BILIARY RECONSTRUCTION AFTER COMPLICATED GALL BLADDER SURGERY

Essay

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In **General Surgery**

Presented by

Mohamed Lotfey Elarief

M.B.B.CH

Under Supervision of

Prof. Dr. Ashraf Abd Elmoghny Mostafa

Professor of General Surgery

Faculty of Medicine, Ain Shams University

Prof. Dr. Ahmed Mohamed Kamal

Assistant Professor of General Surgery

Faculty of Medicine, Ain Shams University

Dr. Mahmoud Saad Farahat

Lecturer of General Surgery

Faculty of Medicine, Ain Shams University

Faculty of Medicine

Ain Shams University

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الطبيب / محمد لطفي العريف

بكالوريوس الطب والجراحة

تحت إشراف

أ.د/ أشرف عبد المغني مصطفي

أستاذ الجراحة العامة كلية الطب

جامعة عين شمس

د/ أحمد محمد كمال

أستاذ مساعد الجراحة العامة كلية الطب

جامعة عين شمس

د/ محمود سعد فرحات

مدرس الجراحة العامة كلية الطب

جامعة عين شمس

كلية الطب

جامعة عين شمس

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الْكِتَابَ والْحِكْمَةَ
وَعَلَّمَكَ مَا لَمْ تَكُنْ
تَعْلَمُ وَكَانَ فَضْلُ
اللهِ عَلَيْكَ عَظِيمًا
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Mohamed Lotfey Elarief

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LIST OF ABBREVIATIONS

Abbrev.	Full term
BDI	Bile Duct Injury
CBD	Common bile duct
CD	Cystic duct
CHD	Common hepatic duct
CT	Computed tomography
EBDs	Extra hepatic bile ducts
ERCP	Endoscopic retrograde cholangiopancreatography
GB	Gall bladder
HA	Hepatic artery
HIDA	Hepatobiliary iminodiacetic acid scan
HJ	Hepatico _jejunostomy
IBDI	Iatrogenic bile duct injury
IBDs	Intra hepatic biliary ducts
IOC	Intraoperative cholangiography
LC	Laparoscopic cholecystectomy
LHA	Left hepatic artery
LHD	Left hepatic duct
MPD	Main pancreatic duct
MRCP	Magnetic resonance cholangiopancreatography
OC	Open cholecystectomy
PTC	Percutaneus trans-hepatic cholangiography
PV	Portal vein
RASD	Right anterior sectoral duct
RHA	Right hepatic artery
RHD	Right hepatic duct
RPSD	Right posterior sectoral duct

INTRODUCTION

Iatrogenic bile duct injury (IBDI) remains a serious complication after gastrointestinal surgery *(Archer et al., 2001).*

Historic notes from Greece, Egypt and Roma show an occurrence of bile duct disease in ancient history *(Beal, 1984).*

There are two main groups of surgical procedures leading to iatrogenic bile duct injuries. The first group involves surgical procedures performed on the biliary tract such as open and laparoscopic cholecystectomy, choledochotomy and choledochodudenostomy. The second group entitled upper abdominal surgery such as gastric resection (most frequently the Billroth II partial gastric resection), hepatic resection and liver transplantion, lymphadenectomy and other procedures within the hepato - duodenal ligament *(Yeo et al., 2002).*

Iatrogenic bile duct injuries occur most frequently during cholecystectomy. Indeed the number of patients with IBDI has been increased two-folds, which is attributed to widespread use of laparoscopic cholecystectomy *(Archer et al., 2001).*

Biliary injuries, usually present with jaundice, fever, chills, and epigastric pain. The clinical picture

depends on the type of injury and presence or absence of drain and is divided into two groups: **1-Bile leak:** in patients with drain bile leaks in the drain or result in biliary peritonitis if not drained.

2- A group of patients with biliary **ligature or stricture**, jaundice and cholestasis are the commonest clinical symptom *(Jarnagin et al., 2002).*

Iatrogenic bile duct injuries lead to serious complications that might end in biliary cirrhosis, hepatic failure and death *(Negi et al., 2004).*

Investigations in iatrogenic bile duct injuries entitled laboratory as well as radiological investigation-ns. Laboratory investigations include serum bilirubin, alkaline phosphatase and liver enzymes *(Sikora et al., 2006).*

Radiological investigations; include abdominal ultrasound, endoscopic retrograde cholangiopancreato-graphy (ERCP), computed tomography, and magnetic resonance-cholangiography *(Gouma et al., 2002).*

The choice of the appropriate treatment for IBDI is very important, because it may avoid serious complications and improve quality of life in patients *(Tocchi et al., 2000).*

Non-invasive, percutaneous radiological and endoscopic techniques are recommended as initial treatment of IBDI. When these techniques are not effective, surgical management is considered *(Hall et al., 2004).*

Endoscopic dilatation with insertion of biliary stent during ERCP is the most frequently used non-surgical method in the treatment of IBDI *(Vitale et al., 2008).*

The goal of surgical reconstruction is to do patent anastomosis to allow good bile flow to the alimentary tract.

AIM OF THE WORK

To highlight different modalities of diagnosis of biliary duct injuries and its correction after complicated gall bladder surgery.

EMBRYOLOGICAL DEVELOPMENT OF THE BILIARY SYSTEM

The hepatobiliary system develops during the second half of the eight week embryonic stage of development, known as the organogenetic period *(Moore & Persaud, 2003).* Many of the anatomic variations of the system are the consequences of occurrences during this period *(Wind, 2000).*

By the 4th week of embryological growth, ventral (caudal) and dorsal (cranial) outpunching develop at the junction of the foregut and midgut. The gallbladder, extrahepatic bile ducts (EBDs), central intrahepatic bile ducts (IBDs), and ventral pancreas with its ductal network are derived from the ventral outpouching, the hepatic diverticulum. The dorsal bud arises from the dorsal mesogastrium and is the precursor of the dorsal pancreas and its ductal system. At about this time, the developing ventral pancreas, gallbladder, and bile duct rotate clockwise (when viewed from the top) posterior to the duodenum and join the dorsal pancreas in the retroperitoneum. The ventral pancreatic duct and the CBD are, therefore, linked by their embryological origins, resulting in the adult configuration of their common entrance into the duodenum at the major duodenal papilla *(Mortele´ et al., 2006).*

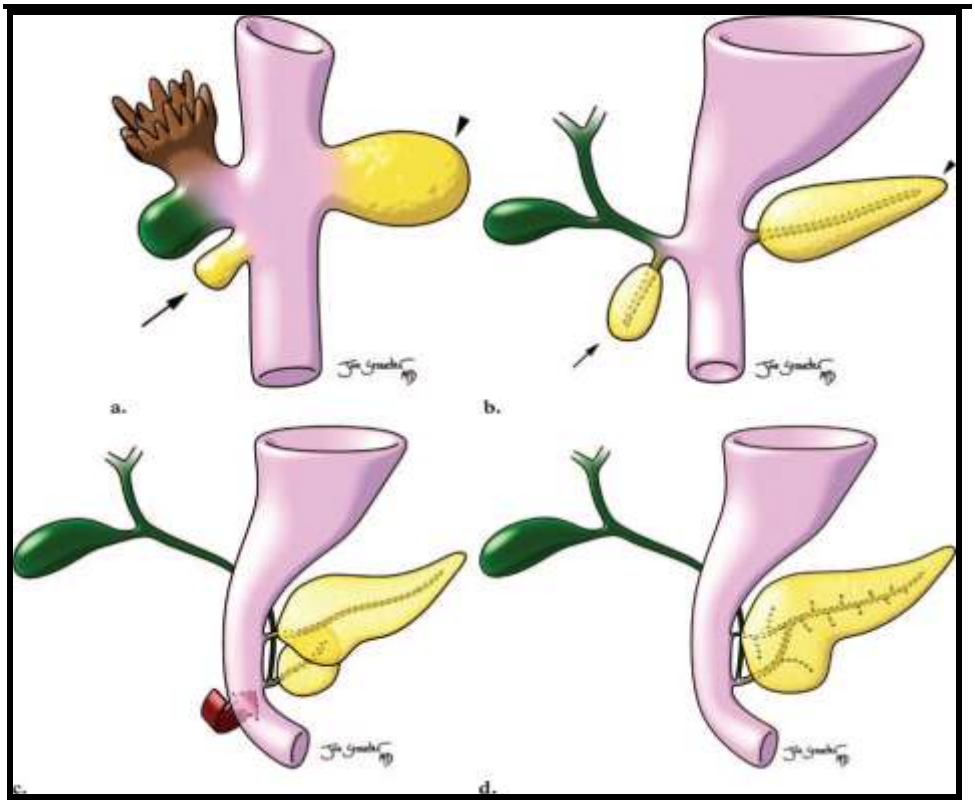

Figure (1): Drawings illustrate the normal embryological development of the pancreas and biliary tree. The ventral pancreatic bud (arrow in a and b) and biliary system arise from the hepatic diverticulum, and the dorsal pancreatic bud (arrowhead in a and b) arises from the dorsal mesogastrium. After clockwise rotation of the ventral bud around the caudal part of the foregut, there is fusion of the dorsal pancreas (located anterior) and ventral pancreas (located posterior). Finally, the ventral and dorsal pancreatic ducts fuse, and the pancreas is predominantly drained through the ventral duct, which joins the common bile duct (CBD) at the level of the major papilla. The dorsal duct empties at the level of the minor papilla *(Mortele´ et al. 2006).*