THE NEW TRENDS IN MANAGEMENT OF BILIARY STONE DISEASE

An Essay
Submitted in Partial Fulfilment of
Master Degree of General Surgery

By

YOUSRY ABDEL FATTAH
M.B., B. Ch.
Ain Shams University

Supervised By

Prof. Dr. Mohamed Samir Abo Zeid
Professor of General Surgery
Faculty of Medicine
Ain Shams University

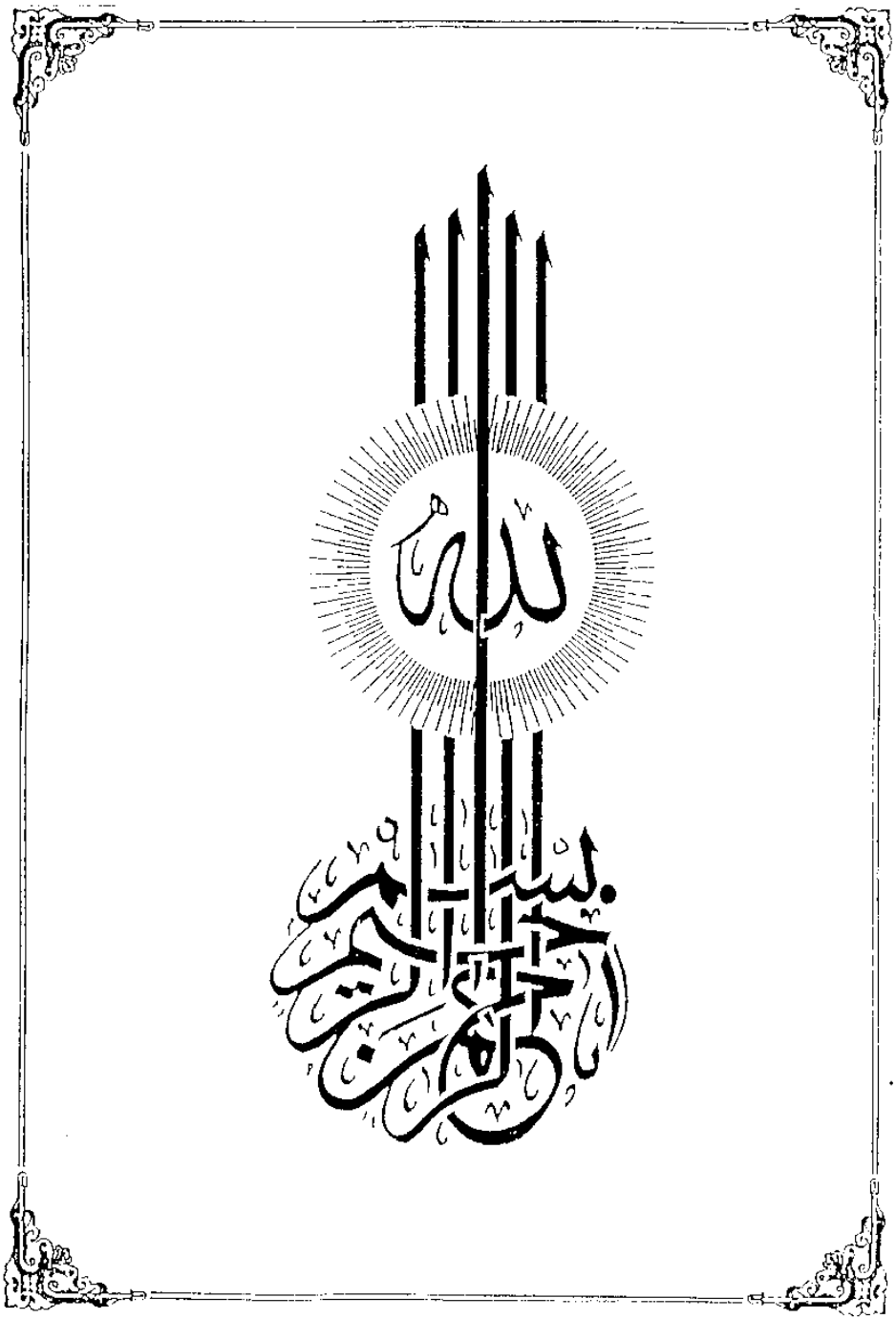
Dr. Alaa Abd Alla
Assist. Professor of General Surgery
Faculty of Medicine
Ain Shams University

1991

TO MY MOTHER

FATHER

BROTHERS, ALAA & MOHAMED



ACKNOWLEDGEMENT

==========

I wish to express my atmost gratitude to ***Prof. Dr. MOHAMED SAMIR ABO ZEID****, Professor of General Surgery, Faculty of Medicine, Ain Shams University, for his generous authoritative advice throughout this work.*

Also, I am extremly indebted to ***Dr. ALAA ABD ALLA****, Assistant Professor of General Surgery, Faculty of Medicine, Ain Shams University, for his valuable guidance and meticulous supervision.*

CONTENTS

INTRODUCTION

AND

AIM OF THE WORK

REVIEW OF LITERATURE

INTRODUCTION

The treatment of biliary stone disease is changing rapidly as new technology is introduced. This work will review the new trends in management of biliary stone disease, the selection of patients for these various modes of therapy, the success rate and the potential complications.

AIM OF THE WORK

This work aims to review the new trends in management of biliary stones. These trends include biliary lithotripsy, medical dissolution of biliary stones, laparoscopic cholecystectomy, endoscopic managemnt of bile duct stones, and radiologic methods of bile duct stone extraction.

TYPES OF BILIARY STONES

Types of Biliary Stones

Biliary stones can be analysed by infra-red spectroscopy (Neoptolemos et al., 1986). There are 2 major types, cholesterol and pigment stones (black and brown) (table 1).

Biliary stones are composed mainly of cholesterol (11-98%) (Sherlock, 1989). Other constituents include calcium salts of bilirubin and trace amount of fatty acids, phospholipids, bile acids and glycoproteins. Crystallography confirms that the cholesterol is in monohydrate and andydrous forms and is the major constituent, with calcium carbonate and phosphate, palmitate and amorphous material also identified (Sutor and Wooley, 1971).

The nature of the nucleus of the stone is uncertain-pigment, glycoprotein and amorphous material have all been suggested (Sherlock, 1989).

Table 1: Classification of Biliary Stones (Sherlock, 1989).

Type	Cholesterol	Pigment	
		Black	Brown
Location	Gallbladder, ducts	Gallbladder, ducts	Ducts
Major constituent	Cholesterol	Bilirubin, calcium salts	Calcium
Consistency	Crystalline with nucleus	Hard	Soft, friable
% Radioopaque	15%	60%	0%
Associations			
a) Infections	Rare	Rare	Usual
b) Other diseases	Biliary fistula Ileal resection Liver diseases	Haemolysis Cirrhosis	Chronic partial biliary obstruction

The distinction between cholesterol and pigment biliary stones can be made easily by inspection of a stone and by chemical analysis. It also has the merits of distinguishing those stones which should respond to medical dissolution therapy (cholesterol gallstones) and those that will not.

The cholesterol gallstones are light brown, smooth or faceted, single or multiple, and on cross section show a laminated and/or crystalline appearance. The pigment stones are smaller black or brwon in colour, more numerous, irregular in shape and amorphous or crystalline on cross section (Bouchier, 1988).

A cholesterol stone may be diagnosed when the stones are small and float on cholecystography (Bouchier, 1988), or ultrasonography demonstrates floating stones with sonic shadowing without internal echoes (Good et al., 1979).

PATHOGENESIS OF BILIARY STONES

Pathogenesis of Biliary Stones

A) Pathogenesis of cholesterol stones:

Three major factors determine the formation of cholesterol gallstones (Fig. 1), these are altered hepatic bile which becomes supersaturated with cholesterol, nucleation of cholesterol monohydrate crystals and the function of the gallbladder (Sherlock, 1989).

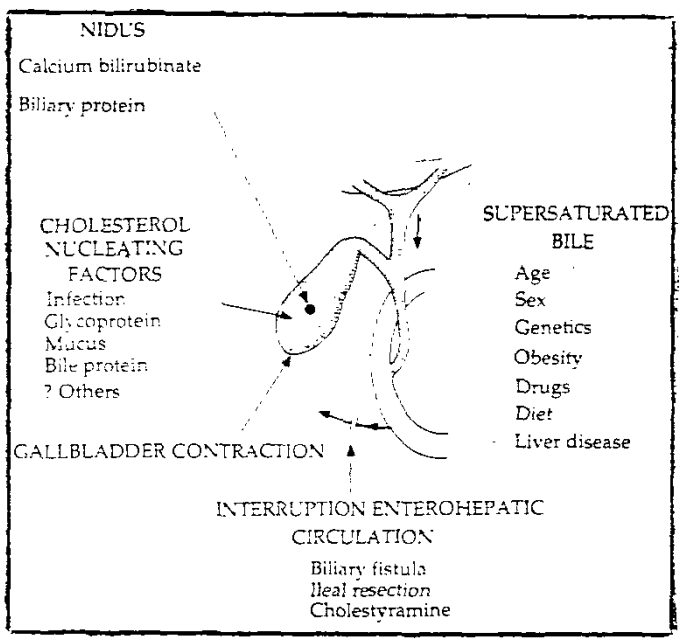


Fig. 1: Fators responsible for cholesterol gallstone formation (Sherlock, 1989).

I- Altered Hepatic Bile Composition

Bile is 85-95% water. Cholesterol is insoluble in water and must be maintained in solution. This may be by the formation of micelles that have a hydrophilic external surface and a hydrophobic internal surface. Cholesterol is incorporated into the hydrophobic interior.Phospholipids are inserted into the walls of the micelles so that they are enlarged; these mixed micelles are thus able to hold more cholesterol (Carey and Small, 1978). This micellar theory is not as simple as originally thought and the distinction between lithogenic bile, which is outside the micellar liquid zone and is supersaturated with cholesterol, and non lithogenic bile which is unsaturated, is not clear cut. In particular supersaturated bile is frequently found in healthy individuals during fasting (Holzbach et al., 1973).

It seems that biliary cholesterol may be also solubilized by vesicles. These have been shown by ultracentrifugation and electron microscopy in fresh supersaturated and unsaturated bile (Ulloa et al., 1987). The cholesterol is carried in bile in stable vesicular form in association with phospholipids but not bile acids. This biliary non-micelle complex has a major cholesterol transport function especially at low bile acid concentrations