Open Common Bile Duct Exploration

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Disclosures

- None
Overview

• Common bile duct (CBD) stones are identified in 10 to 15 percent of patients undergoing surgery for symptomatic cholelithiasis

• CBD stones should be removed surgically or endoscopically to prevent further complications:
  • acute suppurative cholangitis
  • obstructive jaundice
  • hepatic abscess
  • acute pancreatitis

• Diagnosis should be suspected based on labs, symptoms, and imaging findings
Options for Management

• Endoscopic therapy
  • ERCP (EUS useful adjunct)
  • Transgastric laparoscopic-assisted ERCP
  • Rendezvous procedure

• Surgical therapy
  • L/S CBD exploration
    • Transcystic
    • Transductal
  • Open CBD exploration

• Percutaneous management
  • Cholangitis not candidate for ERCP
  • Not candidate for surgical or endoscopic management
Predictors of Choledocholithiasis

• Very strong predictors
  • CBD stone on U/S
  • Acute cholangitis
  • Serum bilirubin >4 mg/dL

• Strong predictors
  • Dilated CBD on U/S (>6 mm GB in situ)
  • Serum bilirubin 1.8-4.0 mg/dL

• Moderate predictors
  • Abnormal liver biochemistry other than bilirubin
  • Age >55
  • Clinical history of gallstone pancreatitis
## Risk Stratification

<table>
<thead>
<tr>
<th>Criteria</th>
<th>High</th>
<th>Intermediate</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>One or more very strong predictor <strong>and/or</strong> both strong predictors</td>
<td>One or more strong predictors <strong>and/or</strong> one or more moderate predictors</td>
<td>No predictors</td>
</tr>
<tr>
<td>Risk of CBD Stones</td>
<td>&gt;50%</td>
<td>10-50%</td>
<td>&lt;10%</td>
</tr>
<tr>
<td>Additional evaluation</td>
<td>ERCP</td>
<td>1) MRCP or EUS with ERCP as indicated 2) Proceed to surgery</td>
<td>None</td>
</tr>
<tr>
<td>Surgical treatment</td>
<td>Cholecystectomy</td>
<td>1) Cholecystectomy 2) Cholecystectomy + IOC/LS CBDE</td>
<td>Cholecystectomy/IOC as indicated</td>
</tr>
</tbody>
</table>
Case Presentation

- 60 female with multiple medical problems including Hepatitis C
- Pruritis and dark urine in 2016
- LFTs – AP 987, AST 171, ALT 225, TB 3.4, DB 1.5
- RUQ US – cholelithiasis and dilated duct, c/w choledocholithiasis
Case Presentation

- ERCP – removal of stone fragments, large impacted stone not extracted (stent placed)
- GI recommended consideration for additional attempts at endoscopic management
- Patient was reluctant to undergo further endoscopic treatment
- Surgical consultation requested
Indications for Open CBD Exploration

• Open cholecystectomy + CBD stones
• Failed or complicated laparoscopic approach
• Clinical scenarios
  • Severe inflammation in triangle of Calot
  • Impacted stones
• Limited laparoscopic equipment, experience, and/or resources
Techniques for stone removal

- Manual manipulation
- Forceps
- Saline irrigation
- Fogarty catheter with balloon
- Wire basket
- Choledochoscopy
Case Presentation

• 54-year-old female with previous medical history significant for clinically severe obesity for which she underwent a Roux-en-Y gastric bypass in 1998
• L/S Cholecystectomy 2001
• Surgically-assisted transgastric ERCP for choledocholithiasis in 2008
• Now presents with a two day history of abdominal pain
• No signs of infection, abdomen benign
• Labs normal except for ALP 264 Bili 0.6/0.4
Warning: Not for diagnostic use
Case Presentation

• Ultrasound, CT and MRCP all demonstrated a dilated CBD 11 mm with calculi measuring 1.2 x 0.6 cm in the distal CBD

• GI consultation was obtained
  • Transgastric ERCP
  • CBD Exploration

• Surgical exploration
  • Open common bile duct exploration
  • Stones and debride flushed and removed
  • Choledochoscopy confirmed duct clearance
  • Choledochoduodenostomy
Choledochoduodenostomy
ASPECTS OF TREATMENT*

Technique of transduodenal exploration of the common bile duct

Duodenoscopic appearances after biliary sphincterotomy

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Post Operative Management

• Consider early drain removal
  • Low output
  • Nonbilious
  • Clinically stable

• Monitor LFTs
  • May take several days to weeks to normalize

• Clamp T-tube at discharge
  • Flush
  • Dressing changes as needed

• Consider outpatient T-tube removal after 4 weeks

• Prior to T-tube removal
  • T-tube cholangiogram
  • LFTs
Complications

• Symptoms:
  • Fever
  • Leukocytosis
  • Persistent pain
  • Bile leakage around T-tube or through drain
  • Jaundice
  • Rigors

• Radiologic workup
  • U/S vs CT
  • T-tube cholangiogram

• Diagnosis:
  • Bile duct leak (2-6%)
  • Subhepatic abscess (0.7%)
  • Retained stones (3-6%)
Case Presentation

- 82-year-old male with multiple medical problems who presented with abdominal pain and pancreatitis
- CT showed focal acute interstitial edematous pancreatitis and porcelain gallbladder
- Ultrasound contracted gallbladder with mural calcification and/or cholelithiasis, normal CBD
- LFT’s normal
- Pancreatitis resolved and he was reluctant to undergo surgery, but developed intermittent episodes of RUQ pain
Warning: Not for diagnostic use
Conclusions

• Choledocholithiasis is a relatively common disorder encountered in our patient population

• Risk stratification can be useful for determining appropriate imaging and intervention in suspected cases

• Endoscopic management is currently the standard procedure for managing CBD stones
  • Abnormal anatomy can make ERCP more difficult or impossible
  • Recent data suggest that there may be benefit to L/S CBDE for intermediate risk patients

• Numerous complex procedures can be utilized, but all surgeons who perform cholecystectomy should be familiar with the technique of open CBD exploration