Choledocholithiasis due to Retained Cystic Duct Stump: A Novel Minimally Invasive Approach

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Chief Complaint

- xx year old male directly admitted from surgeon’s office on dd/mm/yyyy with dehydration
Relevant PMH / PSH

- Open cholecystectomy
- Acute cholangitis
- ERCP for acute cholangitis
- Laparoscopic CBD exploration
HPI

- Increased T-tube output (>500 ml / day)
- Poor appetite
- Postprandial pain
Other PMH / PSH

- HTN
- DM
- CAD s/p CABG (2005)
- Prostate cancer s/p radiation and hormonal therapy
Physical Exam

- Temp - 97.0
- BP - 108/58
- HR - 70
- Alert and oriented
- No jaundice
- Poor skin turgor
- Dry mucous membranes
- T-tube filled with bile
- JP drain empty
Labs

- **BUN** – 104
- Creatinine – 3.6
- Total bilirubin – 2.3
- Lipase – 1772
- Albumin – 2.8
T-tube cholangiogram
(12/27/2011)
Pre-op Course

• Acute kidney injury resolved with intravenous hydration

• Hematuria from traumatic Foley catheter insertion (2/1/2012)
  – Continuous bladder irrigation
  – Prostate fulguration
Surgery (2/10/2012)

- Combined ERCP / percutaneous CBD exploration
- Failed sphincterotomy due to duodenal diverticulum
- Choledochoscopy
- Laser lithotripsy of CBD stones with holmium laser
- Balloon sphincteroplasty (8 mm)
- T-tube (Council tip Foley catheter) replaced
- Completion T-tube cholangiogram
Post-op Course

• POD#3 – Bile leak into JP drain
• POD#4 – T-tube cholangiogram revealing T-tube (Foley catheter) migrated into duodenum
• POD#7 – Discharged home
Choledocholithiasis
Diagnosis

- CT scan
- MRCP
- Transabdominal ultrasound
- Endoscopic ultrasound
- ERCP
- Intraoperative cholangiogram
- Choledochoscopy
- PTC
Endoscopic Treatment (ERCP)

- Extraction
  - Balloon
  - Basket
- Lithotripsy
  - Mechanical
  - Electrohydraulic
  - Laser
- EBS (endoscopic biliary sphincterotomy)
- EBD (endoscopic balloon dilation)
Percutaneous Treatment

- Similar to endoscopic treatment
Surgical Treatment

- Common bile duct exploration
  - Trancystic
  - Choledochotomy
- Sphincterotomy
- Transduodenal sphincteroplasty
- Cholecysto-jejunostomy
- Choledocho-duodenostomy
- Choledocho-jejunostomy
Non-invasive Treatment

- Extracorporeal shock wave lithotripsy
Post-cholecystectomy Syndrome
Success of Cholecystectomy

• Gallbladders with stones (n = 170)
  – 152 (89.4%) complete symptomatic relief
  – 15 (8.8%) partial symptomatic relief
  – 3 (1.8%) total failures

• Non-calculous gallbladders (n = 47)
  – 36 (76.6%) complete symptomatic relief
  – 7 (14.9%) partial symptomatic relief
  – 4 (8.5%) total failures

Criteria for Cholecystectomy

- A satisfactory account of one or more attacks of biliary colic
- Residual tenderness in the region of the gallbladder following such episodes
- Indigestion, which is usually characterized by flatulence, bloating and discomfort
- A positive cholecystogram giving evidence of a nonfunctioning gallbladder or stones
- Reasonably exact exclusion of conditions that simulate cholecystitis

Criteria for Cholecystectomy

“When such symptoms are presented by a stable, sensible individual who is not given to habitual complaining, good results almost certainly can be assured.”

Vague Symptoms and Evidence of Gallbladder Disease on Cholecystography

1) Those presenting signs of constitutional inadequacy, with or without the mild grades of affective disorders
2) Migrainous individuals, with or without abdominal equivalents
3) Patients with the more severe degrees of the syndromes of so-called irritable colon
4) Those with lowered basal metabolic rates

Causes of the Postcholecystectomy Syndrome

• (other than incorrect initial diagnosis)
• Mechanical irritation or obstruction of the common bile duct because of stone or cystic duct remnant
• Functional spasm and incoordination (biliary dyskinesia) of the sphincter of Oddi
• Gastritis from bile reflux
• Diarrhea from increased bile flow

Removal of the Enlarged Remnant Cystic Duct

• Most patients also had CBD drained

• Stone in cystic duct stump (n = 7)
  – 83% successful (excluding 1 lost to follow-up)

• Stone in the CBD (n = 11)
  – 60% successful (excluding 1 lost to follow-up)

• No calculi present (n = 26)
  – 46% successful (excluding 1 lost to follow-up)

Laser Lithotripsy