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Management of Complications of Laparoscopic Cholecystectomy

Essay

Submitted for Partial Fulfillment of Master Degree of General Surgery

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List of Abbreviations

CBD	Common bile duct.
CHD	Common hepatic duct.
CT	Computed tomography.
ERCP	Endoscopic retrograde cholangiopancreatography.
HIDA	Hepatobiliary iminodiacetic acid.
LHD	Left hepatic duct.
MRCP	Magnetic resonance cholangiopancreatography.
PTC	Percutaneous transhepatic cholangiography.
RA	Right anterior.
RAD	Right anterior bile duct.
RHA	Right hepatic artery.
RHD	Right hepatic duct.
RP	Right posterior.

Aim of the Work

The aim of the work is to review the new concepts in the identification of complications of laparoscopic cholecystectomy and their diagnosis with clinical as well as imaging investigations and at last the new trends in their management.

Introduction

Minimal access surgical techniques are now considered to be the gold standard for biliary, anti-reflux and bariatric surgery (*Hinder, 1994*). This is mainly due to improved patient recovery with reduced pain, shorter hospital stay and a quicker return to normal daily activities (*Soper et al., 1992*).

Following the first laparoscopic cholecystectomy, performed by Phillipe Mouret in 1987, there were a large number of surgeons attempting this new technique. Indeed, many of the early operations were fuelled by strong public demand, and supported by commercial companies. However, it was not long before hospitals and surgical societies noted the increased rates of complications associated with these new techniques, (*Brosens et al., 2003*). However it is know that iatrogenic extra hepatic biliary tract injuries result in 0.2 -1% of laparoscopic or open cholecystectomy (*Sawaya et al., 2001*).

The reason for the high rate of initial complications was the failure to recognize that the adoption of minimally invasive techniques for cholecystectomy required the surgeon to learn

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new skills. Indeed, the skills acquired in open surgery have not led to an improved performance in the laparoscopic arena (*Figert et al., 2001*).

Hence all the surgeons were effectively novices in this field, regardless of their previous surgical experience. Furthermore, there was a learning curve associated with the acquisition of new skills, and many of the complications occurred due to a lack of initial training. Once a surgeon had passed beyond the learning curve, the complication rates were visibly reduced (*Voitk et al., 2001*).

Iatrogenic bile duct lesions are serious complications during laparoscopic cholecystectomy and include biliary leakage and major bile duct injury. The incidence of biliary lesion following laparoscopic cholecystectomy has been found up to threefold higher than that of open procedure. The bile duct is prone to be damaged by the use of diathermy and the excessive dissection required to delineate the anatomy of Calot's triangle, results in ischemic injury to the biliary tract. Other risk factors include difficulty in dissection due to acute or severe chronic inflammation, morbid obesity, unexpected bleeding, and presence of anomalous duct or vessel. These biliary injuries

include leaks, strictures , transections or ligation of major bile duct (**Zacks., 2002**).

Percutaneous transhepatic cholangiography (PTC) or endoscopic retrograde cholangiopancreatography (ERCP) has traditionally been performed in these patients to describe the biliary anatomy before re-exploration and repair of ductal injury, these procedures are invasive and have the potential for serious complications . Magnetic resonance cholangiopancreatography (MRCP) is rapid and noninvasive and compared with ERCP, it is similar in accuracy in diagnostic evaluation of ductal pathology, and superior in delineating proximal ductal anatomy in complete obstruction of the bile duct (**Fulcher, 1999**).

To be able to diagnose and manage a biliary injury, it is necessary to be aware of the strategies for classification. The Bismuth classification was developed prior to the advent of laparoscopic surgery and is still used. More recently, the Strasberg, McMahon, Neuhaus and Stewert systems have been proposed. They vary in complexity and whether clinical and therapeutic aspects are incorporated, but essentially there is a gradation from accessory duct damage through to occlusion of the common bile duct .It is generally accepted that the repair of a

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bile duct injury should be performed by an experienced biliary surgeon for the best results. This implies that the patients operated upon by general surgeons should be transferred to a biliary centre for further management. The procedure of choice for transection of the common bile duct is a biliary-enteric anastomosis such as a Roux-en-Y choledochojejunostomy, though a minor laceration may be sutured after insertion of a T-tube drain beside the anastomosis . If the complication is noted postoperatively, the initial procedure of choice is an endoscopic retrograde cholangiogram (ERC) to define the problem. Bile duct injury is a serious complication of laparoscopic cholecystectomy, and inadequate repair may lead to further complications such as secondary biliary cirrhosis, liver failure and death (*Rajesh et al., 2007*).

Surgical Anatomy of the Gallbladder and Biliary Tree

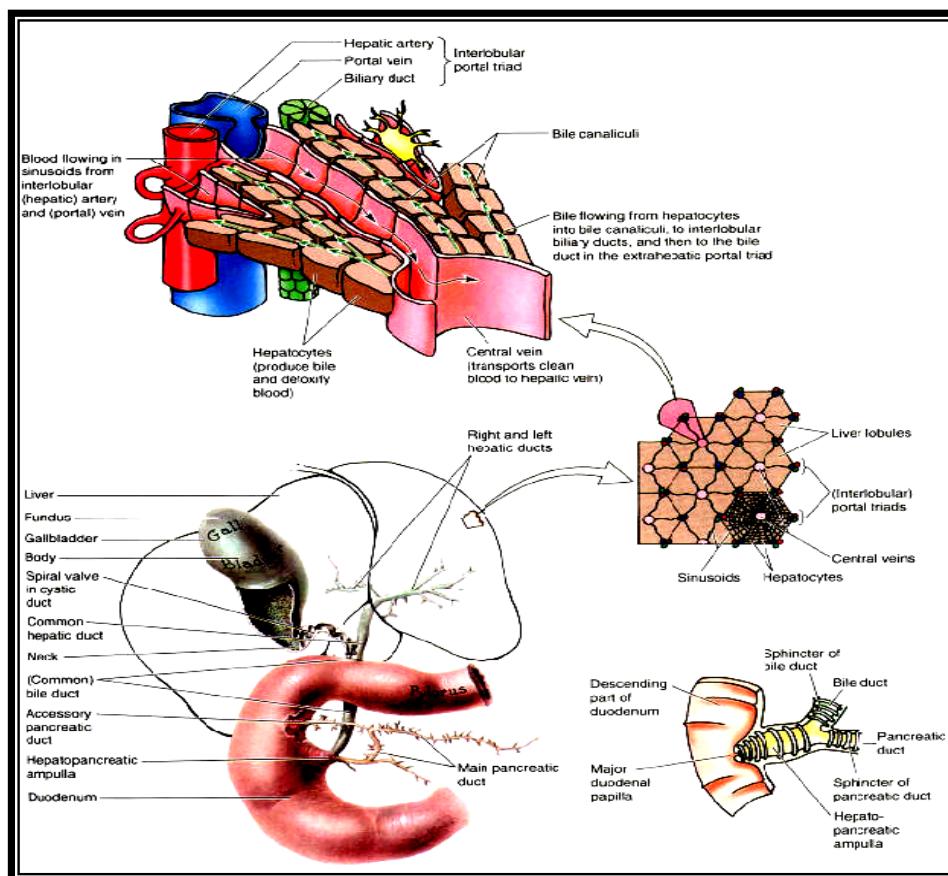


Fig. (1): Anatomical overview of liver lobule & extrahepatic biliary system (*Moore & Dalley 1999*).