RETAINED AND RECURRENT BILE DUCT STONES CAUSES AND PREVENTION

ESSAY

Submitted for the Partial Fulfilment

of M.Sc. Degree

(General Surgery)

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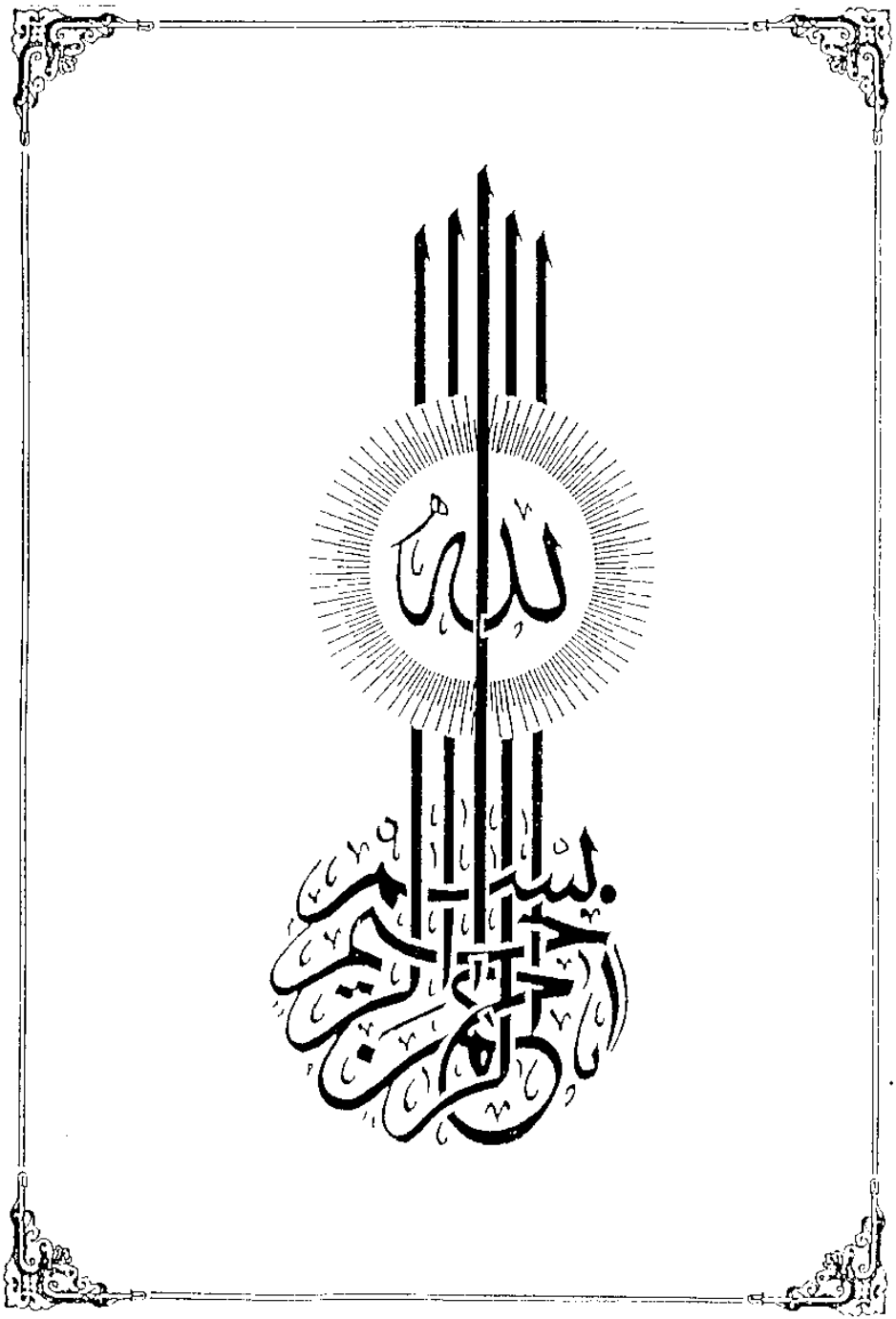
A C K N O W L E D G M E N T

First and foremost thanks are due to GOD, the most Beneficial and Merciful.

In a few grateful words, I would like to express my deepest gratitude and appreciation for the unfailing support, valuable advice, and generous help rendered me by Professor Dr. SAID DRAZ, Professor of the General Surgery, Ain Shams University. He sacrified a good deal of his precious time to guide me throughout the preparation of this work. Every detail, every word in this work has been kindly assisted by his untiring effort and his sincere care.

JOSEPH WILLIAM
1986



C O N T E N T S

INTRODUCTION

I N T R O D U C T I O N

Residual biliary calculi are either retained or recurrent calculi. They are demonstrated within the ductal system following an operation intended to remove them in the biliary system.

We call retained bile calculi, the calculi that could not be extracted during the operation and are discovered on tube cholangiogram obtained 7-10 days post-operatively. They might have been overlooked in 4 % in cases of exploration of the common bile duct as indicated by pre-operative and operative findings suggesting choledocholithiasis (Bouchier, 1982) and in 1 % of cholecystectomies when exploration of the common bile duct was not judged necessary as the stones were located in the gallbladder only (Bouchier,1982). Or they are the calculi that were recognized at the initial operation but could not be extracted for intrahepatic reasons such as intrahepatic stones.

The other type of residual stone is the true recurrent stone which reforms in the bile duct months or years after cholecystectomy and complete choledocholithotomy.

Recurrence is maximal in the first two years after the operation and increases with time(Dowling et al., 1982).

Choledocholithiasis is responsible for much of the serious morbidity of gall stone diseases such as ascending cholangitis , intermittent fever secondary biliary cirrhosis and may be liver failure.The detection and elimination of stones within common bile duct are major objective of biliary surgery . (Bouchier, 1982).

The aim of this review is to study the different aetiological causes reported till now, and trying to collect the recent methods of investigation for such cases, in view to facilitate their early detection and their proper management, then we will review the different methods of management and the methods to prevent the development of such stone .

REVIEW OF LITERATURE

INCIDENCE

Retained and recurrent choledocholithiasis remain a challenge for both the surgeon and the patient despite the use of modern technology before, during and after operation.

There remains, even today, a proportion of patients , 2-7 % , who after an interval of time following initial surgery for biliary lithiasis comes for re-operation because of retained or recurrent common bile duct calculi (Lygidakis, 1981).

Biliary reoperation is associated with a recurrence rate as high as 10% and the recurrence rate is even higher after subsequent re-operation (Lygidakis, 1983).

Moreover, even endoscopic papillotomy for the removal of residual or recurrent bile duct calculi carries a residual stone rate of approximately 9 % . A mortality rate of 1.4 % and a morbidity rate of 7% (Safrany , 1978).

Moreover, reexploration of the common bile duct is associated with a mortality twice as high as that

for primary choledochotomy and four times as high as that for uncomplicated cholecystectomy(Lygidakis , 1983).

Table (1):

TABLE 42-3. Residual Calculi Following Operations for Calculous Biliary Tract Disease (The New York Hospital-Cornell Medical Center)

Year	Total No. Operations	Residual Stones Following Total Operations	Cholecystectomy or Cholecystostomy Combined With Common Duct Exploration	Common Duct Stones Recovered	Residual Stones Following Common Duct Exploration
1973	439	2 (0.5%)	74 (16.7%)	49 (66.2%)	1 (1.35%)
1972	499	4 (0.8%)	83 (17%)	47 (56%)	3 (3.6%)
1971	427	1 (0.2%)	57 (13.3%)	30 (52.6%)	1 (1.75%)
1970	437	5 (1.1%)	65 (14.9%)	44 (67.7%)	4 (6.15%)
1969	442	3 (0.7%)	58 (13.1%)	38 (65.5%)	2 (3.4%)

(James Hardy , 1977)

Text Book of Surgery Principles and Practices.

TABLE 42-1. Incidence of Residual Calculi Following Cholecystectomy With or Without Choledocholotomy

	Total Operations	Cystic Duct Exploration	Cystic Duct Stones	Stones in Ductal System Following Cystic Duct Exploration
olcock & Perry* 954–1958	1754	503 (28%)	139 (28%)	8 (1.6%)
artlett 943–1963	4763	2066 (43%)	744 (36%)	86 (4.2%)
unphy 960–1969	952	200 (21%)	137 (68%)	14 (7.0%)
oller & Santavirta niv. Hosp. Helsinki 960–1969	1937	289 (15%)	250 (86%)	20 (6.9%)
YH–CMC 932–1967	6795	946 (14%)	567 (60%)	47 (5.0%)
972†	499	83 (17%)	47 (56%)	3 (3.6%)
otals	16,700	4087 (24%)	1884 (46%)	178 (4.3%)

*9 residual stones among a total of 1754 operations (0.5%)
†4 residual stones among a total of 499 operations (0.8%)

(James Hardy, 1977).

(After Frank Glenn, 1974).

ANATOMY OF THE BILIARY SYSTEM

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 of this diverticulum becomes the gall bladder, cystic duct and the common bile duct whereas the cranial portion develops into the liver and the hepatic bile ducts.

The gall bladder is a thin walled, pear shaped organ incompletely covered by peritoneum and attached to the inferior surfaces of the right and quadrate lobes of the liver. Normally it is 7-10 Cm long and 3 - 5 Cm in diameter and has a capacity of 30 - 60 ml. Anatomically it is divided into a fundus or tip which protrudes from the anterior edge of the liver, a corpus or body, an infandibulum called Hartmann's pouch and a narrow neck that leads into the cystic duct Topographically the fundus of the gall bladder is located behind the 9th costal cartilage at the junction of the costal margin with the right border of the rectus abdominis muscle.

Anomalies of the Gall Bladder: are rare and include congenital absence, duplication, left sided gall bladder with the cystic duct entering the left side of the common bile duct or left hepatic duct and location of the gall bladder partially or completely within the liver "floating gall bladder" in which the vesicle suspended from the liver by a peritoneal mesentery .

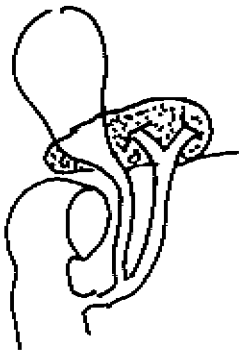
The most common variant is the phrygian cap. deformity (18%) in which the distal fundus is folded upon itself (Boyden, 1935) all other variants are rare despite of the exhaustive description in some texts (Maingot, 1980).

The subvesical duct runs in the liver substance deep to the gall bladder fossa and is present in about 50% of individuals (Healy and Shroy, 1953)it is liable to inadvertant damage during cholecystectomy which may cause troublesome bile leakage this risk is a point used for those who preconize the routine use of drain following cholecystectomy.

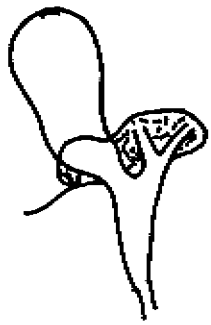
The Cystic Duct : is very variable in length and mode of union with the common hepatic duct it arises at the neck of the gall bladder usually rapidly narrowing to 1-3 mm internal diameter. In most people the duct follows a straight oblique course to join the

common hepatic duct. The junction is easily seen with minimal dissection in about 68 % while in the remainder the duct runs a longer course parallel with or spiralling around the common hepatic duct (Johnston et al.,1952).

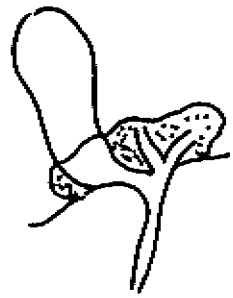
The distal part of the cystic duct in these circumstances is often incorporated in the wall of common hepatic duct. There are many anomalies for the cystic duct it may joint the common hepatic duct at low level or it may come adherent to the common hepatic duct or join it at high level. The cystic duct may be very short or absent and in this case the gall bladder opens directly into the common hepatic duct (Sutton et al.,1967), or it may spiral anteriorly or posteriorly with union on the left side of the common hepatic duct.



Low union with common hepatic duct.

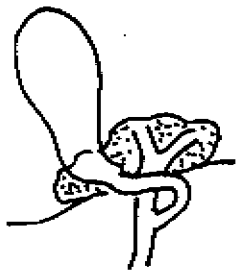


Adherence to common hepatic duct

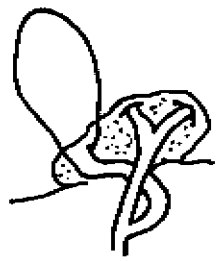


High union with common hepatic duct

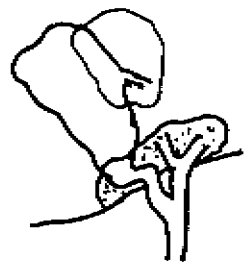
bsent or very short cystic duct



Ant. spiral with union on left side of common hepatic duct



Post. spiral with union on left side of common hepatic duct



Accessory hepatic duct entering the gall bladder

Anomalies of the cystic duct

"Orloff, 1977"