VANDERBILT UNIVERSITY MEDICAL CENTER

Emergency General Surgery

Practice Management Guidelines: Biliary Disorders

I. **Background:** Biliary disorders (cholelithiasis, cholecystitis, choledocholithiasis, pancreatitis, and cholangitis) are some of the more common reasons for Emergency General Surgery consultation and need for operative management.

II. **Guideline:**

A. **Initial Evaluation with Concern for Biliary Pathology**

- a. Labs
  - i. CBC
  - ii. CMP
  - iii. Lipase
- b. Imaging
  - i. Right Upper Quadrant Ultrasound is the preferred imaging modality
  - ii. CT Abdomen/Pelvis with IV Contrast
    1. If diagnostic uncertainty
    2. If concern for severe pancreatitis
  - iii. HIDA Scan
    1. If concern for acalculous cholecystitis
    2. If diagnostic uncertainty for cholecystitis and high risk for laparoscopic cholecystectomy
  - iv. MRI/MRCP should be considered only:
    1. When IOC and/or EUS/ERCP are a prohibitive risk
    2. When there is a potential malignancy and MRCP findings will impact management
- c. Emergency General Surgery Consultation
  - i. Patients with gallstone-related disease who will require cholecystectomy should be preferentially admitted to EGS
  - ii. Patients with prohibitive operative risk factors should be admitted to a medical team
  - iii. Patients referred for bile duct injury should be evaluated by Hepatobiliary Surgery
  - iv. Patients with cirrhosis who are listed for liver transplant should be evaluated by Hepatobiliary Surgery
- d. Considerations for Gastroenterology (Advanced Endoscopy) Consultation
  - i. High Risk for Choledocholithiasis
  - ii. Postoperative bile leak (see below)
- e. Considerations for Radiology (Image-Guided Procedures) Consultation
  - i. Prohibitive modifiable surgical risk (Recent MI, multisystem organ failure)

B. **Antibiotic Therapy**

- a. Without Sepsis
  - i. First Line: Ceftriaxone/Metronidazole (only need metronidazole if biliary-enteric anastomosis)
  - ii. Severe PCN allergy: Levofloxacin/Metronidazole (only need metronidazole if biliary-enteric anastomosis)
- b. Sepsis/MDR risk
  - i. First Line: Piperacillin/Tazobactam
  - ii. Severe PCN allergy: Cefepime/Metronidazole/Vancomycin

c. Duration
    i. Stop postoperatively if cholecystectomy performed
    ii. 4 days if cholecystostomy tube placed

C. **Indications for Laparoscopic Cholecystectomy**
    a. Cholelithiasis with intractable pain
    b. Acute cholecystitis
    c. Gallstone pancreatitis
    d. Choledocholithiasis

D. **Risk Assessment for Choledocholithiasis**
    a. **High:** Choledocholithiasis identified on imaging, Clinical signs of ascending cholangitis, or Total Bilirubin $\geq$ 4 mg/dL with CBD dilation on imaging
    b. **Intermediate:** Abnormal liver biochemical tests or dilated CBD (> 6mm) on imaging
    c. **Low:** None of the above risk factors present
    d. **Indication for Intraoperative Cholangiogram:** Intermediate or high risk for choledocholithiasis

E. **Management after Subtotal Cholecystectomy**
    a. Surgical drain placement in gallbladder fossa
    b. Evaluate drain for bilious output
        i. If bilious, consult Gastroenterology for evaluation for ERCP (see bile leak)
        ii. If nonbilious, discharge patient. Drain management decision to be determined by rounding attending

F. **Special Considerations**
    a. **Prior Roux-en-Y Gastric Bypass with possible choledocholithiasis**: Laparoscopic Cholecystectomy with Intraoperative Cholangiogram with possible common bile duct exploration vs. Laparoscopic-Assisted ERCP. Need to coordinate OR timing with GI with attending discussion.
    b. Gallstone Pancreatitis: Early Laparoscopic Cholecystectomy if mild or moderate, defer cholecystectomy in severe cases
    c. Pregnancy: Symptomatic cholelithiasis, acute cholecystitis, choledocholithiasis, or cholangitis warrants cholecystectomy during hospital admission

G. Management of Postoperative Bile Leaks
    a. Early presentation, bilious drain output: if low volume and reliable patient follow up, consider discharge and expectant management for spontaneous leak resolution; otherwise consult GI for ERCP
    b. Delayed presentation, no drain in place: if noninvasive imaging suggests a biloma or percutaneously drainable fluid collection, consult IR for percutaneous drain placement prior to ERCP
    c. Role of nuclear medicine (HIDA) scan in assessing for post-cholecystectomy bile leak should be limited to low- or intermediate-suspicion cases in which other objective criteria (drain output, imaging findings, etc. are equivocal)
    d. Endoscopic therapy should consist of placement of a temporary biliary endoprosthesis with or without biliary sphincterotomy. Plastic stent therapy is appropriate in most cases, as there are no compelling data that metal stents offer higher leak resolution rates even in the setting of subtotal or fenestrated cholecystectomy.
    e. If bile leak refractory despite endoscopic therapy, consider leak from duct not in continuity with biliary tree (i.e. right posterior sectoral duct)
    f. If common bile duct or common hepatic duct injury or transection, consult hepatobiliary surgery

III. References

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Appendix
Laparoscopic Common Bile Duct Exploration

Equipment Necessary to Complete LCBDE	
Intraoperative Cholangiogram	
Fluoroscopy	
12 Ga Angiocath	
6 Fr Open Ended Ureteral Catheter	
Tuohy Borst Connector	
(2) 60 mL Luer Lock Syringes	*One containing saline and one with 50/50 saline-contrast mix*
3-way stopcock	
Extension Tubing	
Glucagon, 1 to 2 mg	*Given intravenously by anesthesia provider to relax Sphincter of Oddi*
Clips or Olsen-Reddick Clamp	*To secure ureteral catheter at ductotomy*
Stone Capture with Nitinol Baskets	
Fluoroscopy and IOC setup	
Stone retrieval baskets	*Tipped baskets are more easily visualized on fluoroscopy but can damage the choledochoscope*
Balloon Dilation of Sphincter of Oddi	
0.035” Floppy-tipped guidewire x 150 cm	*Balloons are advanced into CBD via Seldinger technique*
Balloon Dilators	*6 or 8 mm x 75 cm; 40, 80 and 100 mm are common lengths of the balloons*
Rotational Inflation Device	

Choledochoscopy	
Flexible choledochoscope	*With a working channel in order to introduce stone retrieval baskets*
0.035” Floppy-tipped guidewire x 150 cm	*The scope can be advanced into CBD via Seldinger technique*
Second video monitor tower with a light source	*Allows for simultaneous endoscopic and laparoscopic views during choledochoscopy*
Pressurized bag of saline with tubing	*To allow for visualization during choledochoscopy in the same fashion as cystoscopy*
Atraumatic laparoscopic grasper	*For intra-abdominal manipulation of the choledochoscope*
Nitinol stone retrieval baskets	*Advanced through the working channel*
Balloon Dilators	*Used to dilate cystic duct if necessary to accommodate scope*
Additional Optional Equipment	
Laser lithotripter	*To fragment stones*
Endobiliary stent	*May be placed over wire across Sphincter of Oddi if obstruction not relieved by other measures. ERCP then would be need to be scheduled postoperatively*
Laparoscopic ligating loop	*To close cystic duct after manipulation/exploration*

Transcystic CBD Exploration with Balloon Sphincteroplasty