Isolated Liver Mass: Imaging and When to Biopsy

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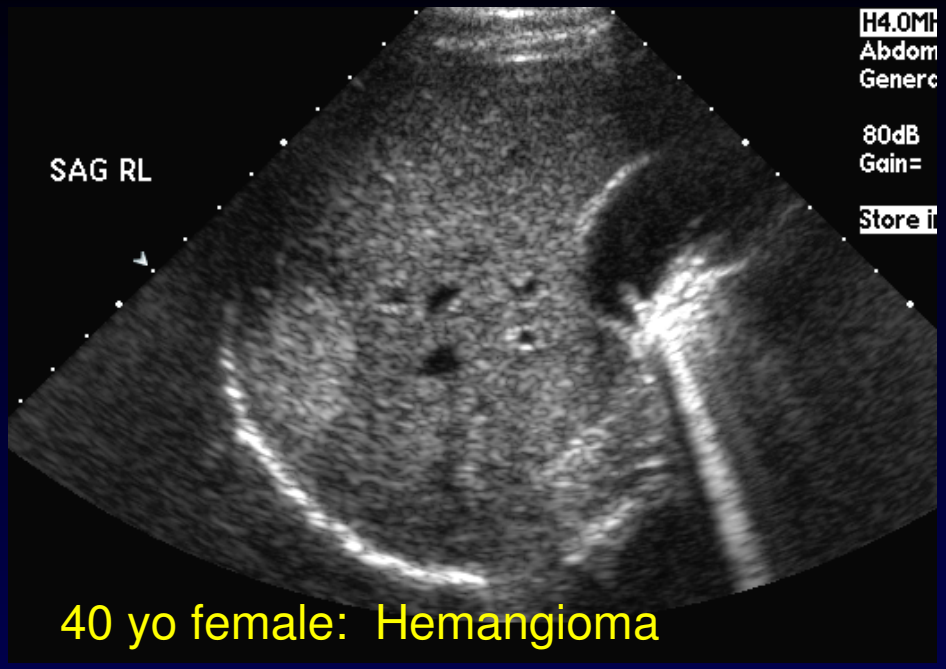
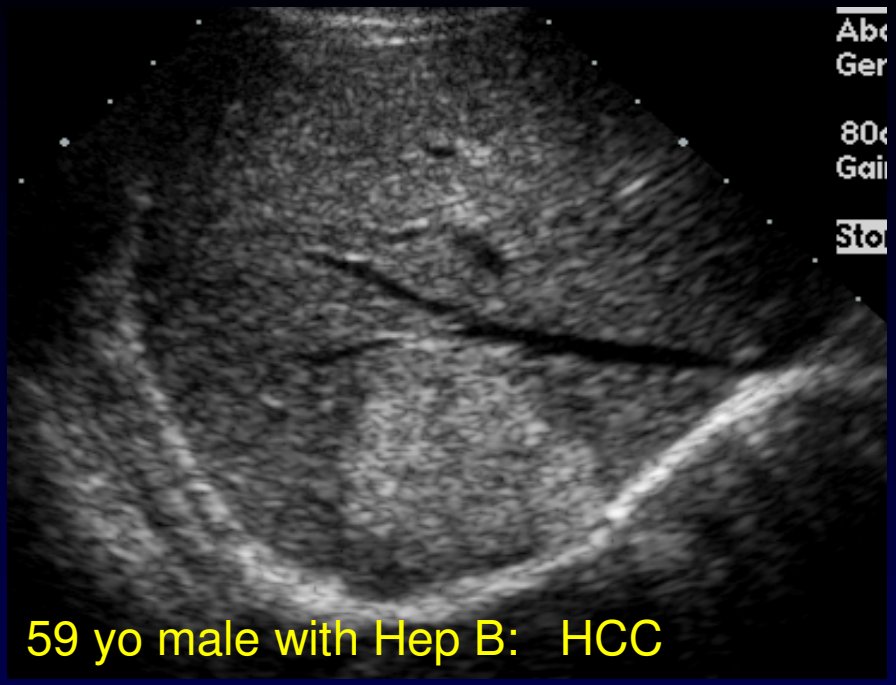
Objectives

- To review the radiological workup of a liver mass.
- To discuss the appropriate indications as to when to biopsy a liver mass.
- To present radiological interventions available for focal liver mass(es).



40 yo female: Hemangioma



59 yo male with Hep B: HCC

- Asymptomatic/symptomatic
- Age
- Gender
- Oral contraceptives, anabolic steroids, glycogen storage disease
- Risk factors for chronic liver disease
- History of primary malignancy
- Travel history

Clinical Features

- Asymptomatic/symptomatic
- Age
- Gender
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- Lab tests, including tumor markers
- Imaging studies

- Majority of lesions characterized without biopsy.
- 156/160 (98%) correct pre-op diagnosis.

Torzilli et al. Hepatology 199;30:889

Size of the Mass

- < 1 cm are commonly benign*
  - Cysts, hemangiomas, biliary hamartomas
  - Difficult to characterize and biopsy
  - Clinical follow-up
  - <0.5 cm and no risk factors -> no F/U+
- Larger lesions can be characterized in most cases

*Schwartz et al. Radiology 1999;210:71
+Berland et al. JACR 2010;7(10):754

Imaging Work Up of a Liver Mass

- Most cases detected on US or single phase CT
- Ideally MRI is the best study for characterizing liver masses
- Practically triple phase CT can characterize liver masses
- Where to work up a liver lesion depends on local expertise and resources and likelihood of referring to a tertiary centre for treatment/management

Common Liver Masses

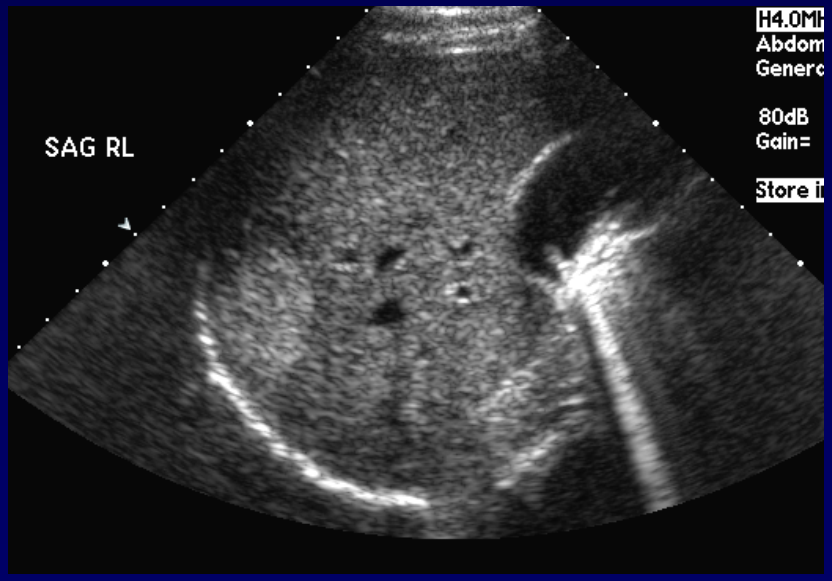
- No underlying liver disease
  - Hemangioma
  - Focal Nodular Hyperplasia
  - Hepatic Adenoma

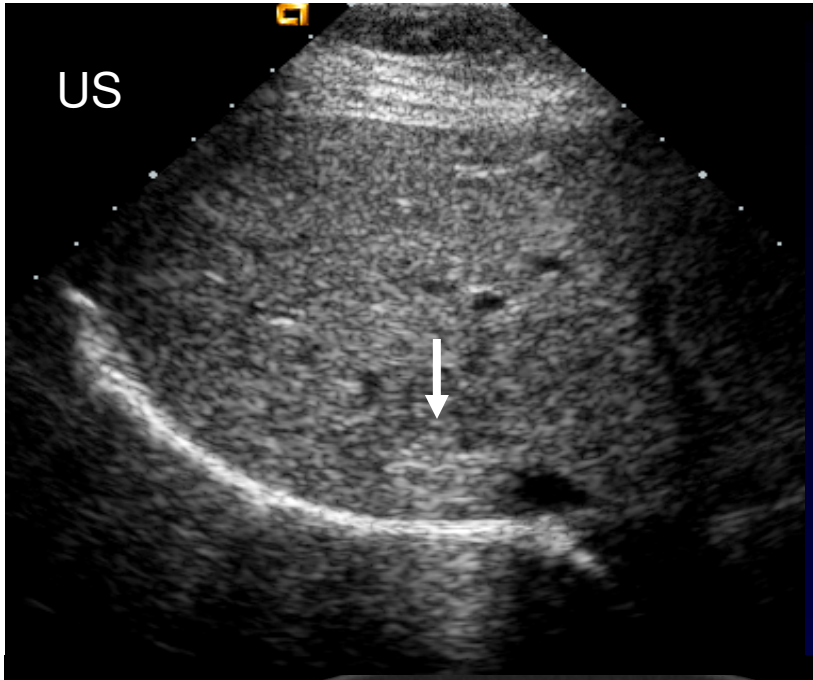
  - Hepatic Metastases
  - Cholangiocarcinoma

- Underlying liver disease
  - Regenerative Nodules
  - Dysplastic Nodules
  - Hepatocelullar Carcinoma

Hemangioma

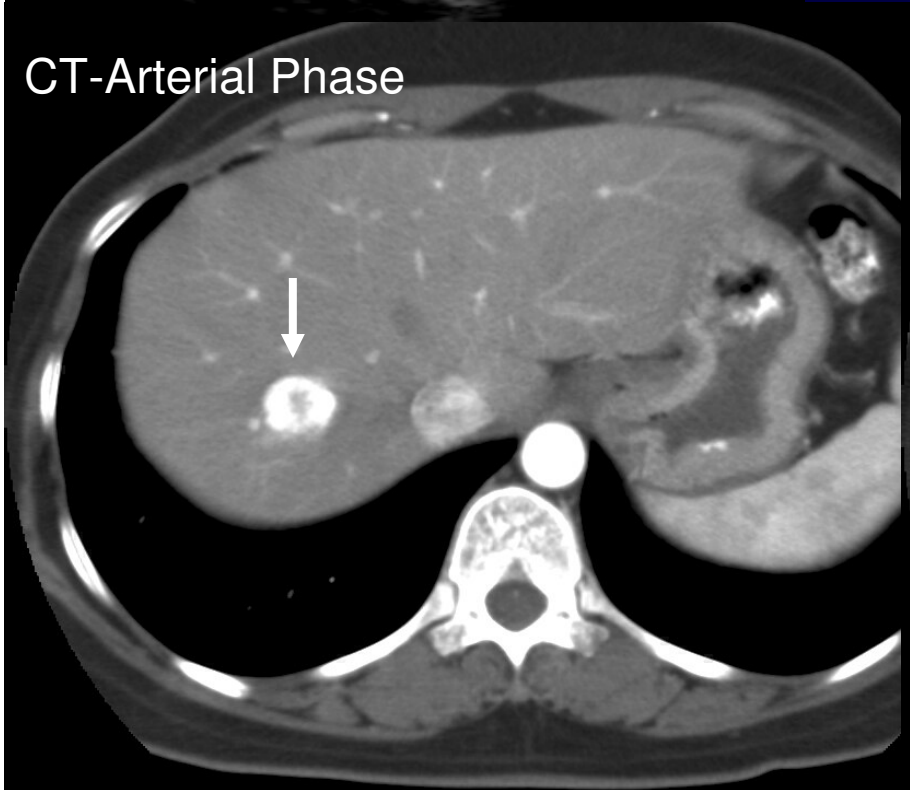
- US appearance:
  - well-defined, hyperechoic / echogenic (67% - 79%), homogenous (58% - 73%)
  - faint increased through transmission / posterior acoustic enhancement

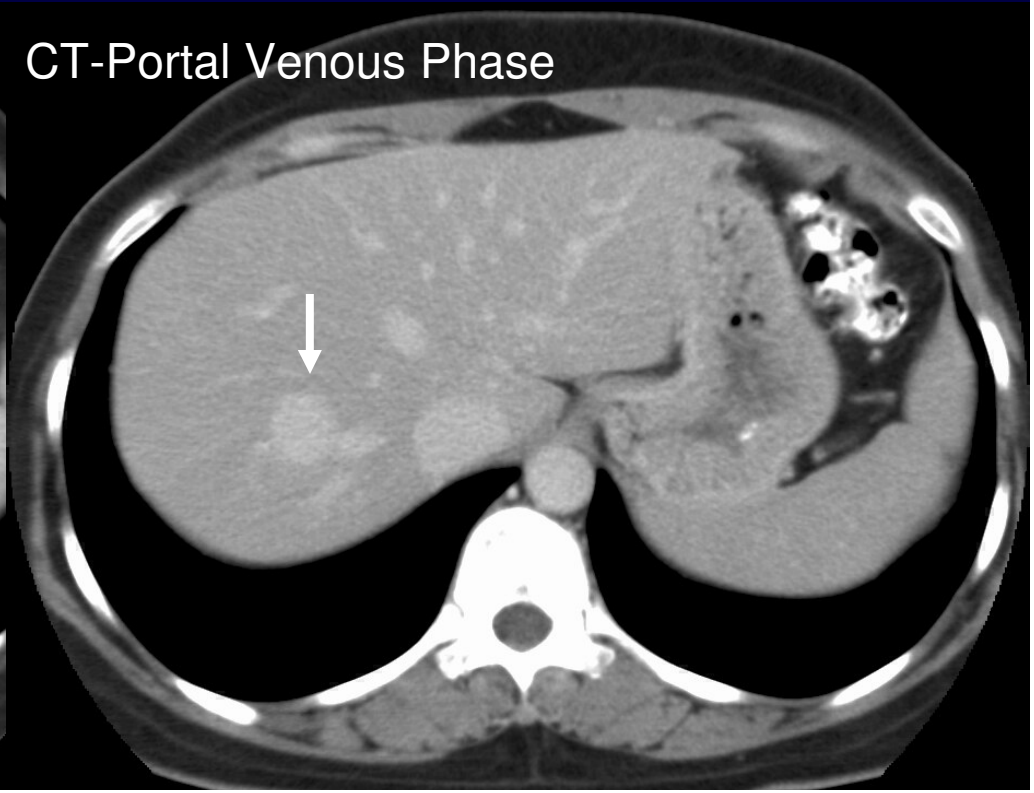


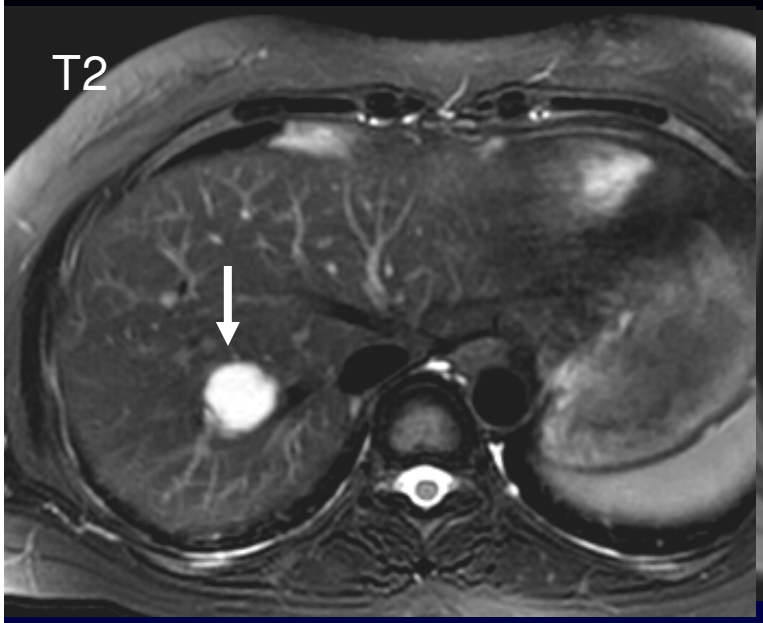


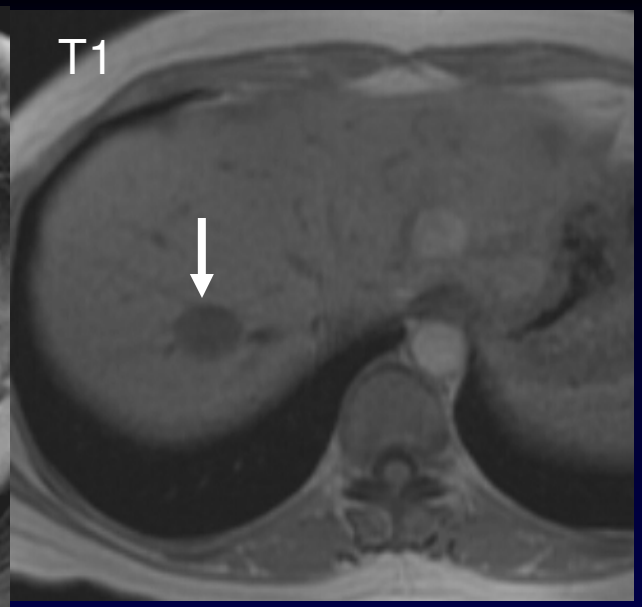
Hemangioma

- peripheral nodular enhancement with centripetal fill-in of lesion within 15 min
- equal or hyperdense to aorta
- contrast persists on delayed imaging



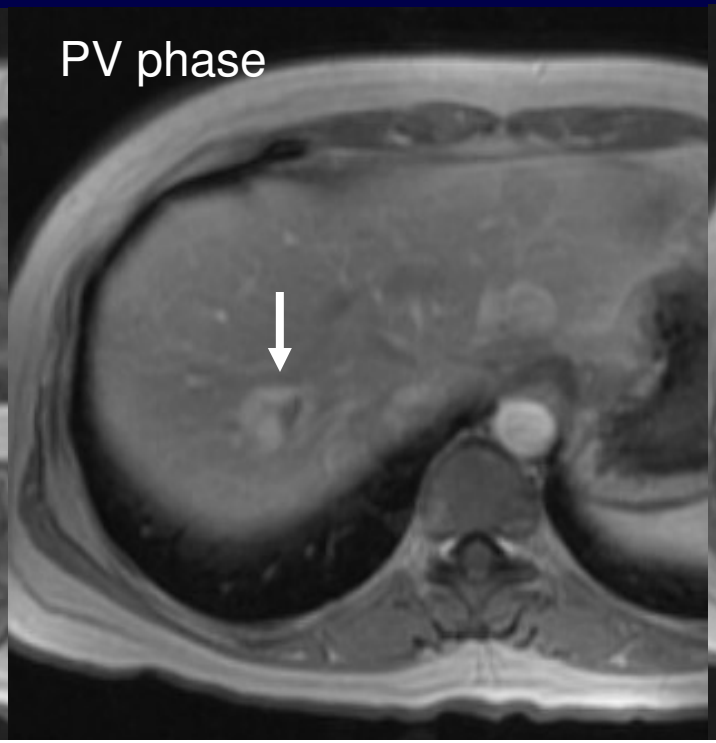


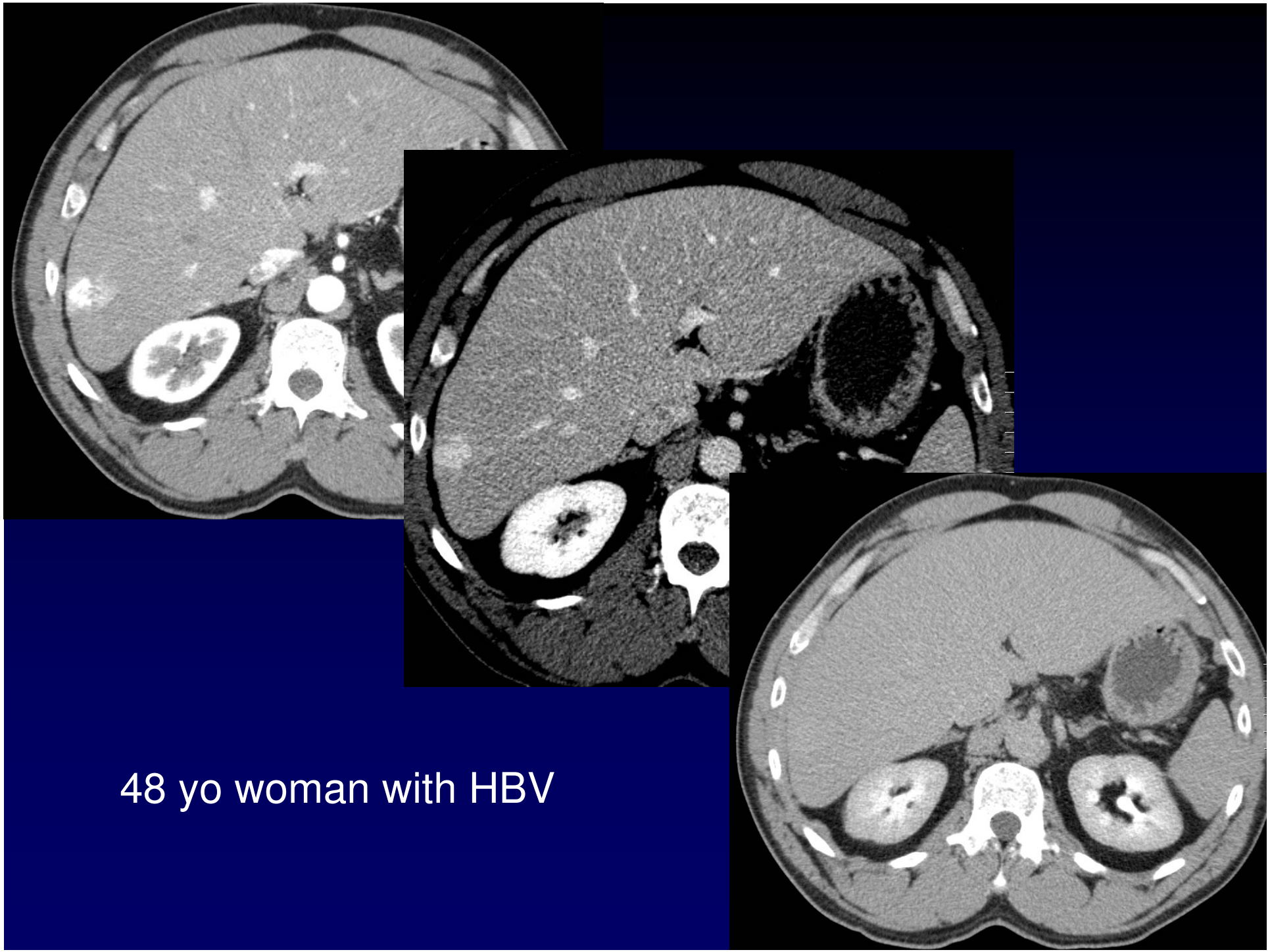




Hemangioma MRI appearances

- Bright/hyperintense on T2
- Peripheral nodular enhancement with fill in





48 yo woman with HBV

Hemangioma
MRI appearances

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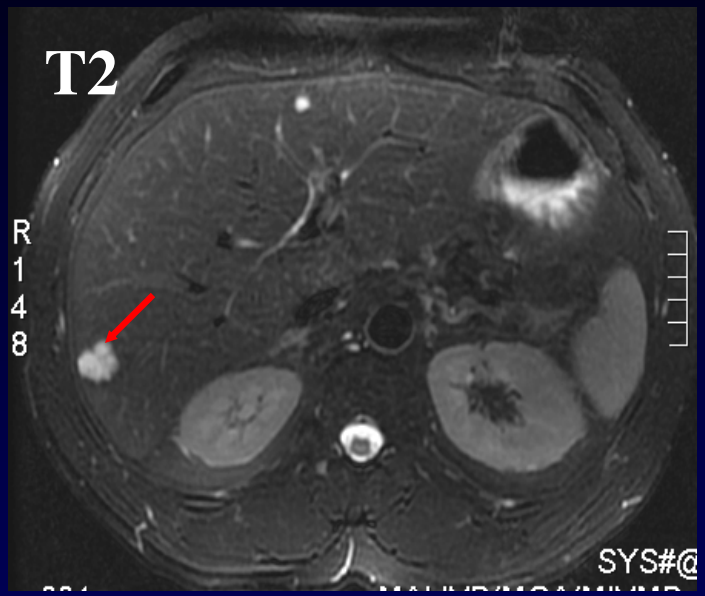
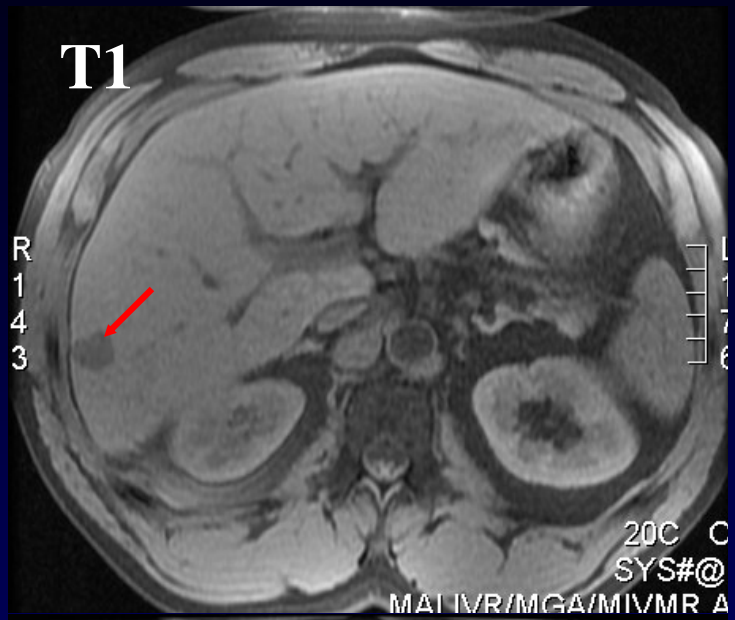
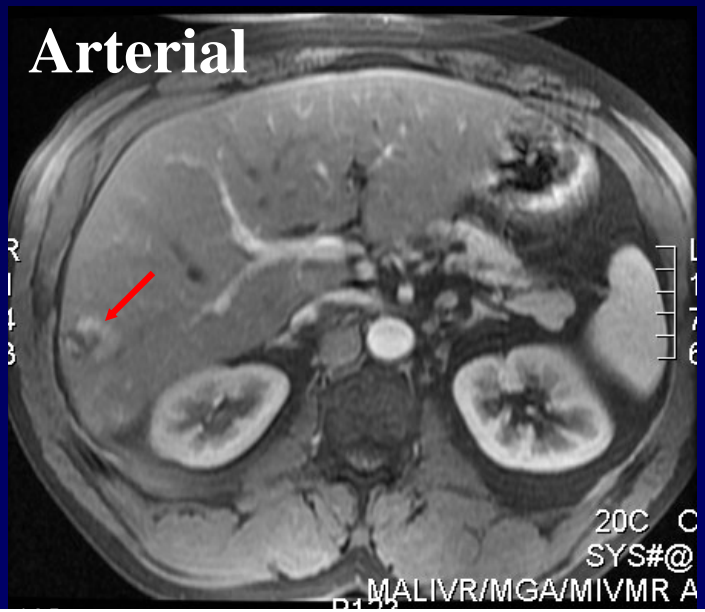
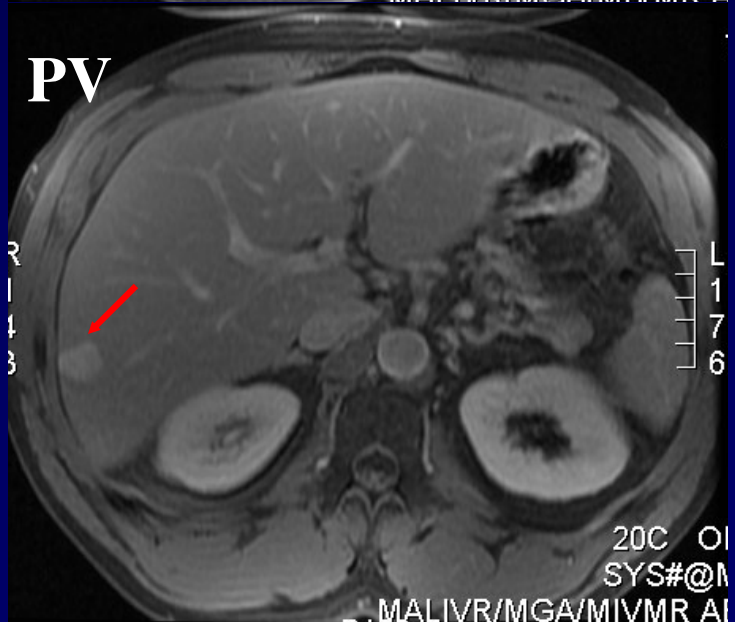
- Peripheral nodular enhancement with fill in

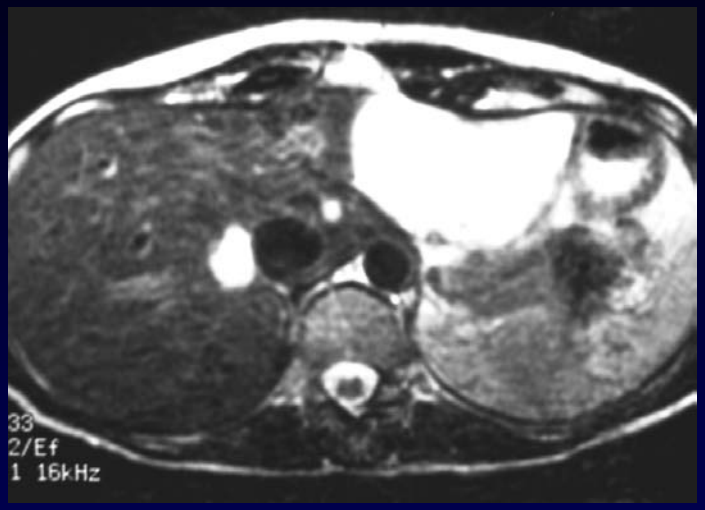




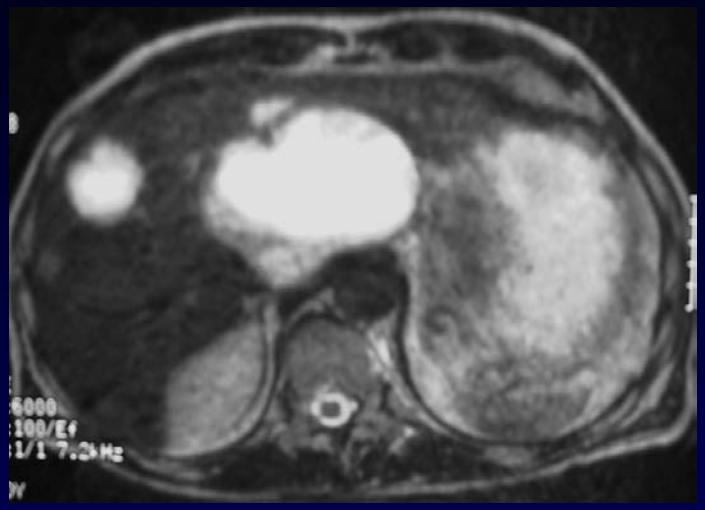




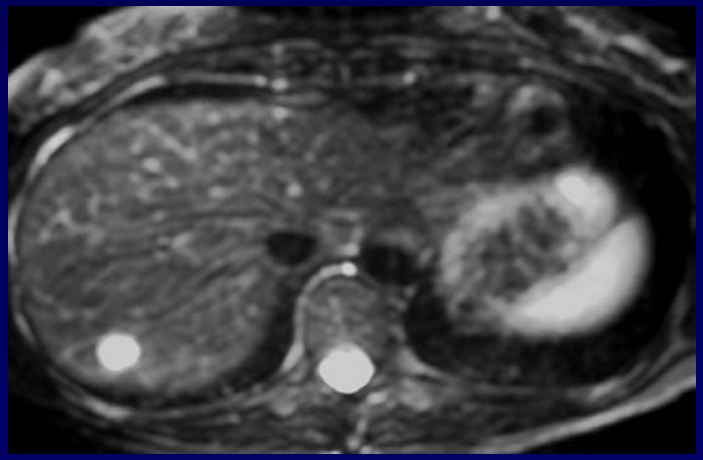
DDx of T2 Hyperintense Liver Lesions



hemangiomas



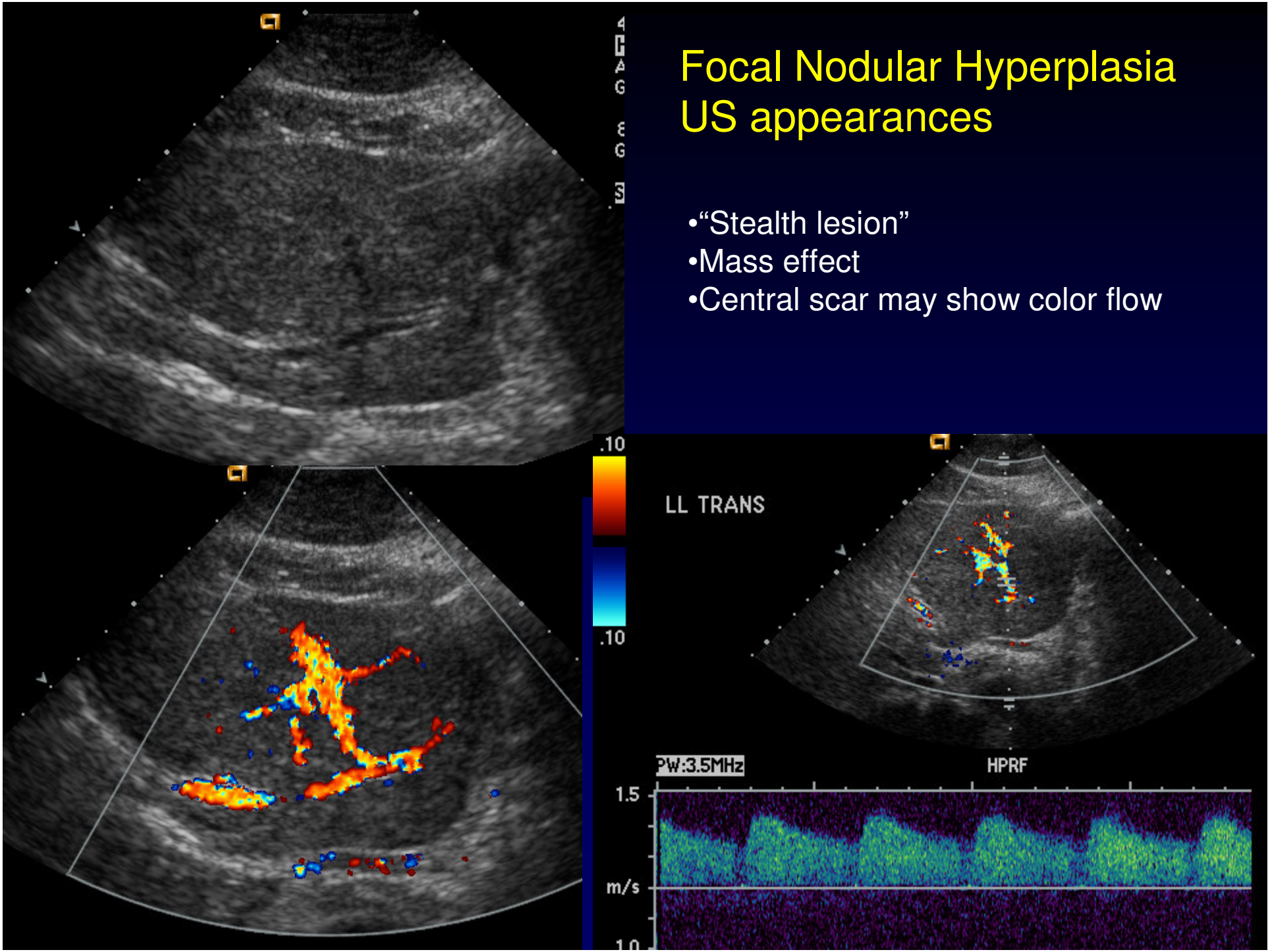
Hypervascular mets
(neuroendocrine)

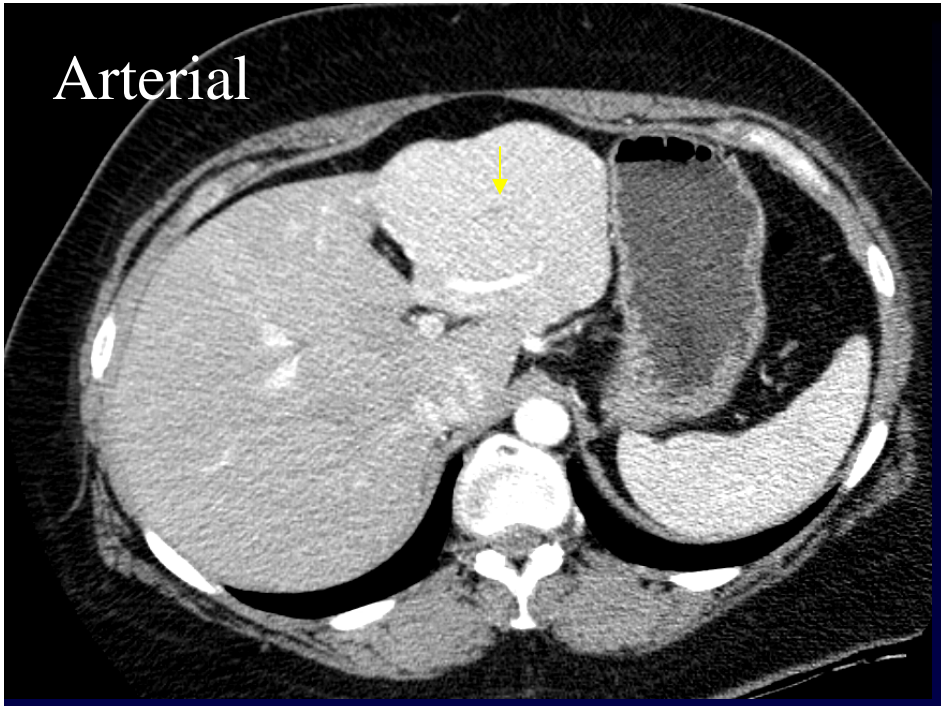


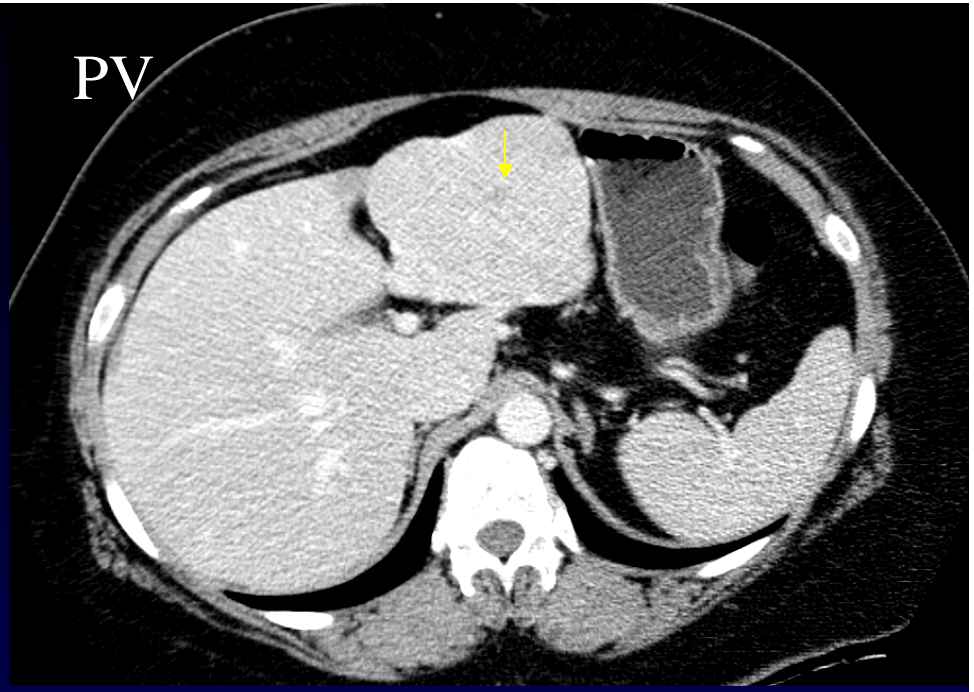
cyst

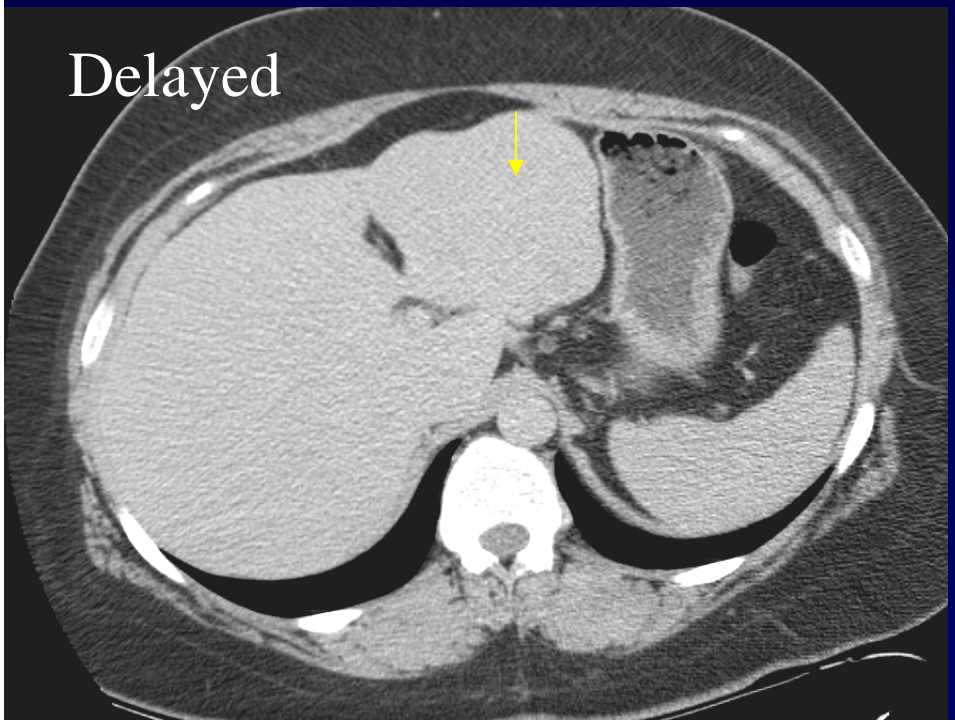
Focal Nodular Hyperplasia
US appearances

- "Stealth lesion"
- Mass effect
- Central scar may show color flow



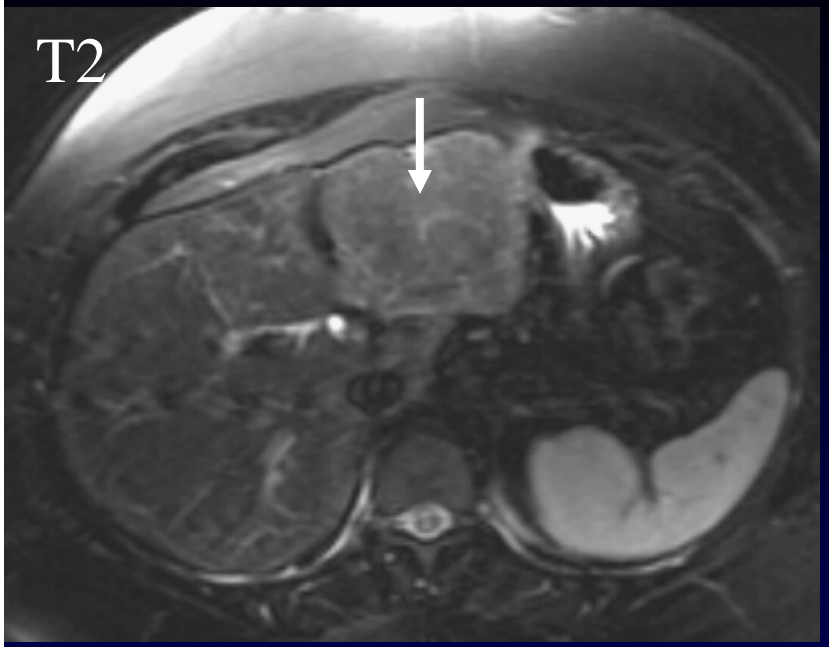






Focal Nodular Hyperplasia

- hypervascular on the arterial phase
- isodense on portal venous phase with delayed enhancement of central scar



Focal Nodular Hyperplasia

Central Scar T2 bright / hyperintense

- hypervascular on the arterial phase
- isodense on portal venous phase
- with delayed enhancement of central s