Gastroparesis and Liver Masses

Christopher L. Bowlus, MD
University of California Davis
School of Medicine

Disclosures

- I have no disclosures related to the topics of this presentation.

- I will be discussing off-label use of metoclopramide, domperidone, and macrolide antibiotics

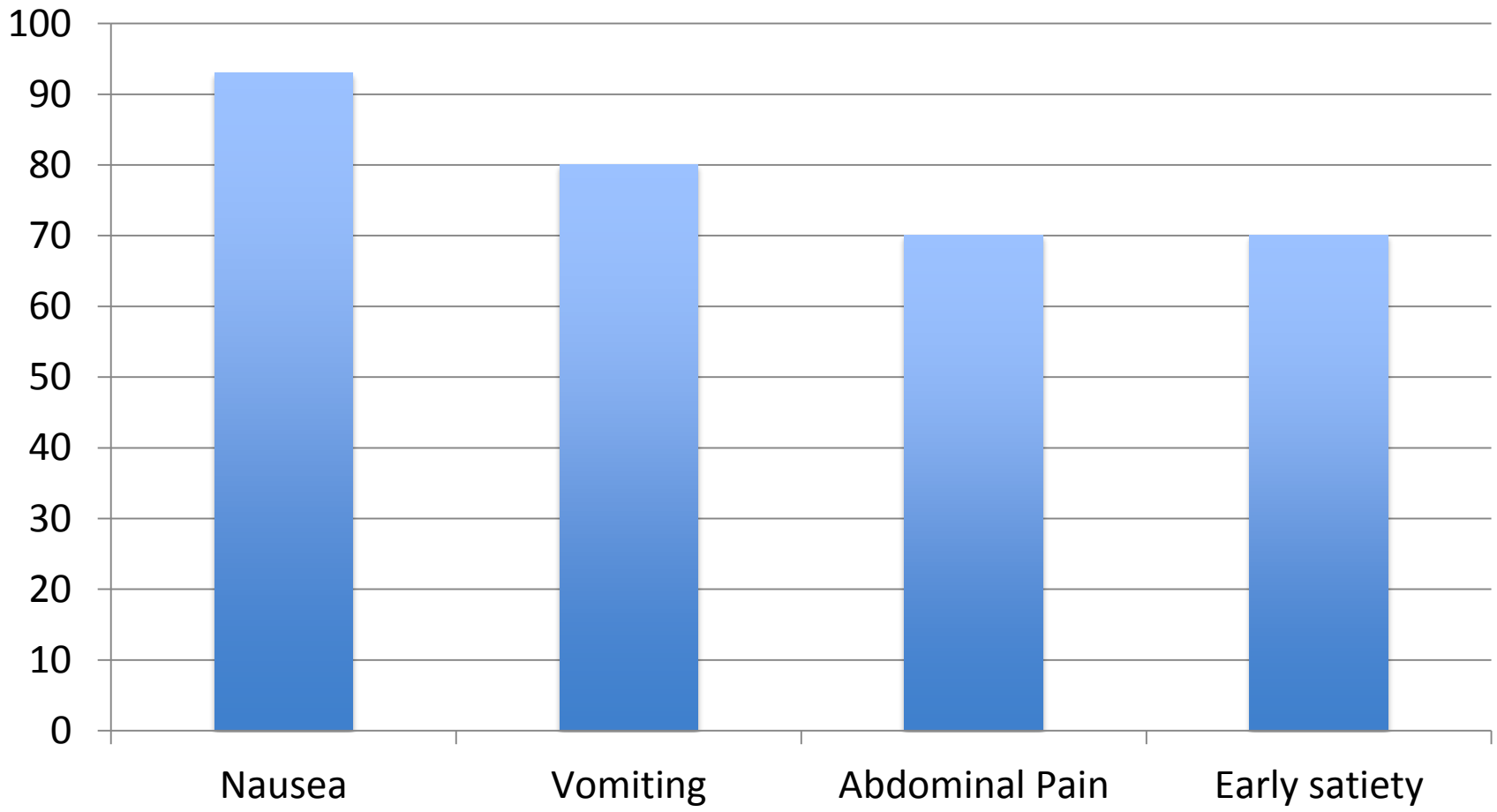
Gastroparesis

- Syndrome of delayed gastric emptying
  - Absence of mechanical obstruction
  - Cardinal symptoms of
    - Nausea, vomiting, early satiety, bloating, upper abdominal pain
- Incidence (per 100,000 person-years)
  - Men 2.4
  - Women 9.8
- Prevalence (per 100,000 persons)
  - Men 9.6
  - Women 38

Etiology

- Idiopathic
  - Viral?
- Dysautonomia
  - Diabetic neuropathy
    - ~1% of Type 2 DM
  - Amyloid neuropathy
  - Primary autonomic neuropathy
- Post-surgical
  - Fundoplication
  - Roux-en Y
- Infiltrative
  - Scleroderma
  - Amyloidosis
- Medications
  - Narcotics
  - TCA
- CNS Disorders
  - Parkinsonism
  - Multiple sclerosis
- Spinal cord injury

Clinical Presentation



Evaluation

- Exclude mechanical obstruction
  - EGD
  - Less often CT or MR enterography
    - Small bowel follow through if above not available
- Assess gastric motility
  - Gastric emptying study
  - Wireless motility capsule (“Smart Pill”)
  - ^{13}C breath test

Gastric Emptying Study

- Before the test
  - Stop all medications that might affect gastric emptying
  - Blood glucose < 275 mg/dL
- During the test
  - Measure at at time 0, 1h, 2h, and 4h
    - Going to 4h increases sensitivity from 33% to 58%

Interpretation of GES

- Positive test (may vary by institution)
  - > 10% retained after 4 hours

  and/or
  - > 60% at 2 hours

- Severity (at 4 hours)
  - 10 - 15% (Mild)
  - 15 - 35% (Moderate)
  - > 35% (Severe)

Differential Diagnosis

- Psychiatric illness
- Rumination syndrome
- Functional dyspepsia
- Cyclic vomiting syndrome
  - Cannabinoid hyperemesis

Gastroparesis - Treatment

- Initial Management
  - Dietary Modification
  - Hydration/Nutrition
  - Optimize glycemic control
  - Prokinetic medications
- Refractory Symptoms
  - Decompression
  - Surgery
  - Gastric electrical stimulation

Dietary Modification

- Reduce fat
  - Slows gastric emptying
- Reduce non-digestible fiber (fruits &vegetables)
  - Requires effective antral motility
- Small frequent meals
- Homogenized

Hydration and Nutrition

- Assess and replace
  - hypokalemia
  - metabolic alkalosis
  - micronutrient
  - vitamin deficiency

Optimize Glycemic Control

- Acute hyperglycemia reduces gastric emptying and efficacy of prokinetic agents

- Avoid incretins (exenatide and pramlintide)
  - Delay gastric emptying
  - DPPIV inhibitors do not affect gastric emptying

Prokinetic Agents

- Use 15 minutes before meals and at bedtime
- Prefer liquid preparations is available.

Metoclopramide

- FDA approved for gastroparesis for no more than 12 weeks
  - Unless benefits outweigh risk
- Risks
  - Anxiety, restlessness, depression, hyperprolactinemia, QT prolongation
  - **Extrapyramidal side effects**
    - **0.2% dysontia**
    - **1% tardive dyskinesia**
  - Written consent prior to treatment
- 5 mg doses titrated to effect (40 mg max dose)
- Consider drug holidays

Domperidone

- Not easily available in US
  - Patients can obtain from Canada
- Requires FDA IND
- Limited data of efficacy
- Increased risk of arrhythmias
  - Prolonged QT
- Drug-drug interations

Macrolide Antibiotics

- Erythromycin
  - Increases gastric motility and emptying
  - Liquid formulation 40 to 250 mg TID before meals
  - IV formulation if acute setting
  - Tachyphylaxis after 4 weeks of use
- Azythromycin
  - Similar effect on gastric emptying

Cisapride

- Effective in open label trials
- Associated with cardiac arrhythmias and death
- Available through limited access from manufacturer

Decompression and feeding

- Percutaneous endoscopic gastrostomy (PEG) Tube
  - Decompress for pain relief
- Percutaneous endoscopic jejunostomy (PEJ) Tube
  - Feeding
- Parenteral feeding
  - Last resort

Surgery

- Surgically placed jejunostomy
- Subtotal gastrectomy

Gastric Electrical Stimulation

- Compassionate use only
  - Requires IRB approval

- Improves symptom severity and gastric emptying in diabetics

Gastroparesis Summary (1)

- Syndrome of delayed gastric emptying without mechanical obstruction
- Typical presentation includes nausea, vomiting, abdominal pain, and early satiety
- Evaluation includes EGD and gastric emptying study

Gastroparesis Summary (2)

- Initial treatment is dietary modification
  - Low fat, soluble fiber
- In diabetics, optimize glycemic control
- Medical options are limited
  - Metoclopramide use with caution
  - Erythromycin for short term use
- Refractory cases
  - PEG or PEJ Tube
  - Gastric electrical stimulation

Liver Masses

- Solid versus Cystic versus Abscess
- Broad differential diagnosis
- Frequently incidental finding on imaging
- Usually can be managed without biopsy

Common Solid Liver Masses

- Benign
  - Hemangioma
  - Focal nodular hyperplasia (FNH)
  - Hepatic adenoma
  - Nodular regenerative hyperplasia (NRH)
  - Regenerative nodules
- Malignant
  - Hepatocellular carcinoma
  - Cholangiocarcinoma
  - Metastatic disease

Clinical Presentation

- Majority are asymptomatic
  - Abdominal pain is frequent but typically unrelated to mass, which is an incidental finding
- Exam is usually normal
  - Exception is cirrhosis!
    - Think HCC

Diagnostic Approach (1)

- Non-invasive testing is correct in 98% of cases
- Is there underlying liver disease?
  - Cirrhosis or Hepatitis B or Fatty Liver
- Is there extrahepatic malignancy?
  - Colon or stomach
  - Breast, ovaries, bronchus, kidney

Diagnostic Approach (2)

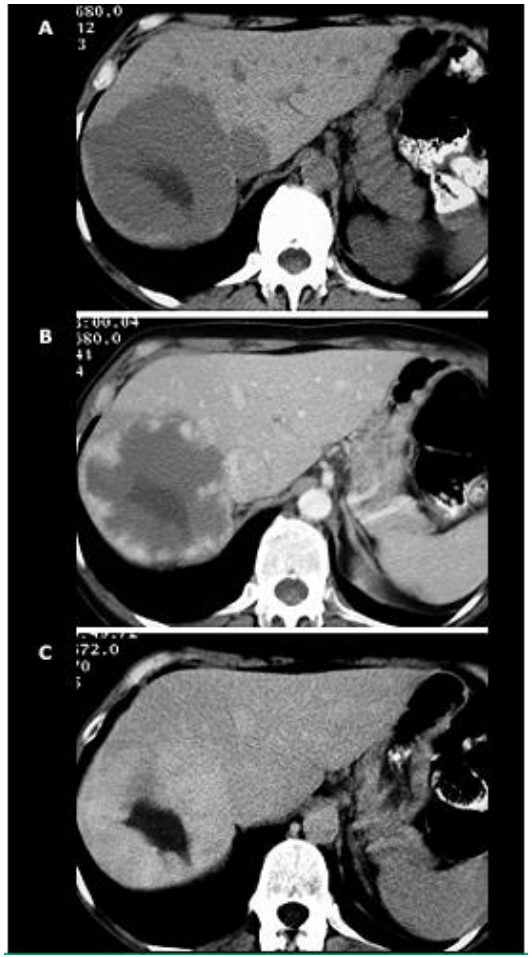
- Undiagnosed liver disease
  - Alpha-1 antitrypsin
  - Hemochromatosis
  - Wilson disease
  - AIH Hepatitis
- Size of the mass
  - < 1 cm is hard to classify

Imaging Studies

- 4 Phase MRI or CT
  - Base/Arterial/Venous/Portal (Delayed)

- Ultrasound typically not helpful

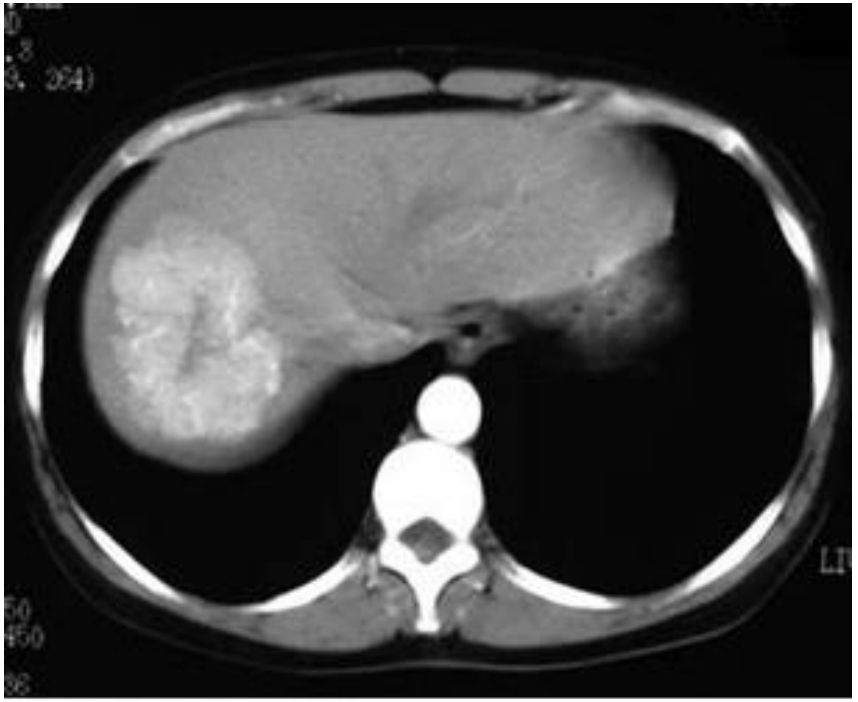
Hepatic Hemangioma



- Hypodense lesion
- Peripheral early enhancement
- Isodense on delayed images

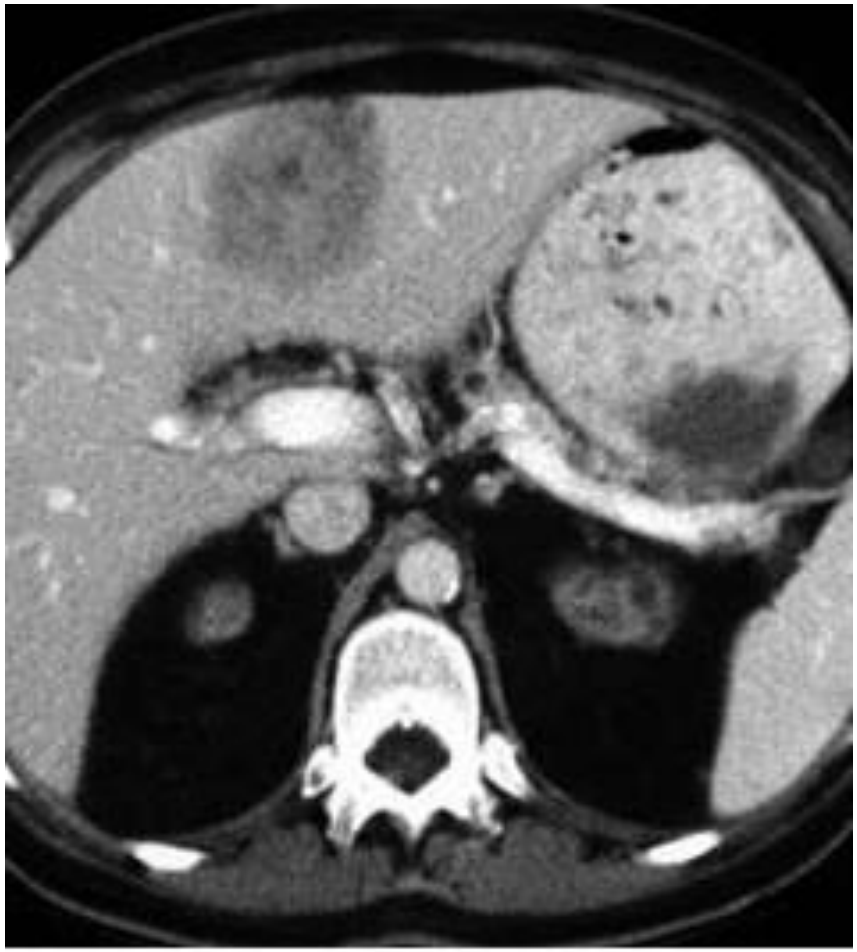
Focal Nodular Hyperplasia

- Common and usually asymptomatic
- Benign
- Central scar is typical
- Can be multiple and large

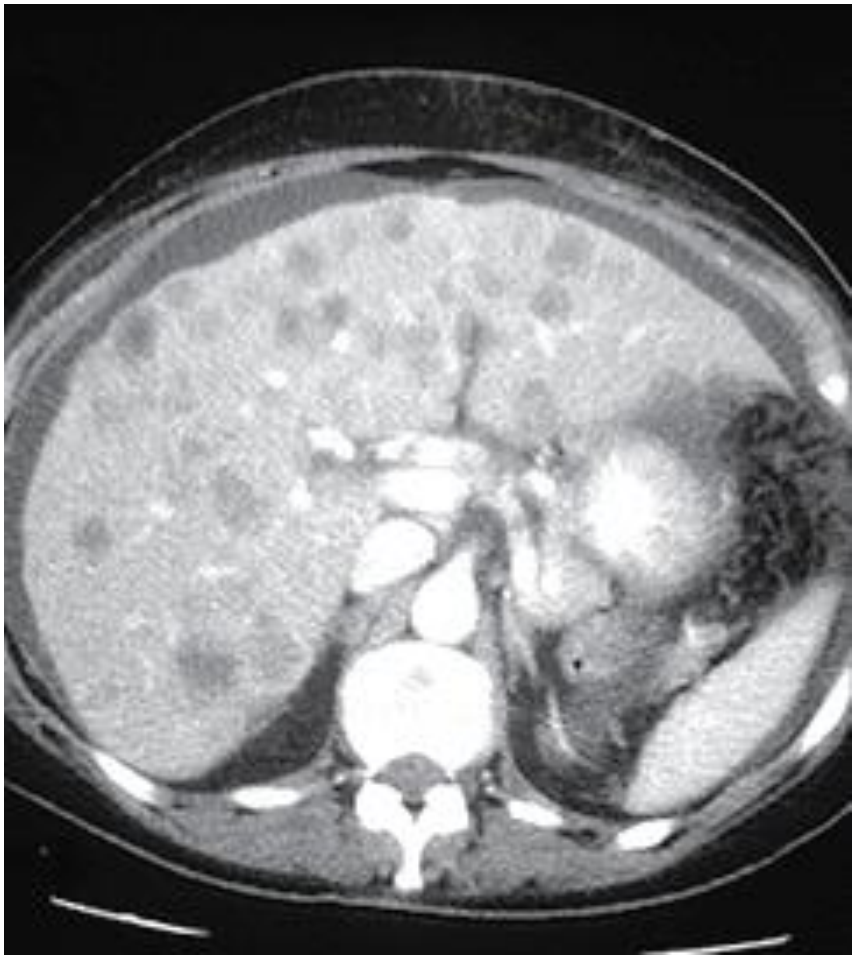


Hepatic Adenoma

- Typically found in young women
- Associated with OCP
- Low malignant potential

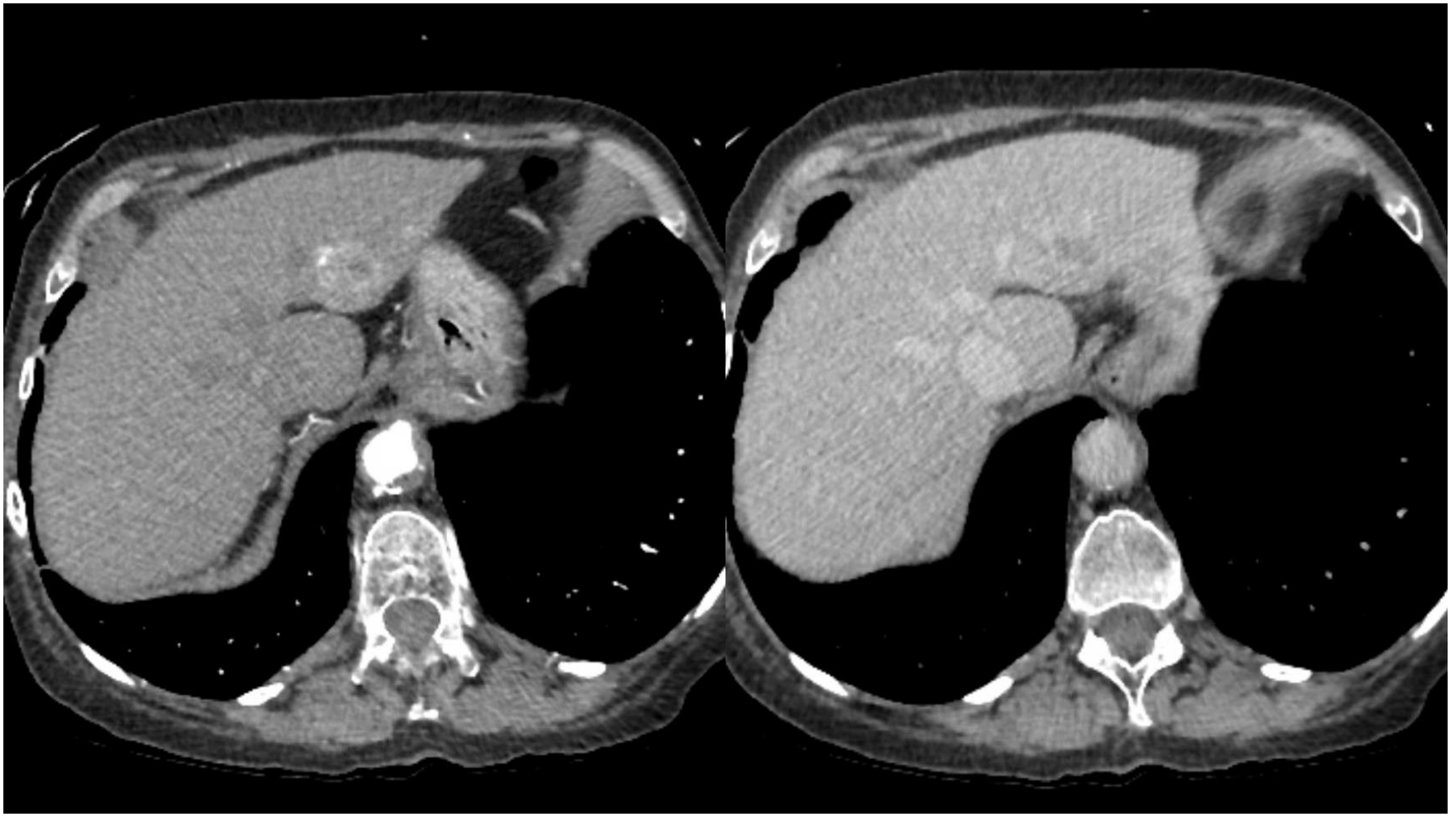


Hepatic Metastases



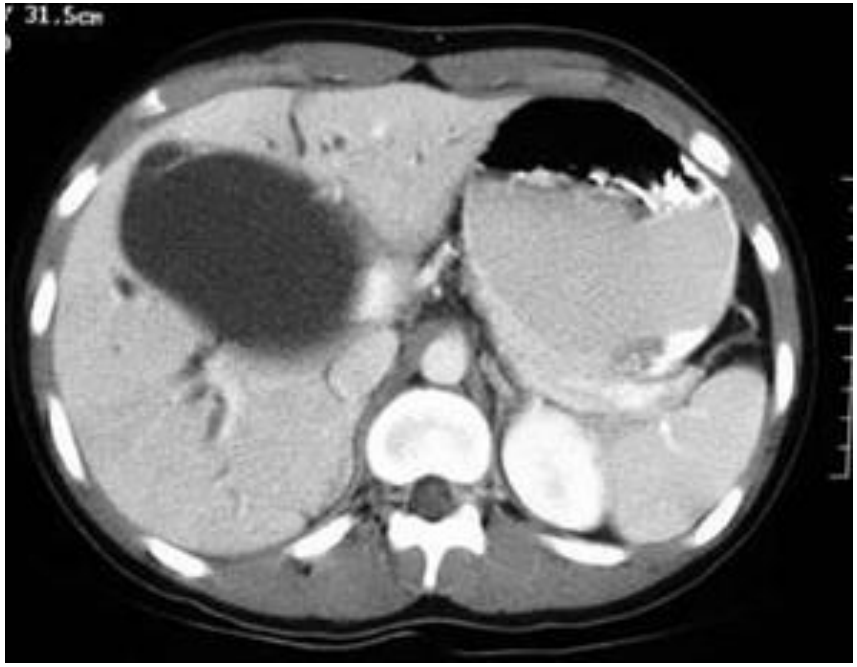
- Multiple hypovascular lesions on arterial phase

Hepatocellular Carcinoma



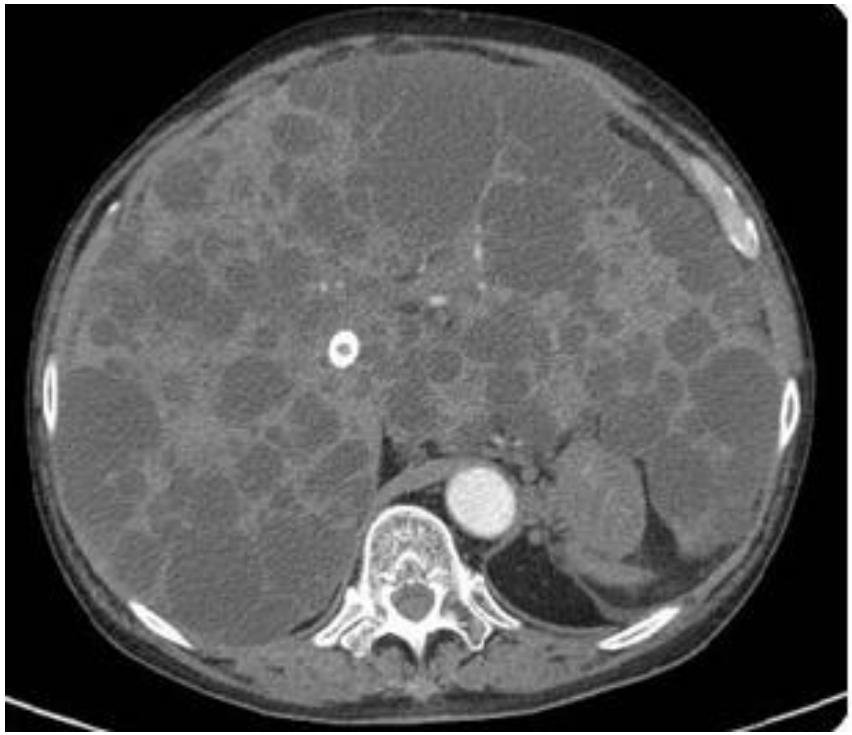
Simple Liver Cyst

- Congenital
- Benign
- Occasionally symptomatic
- Surgery is treatment of choice if symptoms require



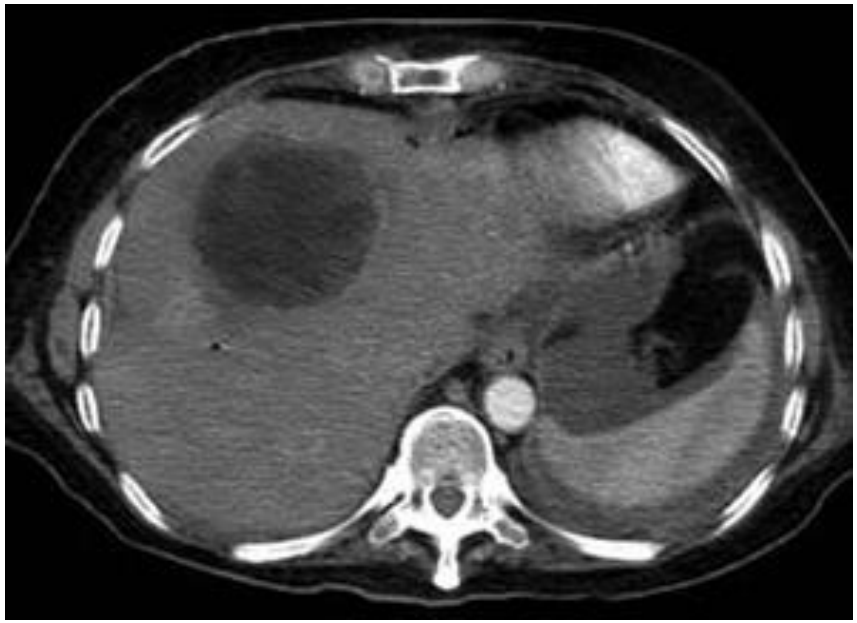
Polycystic Liver Disease

- Usually associated with PCKD
- Massive enlargement of liver but normal function
- Rarely requires transplant



Amebic Liver Abecess

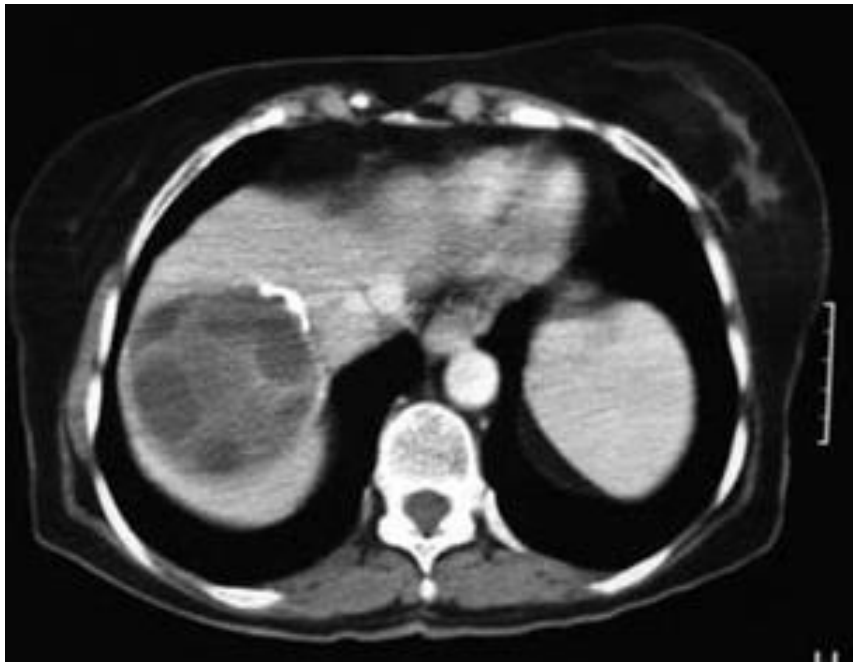
- Caused by *Entamoeba histolytica* found in tropics
- Abdominal pain and fever
- Serologies available
- Treatment with antibiotics



Hydatid Cysts

- Caused by *Echinococcus granulosus or E. multilocularis* found in dogs

- Antibody tests are available



Summary

- Most liver mass lesions and cysts are
  - Asymptomatic
  - Benign
  - Identified on routine imaging for other reasons

- Evaluate risk factors for specific lesions
  - Solid
    - Liver disease, cirrhosis, hepatitis C
    - OCP
    - Known malignancy
  - Cystic
    - Family history of cystic disease
    - Travel