Recent Laparoscopic Management Of common Bile Duct Stones

Essay

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In general surgery

By

Mohamed Hassan Abo El Hassan

M. B. B. Ch.

Supervised by

Prof. Dr. Ali BahgatLashen

Professor of General Surgery

Faculty of Medicine Ain-Shams University

Prof. Dr. Mohamed Mustafa Marzouk

Professor of General Surgery

Faculty of Medicine Ain-Shams University

Faculty of Medicine

Ain-Shams University

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INTRODUCTION

Common bile duct stones may appear in one of the following five ways: without symptoms, biliary colic, jaundice, pancreatitis and cholangitis. The last four conditions may appear in all possible combinations. Sometimes CBDS are an unanticipated finding during elective cholecystectomy (**Blumgart, 2007**).

The classic triad of fever with chills, jaundice and pain leads to the suspicion of choledocholithiasis and when associated with known cholelithiasis, the diagnosis is certain (**Girard, 2000).**

CBDS can be caused either by primary bile duct stones that originate in the bile duct or by secondary bile duct stones that have descended from the gallbladder. In the primary stones, bilirubin is the dominant component and is associated with biliary stasis and infection. In secondary stones, cholesterol is the dominant component. It is therefore important to distinguish between primary and secondary stones. Cholecystectomy and choledocholithotomy are sufficient in the management of secondary stones, while the presence of primary stones often necessitates a more complex drainage procedure to prevent recurrence(**Uchiyama et al; 2003).**

Liver function tests (LFTs) can be used to screen for CBDS (**Peng et al; 2005)**. Elevated serum bilirubin and alkaline phosphatase typically reflect biliary obstruction, but these are neither highly sensitive nor specific for CBDS (**Freitas et al; 2006)**.Elevated serum gammaglutamyltranspeptidase (GGT) and alkaline phosphatase (ALP) were the most frequent abnormalities in laboratory values of patients with symptomatic CBDS (**Caddy and Tham, 2006).**

There are various imaging modalites for evaluation of common bile duct such as:Ultrasonography , ERCP , Endoscopic Ultrasound (EUS); Magnetic Resonance Cholangiopancreatography (MRCP); Intraoperative Cholangiography (IOC);Conventional Computed Tomography (CCT)and Intraductal Ultrasonography (IDUS) (**Jennifer et al; 2008).**

The management of CBD stones traditionally required open laparotomy and bile duct exploration. With the advent of endoscopic and laparoscopic technology the main options for treatment are pre- or postoperative ERCP with endoscopic biliary sphincterotomy (EST), laparoscopic trans-cystic exploration of common bile duct and laparoscopic choledochotomy **(Tang and Li, 2005)** .

There are other options for the treatment of CBDS such as electro hydraulic lithotripsy (EHL), extracorporeal shockwave lithotripsy (ESWL), dissolving solutions, and laser lithotripsy. It is unlikely that one option will be appropriate for all clinical circumstances in all centers. Variables such as disease status, patient demographics, availability of endoscopic, radiological and surgical expertise and healthcare economics will all have significant influence on practice **(Carr-Locke, 2006)**.

When one considers the costs, morbidity, mortality and the time required before the patient can return to work, it would appear that laparoscopic cholecystectomy with common bile duct exploration is more favorable than open surgery or laparoscopic cholecystectomy with pre-operative or post-operative endoscopic sphincterotomy. However the technique requires advanced laparoscopic skills, including suturing, and the use of a choledochoscope, guidewires, dilators and balloon stone extractor; it should be emphasized that this procedure is very challenging, and it should be performed by well-trained laparoscopic surgeons with experience in biliary surgery **(Vecchio and Macfadyen, 2002).**

Although laparoscopic common bile duct exploration appears to be the most cost-effective method to treat common bile duct stones. Occasionally, anatomic or physiologic considerations preclude the minimal access approach, and conversion to an open operation in such cases reflects sound judgment and should not be considered a complication (**Nagle and Soper, 2007).**

AIM OF THE WORK

The aim of this work is to review the laparoscopic option in the management of common bile duct stones, its advantages and complications.

SUMMARY

The incidence of common bile duct stones in patients having gallstones varies between 8 and 20 percent .10-30% of gall stones will become symptomatic.

Common bile duct stones are usually accompanied by gallbladder stones but in about 5% of cases the gallbladder is empty.

Attacks of biliary colic and obstructive Jaundice is seen if a stone obstructs the Common bile duct .In the absence of infected bile ,asymptomatic jaundice, often fluctuating, will ensue and in many patients there will be spontaneous complete resolution. This will happen if as ductal dilatation develops, the stone floats back up the Common bile duct and away from the narrow distal and as an edema subsides. However, occasionally jaundice is relieved because the stone indeed passes into the duodenum.

High values (more than or equal to the double of the normal value) of serum glutamic oxalacetictransminase (SGOT), Alkaline phosphatase (ALP) and conjugated bilirubin with dilated duct (>8mm) are all diagnostic factors of common bile duct lithiasis.

Abdominal ultrasound, endoscopic ultrasound, computerized tomography scan (CT scan), computerized tomography chalangioogram (CT chalangiogram), Magnetic resonance cholangiopancreatography, Endoscopic retrograde cholangiopancreatography (ERCP) Percutanoustranshepatic cholangiography , all are radiological tools to detecte presence of common bile duct stones .

The modern era of common bile duct surgery started with Mirizzi, who introduced the intra-operative cholangiography in 1932. Intra-operative choledochoscopy had been developed as an adjunctive to intra-operative cholangiography, which helped to detect the common bile duct stones in an additional 10% to 15% of instances that otherwise an important technique for efficient and effective management of common bile duct stones. Efforts have been exerted to treat patients with common bile duct stones in one session and avoid potential complications of endoscopic sphincterotomy.

Laparoscopic bile duct clearance, which was first carried out in April 1990, has since then been shown to be potentially preferable option when compared with endoscopic retrograde cholangio-pancreatography

(ERCP), allowing the surgeon to reclaim the treatment of common bile duct stones detected at routine intra-operative cholangiography.

Recently, single stage laparoscopic cholecystectomy and laproscopic exploration of common bile duct is the primary apporach for patients with common bile duct stones, except in the presence of severe biliary sepsis.

When one considers the costs, morbidity, mortality and the time required before the patient can return to work, it would appear that laparoscopic cholecystectomy with common bile duct exploration is more favorable than open surgery or laparoscopic cholecystectomy with pre-operative or post-operative endoscopic sphincterotomy. However the technique requires advanced laparoscopic skills, including suturing, and the use of a choledochoscope, guidewires, dilators and balloon stone extractor; it should be emphasized that this procedure is very challenging, and it should be performed by well-trained laparoscopic surgeons with experience in biliary surgery.

Although laparoscopic common bile duct exploration appears to be the most cost-effective method to treat common bile duct stones. Occasionally, anatomic or physiologic considerations preclude the minimal access approach, and conversion to an open operation in such cases reflects sound judgment and should not be considered a complication.

Laparoscopic CBD exploration may be done after initial confirmation (detection) of a stone by IOC laparoscopic ultrasound. The cystic duct is dilated with graded dilators, balloon dilatation and Choledochoscopic stone removal is done. The same limitations to transcystic intervention are applicable in laparoscopy as well. Alternatively the CBD may be approached by a choledo-chotomy where the CBD is opened with scissors or a harmonic scalpel and the CBD explored using a therapeutic choledochoscope. Alternatively Steerable catheters under fluoroscopic guidance are used. Laparoscopic ante grade sphincterotomy may be added to provide bile duct drainage and to prevent the problem of recurrence.

الملخص العربى

تصلنسبةالإصابةبحصواتالقناةالمرارةفيالمرضىالمصابينبحصواتالمرارةمن8-20%،معذلكلاتوجدحصواتفيالمرارةفيحوالي5%منالمرضبحصواتالقناةالمرارية.

وقدتظلحصواتالقناةالمرارةبدونأعراضأوتظهرعلىهيئهمغصبالبطن،ارتفاعنسبهالصفراءبالدم،التهابالبنكرياسأوالتهابالقنواتالمرارية.وقدتكتشفهذهالحصواتقبل،أثناءأوبعدعمليهاستئصالالمرارة.

هناكنوعانمنحصواتالقناةالمرارية،حصواتأوليهوهيالتيتتكونأساساداخلالقناةالمرارةوحصواتثانويةتنتقلعنطريقالمرارة.ومنالضروريتحديدنوعالحصواتحيثأنأسلوبالعلاجيختلففيالحالتين.

هناكالعديدمنالفحوصاتالتييمكنعملهالتشخيصحصواتالقناةالمرارةمثلاالفحوصاتالمعمليةوأهمهازيادةفيمستوىالبليروبينالمرتبطوأنزيماتالكبدوإنزيمالفوسفاتيزالقلويوتصويرالقنواتالمرارةباستخدامالموجاتفوقالصوتية،المنظارالارتجاعيلتصويرالقناةالمرارةوقناةالبنكرياس،الأشعةالمقطعية،الرنينالمغناطيسيعلىالقنواتالمرارةوتصويرالقنواتالمرارةأثناءالجراحة.

فيهذهالأياميعداستكشافالقناةالمرارةباستخداممنظارالبطنالجراحيمنالطرقالمفضلةلعلاج حصواتالقناةالمرارةفيمراكزمتعددةلاستخدامالمنظارالجراحي .
فعندماتوضعالتكاليفومعدلالمضاعفاتالمرضيةوالوفياتومدةرجوعالمريضلحياتهالطبيعيةموضعالاعتباريظهرلناأنهذهالطريقةهيأفضلالطرقالمتاحة .
لكنالتقنيةالمستخدمةفيهاتحتاجإلىمهاراتمتقدمةفياستخداممنظارالبطنالجراحيمنذلكالخياطةبالمنظارواستخداممنظارالقناةالمرارةوالأسلاكالمرشدةوالموسعاتوالبالونلاستخراجالحصوات.لابدمنالتأكيدعلىأنهذهالطريقةطريقةواعدةولاتجربإلابواسطةجراحماهرومدربفياستخداممنظارالبطنالجراحيوفيمكانمؤهللإجراءهذهالعملية.

وقد بدأ عهد تطور جراحة القنوات المراريه علي يد ميريزي الذي قام بتصوير القنوات المراريه بالصبغه أثناء عملية إستئصال الحوصله الصفراويه في عام 1932م ومنذ ظهور منظار القنوات المراريه كبديل لتصوير القنوات المراريه بالصبغه اثناء العمليه ساعد في اكتشاف من 10% الى 15 % من الحالات التي كانت لا تكتشف .

إن النتائج توضح ان منظارالقنوات المراريه طريقه مهمه من اجل علاج فعال و كفء لحصوات القنوات المراريه ولقد بذلت جهود من اجل علاج مرضى حصوات القنوات المراريه في جلسة واحده لكي نتجنب المضاعفات الناتجه عن شق العضله العاصره .

وقد تمت أول عملية إستئصال حصوات القنوات المراريه بإستخدام منظار البطن الجراحي في إبريل من عام 1990م ومنذ ذلك الحين أصبحت خياراً مفضلاً علي شق العضلة العاصرة بإستخدام منظار تلوين القنوات المرارية البنكرياسية,حيث تسمح للجراحين بعلاج حصوات القنوات المراريه التى تكتشف في التصوير الروتيني للقنوات المراريه اثناء العمليه.

لقد قام مارتين وأخرون بتسجيل 300 مريض خضعوا لعلاج حصوات القنوات المراريه بمنظارالبطن الجراحي معتقدين أن هذه العمليه كانت مكافئه كبديل لمنظار تلوين القنوات المراريه والبنكرياسيه مع فائدة تقليل التكلفه بواسطة إجراء العمليه في خطوة واحده وتجنب المضاعفات المصاحبه لإستخدام منظار تلوين القنوات المراريه والبنكرياسيه بالصبغه . ولقد وجد أن إستخدام منظار البطن الجراحي في علاج حصوات القنوات المراريه يقلل فترة الإقامة بالمستشفي وتكاليف العلاج مما يضعها في الأولويه كعلاج من خطوة واحده.

هناك العديد من المضاعفات الناتجة عن شق العضلة العاصرة بإستخدام منظار تلوين القنوات المرارية البنكرياسية مثل الفشل فى الدخول بالمنظار،الفشل فى إستخراج الحصوه، النزيف ،إلتهاب البنكرياس ، ثقب الأثني عشر ، إرتجاع بالإثني عشر ، تكرار تكون الحصوات المرارية وإلتهاب القنوات المرارية الصاعد لذلك يجب أخذ الإحتياطات اللازمه عندما نقوم بإستئصال حصوات القنوات المراريه على مرحلتين.

حديثا أصبح إستئصال الحوصله الصفراويه وحصوات القنوات المرارية بإستخدام منظار البطني الجراحي فى خطوه واحده هوالخيار الأول ماعدا فى حالة وجود إلتهاب بالقنوات المراريه.

طرقعلاجحصواتالقنواتالمراريهعنطريقمنظارالبطنال جراحى

رسالةتوطئةللحصولعلىدرجةالماجستيرفيالجراحةالعامة

مقدمهمن

طبيب / محمدحسنابوالحسن

بكالوريوسالطبوالجراحة

تحتإشراف

الأستاذالدكتور / علىبهجتلاشين

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كليةالطب -جامعةعينشمس

الاستاذ الدكتور/محمدمصطفى مرزوق

استاذ الجراحةالعامة

كليةالطب -جامعةعينشمس

كليةالطب

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Embryology

The development of the liver and biliary system is a complex process that can lead to numerous anatomic variations. A thorough knowledge of this anatomy is essential in radiologic, endoscopic, and surgical approaches to the biliary system **(Vakili and Pomfret, 2008).**

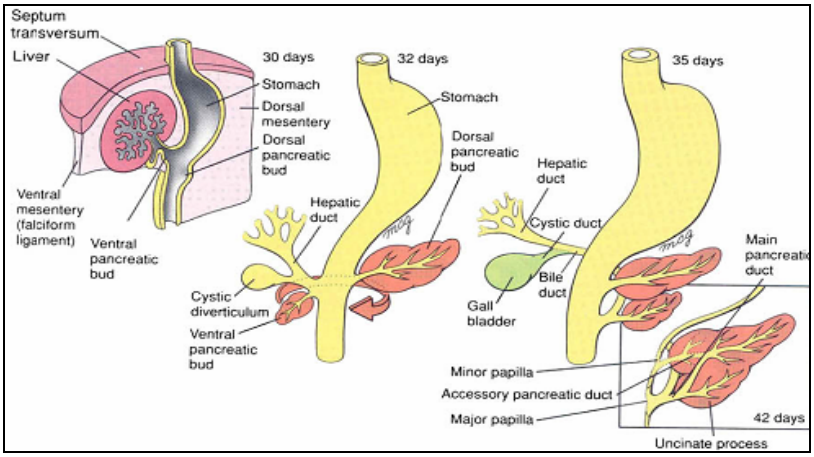

Figure (1): Development of the liver, gallbladder, bile ducts, and pancreas. The liver bud begins to expand into the ventral mesentery during the fourth week **(Vakili and Pomfret, 2008).**

The gallbladder, bile ducts, liver and primitive ventral pancreas originate from a diverticulum that appears on the ventral surface of the primitive fore gut near the yolk sac. At 4^{th} week of gestation, three separate buds can be recognized; the cranial bud penetrates the splanchnic mesenchyme of the septum transversum and develops into the liver; the caudal bud becomes the gallbladder; and a smaller basal bud gives rise to the ventral pancreas. Their centrifugal migration causes elongation of those segments originally attached to the foregut which then becomes the hepatic, cystic and common bile ducts, respectively **(MacSween and Scothorne, 2001).**

The common bile duct and the hepatic ducts may be seen at the beginning of the 5th week. The solid stage of the ducts takes place during the 5th week. The ducts elongate to reach the liver, progressively forming at this time. Slow ductal recanalization occurs approximately from the 6th through 12th weeks. Human fetal gallbladder contractility in the second half of pregnancy has been reported **(Skandalakis et al., 2006).**