RUQ Abdominal Pain

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Mrs. Stone

41 year-old woman in the ER presenting with 12 hours duration of progressively worsening right upper quadrant discomfort associated with nausea and vomiting. She reports chills.

History

What other points of the history do you want to know?

History, Mrs. Stone

Consider the following:

- Characterization of Symptoms
- Temporal sequence
- Alleviating / Exacerbating factors
- Associated signs/symptoms
- Pertinent PMH
- ROS
- MEDS
- Relevant Family Hx
- Relevant Social Hx

History Mrs. Stone

- **Characterization of Symptoms**
  - Epigastric and RUQ pain radiating to the back
  - Nausea and bilious vomiting followed the onset of pain
  - Pain constant in nature
- **Temporal sequence**
  - Symptoms started 40 minutes after a meal

History Mrs. Stone

- **Alleviating / Exacerbating factors**:
  - Nothing makes this pain better
  - Breathing and movement makes pain worse
- **Associated signs/symptoms:**
  - Similar symptoms in the past – never lasted long
  - Denies history of jaundice

History Mrs. Stone

- **Pertinent PMH:** Obesity, G4P4
- **PSH:** Hysterectomy
- **ROS:** no change in bowel habits, no weight loss, no BRBPR, no melena, no diarrhea, not sexually active
- **MEDS :** None, NKDA
- **Relevant Family Hx:** Mother had cholecystectomy
- **Relevant Social Hx:** non-smoker, no ETOH, divorced

What is your Differential Diagnosis?

Differential Diagnosis

Based on History and Presentation

- Acute Cholecystitis
- Chronic Cholecystitis
- Choledocholithiasis
- Pulmonary Embolism
- Pyelonephritis
- Peptic Ulcer Disease
- Myocardial Infarction
- Pancreatitis
- Bowel Obstruction
- Rectus Sheath Hematoma
- Hepatitis
- Liver Tumor
- Cholangitis
- Colon Tumor
- Colitis/ Typhlitis
- Gastritis
- Appendicitis
- Pneumonia
- PID, Ectopic

Physical Examination

What specifically would you look for?

Physical Examination Mrs. Stone

- **Vital Signs: T: 100.5, HR: 115, BP: 132/84, RR: 22**
- **Appearance: obese woman in mild distress**
- **Relevant Exam findings for a problem focused assessment**

HEENT: no scleral icterus, dry mucous membranes	**Neuromuscular:** non focal exam, good strength
Chest: CTA Bilaterally, shallow breathing	**Skin/Soft Tissue**: no rashes, no jaundice
CV: tachy, no murmurs, gallops, rubs	**Genital-rectal:** heme negative, no masses, no cervical motion tenderness
Abd: soft, non distended, RUQ tenderness with positive Murphy's sign, bowel sounds normal, no palpable masses	**Remaining Examination findings non-contributory**

Laboratory

What would you obtain?

Labs ordered, Mrs. Stone

- CBC: Hb/Hematocrit, WBC, Platelets
- Electrolytes
- Liver Function Tests
- Amylase /Lipase
- PT/PTT
- Urinalysis
- B-HCG
- Cardiac Enzymes, EKG
- ABG

Labs Mrs. Stone

CBC: Hb, Hematocrit WBC	13.2 mg/dl, 39% 13,000
Electrolytes :	normal
LFT's :	Bili: 1.8, AST:110, ALT:140, AlkPhos: 170
Amylase, Lipase:	normal
PT/PTT:	normal
U/A and b-HCG:	negative
ABG:	normal
Cardiac Enzymes, EKG:	normal

Lab Results Discussion

- Labs point out that a cardiac, pulmonary or urinary source of symptoms is highly unlikely
- Patient has no pancreatitis
- Elevated WBC raises the suspicion for an infection
- Mild elevation in liver function tests may point towards the diagnosis

Differential Diagnosis

Would you like to update your differential?

Differential Diagnosis

Would you like to update your differential?

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- Chronic Cholecystitis
- Choledocholithiasis
- Peptic Ulcer Disease
- Bowel Obstruction
- Appendicitis
- Pneumonia
- Liver Tumor
- Cholangitis
- Colon Tumor
- Gastritis

Interventions at this point?

Interventions at this point?

- Start IV with Lactated Ringers or similar isotonic crystalloid solution for rehydration
- Pain medication administration
- Proceed with confirmatory studies of suspected differential diagnoses

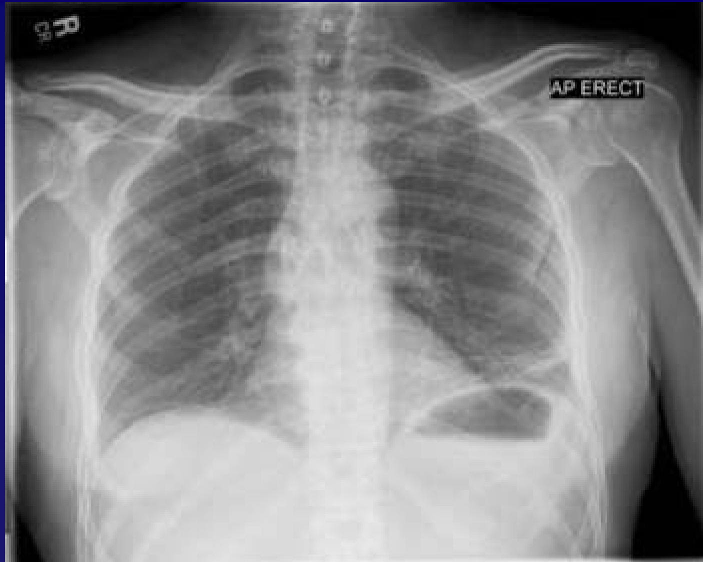
Studies (X-rays, Diagnostics)

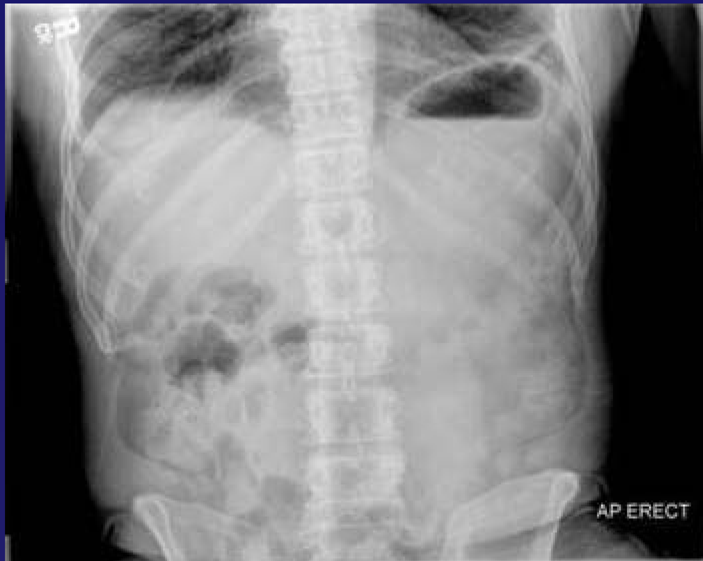
What would you obtain?

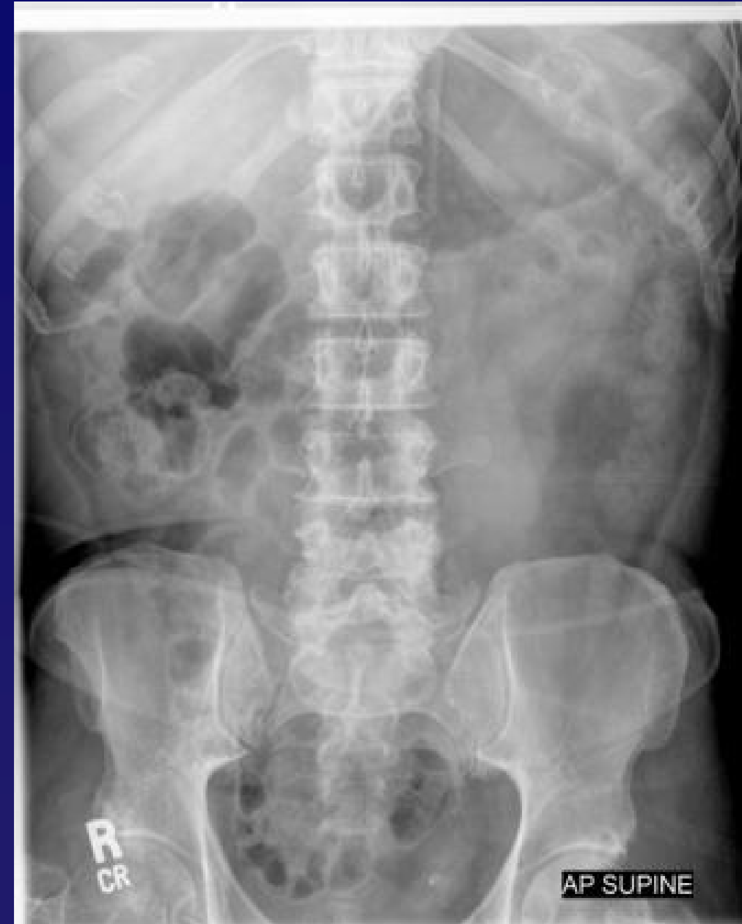
Studies ordered Mrs. Stone

- Acute Abdominal Series
- Ultrasound Right Upper Quadrant

Acute Abdominal Series







Imaging Results

- Abdominal Series is Negative

What information will the US report provide that may help confirm your diagnosis?

RUQ US Information

- Presence of gallstones or sludge
- Presence of pericholecystic fluid
- Gallbladder wall thickening
- Presence of sonographic Murphy’s sign
- Intra- or extrahepatic ductal dilation
- Liver, pancreas, right kidney abnormalities

US Mrs. Stone

LLD GB

Ultrasound demonstrating air in the wall of the gallbladder and sludge in the lumen.

What is your Diagnosis?

Diagnosis

- **Acute Emphysematous Cholecystitis**

What additional treatment would you now institute?

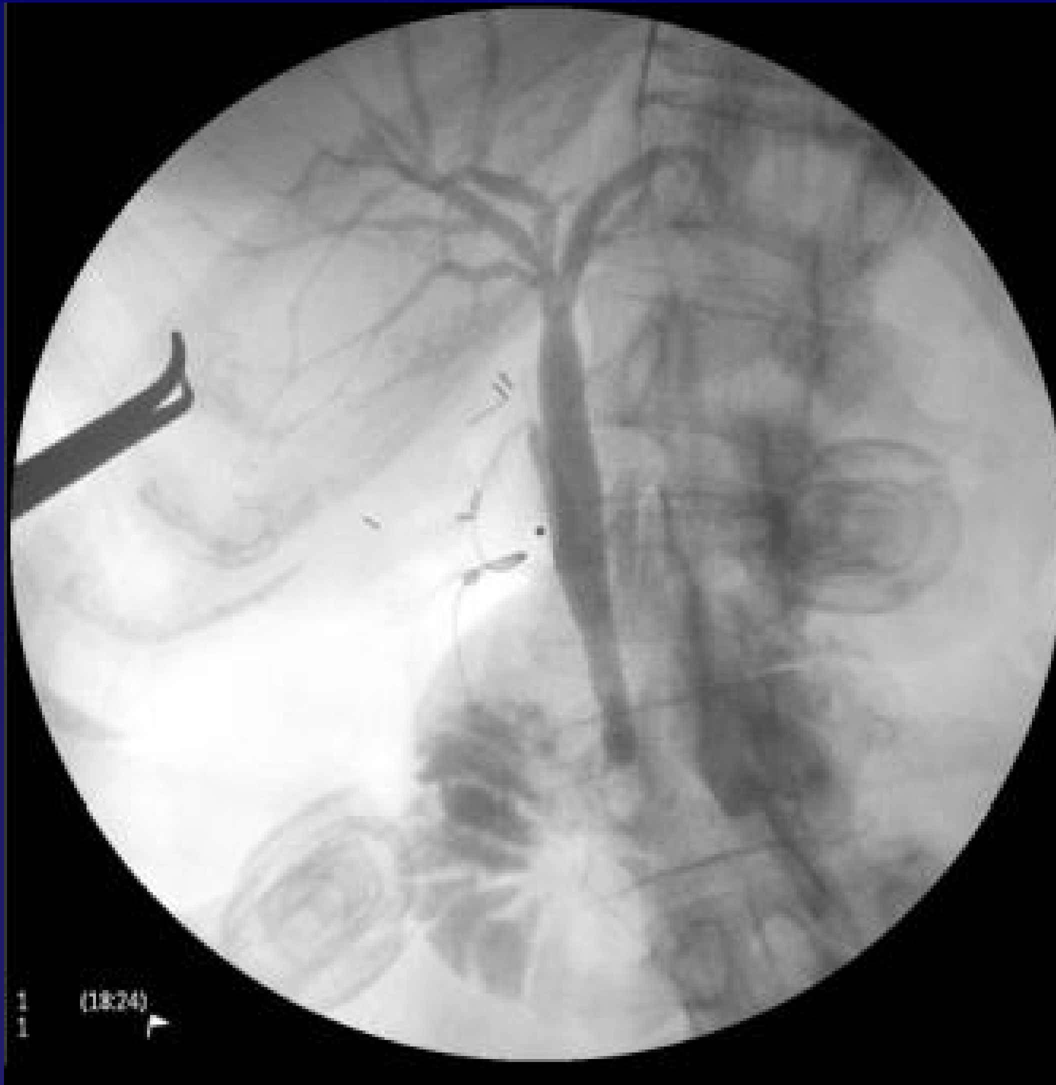
Interventions at this point?

- Administer IV antibiotics
  - What type?
- Admit the patient to the hospital
- Bring the patient to the OR
  - When?
  - What operation would you do?

OR Findings

- Acute gangrenous cholecystitis with contained perforation
- Mrs. Stone underwent a difficult laparoscopic cholecystectomy with intraoperative cholangiogram. A drain was left under the liver

Intraoperative cholangiogram



Normal intra- and extrahepatic biliary tree without filling defects, normal flow into the duodenum

Post op Management

- Mrs Stone's pain improved markedly after the surgery and she was able to tolerate a diet on POD#1
- Her drain output was serosanguinous and minimal. The drain was pulled and she was sent home on POD#2 in excellent condition with a 2-week follow up in the office

Alternative Scenarios

- **Mrs. Piedra is 44 years-old and has unrelenting mid-epigastric pain associated with nausea and tenderness on palpation of the right upper quadrant**
- **Her WBC, amylase and LFTs are normal except for a mildly elevated Alkaline Phosphatase**
- **A RUQ US is requested**

Mrs. Piedra's US

GE
L9

GB SAG LLD

What do you see?

Mrs. Piedra's US report

- One stone seen at gallbladder infundibulum
- No pericholecystic fluid
- Normal gallbladder wall thickness
- Normal Common Bile Duct size
- Negative sonographic Murphy's sign
- Normal liver, no intrahepatic ductal dilation
- Pancreas normal, right kidney normal

Mrs. Piedra is still symptomatic even after pain medications are given.

What would you do next?

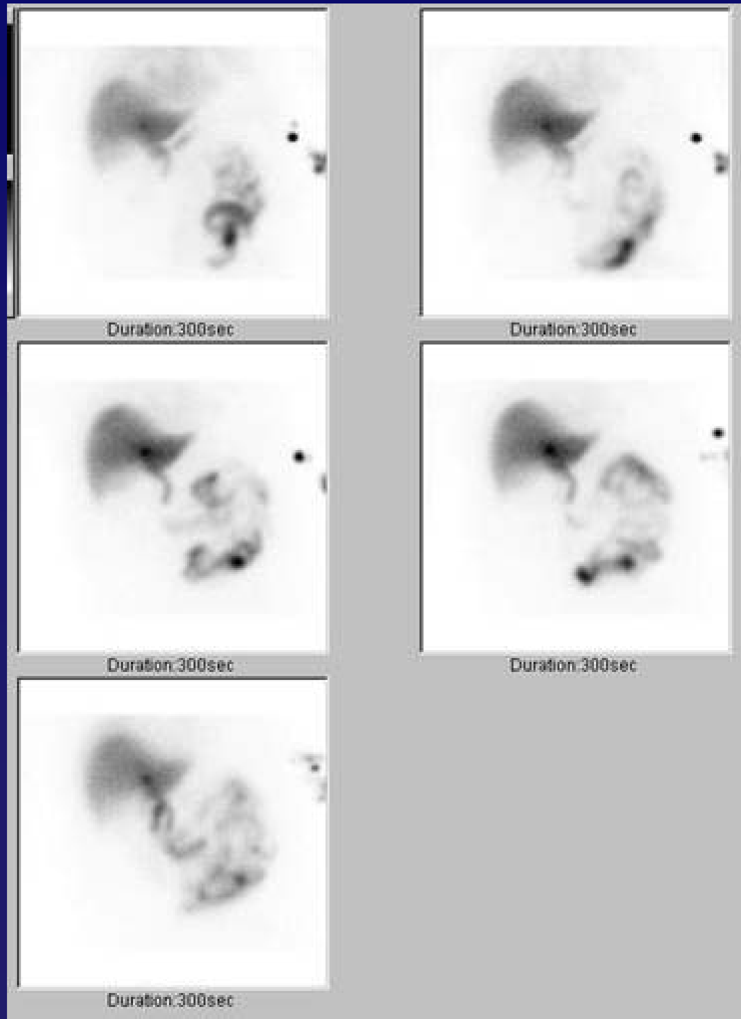
HIDA scan vs. CT abdomen

What would prompt you to choose either?

HIDA scan

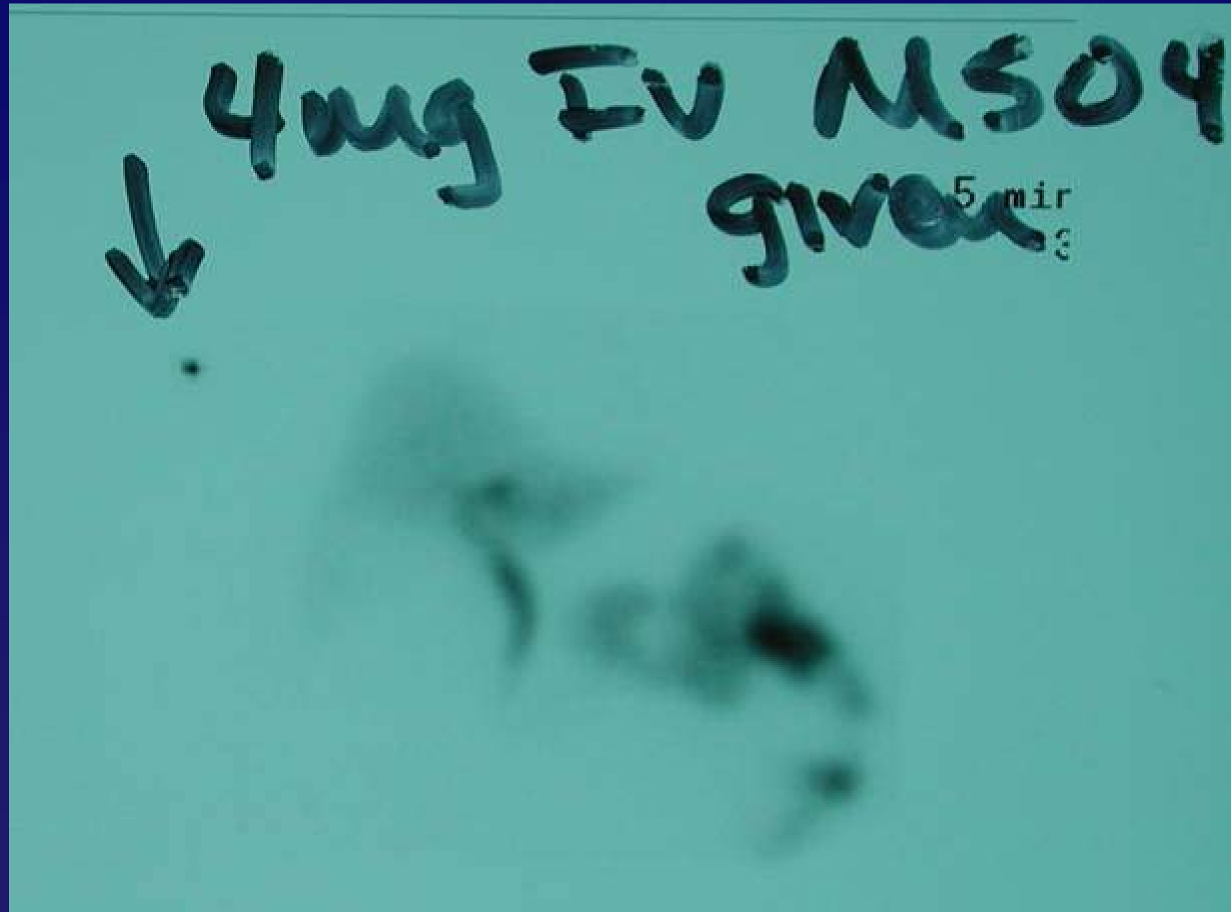
What are you looking for on a HIDA scan in this patient?

HIDA Scan



- Liver uptake (normal)
- Excretion into duodenum
- Filling of the gallbladder
- Function of the gallbladder
- Biliary tract leaks

HIDA Scan Mrs. Piedra



HIDA scan demonstrates non-visualization of the gallbladder. Uptake in the liver was normal and small bowel was visualized.

Why was morphine given with this study?

When is CCK utilized?

HIDA scan

- Morphine was utilized to induce sphincter of Oddi contraction that might help with gallbladder filling. If the gallbladder still does not fill the study is highly suggestive of acute cholecystitis
- CCK is administered to assess the gallbladder ejection fraction in cases of suspected chronic cholecystitis. Reproduction of the patient’s pain during administration of CCK is a good predictor of symptom resolution after cholecystectomy

CT SCAN Abdomen/Pelvis

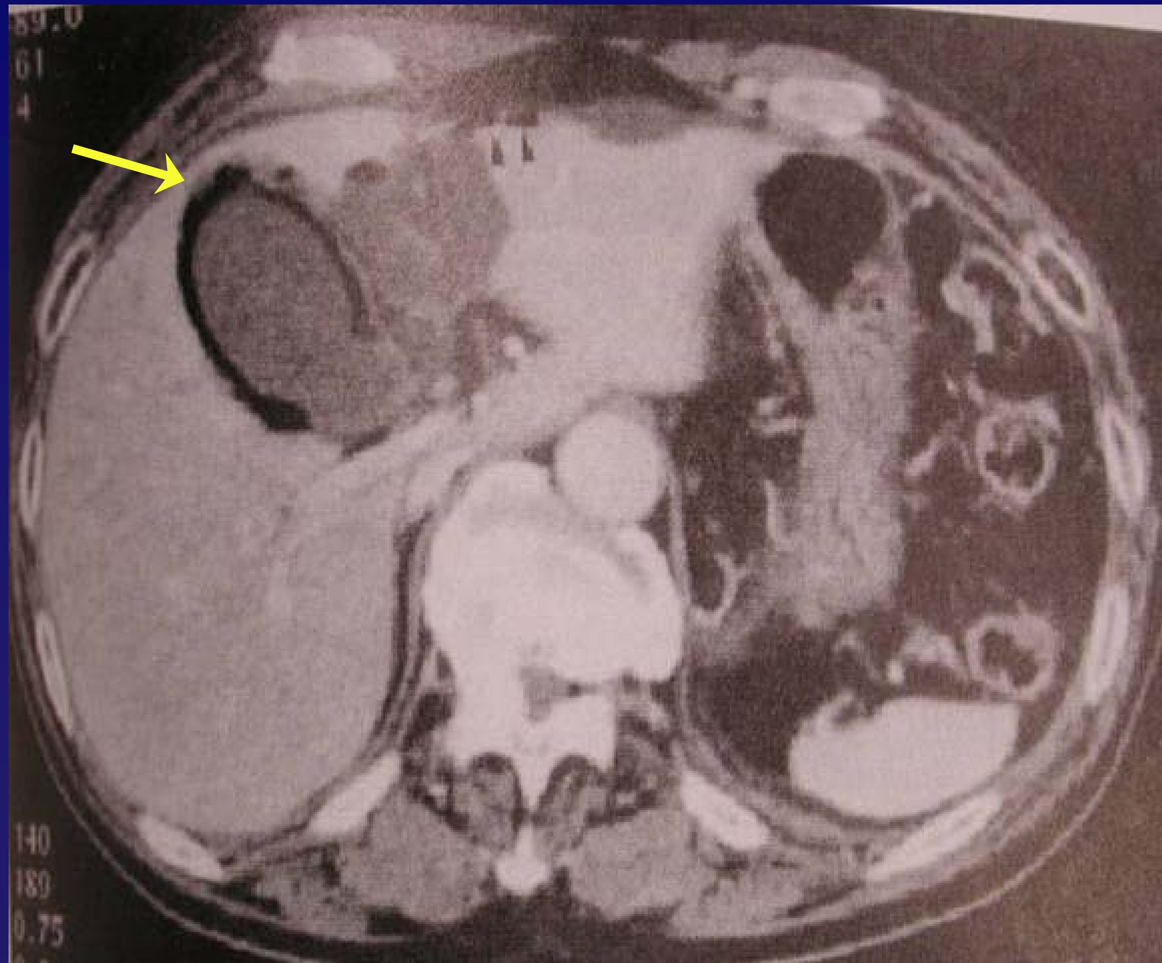
What are you looking for with a CT SCAN in this patient?

CT SCAN Indications

Rule out other causes of abdominal pain besides cholecystitis (especially in the face of normal RUQ US and/ or HIDA)

- Pancreatitis
- Perforated hollow viscus
- Bowel obstruction
- Intra-abdominal or Retroperitoneal masses
- Liver pathology
- Biliary tract disease: tumors

CT SCAN Mrs. Stone



Study demonstrates emphysematous cholecystitis (arrow points at the air in the wall of the gallbladder)

CT SCAN Mrs. Piedra

Study demonstrates inflammatory changes (arrows) around a distended gallbladder suggestive of cholecystitis. This patient was found to have gangrenous cholecystitis in the OR

What would you do differently if Mrs. Stone was an 80 year old frail lady with hemodynamic instability?

What would you do if Mrs. Piedra had intermittent symptoms, no gallstones on the US and decreased Ejection Fraction on HIDA scan?

What would you do if Mrs. Stone was currently neutropenic and had symptoms and findings of acute cholecystitis?

Discussion

- Acute cholecystitis is a common disease that can be treated with minimal morbidity if diagnosed early
- Typical, unrelenting symptoms of more than 6 hours duration is highly suggestive of the disease
- A RUQ US is the first test of choice as it is highly sensitive in diagnosing gallstones and may demonstrate findings of acute cholecystitis

Discussion

- The absence of acute cholecystitis findings on US does not exclude the diagnosis
- It should also be kept in mind that acute cholecystitis can occur in the absence of gallstones (acalculous form of the disease)
- The gold standard for the diagnosis of acute cholecystitis is a HIDA scan but in most patients the diagnosis can be made without it
- Percutaneous drainage should be considered in very high risk patients

QUESTIONS ??????

Summary

Acute cholecystitis should be treated operatively when recognized. It is best to do this as soon as possible as it may result in severe complications. Alternatives to surgery for simple uncomplicated cases of acute cholecystitis include antibiotic treatment and percutaneous drainage in medically unfit patients.

Summary

Caution should be exercised in patients that have had symptoms lasting more than approximately 5 days as the inflammatory changes at this time may make the surgery difficult. These patients could be allowed to "cool down" and return approximately 6 weeks later for definitive operative treatment.

Acknowledgment

The preceding educational materials were made available through the

ASSOCIATION FOR SURGICAL EDUCATION

In order to improve our educational materials we welcome your comments/ suggestions at:

feedbackPPTM@surgicaleducation.com