Adenoma

- ↑ risk Heterogeneous group of benign hepatocellular neoplasms with distinctive genetic, pathologic, and clinical features.
- Etiology
  - in oral contraceptive and anabolic steroid users
  - Pregnancy increases growth rate and risk of rupture
  - Hepatic steatosis ↑ growth and number of adenomas
  - Diabetes mellitus
  - von Gierke type I glycogen storage disease
    - » Multiple adenomas in 60% of affected patients

Presentation

- RUQ pain (40%): Due to hemorrhage
- Asymptomatic (20%)
  - Especially those with *HNF1A* type
- No elevation of serum α-fetoprotein
- Hemorrhage: Intrahepatic or intraperitoneal (40%)
- Rupture: Increased risk in pregnancy
- May regress on withdrawal of oral contraceptives

Demographics

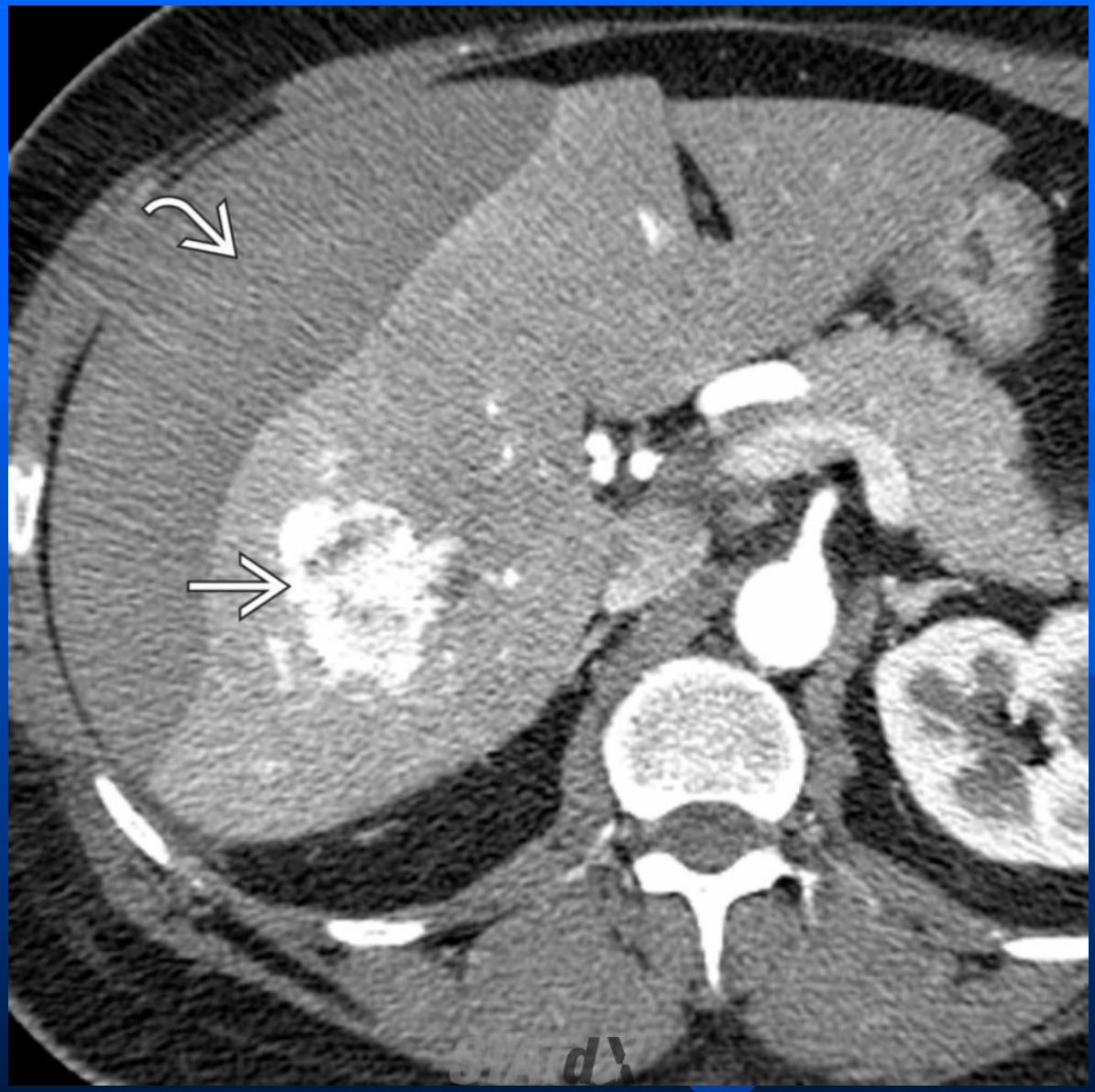
- **Age**
  - Young women in childbearing age group
  - Predominantly in 3rd and 4th decades
- **Gender**
  - 98% seen in females
    - » Not seen in males unless on anabolic steroids or with glycogen storage disease

Imaging

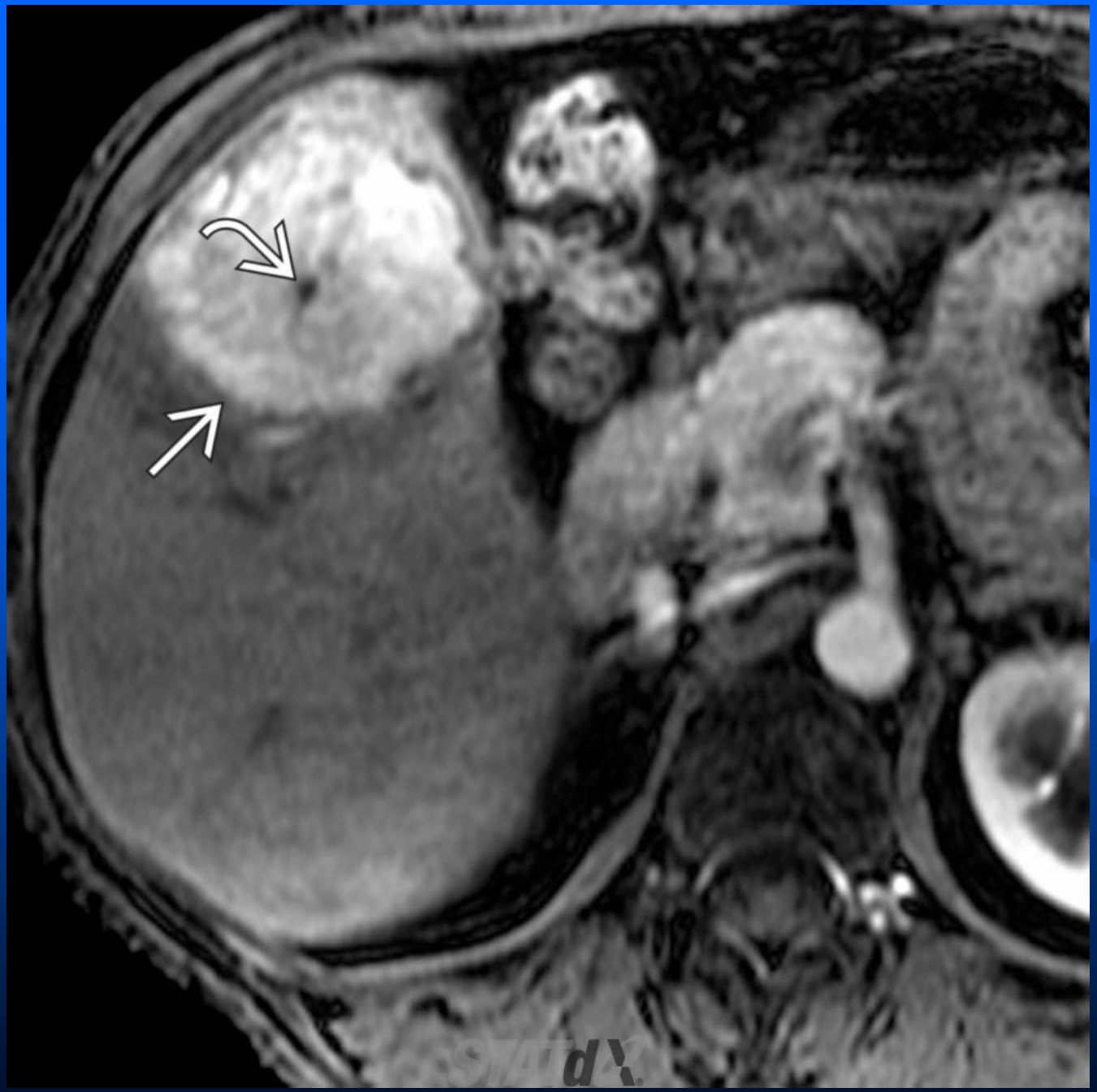
- Uncommon benign neoplasm; much less common than focal nodular hyperplasia (FNH)
  - Almost all in young women with high estrogen environment, including steatosis and oral contraceptive use
  - Anabolic steroids, diabetes, and glycogen storage disease are other causes
- Key features (not always present): Hypervascularity, fat content, hemorrhage, encapsulation
- MR shows some elements better than CT (lipid and hemorrhage)
- Gadoxetate-enhanced MR (Eovist; Primovist)
  - Adenoma shows no substantial uptake or retention
  - Key distinction from FNH
- T1WI: Mass: Heterogeneous signal intensity
  - Increased signal intensity (due to fat or recent hemorrhage)
  - Decreased signal intensity (necrosis, calcification, old hemorrhage)
- Heterogeneous, hypervascular mass with foci of fat or hemorrhage in a young woman

DDx:

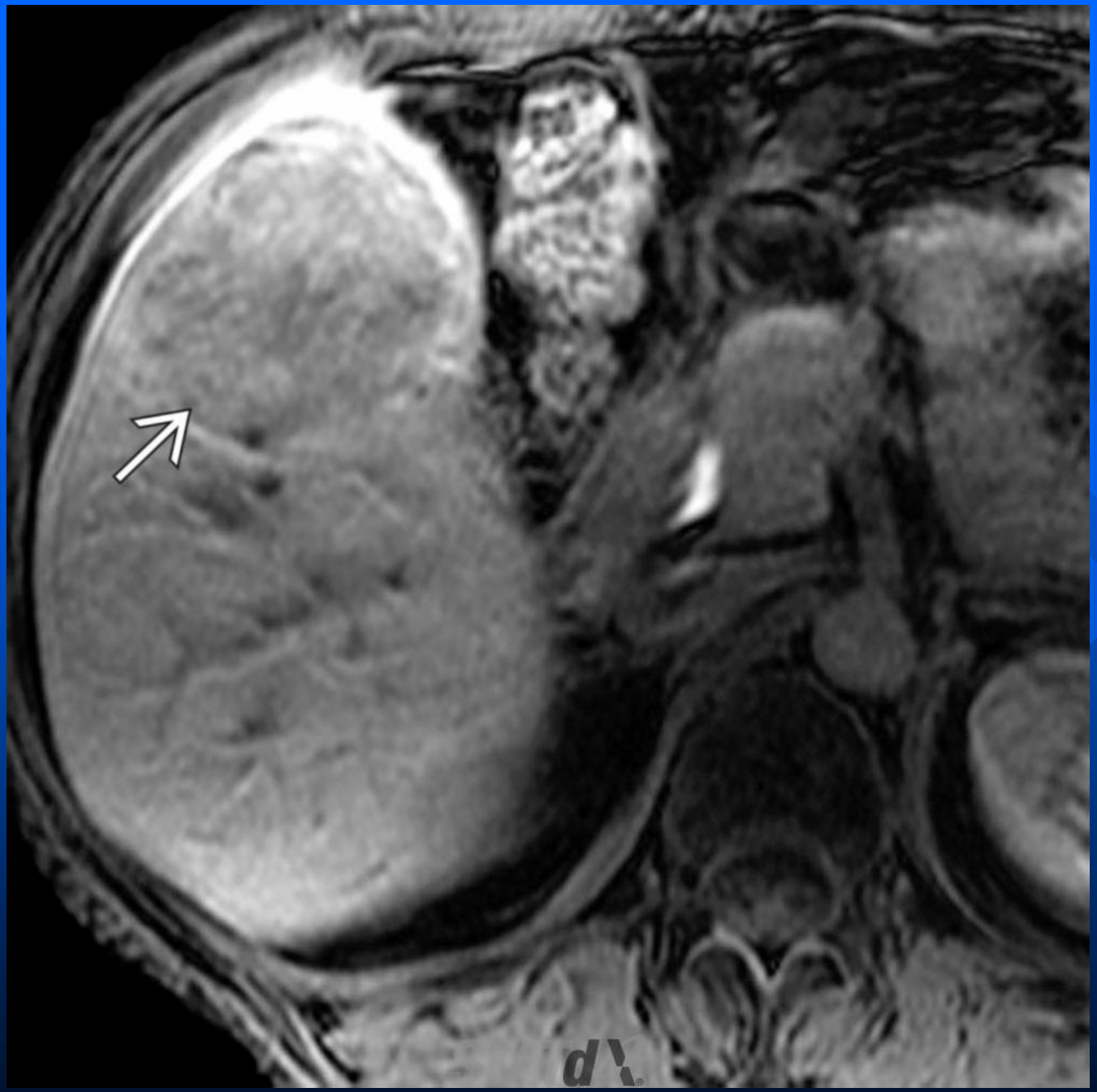
- **Hepatocellular Carcinoma**
  - May be hard to distinguish on imaging or pathology
  - Biliary, vascular, nodal invasion and metastases = malignancy
  - HCC typically occurs in older, cirrhotic men
    - » Adenoma occurs in young, healthy women
- **Fibrolamellar HCC**
  - Large, lobulated mass with scar and septa
  - Vascular, biliary invasion and metastases common
- **Focal Nodular Hyperplasia**
  - Arterial phase: **Homogeneously** enhancing mass
  - All other phases: Isodense to normal liver
  - T2WI: Scar is typically hyperintense
  - **Uniformly retains gadoxetate on delayed phase MR**
- **Hypervascular Metastases**
  - Usually multiple; look for primary tumors
    - » Breast, thyroid, kidney, and endocrine
  - Arterial phase: Heterogeneous enhancement
  - Portal and delayed phases: Iso-/hypodense washout



Axial CECT of a 40-year-old woman with sudden RUQ pain and syncope shows an intensely enhancing mass (white solid arrow) in the right lobe of the liver. A lentiform heterogeneous collection of fluid indents the surface of the liver, and within this collection is a focus of higher density (white curved arrow) likely representing a sentinel clot. A ruptured inflammatory hepatic adenoma was resected.



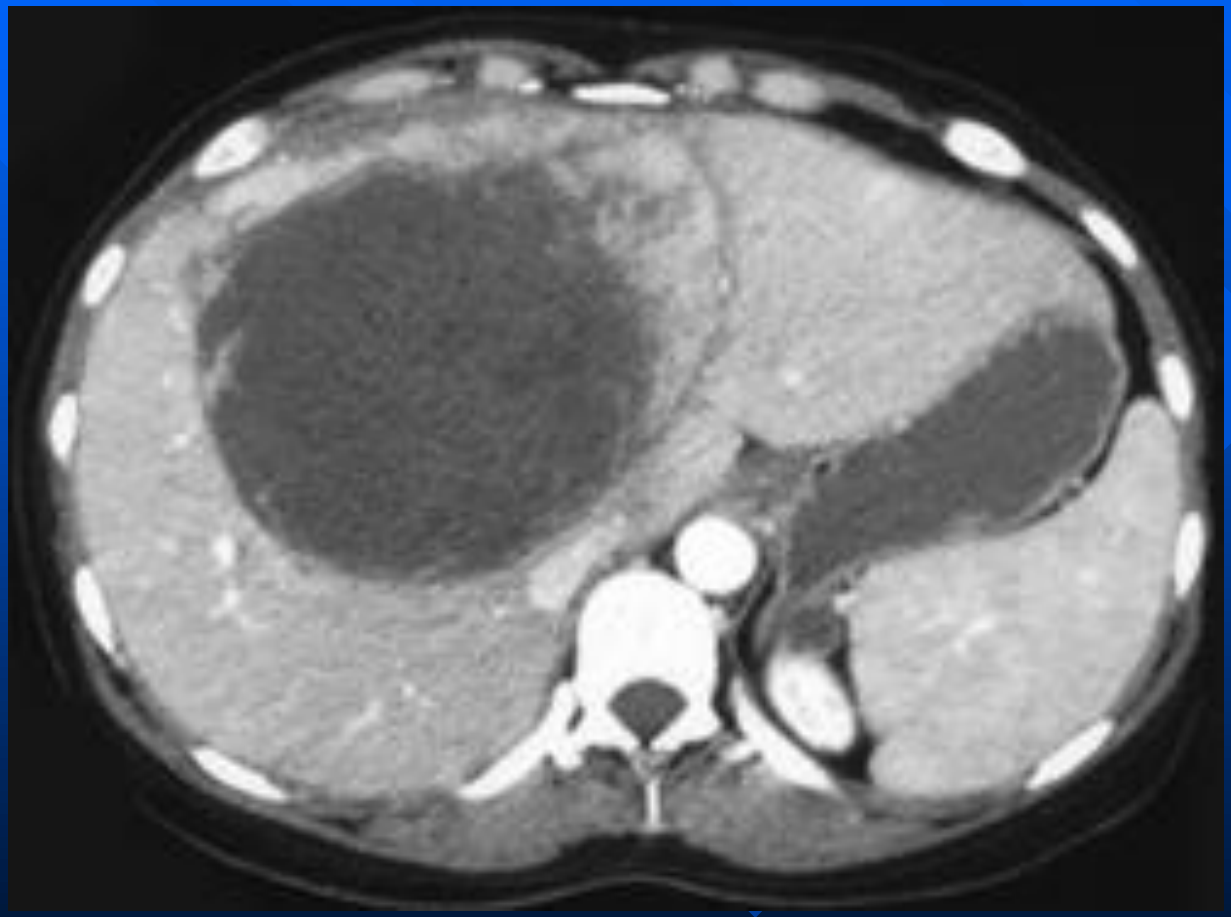
On MR sections in the same case taken after bolus injection of gadoxetate (Eovist) the mass is hypervascular (white solid arrow) whereas the central scar is hypointense (white curved arrow). The mass and central scar were nearly isointense on the venous phase images (not shown).



On a 20-minute delayed image in the same case the mass (white solid arrow) retains less contrast material than normal liver. Because there was concern that the lesion was not a typical FNH, it was resected.

Axial opposed-phase GRE T1WI MR shows an encapsulated mass (white solid arrow) with hyperintense foci (white curved arrow) representing hemorrhage or fat. The in-phase images showed increased signal within the mass.

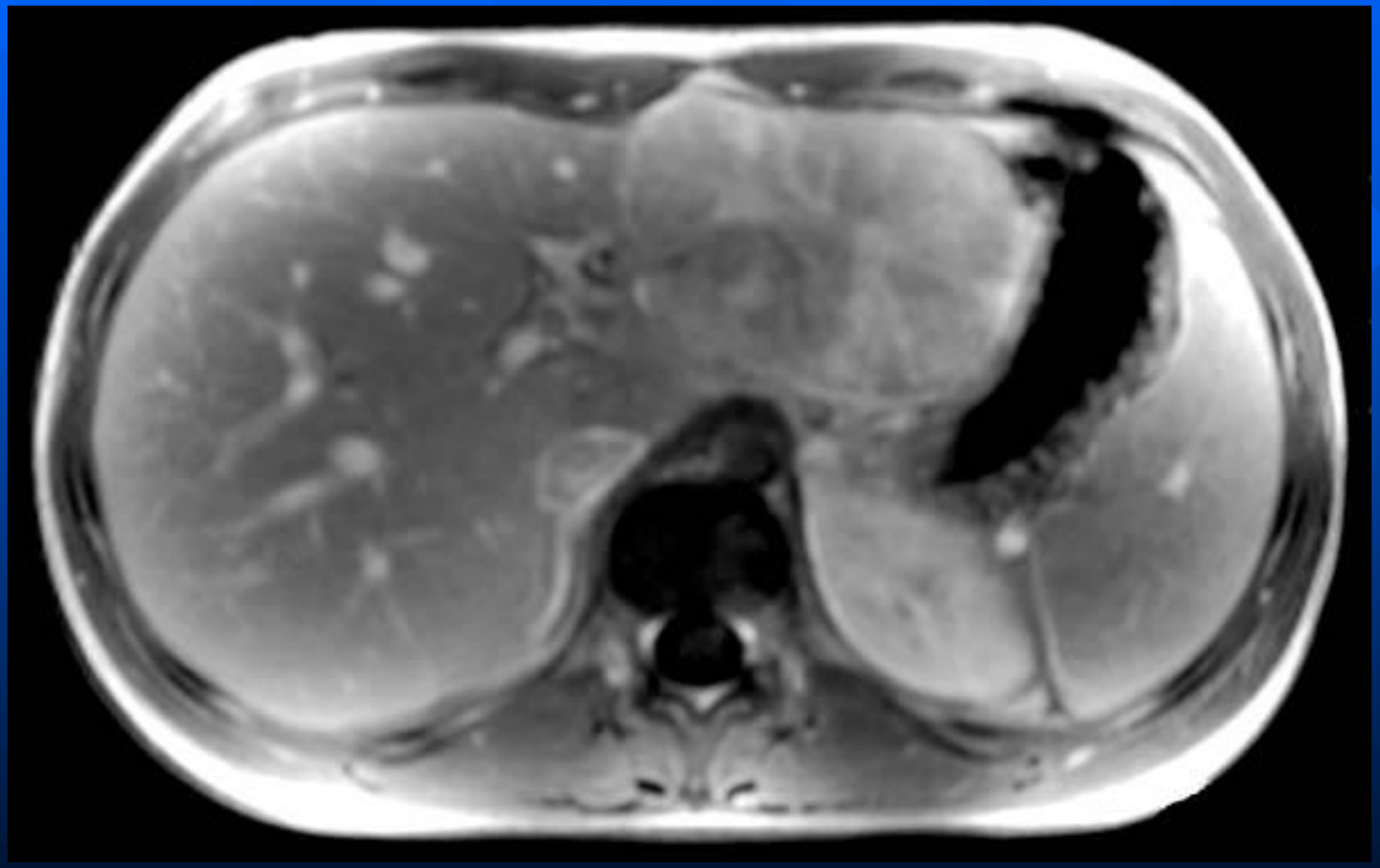
Hepatic adenoma that recently bled



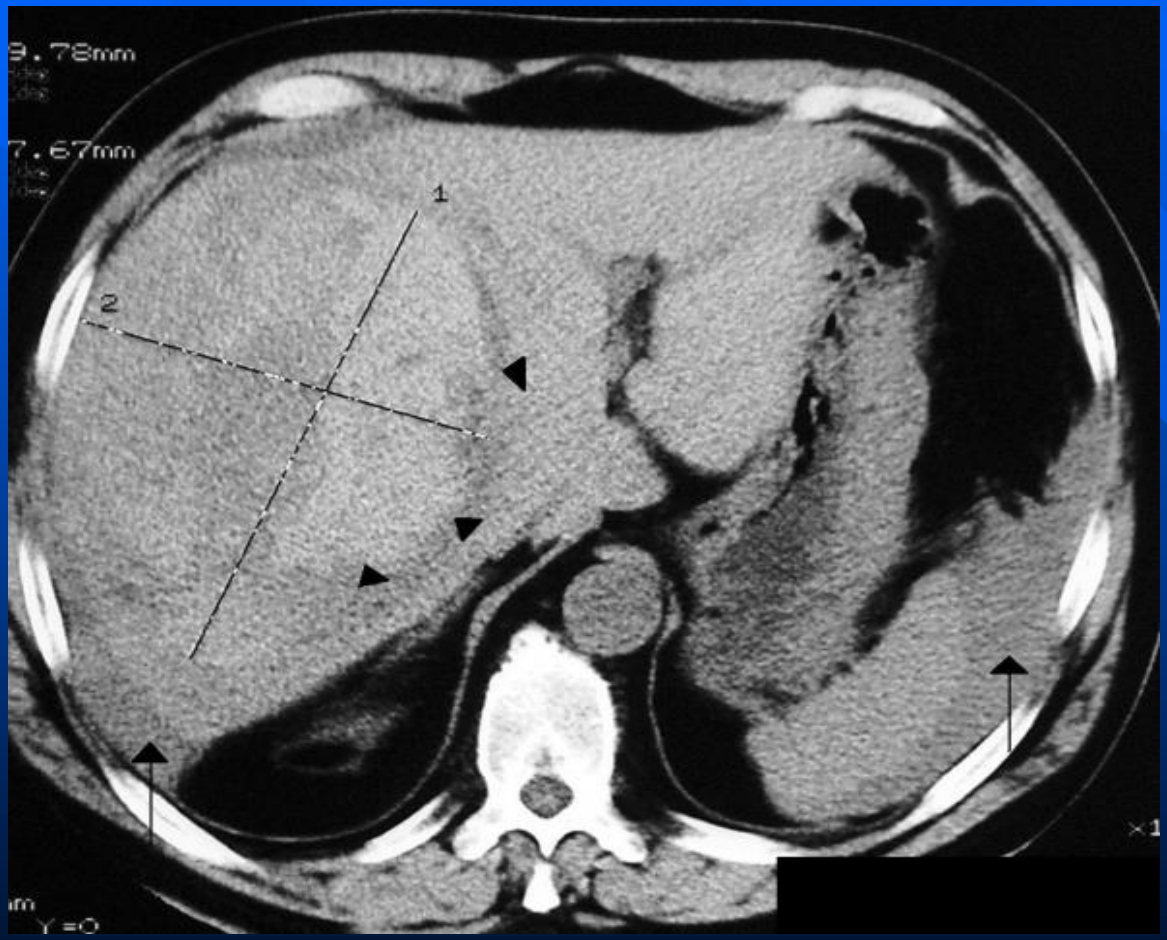
Adenoma

- May lose signal on out of phase imaging
- Central core will not be T2 bright, no delayed enhancement.

Liver cell adenoma mimicking focal nodular hyperplasia



Bleeding liver cell adenoma



Multiple adenomas, Non contrast