Laparoscopic Cholecystectomy Versus Conventional Cholecystectomy

In Ain Shams University Hospitals

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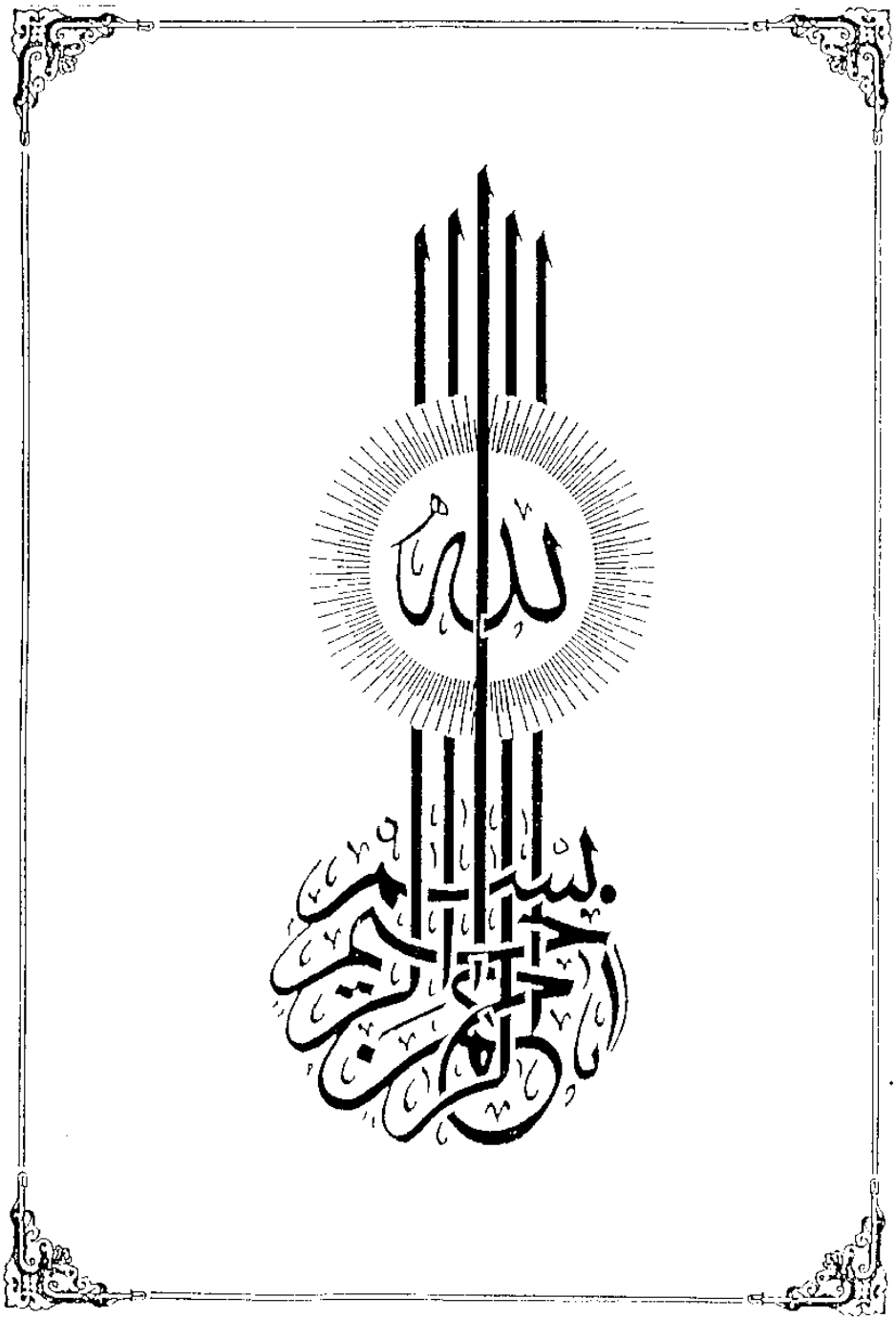

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INTRODUCTION

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INTRODUCTION

The only curative treatment for stones in the gallbladder is to remove the stones and to remove the nest of their formation. Hence, the only curative treatment is cholecystectomy. In addition, it is the most accepted method of treating patients with symptomatic gallstones.

The purpose of cholecystectomy is the relief of symptoms and disability and the prevention of mortality (Neugebauer et al., 1991).

In 1882 Langenbuch performed the first cholecystectomy and it is still the standard surgical method for dealing with the diseased gallbladder. Alternative treatments for gallstones have been advocated recently including stone dissolution, lithotripsy and percutaneous stone removal. All of these approaches, however, leave the gallbladder in situ with the possibility of stone recurrence (Grace et al., 1991).

Interventional laparoscopy has been used by gynecologists for many years. Interventional laparoscopy began in 1962 with introduction of laparoscopic tubal ligation. Since that time, operative laparoscopic surgery has developed and flourished within gynecology. The treatment of endometriosis, adhesiolysis to enhance fertility, tuboplasty, salpingostomy, fimbrioplasty, ovarian biopsy and cystectomy, all have been achieved successfully using laparoscopic technology (Talamini et al., 1992)

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The development of laparoscopic techniques in general surgery has been much slower. Laparoscopic appendicectomy has been reported (Gotz et al., 1990), and despite the advantage of this approach, the lack of widespread training in laparoscopic techniques has prevented the procedure from becoming widely accepted (Talamini et al., 1992).

Laparoscopic cholecystectomy has taken the general surgical world by storm. The initial approach to gallstone disease using laparoscopy involved direct cannulation of the gallbladder and removal of the stones while leaving the gallbladder behind (Gadecz et al., 1990).

Experimental laparoscopic biliary surgery was started in Dundee by Cuschieri and El Ghany in 1985. First laparoscopic cholecystectomy in the peg was performed by Nathanson and Cuschieri in 1987. Mouret, in Lyon, was the first surgeon to perform the operation in the human using standard laparoscopic equipments in 1987. (Cushieri et al., 1992).

Laparoscopic cholecystectomy is the most promising new technique for the treatment of cholelithiasis in terms of reduction in postoperative morbidity and length of convalescence (Neugebauer et al., 1991). The first laparoscopic cholecystectomy was performed in Ain Shams University hospitals in 1991. We will review our initial experience with laparoscopic cholecystectomy compared with patients who underwent conventional laparotomy cholecystectomy.

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REVIEW OF LITERATURE

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ANATOMY OF THE EXTRAHEPATIC BILIARY TRACT

NORMAL ANATOMY:

HEPATIC DUCTS:

The intrahepatic segmental bile ducts unite to form lobar ducts, which in turn coalesce to form the right and left hepatic ducts that represent the beginning of the extrahepatic biliary system (Schwartz, 1990).

The left hepatic duct drains the three segments (II, III, IV) which constitute the left liver. The right hepatic duct drains segments (V, VI, VII, and VIII). It is short and joins the left duct to form the confluence lying in front of the right portal vein and forming the common hepatic duct (Blumgart et al., 1988). (Fig. 1).

The common hepatic duct is 3-4 cm in length it passes downward in the superior portion of the hepatoduodenal ligament and lies in front of the vena cava and to the right of the hepatic artery. It unites with the cystic duct to form the common bile duct. An accessory right hepatic duct occurs in 5%

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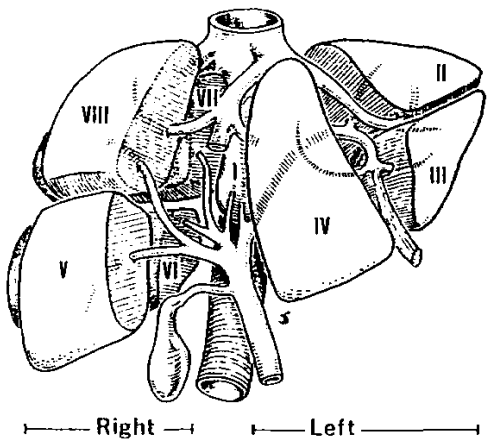

Fig. 1: Diagram showing the biliary drainage of the two functional hemilivers. Note the position of the right anterior and right posterior sectors. The caudate lobe drains into the right and left ductal system.

(Blumgart et al., 1988)

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THE GALLBLADDER:

The gallbladder is located in the liver bed, in line with the anatomic division of the liver into right and left lobes (cystic fossa).

It is pear shaped divided into 4 anatomic parts: fundus, body, infundibulum and neck (Schwartz, 1991).

The **fundus** begins at the anterior border of the liver and extends forward and downward. It generally rests on the duodenum or transverse colon. It is in contact with the anterior abdominal wall near the lateral border of the right rectus muscle, but its position in relation to the abdominal wall and ribs may vary.

Kinking of the fundus accounts for the phrygian cap anomaly.

The **body** is continued into the tapered portion or neck, which points backwards and upwards towards the transverse fissure of the liver and terminates in the cystic duct.

The neck occupies the deepest part of the gallbladder fossa and lies in the free portion of the hepatoduodenal ligament.

Between the neck of the bladder and the body is a forward bulging known as the infundibulum (Gadacz, 1991) (Fig. 2).

Sometimes the gallbladder is deeply embedded in the liver but occasionally presents on a mesenteric attachment may be liable to volvulus.

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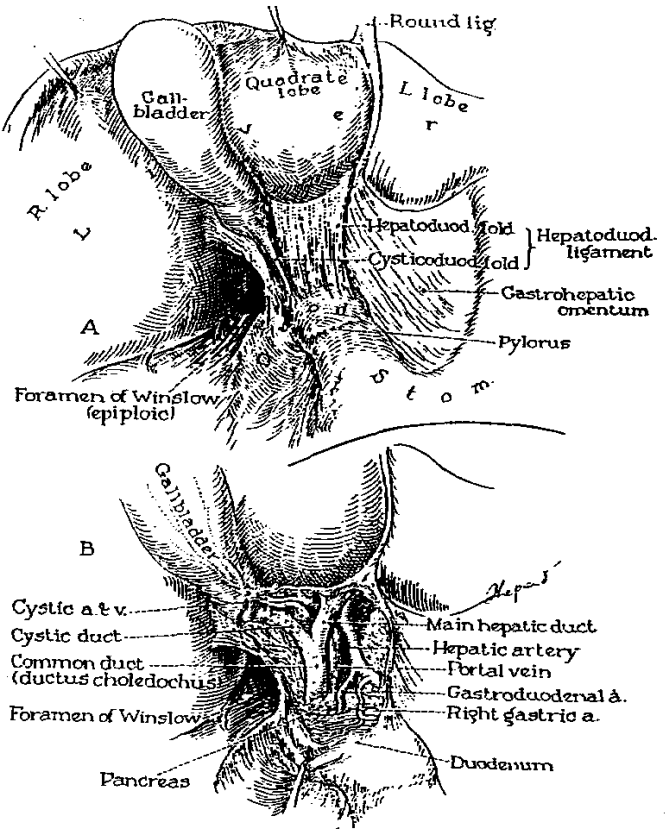

Fig. 2: Anatomy of the gallbladder and ducts in connection with the structures within the hepatoduodenal ligament (the right portion of the gastrohepatic omentum). **(Gadacz, 1991)**

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THE CYSTIC DUCT:

Arises from the neck or infundibulum of the gallbladder and extends to join the common hepatic duct. Its lumen is usually 1-3 mm. Its length is variable depending on the type of union with the common hepatic duct averaging 4 cm.

The mucosa is arranged in spiral folds known as the valves of Heister. Its wall is surrounded by a sphincteric structure called the sphincter of Lutkens (Blumgart et al., 1988).

- Variations in the point of union between the cystic duct and the common hepatic duct are surgically important (Fig. 3):

a. May lie parallel to common hepatic duct and actually be adherent to it for a variable length
b. May be very long and unit with the hepatic duct in the duodenum.
c. May be absent cystic duct or very short.
d. May be high union with the hepatic duct.
e. May enter the right hepatic duct.
f. May be spiral and winding round the hepatic duct either anteriorly or posteriorly and joins the hepatic duct from the side (Schwartz, 1990).

The Cholecystohepatic Triangle Of Calot:

This anatomic region of surgical importance is formed by:
The cystic duct and the gallbladder (neck) laterally (inferiorly).

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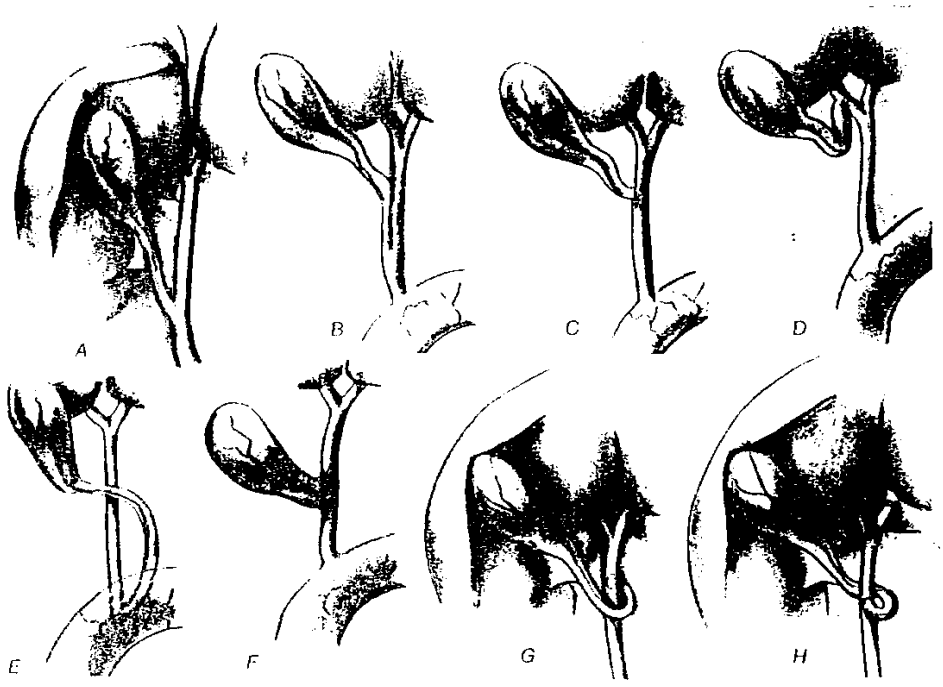

Fig. 3: Variations of the cystic duct. A. low junction between cystic duct and common hepatic duct. B. Cystic duct adherent to common hepatic duct. C. High junction between cystic and common hepatic duct. D. Cystic duct drains into right hepatic duct. E. Long cystic duct that joins common hepatic duct behind duodenum. F. Absence of cystic duct. G. Cystic duct crosses anterior to common hepatic duct and joins it posteriorly. H. Cystic duct courses posteriorly to common hepatic duct and joins it anteriorly. (Schwartz, 1989)

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The right lobe (edge) of the liver above, **and** the common hepatic duct *medially (Fig. 4).*

- The **contents** of the triangle include:

a. The right hepatic artery which enters posteriorly to the common hepatic duct (in 87 % of case) or anteriorly to the duct (in 13 %). It parallels the cystic duct for a short distance before it gives the cystic artery then turning cranial to reach the liver.

b. Aberrant right hepatic artery (in one quarter of cases) may be seen originating from the superior mesenteric artery and coursing through the triangle

c. The cystic artery arises from a normal or aberrant right hepatic artery within the triangle. It usually divides into a superficial branch that goes to the serosal surface and a deep branch reaching to the hepatic surface of the gallbladder. Duplication of the cystic artery is found in about 25 % of patients. These vessels may arise either from adjacent or separate sites (Schwartz, 1990).

d. A berrant or accessory hepatic ducts commonly enters the cystic or common hepatic duct with a reported incidence of 15 % (Schwartz, 1990).

e. The cystic lymph node (Schwartz, 1990).

COMMON BILE - DUCT:

The common bile duct is formed by the union of the common hepatic and the cystic ducts. It is 7-8 cm long and is described in three parts:

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