



54 year old woman with a liver mass

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Overview

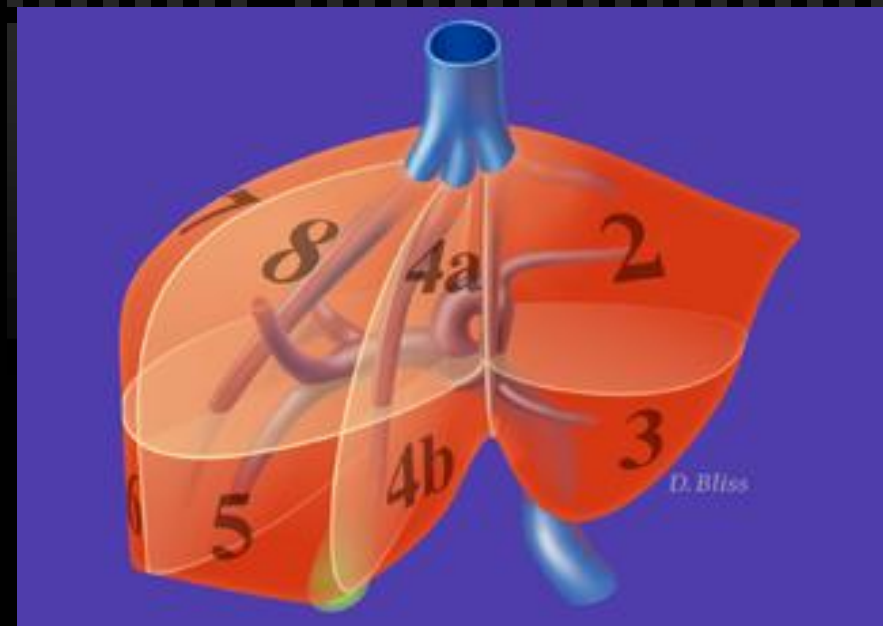
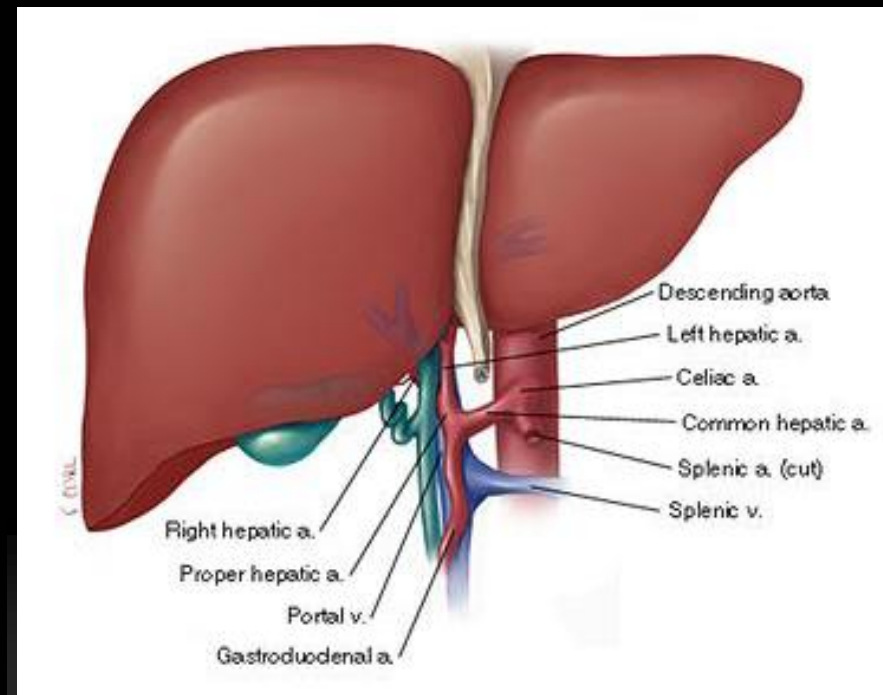


- ✓ Liver anatomy
- ✓ Presentation of our patient
- ✓ Differential diagnosis
- ✓ Menu of tests
- ✓ Radiographic images
- ✓ Discussion of our patient's diagnosis



Anatomy

- ✓ Anatomic lobes
 - ✓ Right, left, caudate, and quadrate
- ✓ 8 functional segments
 - ✓ Vascular and biliary supply
- ✓ Dual blood supply
 - ✓ Hepatic artery (25%)
 - ✓ Portal vein (75%)
- ✓ Venous drainage
 - ✓ Sinusoids -> central v. -> interlobular v. -> hepatic v. -> IVC





Our patient

- ✓ 54 year old woman
- ✓ Hepatitis C
- ✓ Recently:
 - ✓ Fever, nausea, night sweats, and fatigue
 - ✓ Abdominal pain (R lower and upper quadrants)
 - ✓ Denies weight loss
 - ✓ Fecal occult blood: trace positive
- ✓ Abnormal surveillance ultrasound in segment 5



Differential diagnosis

✓ Benign

✓ Common:

- ✓ Hemangioma
- ✓ Focal nodular hyperplasia
- ✓ Nodular regenerative hyperplasia
- ✓ Hepatocellular adenoma
- ✓ Cyst

✓ Uncommon:

- ✓ Cholangioma

✓ Malignant

✓ Common:

- ✓ Metastases
- ✓ Hepatocellular carcinoma
- ✓ Cholangiocarcinoma

✓ Uncommon:

- ✓ Fibrolamellar carcinoma
- ✓ Angiosarcoma



Imaging studies

- ✓ **Ultrasound**
 - ✓ Screening for Hep C patients
 - ✓ Frequently non-specific, requires additional studies
- ✓ **MR**
 - ✓ Better for distinguishing regenerating nodules from hepatocellular carcinoma in cirrhotic patients
 - ✓ Better sensitivity for small lesions
 - ✓ Expensive
- ✓ **CT**
 - ✓ Fast and less expensive



Multidetector CT (MDCT)



- ✓ Non-contrast
- ✓ Fast bolus IV contrast
 - ✓ Hepatic arterial phase (30 s)
 - ✓ Peak contrast within hepatic artery
 - ✓ Sensitive for small arterially-supplied masses
 - ✓ Portal venous phase (60 s)
 - ✓ Peak contrast within portal vein
 - ✓ Homogeneous enhancement of hepatic parenchyma
 - ✓ Delayed equilibrium phase (3 min)
 - ✓ Hepatic vein
 - ✓ Interstitium

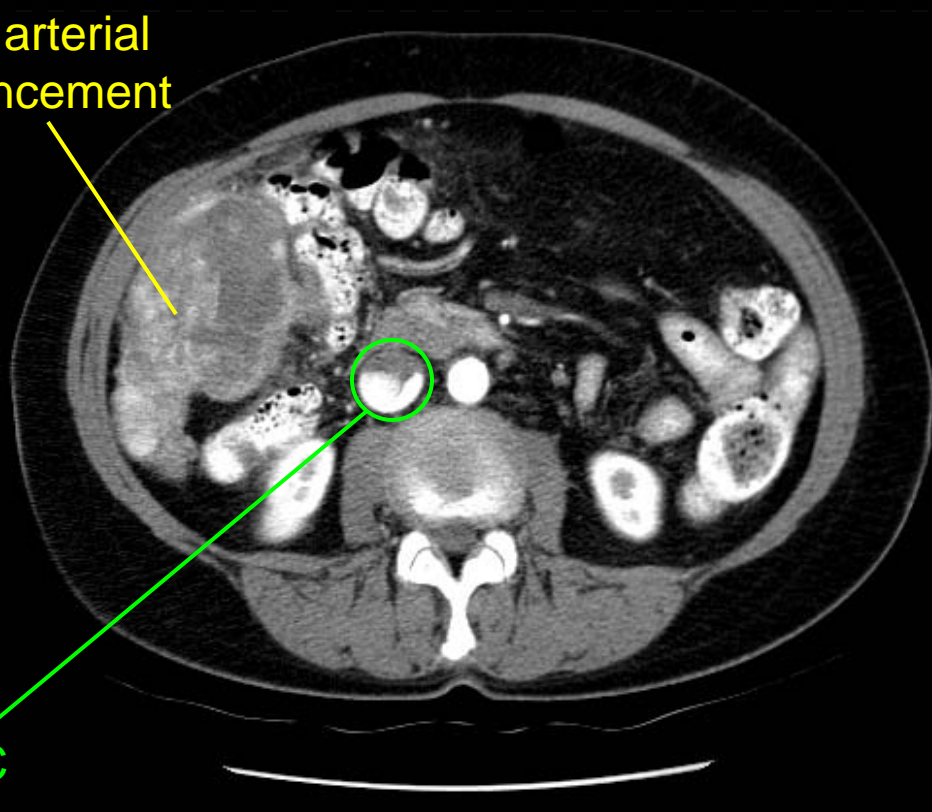
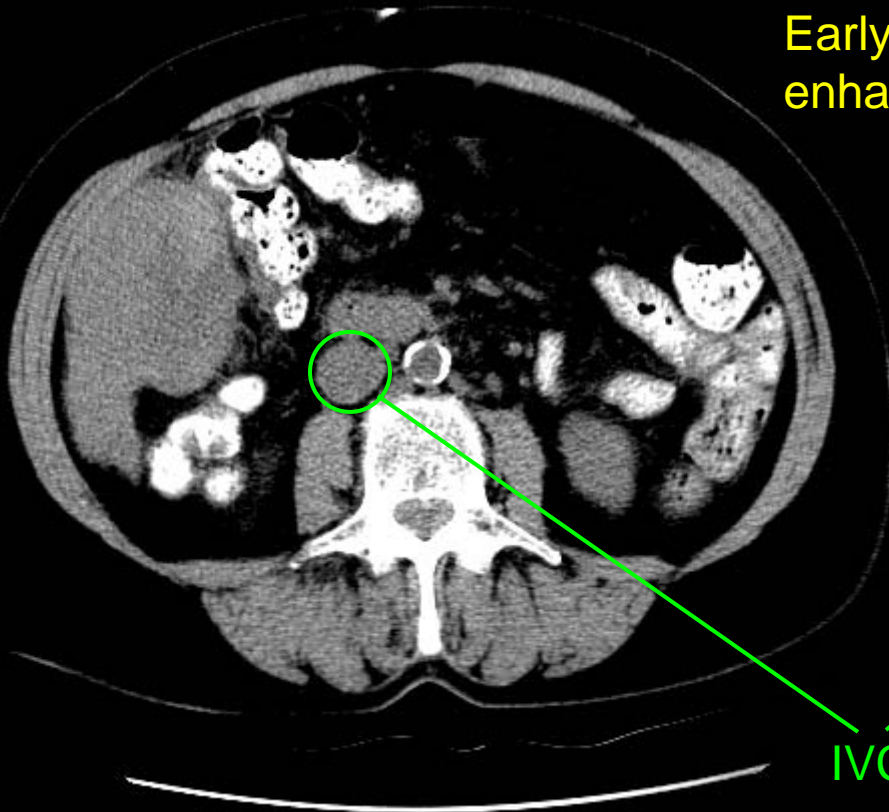


MDCT



Non-contrast

Hepatic arterial phase



IVC



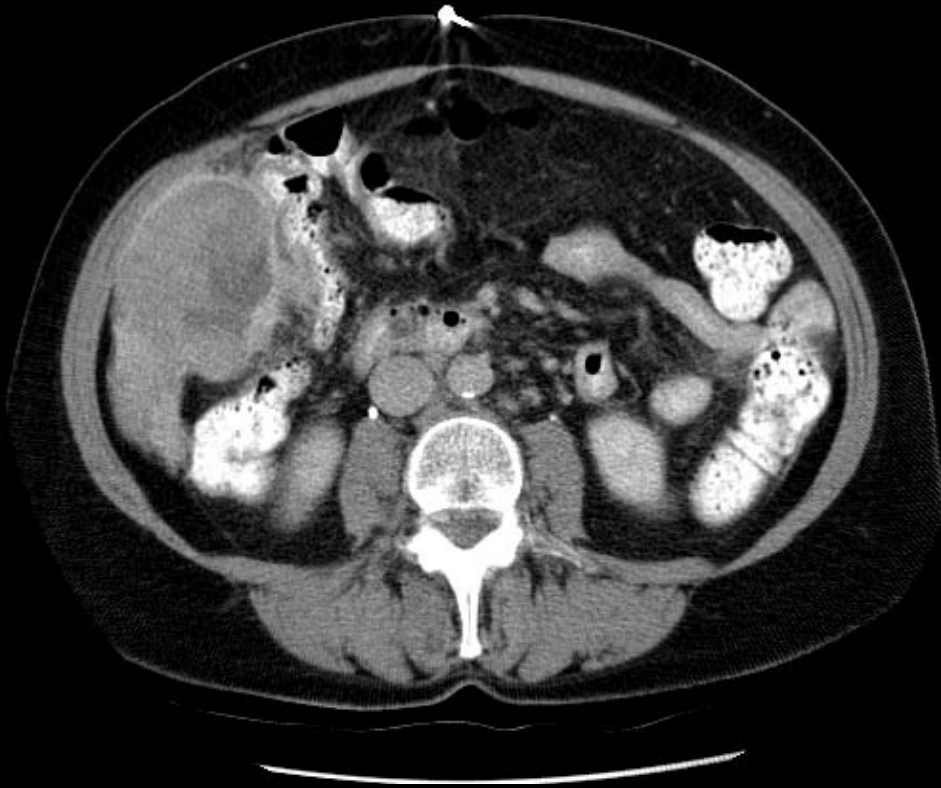
MDCT



Portal venous phase



Delayed equilibrium phase





MDCT



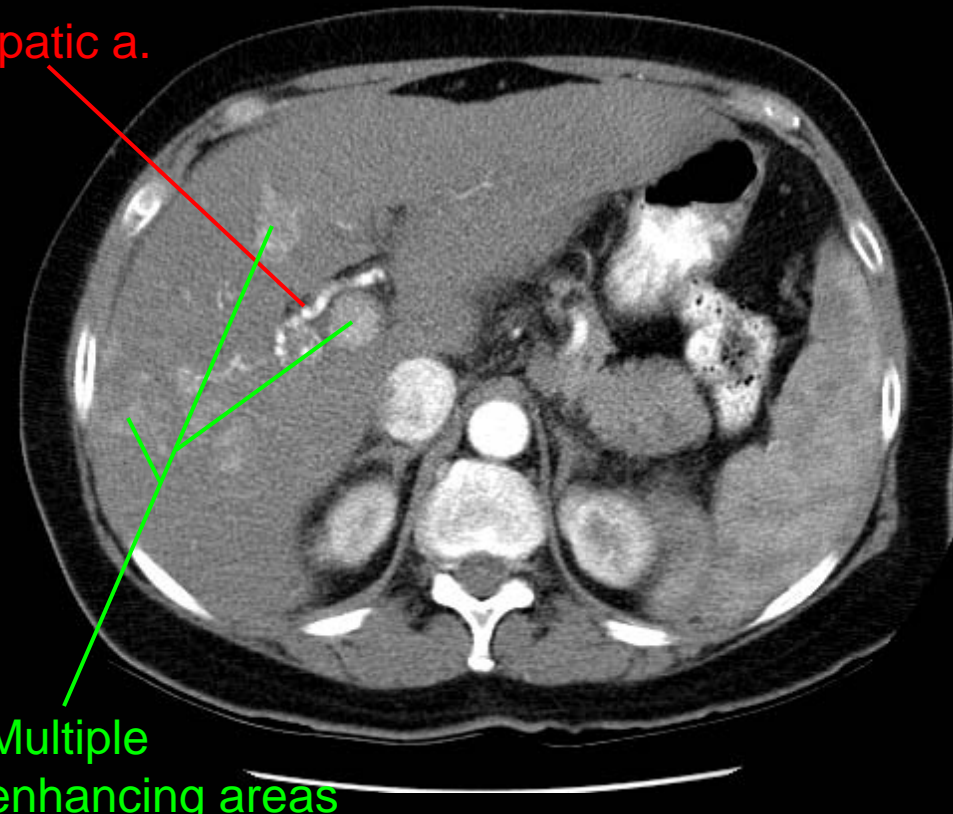
Non-contrast



Hepatic arterial phase

Hepatic a.

Multiple enhancing areas



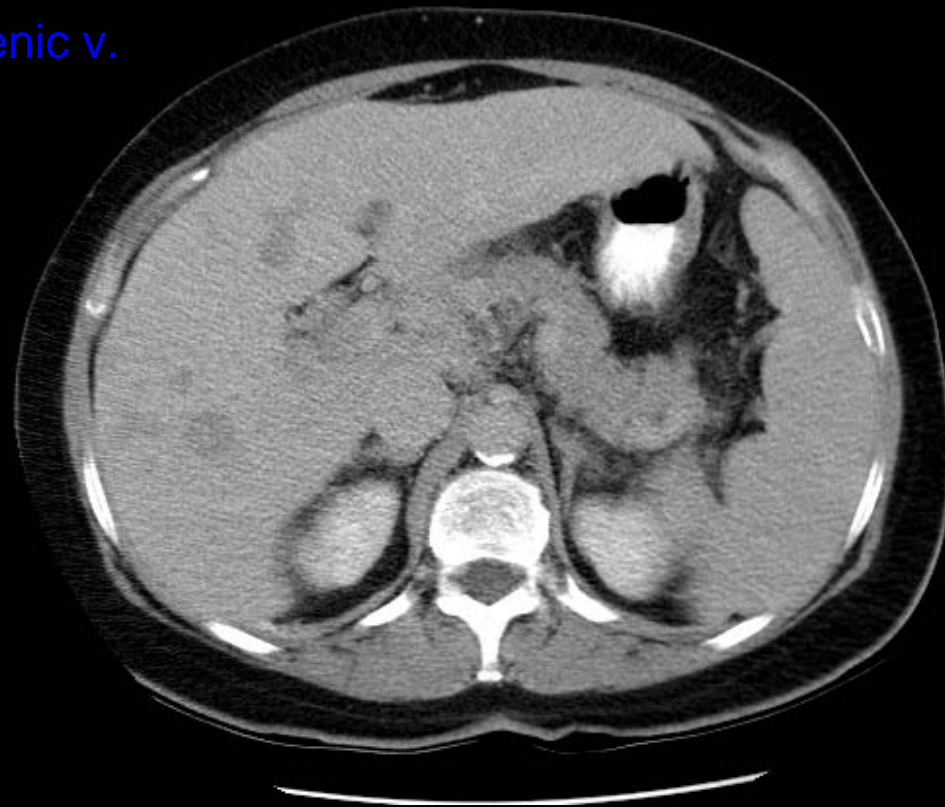
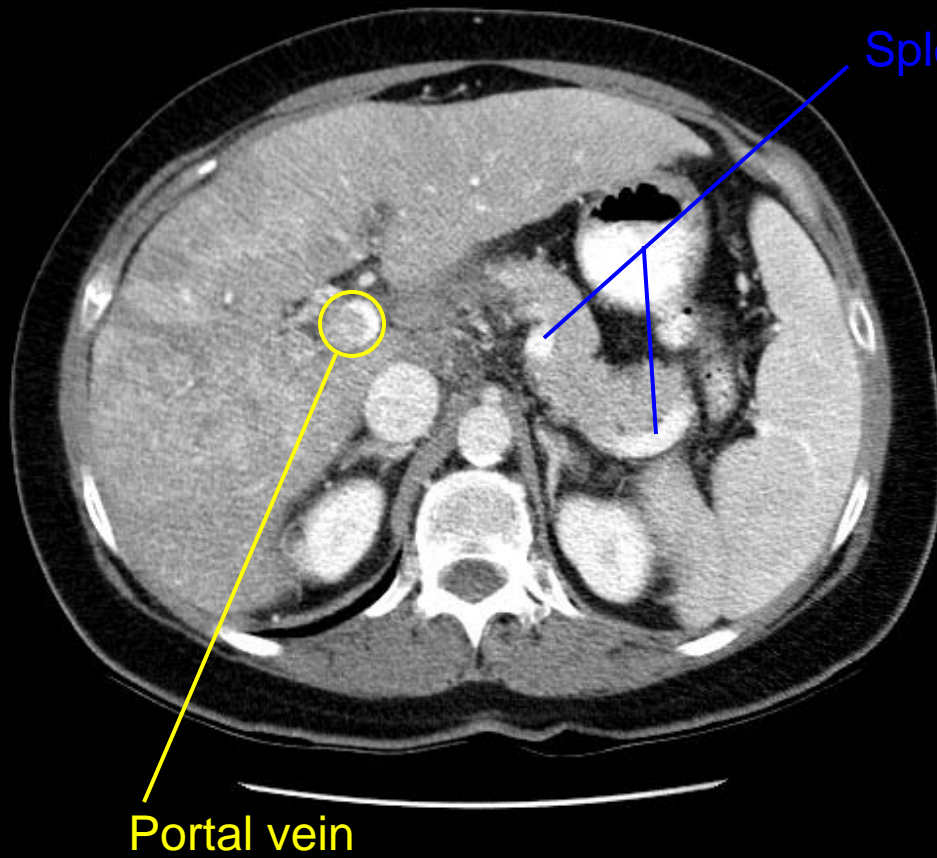


MDCT



Portal venous phase

Delayed equilibrium phase



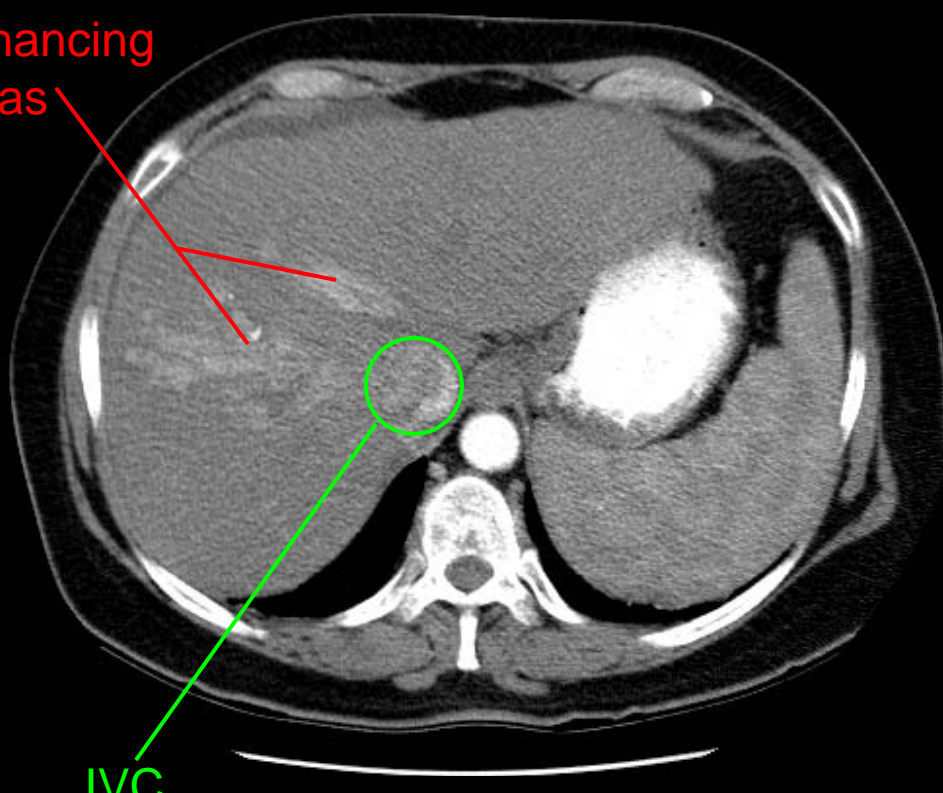
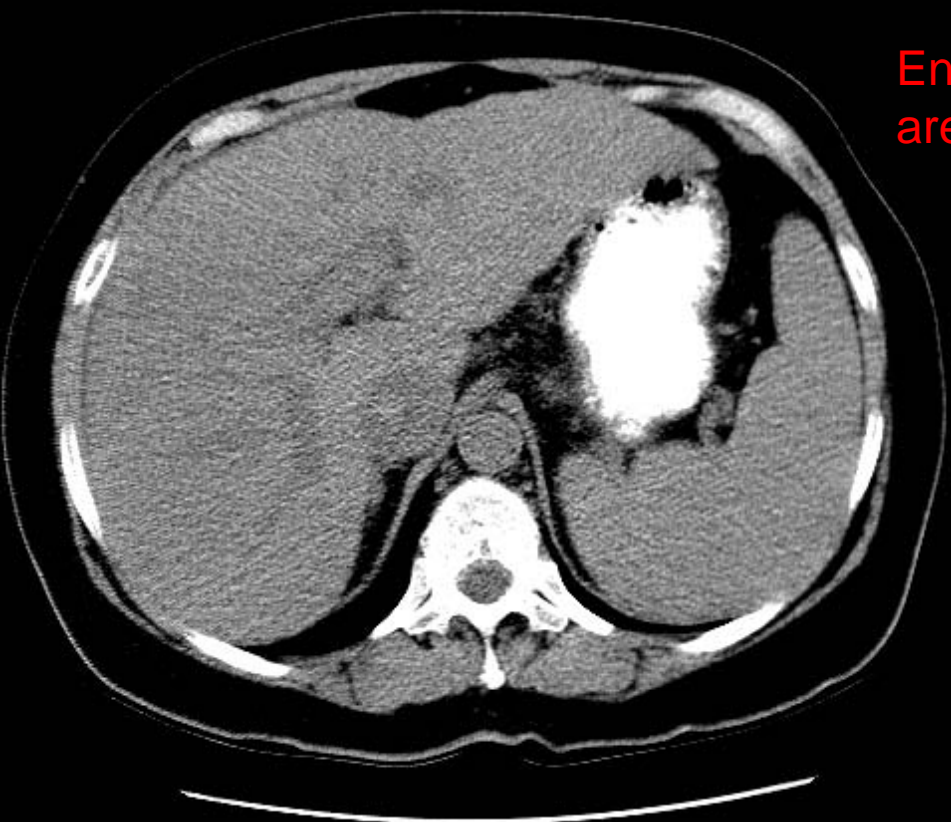


MDCT



Non-contrast

Hepatic arterial phase



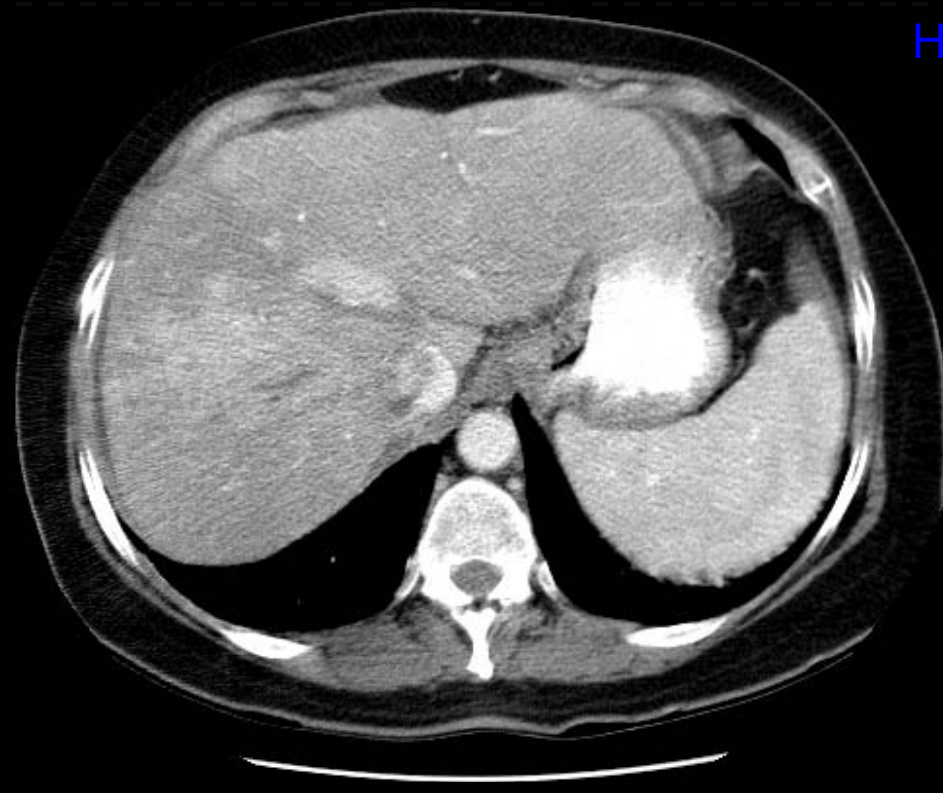


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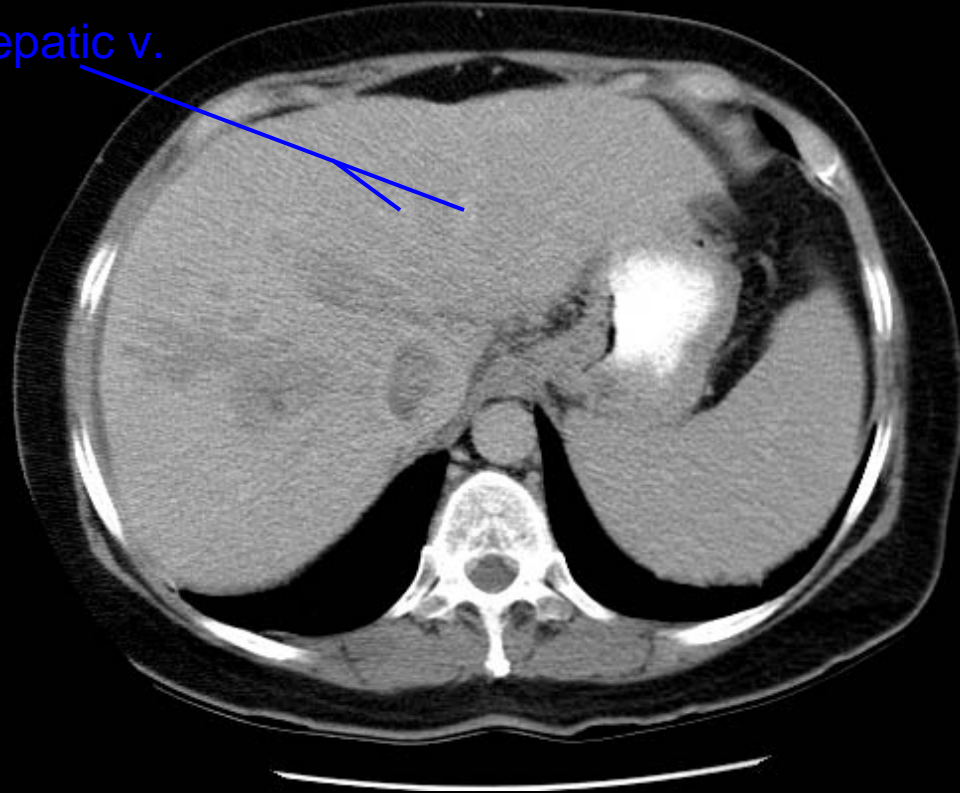


Portal venous phase

Delayed equilibrium phase

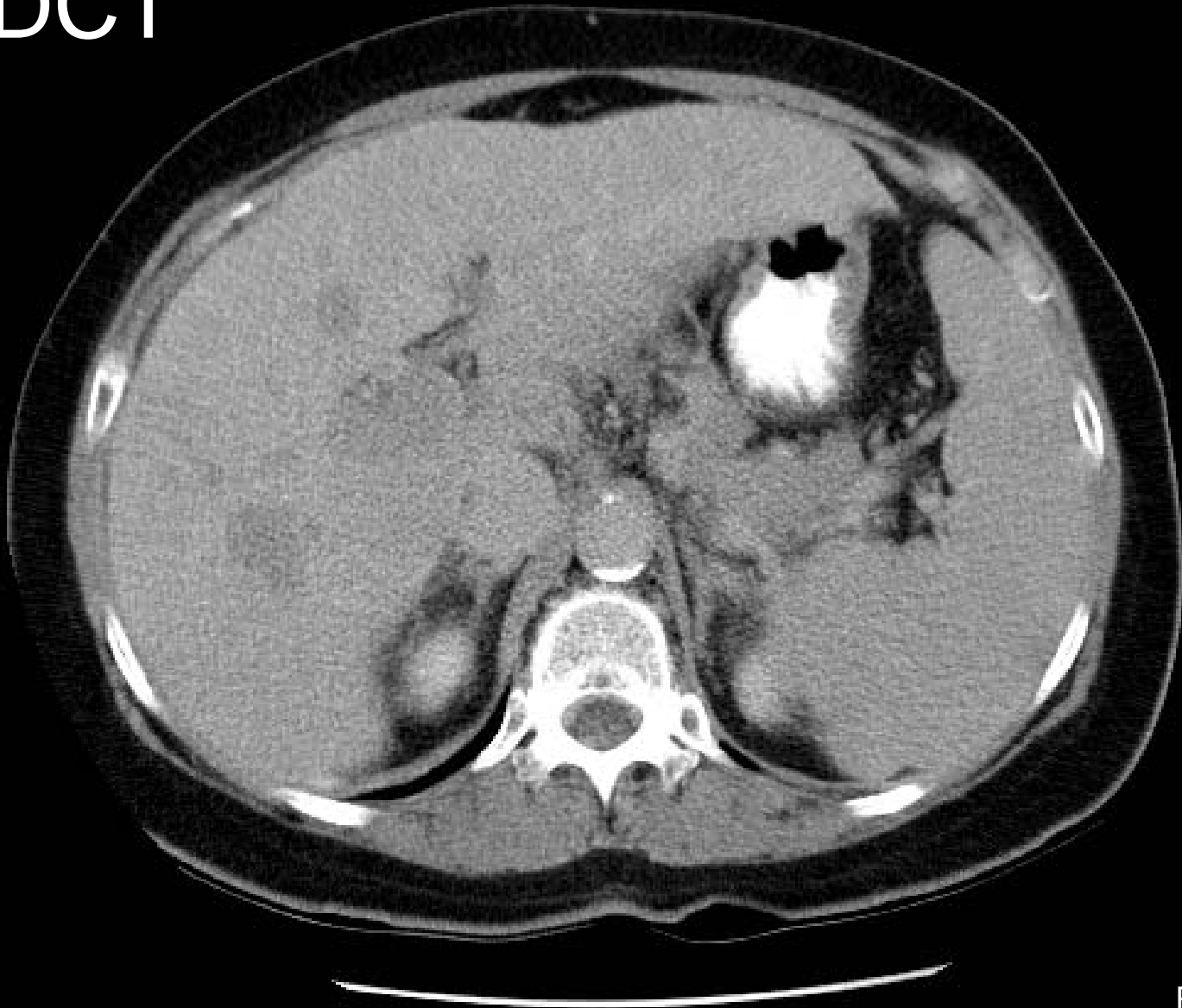


Hepatic v.



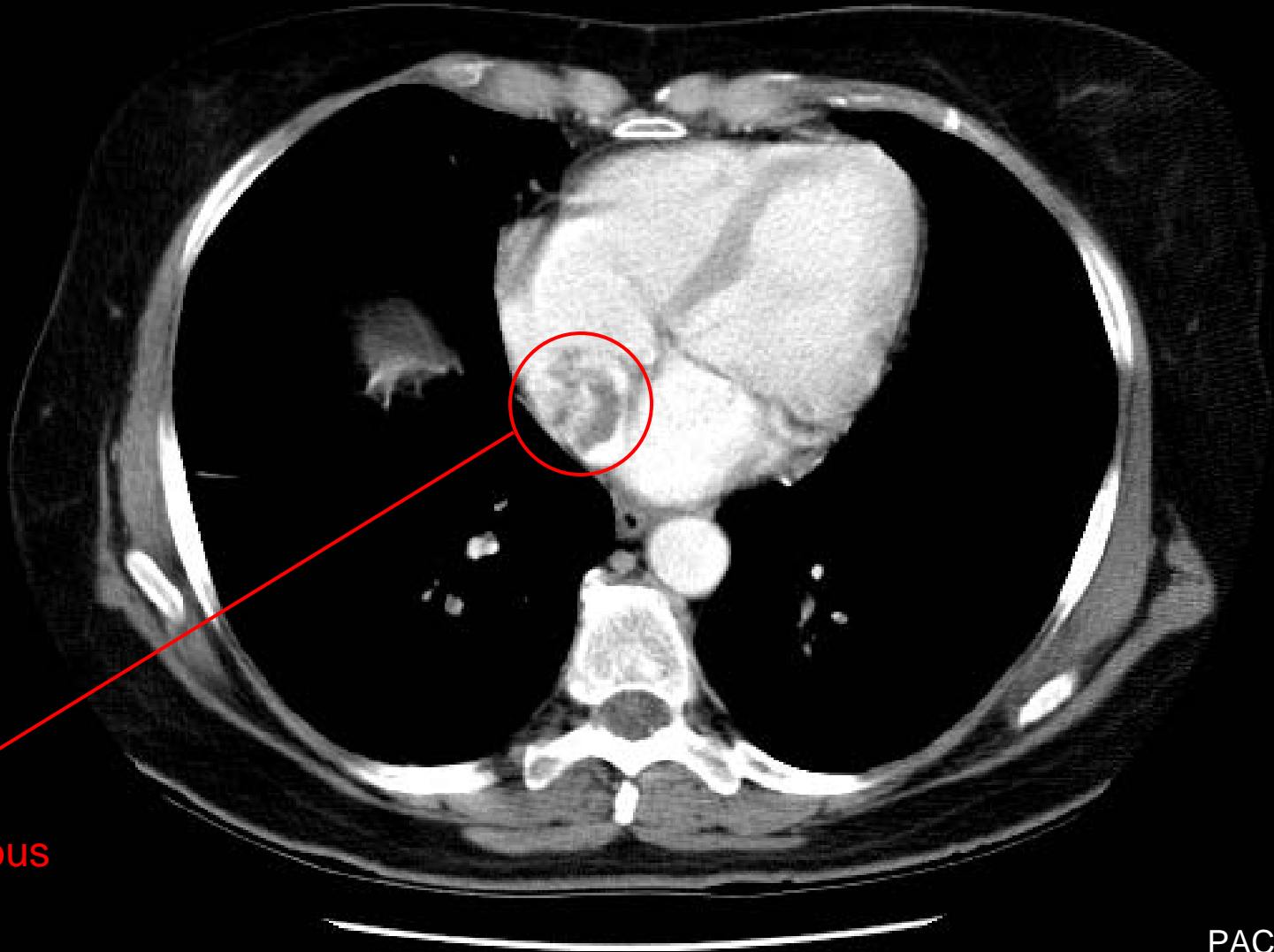
Delayed equilibrium phase

MDCT



Hepatic arterial phase

MDCT



Tumor thrombus



Diagnosis

- ✓ Significant findings:
 - ✓ Chronic liver disease
 - ✓ Elevated AFP (53,905)
 - ✓ Multifocal, early enhancing, heterogeneous mass in hepatic arterial phase
 - ✓ Hypodense or isodense in portal venous and delayed phases
 - ✓ Venous invasion
- ✓ DDX of early enhancing liver lesion
 - ✓ Hemangioma
 - ✓ Focal nodular hyperplasia
 - ✓ Metastasis
 - ✓ Hepatocellular carcinoma
 - ✓ Cholangiocarcinoma

Ultrasound-guided biopsy revealed **hepatocellular carcinoma**



Hepatocellular carcinoma

- ✓ AKA hepatoma
- ✓ Most frequent primary visceral malignancy in the world
- ✓ 80-90% of all primary liver malignancies
- ✓ Incidence:
 - ✓ Western hemisphere < 1%
 - ✓ Africa, Asia (Japan) 5%
 - ✓ Male > Female (2:1 to 8:1)



Etiology

✓ Cirrhosis:

- ✓ 12% Chronic hepatitis B and C
- ✓ 5% Alcoholic cirrhosis
- ✓ 14-30% Hemochromatosis

✓ Carcinogens:

- ✓ Aflatoxin, siderosis, thorotrast, OCPs, anabolic androgens

✓ Metabolic disorders:

- ✓ Alpha-1 antitrypsin, galactosemia, type 1 glycogen storage disease (Von Gierke), Wilson's, tyrosinosis



Hepatocellular carcinoma

- ✓ **Prognosis:**
 - ✓ Frequently late clinical presentation
 - ✓ Median survival 6-20 months
- ✓ **Treatment:**
 - ✓ Surgical resection
 - ✓ Ablation (cryo, chemoembolization, EtOH, RF)
 - ✓ Chemotherapy
 - ✓ Radiation
 - ✓ Liver transplantation



Radiographic Features

✓ 3 forms:

- Solitary (25-60%)
- Multifocal nodules (15-25%)
- Diffuse (10-25%)

✓ Vascular invasion is common

- Portal vein 35%
- Hepatic vein 15%

✓ Mets: lung > lymph nodes, adrenal > bone



References

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