Benign Biliary Disease

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Biliary tract and pancreatic infections present as a systemic septic response or as infections in the upper abdomen.

Typical findings include abdominal pain, a tender upper abdominal mass, fever and leukocytosis, and jaundice.

Various combinations of these symptoms may occur, but it is convenient to consider three common clinical presentations.
In each of the presentations, one or two symptoms dominate

- Upper abdominal pain and fever
- Fever and jaundice
- An upper abdominal mass and fever
In each of the presentations, one or two symptoms dominate

- Upper abdominal pain and fever
- Fever and jaundice
- An upper abdominal mass and fever
Diagnosis

- CBCD
- LFTs
- Serum amylase and lipase
- PT/PTT
- Blood culture
- Chest and abdominal x-rays
- Abdominal ultrasonography
Differential

- Acute cholecystitis
- Acute cholangitis
- Acute pancreatitis
Patient has clinical signs of upper abdominal infection, or serum bilirubin or liver function tests are suggestive

Order abdominal US.

Upper abdominal pain and fever are dominant findings

- US is normal
  - Consider nonbiliary disease, especially acute pancreatitis.
  - Consider abdominal and pelvic CT scans.

- Stones are seen in gallbladder without evidence of cholecystitis or choledocholithiasis
  - Consider other diagnoses.
  - Evaluate for elective cholecystectomy.

- Evidence of acute cholecystitis is apparent
  - If US is equivocal, consider nuclear medicine scanning.
  - Resuscitate; take to OR for urgent cholecystectomy if patient is medically fit or perform percutaneous drainage if not.

Fever and jaundice are dominant findings

- Patient has choledocholithiasis or biliary dilation consistent with cholangitis
  - Resuscitate and give antibiotics.
  - Consider emergency endoscopic, radiologic, or operative biliary drainage.

Fever and abdominal mass are dominant findings

Patient has liver mass, with or without abscess

- Obtain travel history and serologic tests to rule out amebic and echinococcal abscesses.
- For bacterial abscesses, resuscitate, give antibiotics, seek sources, and perform percutaneous drainage.

Patient has signs of pancreatic infection

- Confirm diagnosis via abdominal CT scan.
- Resuscitate and give antibiotics if infection is probable or necrosis is noted on CT.
- Discrete fluid collection: Aspirate or drain.
- Phlegmon: Attempt medical management. If unsuccessful and percutaneous aspirate positive for bacteria, perform open drainage.

Patient has splenic mass, with or without abscess

- Confirm diagnosis via abdominal CT scan.
- Resuscitate and give antibiotics. Treat with splenectomy or percutaneous drainage.
Upper Abdominal Pain and Fever
Considerations

- May present with epigastric or RUQ pain and fever
- Only 2/3 admitted with Dx of acute cholecystitis have acute biliary inflammation
- In some patients, nonsurgical conditions (PN, acute hepatitis, herpes zoster, and AGE) can be distinguished clinically from biliary disease
The most important screening test for acute biliary infection is the abdominal ultrasound.
Differential

- Acute cholecystitis, biliary colic, acute pancreatitis, and acute cholangitis
  - each requires specific management

- Clinical features and blood test results, although helpful, may be inconclusive

- The abdominal ultrasound may provide specific clues
<table>
<thead>
<tr>
<th></th>
<th><strong>Biliary Colic</strong></th>
<th><strong>Acute Cholecystitis</strong></th>
<th><strong>Acute Pancreatitis</strong></th>
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</thead>
<tbody>
<tr>
<td><strong>Duration</strong></td>
<td>Short: 40% &lt; 1 hr</td>
<td>Persistent</td>
<td>Persistent</td>
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<tr>
<td><strong>Pathogenesis</strong></td>
<td>Visceral</td>
<td>Somatic</td>
<td>Retroperitoneal</td>
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<td><strong>Signs</strong></td>
<td>Tender</td>
<td>Guarding and spasm</td>
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<td><strong>Laboratory tests</strong></td>
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<tr>
<td>Liver function tests</td>
<td>Occasionally abnormal</td>
<td>Abnormal</td>
<td>Abnormal</td>
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<tr>
<td>Serum amylase</td>
<td>Normal</td>
<td>Normal or slightly increased</td>
<td>Increased</td>
</tr>
<tr>
<td>Leukocyte counts</td>
<td>Often normal</td>
<td>Increased</td>
<td>Increased</td>
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Cholecystitis
Acute

- The **MOST COMMON** diagnosis in patients presenting with upper abdominal pain and fever
- Characterized by the clinical finding of a midinspiratory arrest on palpation of the RUQ
- Can usually be diagnosed rapidly on the basis of the findings of gb wall thickening, pericholecystic fluid, and stones
Diagnosis

- Occasionally, more complex cases must be evaluated with nuclear medicine scanning to look for cystic duct obstruction
- Concurrent acute obstructive cholangitis must also be considered in all patients with acute cholecystitis
- Supportive lab data include a high serum bilirubin level and an increased AP level
Emphysematous

- An uncommon and insidious variant of acute cholecystitis
- Characterized by gas in the gallbladder lumen or wall or in the pericholecystic soft tissue and biliary ducts secondary to gas-forming bacteria
- The key to the diagnosis is the presence of air on an abdominal sonogram or x-ray
Risk

- Compared with acute cholecystitis, emphysematous cholecystitis is
  - associated with a fivefold increase in the risk of gallbladder perforation
  - as well as a 10-fold increase in mortality in patients younger than 60 years
Acalculous

- Another variant of acute cholecystitis
- Rare
- Originally described as occurring after surgical treatment of unrelated disease
- Subsequently identified in patients with multiple trauma, prolonged critical illness, and sepsis
Etiology

• Predisposing factors include gallbladder ischemia
  – in patients with shock or trauma
  – biliary stasis
  – prolonged fasting
  – hyperalimentation
  – sustained narcotics therapy
Diagnosis

• A high index of suspicion is necessary
• Should be considered in any post-op or acutely ill patient with upper abdominal pain and fever or with unexplained fever and leukocytosis
• Particularly common 2 to 4 weeks post-injury
• Confirmed by findings on abdominal ultrasound or HIDA
Treatment
• Standard treatment consists of IVF administration, analgesics, and cholecystectomy

• Although the timing of operation is somewhat controversial – in ordinary acute cholecystitis, cholecystectomy should be performed at the earliest opportunity
Timing

- This approach has been confirmed by at least one randomized trial
- Comparing early with late laparoscopic cholecystectomy
- The delayed group had a greater need for conversion to open cholecystectomy (23% vs 11%), as well as a longer average total hospital stay and recovery
Some patients with acute cholecystitis are at high risk for gangrene and perforation of the gallbladder.

It is crucial to identify these patients and perform cholecystectomy promptly because delay increases morbidity and mortality.
At Risk

- Clinically, gangrene and perforation of the gallbladder in this high-risk population are suggested by marked systemic toxicity or by the radiologic demonstration of either emphysematous cholecystitis or acute acalculous cholecystitis
Clinical

- With acute cholecystitis, body temperature is slightly increased in most patients
  - averaging 37.8°C
- Normal in 20% of patients
- Risk of gangrene and perforation is higher in patients with marked systemic toxicity
  - HR > 120
  - Temp > 39°C
  - left shift with > 90% PMLs
Caveat

- Unfortunately, findings of systemic toxicity are frequently absent in elderly patients
Patients with acute cholecystitis who have signs of systemic toxicity, emphysematous cholecystitis, or acalculous cholecystitis are at high risk for gb gangrene and perforation.

Require prompt and aggressive treatment – IV Abx + early cholecystectomy is the treatment of choice.

Mortality may be as high as 20 to 30% with the traditional surgical approach.
If perforation and gangrene are not suspected but medical illness poses a high risk of mortality from operation, nonoperative supportive therapy may suffice.

If this fails, another treatment option is percutaneous cholecystostomy.
Other Considerations

• An alternative presentation includes patients whose predominant Sx are fever and jaundice
• Pain is a less marked component
• Jaundice is almost always associated with obstruction of the biliary tree
• The combination of fever + jaundice always suggests acute cholangitis
  - fulminant and fatal if not treated promptly
Cholangitis

• Patients presenting with a temp > 38.5°C + jaundice

• Laboratory studies will reveal leukocytosis

• Blood cultures will often be positive

• A finding of gallstones and dilated biliary ducts on ultrasound supports the diagnosis
Charcots’ s

- RUQ pain
- Fever
- Jaundice
Reynold’s

- RUQ pain
- Fever
- Jaundice
- Hypotension
- Mental status changes
Etiology

• Choledocholithiasis

• Recent biliary manipulation

• Biliary stenting performed for chronic obstruction

• Previous biliary stenting
Treatment

- Resuscitation is started with IVF + Abx
- *Escherichia coli*, *Klebsiella species*, and *enterococci* are the most frequently encountered in this setting
  - aerobes
- Anaerobes may be isolated in 15 to 30% of patients
  - diabetics, elderly, and patients who have previously undergone biliary manipulation
Treatment

• In patients with indwelling catheters, *Enterobacter species, Pseudomonas species*, and *Candida species* are being isolated with increasing frequency
Approximately 75% will respond to conservative measures
  - supportive treatment is continued
Subsequent investigations usually include CT followed by MRCP
ERCP and PTC are reserved for cases in which a drainage procedure is anticipated or if the MRCP is inadequate
Treatment

• For the 25% of patients who do not respond to conservative treatment, early recognition may improve their prognosis.

• These high-risk patients often have systemic hypotension, mental confusion, a temperature higher than 39°C or hypothermia.
Refractory

- Patients who do not improve within 24 hours require urgent biliary decompression
- Historically, this had been accomplished via surgical exploration of the CBD and T-tube drainage
- Rarely, T-tube insertion alone may be lifesaving in a desperately ill patient
- Definitive internal decompression is preferable
• Unfortunately, any surgical decompression in these critically ill patients can result in a mortality of 30 to 40%.

• Non-operative methods of biliary decompression, including percutaneous transhepatic biliary drainage and endoscopic sphincterotomy are preferred.
Alternatives

• PTBD can reduce the mortality associated with initial biliary decompression

• Many patients still require a definitive operation

• Consequently, endoscopic sphincterotomy has been proposed for decompression of the biliary tree in patients with acute cholangitis from choledocholithiasis
Study

- 82 patients with acute cholangitis
  - early operation in 28
  - endoscopic sphincterotomy in 43
  - ABx in 11
- Op mortality = 21%; morbidity = 57%
- ES mortality = 5%; morbidity = 28%
- In patients whose gb is still in place, ES alone, without cholecystectomy, may be a reasonable long-term option
Of 23 patients whose gallbladders were left in situ, only two required cholecystectomy in the 1- to 7-year follow-up period

- one for empyema of the gallbladder
- one for recurrent cholangitis
Other Conditions
Patients with primary sclerosing cholangitis, especially those who have undergone internal or external biliary drainage, are at high risk for recurrent bouts of ascending cholangitis.

Predominantly affects young males, particularly those with chronic ulcerative colitis.
Diagnosis

• Suggested by the dominant cholestatic biochemical profile
  – elevation of the serum [bilirubin], AP level and AST activity

• Because of the concomitant hepatic scarring, ultrasonography may not reveal the presence of dilated intrahepatic ducts
Diagnosis

• Definitive Dx requires visualization of the beaded appearance of the biliary tree by means of cholangiography

• *MRCP* is the imaging modality of choice for elective management of patients with primary sclerosing cholangitis in that it yields results comparable to those of ERCP without being invasive
Gallbladder Empyema

• Can duplicate most of the findings associated with acute cholangitis

• In this condition, acute cholecystitis is complicated by suppuration within the gallbladder, which then becomes the focus of generalized sepsis

• The distended gallbladder may be palpable and tender
Gallbladder Empyema

- When associated with jaundice, it is less likely to be obstructive than when it is associated with acute cholangitis

- True empyema of the gallbladder is rare

- Treatment includes administration of IVF, systemic ABx therapy, analgesics, and early cholecystectomy
Mirizzi Syndrome

- Present with jaundice + inflammation
  - choledocholithiasis
- Extrinsic compression of the duct
- A stone impacted in the cystic duct or in the Hartmann pouch (infundibulum)
- Two types
Type I

- Stone impacted in the cystic duct or Hartmann pouch compresses the CHD and causes inflammation, thereby leading to jaundice
- Treatment of this type consists of obliteration of the cystic duct and careful partial cholecystectomy, with the neck of the gallbladder left in place
Type II

- Protrusion of the stone into the hepatic duct erodes the septum between the cystic duct and the hepatic duct and causes a cholecystocholedochal fistula.

- Treatment involves internal biliary drainage to the wall of the cholecystocholedochal defect, usually with a choledochojejunostomy, in addition to cholecystectomy.
What You Need to Know

- The basic principles of rapid diagnosis, timely physiologic support, and definitive intervention for GB infections have remained relatively unchanged.

- Specific management of these conditions, however, has been transformed as a result of numerous advances in technology.
What You Need to Know

• Improved radiologic and lab techniques have led to more precise pre-operative diagnoses, and newer procedures have led to treatment algorithms that cause less morbidity and permit faster recovery.

• Whereas the pathophysiology remains largely unchanged, their management is now marked by an ever-growing complexity.
What You Need to Know

• Decisions regarding the ultimate course of action for any individual patient are **SOLELY the RESPONSIBILITY OF THE SURGEON**