ACUTE CHOLECYSTITIS

(Last updated 03/26/2019; Reviewers: Sidhant Singh, MD; Bibek Karki, MBBS)

PRESENTING COMPLAINT: Acute abdominal pain, nausea, vomiting, fever

FINDINGS

- **A** Check airway
- **B** ↑/N RR
- **C** ↓/↑/N BP, ↑/N HR, weak/N pulse
- **D** Variable altered (V,P,U,D)*
- **E** Fever, RUQ tenderness, guarding
- **Lpc** CBC, Group and cross match, amylase, electrolytes, LFTs
- **U_{PC}** Gall bladder stones and will be able to elicit a sonographic Murphy's sign), Pericholecystic fluid and thickened gallbladder wall

***V** (verbal), **P (**pain), **U** (unconsciousness), **D** (delirious)

U_{PC} (point of care ultrasound) **L_{PC}** (point of care labs)

DEFINITION:

Acute calculous cholecystitis is inflammation of the gallbladder that occurs most commonly because of the obstruction of cystic duct secondary to gallstones (cholelithiasis).

Acute acalculous cholecystitis is the inflammation of the gallbladder that occurs without any obvious obstructing gallstones. It is usually associated with a recent operation, trauma, burns, multisystem organ failure and parenteral nutrition.

OTHER HISTORY

- **History**: "Four F's" – fat, forty, female, fertile, biliary colic or biliary stones, certain medicines erythromycin or ampicillin can cause hypersensitivity induced cholecystitis
- **Symptoms-** RUQ pain, possibly radiating to back, prior episodes of biliary colic (RUQ pain in the absence of fever, often following fatty meals); fever, nausea and vomiting, right scapular pain (referred pain from diaphragmatic irritation); tachycardia; clay color stools, bloating, chills, indigestion
- **Signs-** Right upper quadrant tenderness, guarding, rigidity, right upper quadrant palpable mass, **Murphy sign** (arrest of inspiration with deep palpation under right subcoastal margin due to gall bladder tenderness), **Boas' sign** (hyperesthesia of9-11th intercoastal region on right side posteriorly)

DIFFERENTIAL DIAGNOSES

Mirizzi syndrome, biliary colic, biliary dyskinesia, choledocholithiasis, gallstone pancreatitis, pancreatitis, peptic ulcer, colitis, gastroenteritis, renal colic, liver abscess, RLL pneumonia

OTHER INVESTIGATIONS

- **Labs:** CBC (Leukocytosis), electrolyte abnormalities (reflecting dehydration), Inflammatory markers and enzymes- elevated CRP, amylase and lipase(rule out pancreatitis), ALT, AST and ALP(normal to mildly elevated), raised bilirubin (fractionation may help distinguish obstructive (increased direct bilirubin) versus hepatic parenchymal (increased indirect bilirubin) issue
- **Imaging:**
    - **USG –** gall bladder shows luminal distention, wall thickness ≥ 4mm; pericholecystic fluid; sonographic Murphy's sign, +/- gallstones, assess common bile duct for dilatation or presence of gallstones
    - **HIDA Scan**: used when USG is equivocal or negative in presence of suspicious symptoms; **non-filling of gallbladder** indicates diagnosis of acute cholecystitis due to obstruction of cystic duct
    - **MRCP**: sensitive to fluid stasis which allows for detection of cystic duct obstruction; may see pericholecystic fluid; high sensitivity (95%) and specificity (97%) for diagnosis of biliary obstruction; much more inferior to US for detecting gallbladder wall thickening (sensitivity 69%)
    - **CT**: not as sensitive as US; gallbladder wall thickness ≥ 4mm; pericholecystic fluid; +/- gallstones; better than US for detecting emphysematous and gangrenous cholecystitis; Assess common bile duct for dilatation or presence of gallstones; Use CT scan when other intra-abdominal diseases are being considered, in obese patients, or when an appropriate window cannot be obtained for US
    - **ERCP**: diagnostic and therapeutic modality if there is common bile duct obstruction

THERAPEUTIC INTERVENTIONS

The management is delineated by the severity of the cholecystitis

Severity Score: Tokyo Criteria - Criteria for diagnosis and severity assessment of acute cholecystitis

Grade	Description
I (Mild)	Mild gallbladder inflammation No organ dysfunction
II (Moderate)	Presence of one or more of the following: - Leukocytosis >18,000

	- Palpable, tender mass in RUQ - Duration >72 hours - Marked local inflammation including biliary peritonitis, pericholecystic abscess, hepatic abscess, gangrenous cholecystitis, emphysematous cholecystitis No organ dysfunction
III (Severe)	Cholecystitis with presence of organ failure (one or more of the following): - Cardiovascular dysfunction (hypotension requiring treatment with dopamine at ≥5 μg/kg/min or any dose of dobutamine) - Neurologic dysfunction (decreased level of consciousness) - Respiratory dysfunction (PaO2:FiO2 <300) - Hepatic dysfunction (PT/INR >1.5) - Hematologic dysfunction (Platelets <100,000)

- **Medications:** Starts with supportive therapy including NPO, intravenous fluids, pain control, antibiotics – second or third generation cephalosporins, fluoroquinolones, metronidazole, or ertapenem; dosed at indicated intervals pre-operatively, with at least one dose within 60 minutes of initial incision
- **Consult**: surgery
- **Procedures:**
    - Acute Cholecystitis in stable patient
        - To operating room for **laparoscopic** or **open cholecystectomy**, ideally **within 72 hours** of onset of symptoms or sooner given severity of symptoms and systemic effects
        - "Critical view of safety" – dissection carried out such that only two structures are seen entering the gallbladder prior to transection of cystic duct and cystic artery
        - Laparoscopic approach: if there is any uncertainty regarding anatomy, consider performing intraoperative cholangiography, fundus-down technique, or converting to open
        - If CBD stones are identified intraoperatively, consider CBD exploration or choledochoscopy with flushing/ basket retrieval of stone / laser lithotripsy; also, possible but not as favorable to consider post-operative ERCP
        - **Post-operative antibiotics** are unnecessary except in severe cases of gangrenous or emphysematous cholecystitis, in which case continue antibiotics for 3-5 days

        - Discharge after patient demonstrates tolerance to PO intake and pain tolerance with PO medications
    - Acute Cholecystitis in hemodynamically unstable patient or otherwise poor surgical candidate
        - Percutaneous cholecystostomy tube + antibiotics (see above); tube to be maintained for 3 months; cystic duct patency should be assessed; if patent, remove tube; Determine candidacy for elective cholecystectomy

CAUTIONS

Complications: Gall bladder perforation (leading to peritonitis or intraabdominal abscess)**;** Intra-Op (transection of or injury to hepatic duct or common bile duct; vascular injury, bowel injury, hypotension from insufflation)**;** Post-Op (Immediate: bleeding, bile leak, wound infection, intraabdominal infection, retained stones in common bile duct**;** Late: incisional hernia, biliary stricture)

REFERENCES & ACKNOWLEDGMENTS

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