RECENT TRENDS IN THE MANAGEMENT OF IATROGENIC BILIARY INJURIES DURING LAPAROSCOPIC CHOLECYSTECTOMY

Essay

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الإتجاهات الحديثة فى تشخيص وعلاج إصابات القناة المرارية أثناء إستئصال المرارة بالمنظار

رسالة

توطئة للحصول على درجة الماجستير
فى الجراحة العامة

مقدمة من

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SUMMARY

Cholecystectomy is the most frequently performed operation in abdominal surgery. Laparoscopic cholecystectomy replacing open cholecystectomy is now performed in more than 80% of surgically treated patients for symptomatic gall stones.

Bile duct injuries during laparoscopic cholecystectomy are a serious problem that is better being prevented than treated.

Strasberg et al., 2002: have classified laparoscopic bile duct injury into 5 types:

Type A: Bile leakage from minor ducts.

Type B: Occlusion of aberrant right duct

Type C: Transaction of aberrant right hepatic duct.

Type D: Lateral injury to major e bile ducts.

Type E: Circumferential injury to major bile ducts.

The mechanisms involved in bile duct injuries during laparoscopic cholecystectomy identify the basic error groups:

A) Misinterpretation of the anatomy.

B) Technical errors.

Except for type D and type E injuries, intraoperative identification is uncommon. Even in

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Mohamed Salah Hassan

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LIST OF ABBREVIATIONS

Abbrev.	Full term
AC	: Acute cholecystitis
BDI	: Bile duct injury
BPP	: Biliary percutaneous procedure
CBD	: Common bile duct
CD	: Cystic duct
CHD	: Common hepatic duct
CT	: Computerized tomography
ES	: Endoscopic sphincterotomy
ERCP	: Endoscopic retrograde cholangio-pancreaticography
GB	: Gallbladder
HJ	: Hepatico-jejunostomy
HP	: Hartmann pouch
IBDs	: Intra-hepatic biliary ducts
IOC	: Intra-operative cholangiography
LC	: Laparoscopic cholecystectomy
LHD	: Left hepatic duct
MRCP	: Magnetic resonance cholangio-pancreaticography
MRI	: Magnetic resonance imaging
PTC	: Percutaneous trans-hepatic cholangiography
RHA	: Right hepatic artery
RHD	: Right hepatic duct
RPSD	: Right posterior sectorial duct
RASD	: Right anterior sectorial duct
HIDA scan	: Hepatobiliary IminoDiacetic Acid Scan

INTRODUCTION

Cholecystectomy is a surgical procedure in which the gall bladder is removed. This procedure is performed in cases when patients suffer from chronic gallstones which cannot be resolved, or severe gallbladder inflammation which does not clear or which threatens other organs and Gallbladder carcinoma *(Simon, 2007).*

Laparoscopic cholecystectomy is considered the gold standard surgical intervention for the treatment of symptomatic gallstones *(Zehetner, 2007).*

Laparoscopic cholecystectomy has now replaced open cholecystectomy as the first-choice of treatment for gallstones and inflammation of the gallbladder unless there are contraindications to the laparoscopic approach *(Kapoor, 2007).*

The laparoscopy became the main surgical technique for cholecystectomy with a rate of laparoscopic performances of about 99% for some teams. The development of recent innovative and experimental surgical techniques (N.O.T.E.S.)reduces the abdominal wall trauma and complications by using ports and removal of the gall bladder or any other abdominal organs *(Baron, 2007).*

Laparoscopic cholecystectomy has many advantages but still it has many hazards, the complications include intra operative and post operative complications. The majority of intra operative complications of laparoscopic surgery result from puncture injuries following insertion of Veress needles or trocars *(Mintz, 1999).*

Serious complications that occur with laparoscopic cholecystectomy, including bile duct injury and bile leak, result from patient selection, surgical inexperience, and the technical constraints that are inherent to the minimally invasive approach. *(Khan, 2007).*

Biliary leakages and bile duct strictures are the most severe complications after cholecystectomy. Biliary leakages are an early complication, whereas biliary strictures are considered a late complication. The rate of clinically-relevant bile leaks after conventional open cholecystectomy ranges from 0.1% to 0.5% *(Gouma and Go, 1994).*

A number of mechanisms causing billiary injury are postulated including an undue dissection in a distorted Calot's triangle, use of diathermy close to bile ducts, local pathology such as acute and chronic inflammation with fibrosed gallbladder, excessive traction on gallbladder *(Bhattacharjee, 2005).*

Many authors proposed investigations like intra-operative cholangiography and magnetic resonance cholangiogram to reduce the rate of such injuries *(Slater et al., 2002).*

The incidence of CBD injury is strongly related to experience and a decrease in CBD injury has been reported *(Nair et al., 1997).*

ERCP is shown to be highly effective in both diagnosis and treatment of biliary complication after laparoscopic cholecystectomy. The rate of the therapeutic effect about 84% but the morbidity rate is less than 4% *(Kianika et al., 2007).* As it is important in drainage in case of biliary leakage, removal of retained common bile duct stone and insertion of stent in biliary stricture *(Quinn et al., 1992).*

MRCP is the imaging modality of choice for the work-up of suspected BDI as it outlines both the intra and extra-hepatic biliary tree, and thus can provide a better map of the biliary anatomy for planning the reconstructive surgery than ERCP *(Khalid et al., 2001).*

In the majority of major BDIs, a Roux-en-Y hepaticojejunostomy (HJ) is the preferred method of repair *(Connor, 2006).*

AIM OF THE WORK

The aim of this work is to clarify the problem of bile duct injuries during laparoscopic cholecystectomy and to increase awareness about the aetiology, clinical presentation, the most recent investigations and different methods of management.

ANATOMY OF THE BILIARY SYSTEM

Normal anatomy of the biliary system

The biliary system consists of the intra-hepatic and extra-hepatic biliary tracts. The ducts located in the hepatic parenchyma, those proximal to the right hepatic "**RHD**" and the left hepatic "**LHD**" ducts, represent the intra-hepatic system. *(Reau & Jensen, 2008).*

Intra-Hepatic Biliary Tract

There are more than 2 kms of bile ductules and ducts in the adult human liver. The intra-hepatic system is further divided by size into small and large ducts. Intra-hepatic large bile ducts roughly correspond to ducts from the first to the fourth branches of the right and left hepatic ducts. Intra-hepatic small bile ducts are further classified as septal bile ducts, interlobular bile ducts, or bile ductules according to their size and location *(Cha et al., 2007).*