Endoscopic management of common bile duct stones
Shannon Acker
August 1, 2011
Gallstones occur in 15% of population

10-50% cause symptoms within 10-20 yrs

10-18% of patients who have cholecystectomy for gallstones have common bile duct (CBD) stones

Natural history of CBD stones is not known, complications appear to be more frequent and severe than with asymptomatic stones

Evolution of CBDS management

- 1889 - first surgical exploration of the CBD by Swiss Surgeon Ludwig Courvoisier via incision in the CBD
- 1960s - Mazzariello, an Argentinean surgeon, introduced non operative instrument extraction of retained CBDS via T-tubes
- 1970s - Gastroenterologists from Germany and Japan introduced endoscopic sphincterotomy for retained CBDS

Evolution of CBDS management

- In the era of open cholecystectomy, intraoperative cholangiography was performed routinely.
- Surgical CBD stone extraction was the recommended treatment option.
- Open CBD exploration results in:
  - lower primary treatment failure
  - fewer additional procedures
  - fewer average number of procedures required per patient
  - lower mortality

when compared to ERCP

Evolution of Cholecystectomy

- Laparoscopic cholecystectomy introduced in 1985 by Erich Muhe - Germany
- Advantages of laparoscopy:
  - shorter hospitalizations
  - quicker return to work
  - decreased complications
  - less postoperative pain

CBDS in the era of laparoscopic cholecystectomy

- Advances in endoscopic stone clearance techniques
  - Endoscopic sphincterotomy
  - Endoscopic baskets, balloons, lithotripsy devices
- Advances in laparoscopy
  - Improved experience and instrumentation
  - Transcystic stone removal
  - Laparoscopic choledochotomy with stone clearance
  - Transcystic stenting followed by post operative ERCP

Surgical versus endoscopic treatment of bile duct stones (Review)

Martin DJ, Vernon DR, Toouli J

THE COCHRANE COLLABORATION®
Advantages of Endoscopic Treatment of CBD Stones

- Optimal for elderly and high risk patients
- Primary treatment for acute cholangitis and gallstone pancreatitis
- Option as single therapy for common bile duct stones
Acute Cholangitis

- 82 patients with severe acute cholangitis due to choledocholithiasis randomly assigned to undergo surgical decompression of the biliary tract or endoscopic biliary drainage

Acute Cholangitis

- Review of 94 pts admitted with acute cholangitis:
  - 82 had CBD stones, 71 underwent decompression
    - 28 surgically, 43 ES
  - Endoscopic sphincterotomy (ES) associated with lower 30 day mortality
  - Of 43 pts undergoing ES
    - 23 had gallbladder left in situ; 2 of 23 required future cholecystectomy
- Endoscopic biliary drainage is associated with a significantly reduced mortality and morbidity rate

Patients with mild or severe pancreatitis who underwent emergency ERCP

- Decreased rates of biliary sepsis (0/97 vs 12/98 patients)
- Decreased rate of hospital morality (5 patients vs 9 patients)

“It is generally agreed that the two-stage approach (ERCP with endoscopic stone extraction followed by laparoscopic cholecystectomy) is indicated in poor-risk patients, including those with established cholangitis or severe pancreatitis.” Cuschieri 1999

Figure 1. Algorithm for endoscopic management of cholangitis.

Randomised trial of endoscopic sphincterotomy with gallbladder left in situ versus open surgery for common bile duct calculi in high-risk patients

Eduardo M Targarona, Rosa M Perez Ayuso, José M Bordas, Emilio Ros, Immaculada Pros, Joaquín Martínez, José Terés, Manuel Trías

<table>
<thead>
<tr>
<th></th>
<th>Group I (n=48)</th>
<th>Group II (n=50)</th>
<th>95% CI</th>
<th>p</th>
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<tr>
<td>Catheter sepsis</td>
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<tr>
<td>Immediate mortality</td>
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<td>3 (6%)</td>
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<td>11 (SD 8)</td>
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<tr>
<td>Post-treatment stay, d</td>
<td>11 (SD 8)</td>
<td>5 (SD 4)</td>
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</tr>
</tbody>
</table>

* * *

Table 2: Technical efficacy and immediate morbidity and mortality

Endoscopic Sphincterotomy as Single Therapy

- 71 patients with both CBDS and gallbladder stones in whom endoscopic clearance of bile duct stones was achieved
  - 3 pts underwent cholecystectomy within 1 week (acute cholecystitis)
  - 42 pts - cholecystectomy was recommended (based on specialist preference)
  - 26 pts - wait and see strategy recommended
    - 5 pts underwent cholecystectomy with no worse surgical outcome

Endoscopic Sphincterotomy as Single Therapy

- 83 pts with CBDS enrolled in RCT of endoscopic sphincterotomy and stone removal vs surgery alone
- 5 year follow up
  - 7/39 ES pts underwent cholecystectomy (6 for symptoms, 1 for cholecystitis)
  - 2/39 ES pts died of gallbladder cancer

Endoscopic and surgical treatment of bile duct calculi in middle-aged and elderly patients with gallbladder in situ are equally effective in the long term.

-Hammarstrom 1995
Indications for Endoscopic Treatment of CBDS

- Acute cholangitis
- Gallstone pancreatitis
- Elderly and high risk patients
Quality of Data

- Only two prospective RCTs comparing endoscopic to surgical treatment of common bile duct stones discovered intraoperatively.

- Numerous exclusion criteria: acute pancreatitis, acute cholangitis, anatomy precluding ERCP, ASA status 3-4, need for a drainage procedure of the CBD.

Surgeon Experience

Over past 30 years:

- Number of cholecystectomies increased from 400,000 to 750,000 per year
- Rate of CBDE dropped from 20% to 2%
- Only 15,000 CBDEs performed each year
- Published data comes from centers of excellence
- No data on outcomes of procedures performed by less experienced surgeons
- Number of CBDEs reported by finishing chief surgery residents:
  - 10 in 1990 (all open)
  - 1.5 open and 0.8 laparoscopic in 2008

Survey of 68 general surgeons practicing in rural US

- Only 45% reported that they perform LCBDE
- 75% reported that ERCP was preferred approach to a patient with choledocholithiasis
- Reasons for not performing LCBDE
  - 58% - time
  - 24% - equipment
  - 6% - lack of good GI backup
  - 3% - reimbursement
  - 1.5% - increased morbidity
  - 1.5% - lack of skill

Application of LCBDE Data

- Taylor 2007 - Australia
- Campbell-Lloyd 2008 - Australia
- Poole 1997 - UK
- O’Neill 2008 - Australia
- Tang 2006 - Hong Kong
- Sgourakis 2002 - Greece
- Tinoco 2008 - Brazil
- Cuschieri 1999 - UK, Italy, Spain, Australia, Portugal, The Netherlands
- Clayton 2006 - New Zealand, Greece
- Suc 1998 - France
- Neoptolemos 1987 - UK
- Tranter 2002 - UK
- Nathanson 2005 - Australia
- Rhodes 1998 - UK
- Gurusamy 2001 - UK
There are several approaches (to the management of CBDS) and current data does not suggest clear superiority of any one approach; decisions regarding treatment are most appropriately made based on surgeon preference as well as the availability of equipment and skilled personnel. (Level I, Grade A) -SAGES Recommendations
Conclusions

Endoscopic management of CBDS:

- Optimal for elderly and high risk patients
- Primary treatment for acute cholangitis and gallstone pancreatitis
- Option as single therapy for common bile duct stones

No data to support use of LCBDE in US