Laparoscopic Exploration

Of Common Bile Duct

Essay

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قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا
إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ
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Mohamed Ahmed Tawfek

List of Abbreviations

ALP	Alkaline phosphatase
AOC	Acute obstructive cholangitis
BES	Biliary endoscopic sphincterotomy
CBD	Common bile duct
CBDS	Common bile duct stones
CF	Cystic fibrosis
CO	Carbon monoxide
CT	Computed tomography
EBD	Endoscopic biliary decompression
ERC	Endoscopic retrograde cholangiography
ERCP	endoscopic retrograde cholangiopancreatography
ERCP/EST	endoscopic retrograde cholangiopancreatography/ endoscopic sphincterotomy
ESWL	Extracorporeal Shockwave Lithotripsy
EUS	Endoscopic Ultrasound
GGT	serum gamma glutamyl transpeptidase
GSP	Gallstones pancreatitis
HDL	High-density lipoprotein
IDUS	Intraductal Ultrasonography
IOC	Intraoperative Cholangiography
LBF	Liver blood flow
LC	Laparoscopic cholecystectomy
LCBDE	Laparoscopic common bile duct exploration
LFT's	Liver function tests
LHD	Left hepatic duct
MRCP	Magnetic Resonance Cholangiopancreatography

MTBE	Methyl-Tertbutyl- Ether
NBD	Nasobiliary Catheter Drainage
PTC	Percutaneous Transhepatic Cholangiography
RHD	Right hepatic duct
TPN	Total parenteral nutrition
TUS	Transabdominal ultrasound
UDCA	Ursodeoxycholic acid

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INTRODUCTION

Common bile duct stones (CBD) stones may occur in 3% to 14.7% of all patients for whom cholecystectomy is preformed ***(Schirmer et al., 2005)***

Patients presenting with (CBD) stones have symptoms including: biliary colic, jaundice, cholangitis, pancreatitis or may be asymptomatic ***(Riciard et al., 2003)***

Common bile duct (CBD) stones may be discovered preoperatively, intraoperatively or postoperatively. The standard preoperative workup for patients presenting with symptoms attributable to cholelithiasis includes liver function tests, and abdominal ultrasound. These tests, combined with clinical exam and history, constitute the entire workup for most patients. Abnormalities in these tests may suggest the presence of choledocholithiasis ***(Dorman et al., 1998)***

Different methods have been used for the treatment of (CBD) stones but the suitable therapy depends on conditions such as patient' satisfaction, number and size of stones, and the surgeons experience in laparoscopy. Endoscopic retrograde cholangiopancreatography (ERCP) with endoscopic biliary sphincterotomy, laparoscopic CBD exploration (transcystic or transcholedochal), or laparotomy with CBD exploration (by T-tube, C-tube insertion, or primary closure) are the most commonly used methods managing (CBD) stones ***(Carr-Locke, 2006).***

Laparoscopic common bile duct exploration (LCBDE) has become safe, efficient, and cost effective. It was associated with successful stone clearance rates ranging from 85% to 95%, a morbidity rate of 4% to 16% and a mortality rate of around 0% to 2%. Patients treated with LCBDE had a significantly shorter hospital stay and lower hospital costs as compared with (ERCP) with endoscopic biliary sphincterotomy ***(Thompson and Tranter, 2002).***

There are other options for the treatment of CBDS such as electrohydraulic lithotripsy (EHL), extracorporeal shockwave lithotripsy (ESWL), dissolving solutions, and laser lithotripsy ***(Carr-Locke, 2006).***

AIM OF THE WORK

To review the recent advances in the laparoscopic exploration of Common bile duct.

ANATOMY OF THE EXTRAHEPATIC BILIARY SYSTEM

The extrahepatic bile ducts (Fig. 1) are represented by the extrahepatic segments of the right and left hepatic ducts joining to form the biliary confluence and the main biliary channel draining to the duodenum. The accessory biliary apparatus, which constitutes a reservoir, comprises the gallbladder and cystic duct ***(Blumgart and Hann, 2007).***

Gallbladder and cystic duct anatomy:

The gallbladder is about 4 cm wide and 7 to 10 cm long in most adults. It is composed of a fundus, body, and neck. The fundus is the blind-ending portion that projects below the inferior edge of the liver where it is in contact with the anterior abdominal wall at the level of the ninth costal cartilage in about 50% of cases .The body is the largest part of the gallbladder and is pointed up and to the left close to the right side of the porta. The body decreases in width and forms the infundibulum as it becomes the neck of the gallbladder with an average length of 5 to 7 mm On the right side of the neck, sometimes as a result of chronic dilatation, there may be a recess that projects toward the duodenum called the Hartmann pouch. The neck of the gallbladder is connected to the cystic duct, which is 3 to 4 cm long and courses inferiorly and to the left of the neck eventually joining the common hepatic duct to form the CBD. The cystic duct has 5 to 12oblique folds, creating a spiral valve known as the valve of Heister. In greater than 70% of cases, the cystic duct joins the right lateral edge of the common hepatic duct superior to the pancreas and about 2 cm inferior to the RHD and LHD confluence, the mean diameter

of cystic duct was about 4 mm and its length ranged from 4 to 65 mm with a mean length of 30 mm ***(Bannister, 1995).***

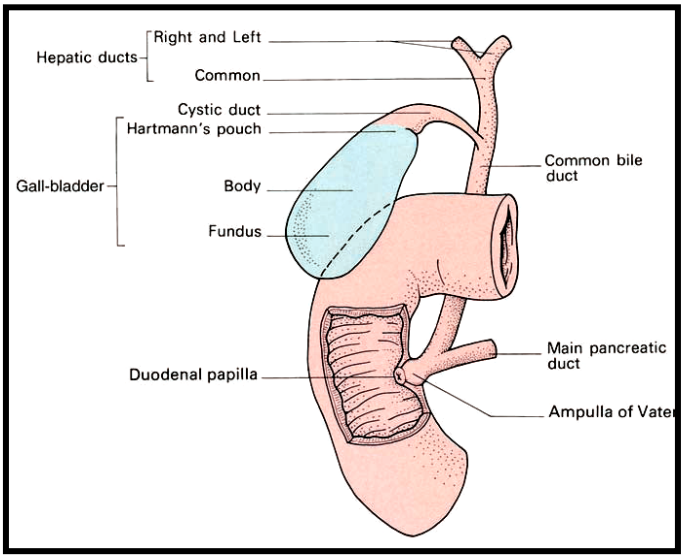

Figure (1): The gall-bladder and its duct system *(Ellis, 2006).*

The left hepatic duct:

Drains the three segments (II, III, and IV) that constitute the left liver. The left hepatic duct traverses beneath the left liver at the base of segment IV, just above and behind the left branch of the portal vein; crosses the anterior edge of that vein; and joins the right hepatic duct to constitute the hepatic ductal confluence. In its transverse portion, it receives one to three small branches from segment IV ***(Blumgart and Hann, 2007).***

The right hepatic duct:

Drains segments V, VI, VII, and VIII and arises from the junction of two main sectoral ductal tributaries. The right hepatic duct is short and joins the left hepatic duct to constitute the confluence lying in front of the right portal vein and forming the common hepatic duct ***(Blumgart and Hann, 2007).***

Common hepatic duct anatomy (CHD):

The left and right hepatic ducts merge to form the CHD. The bile duct confluence is located in the hilar plate anterior to the portal vein. Extrahepatically, a sheath covers the bile duct and hepatic artery branches, which is continuous with the hepatoduodenal ligament. Opening the connective tissue of the hilar plate inferior to segment 4 of the liver exposes the LHD and the confluence of hepatic duct. The intrahepatic portion of the bile ducts is covered by the Glisson sheath except for the bile ducts of the left medial section ***(Kawarada et al., 2000).***

Common Bile Duct (Ductus Choledochus):

The common bile duct begins at the union of the cystic and common hepatic ducts and ends at the papilla of Vater in the second part of the duodenum. It varies in length from 5 cm to 15 cm, depending on the actual position of the ductal union. In 22%, the common hepatic and cystic ducts, on average, run parallel for 17 mm before the ducts actually unite.The average diameter is about 6 mm. The common bile duct can be divided into four portions or segments (Fig. 2) supraduodenal, retroduodenal, pancreatic, and intramural ***(Skandalakis et al., 2000).***