*).

Biliary drainage is another therapeutic application of ERCP . If an occluding bile duct malignancy can not be resected , or if the occlusion is benign but the patient is not capable of undergoing surgery, endoscopic drainage is available as less drastic palliative alternative to surgery. Today biliary drainage is employed also as a preoperative measure (*Classen and Hagenmuller , 1987*).

Endoscopically placed endoprosthesis is now an accepted method for palliation of malignant strictures (***Huibregtse et al , 1986***).

As postoperative stricture occurs in 0.20 to 0.25 % of patients following cholecystectomy (***Pitt et al , 1982***) and owing to the difficulty in reconstructive biliary surgery and its morbidity and mortality , nonoperative alternatives have been sought (***Huibregtse et al , 1986***). So , if endoscopic treatment is available in the form of placement of one or two large bore endoprosthesis ,it should be considered the initial therapeutic modality in patients with postoperative biliary tract strictures (***Huibregtse et al , 1986***).

The development of choledochoscope by Wildegans in 1953, provided a new means of visualizing the interior of the bile ducts at operations . The choledochoscope is a particularly useful instrument in complicated cases in which multiple bile duct calculi are found , or intrahepatic gall stones are present. Its use has replaced peroperative post exploration T-tube cholangiograms , because of difficulties of interpretation of these cholangiograms caused by air bubbles and sphincter spasm (***Kune and Sali , 1980***).

This work is aiming to evaluate the role of endoscopy in the management of obstructive jaundice especially if caused by CBD stones. The indications, limiting factors, complications and values will by studied.

Review

of

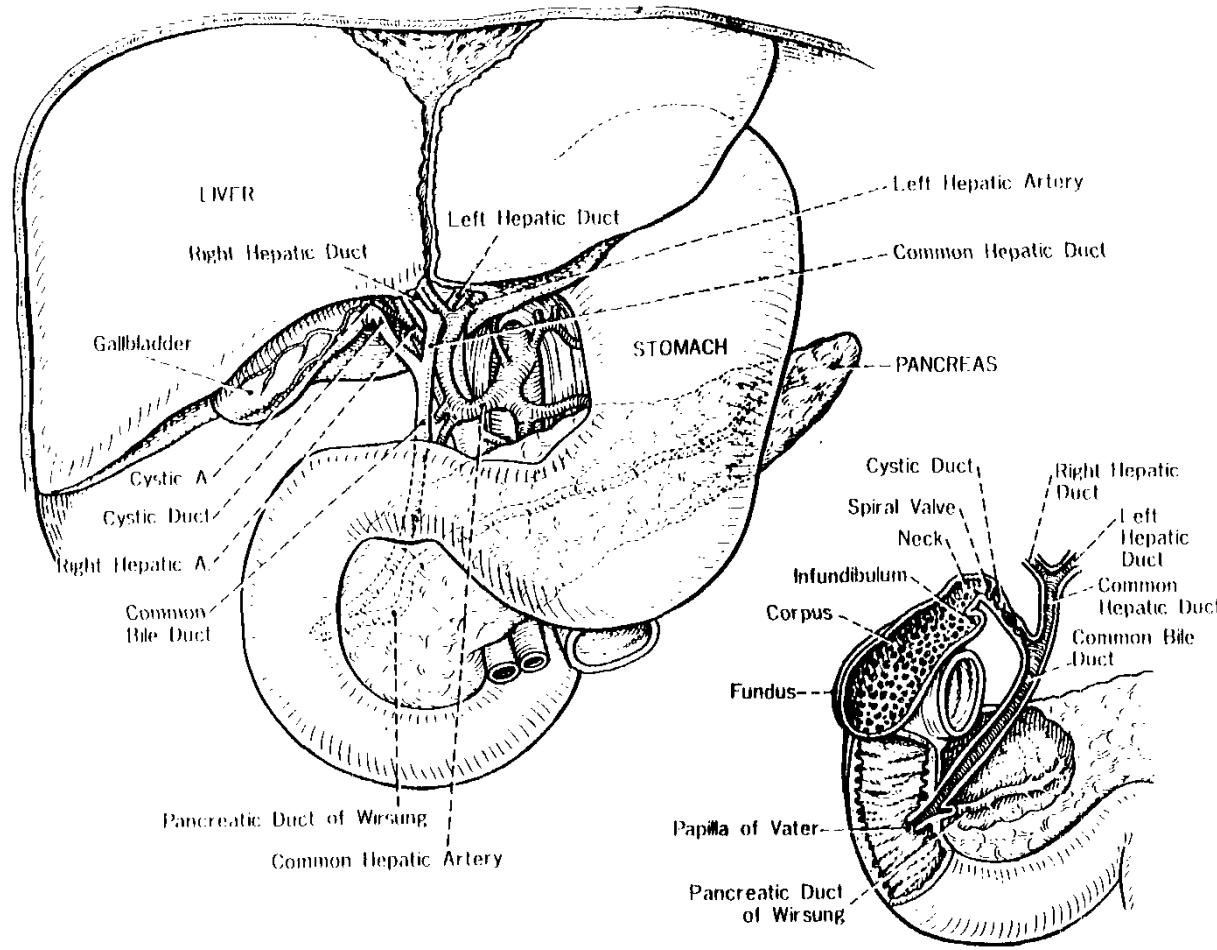
Litrature

Applied Surgical Anatomy of the Biliary Tract

Biliary anatomy first became of practical importance to surgeons toward the end of the last century. Following the first cholecystectomy by Carl Langenbuch in 1882 (*Glenn & Frafe , 1966*). In 1900 George Emerson Brewer of the Mount Sinai Hospital, noting the " many new and ingenious operative procedures " being carried out on the biliary tract, produced one of the first practical guides to the surgical anatomy of this region. Confronted with this developing surgical challenge, he performed 160 dissection " to educate his tactile sense for recognition of structures which, during operation, are often concealed from view or rendered visible only with difficulty. The modern surgeon with excellent anaesthesia, muscle relaxation and good lighting at his command enabling him to use direct vision rather than his sense of touch to demonstrate the biliary anatomy, must surely be gratful. Following Brewer's work, the first half of this century saw the publication of many studies which amply demonstrate the enormous range of individual variations that so characterizes this region (*Flint , 1923 ; Friend , 1929 ; Michels , 1955*); indeed the well-read surgeon of today can be forgiven if he remains buffled by the complexities reported in the literature. More recently, however surgeons have stressed the limited surgical usefulness of much of this data, preferring to emphasize the important major variations (*Benson & Page , 1976 ; Kune & Sali 1980*) .

Embryogenesis of the Biliary Tract :-

In the course of the fourth week of gestation, the embryogenic foregut, at its junction with the midgut, gives rise to the hepatic diverticulum. From the distal end of the diverticulum develops the parenchyma of the liver; the extrahepatic biliary tract and the gall bladder form the proximal portion. By the start of the fifth week, all the parts of the system are indicted. During this stage, the future duct system, like the duodenum itsef, is a solid cord of cells. Toward the end of the fifth week, growth of the left side of the duodenum initiates a shift of the attachment of the liver and the two pancreatic diverticula to their final position on the dorsal surface of the duodenum (*Fig.1*). During the sixth week, the lumina of the ducts become established starting with the



Anatomy of the biliary system. (From ORLOFF, M.J.: The biliary system. *In:* SABISTON, D.C., Jr. (ed.) Davis-Christopher Textbook of Surgery: The Biological Basis of Modern Surgical Practice, 11th ed. W.B. Saunders Company, Philadelphia, 1977.)

common bile duct and progressively extending to the remainder of the system. The gall bladder remains solid until twelfth week. During the process of recanalization, two or three lumina may appear and eventually coalesce. This pattern of solid stage followed by recanalization parallels the changes in the duodenum, but strangely, no solid stage appears in the pancreatic ducts. (***Skandalakis et al, 1983***).

More than one duodenal opening of the common bile duct is not unusual at this stage. The lower one usually vanishes, but a case in which a bifurcated common bile duct persisted was described by Schwegler and Boyden (1937). The proximal portion of the hepatic diverticulum, the future common bile duct, becomes absorbed into the expanding duodenum so that the bile and pancreatic ducts enter the wall together. In most individuals, the dividing septum between the two passages retracts to leave a common ampulla of variable length (***Schwegler and Boyden ,1937***).

The biliary tract is the site of great variation and even gross anomalities, some are fatal in postnatal life, while others, although physiologically functional, may result in operative catastrophes if they are unrecognized during surgical procedure in life (***Markle , 1981***).

Anatomical " normality " in the Biliary Tree :-

Normality, in the sense of anatomical pattern which is repeated in the majority of individuals, is a term which can not be used in relation to the biliary tree (***Benson & Page , 1976***). Variation is such that less than 50% of individuals exhibit a pattern common in even major details. Any attempt to define the " Normal " anatomy of the biliary tree, therefore would be artificial and misleading, so each major area of the extrahepatic biliary tree and its related vessels will be considered separately, and the more important variational groups described.

Bile Ducts at the Liver Hilum :-

The ducts in the hilum may be encountered either deliberately during partial hepatectomy or when dealing with a tumour or stricture of the porta hepatis, or accidentally in the course of a

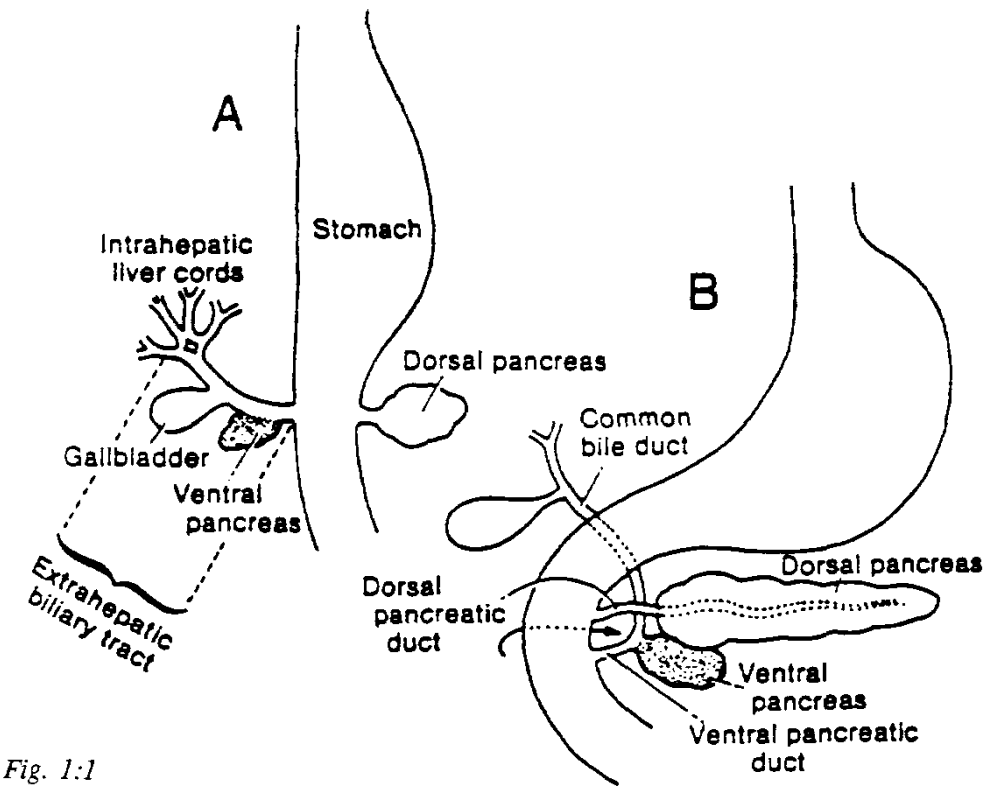


Fig. 1:1

The development of the extrahepatic biliary tract. A. The hepatic diverticulum, from which are formed the hepatic cords and intrahepatic ducts, the extrahepatic ducts, the gallbladder and the ventral pancreas. B. Rotation of the duodenum, bringing the common bile duct posterior to the duodenum and the two pancreatic primordia together. *(From Skandalakis et al., 1979. Used with permission.)*

difficult cholecystectomy. It is important to note that some portion of both the right and left ducts, and hence their confluence, are always, extrahepatic therefore, accessible at the porta (***Kune & Sali, 1980***). In some cases portions of the major tributaries of the right and left ducts are also outside the liver (*Fig. 2*).

Right Hepatic Duct (RHD) :-

Just as the branchial tree has a fairly constant pattern of branches, so have the intrahepatic bile ducts. Hjortsjo (1951) and later Healy and Schroy (1953) clearly demonstrated that each area of the liver has its own, nameable bile ducts, and that the area-ducts drain into major segmental ducts. The functional right lobe (that part of the liver to the right of the lobar fissure marked by gall bladder fossa and inferior vena cava) compromises two segments, anterior and posterior. In 75% of individuals the right anterior and posterior segmental ducts 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 RHD, the segmental ducts emptying into left hepatic duct (LHD) separately (*Fig. 2*) (***Healey & Schroy , 1953; Balasegarem , 1970 ; Kune & Sali , 1980***). This important point has bearing on the question of the so called " accessory " bile ducts and will be referred to below. Among these individuals (75 %) in whom a true RHD is present it is wholly, extrahepatic but in 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 (***Johnsten & Ansen , 1952 ; Kune & Sali , 1980***). The RHD is readily approached by dividing the peritoneum and fat overlying 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 structures.

"Accessory" Bile Ducts :-

Flint introduced the term " accessory bile ducts " in 1923 having found a structure in 15% of individuals which issued from the right lobe of the liver and entered the common hepatic duct (CHD) distal to the termination of the " true " RHD. Since then many other authors have reported