

Liver lesion	Distinctive features
<b>Benign</b>	
Hepatic cyst	○ Simple fluid
Biliary hamartoma	○ Simple fluid ○ Usually multiple ○ Funny appearance on US (multiple hyperechoic foci)
Focal steatosis (or focal sparing)	○ No mass effect ○ Intervening vessels ○ Can use MR in/out phase to confirm
Hemangioma	○ Progressive, discontinuous, peripheral nodular enhancement ○ Can flash-fill (hypervascular) ○ Can have non-enhancing scar (giant)
Focal nodular hyperplasia (FNH)	○ "Stealth lesion" ○ Hypervascular ○ Delayed enhancing central scar ○ Retains Eovist on delay
Adenoma	○ Intra-voxel fat ○ Can hemorrhage ○ Has capsule ○ Assoc. with steroids, OCPs
Angiomyolipoma	○ Gross fat, but 50% are fat poor ○ Can hemorrhage ○ Assoc. with tuberous sclerosis

Liver lesion	Distinctive features
<b>Malignant</b>	
Hepatocellular carcinoma (HCC)	○ Hypervascular ○ Washout ○ Enhancing capsule ○ Can hemorrhage ○ Underlying cirrhosis or other risk factors (Hep B) ○ Elevated AFP
Fibrolamellar HCC	○ Non-enhancing central scar ○ Younger, no cirrhosis
Cholangiocarcinoma	○ Capsular retraction ○ Progressive enhancement ○ Biliary ductal dilatation ○ May calcify
Biliary cystadenoma/cystadenocarcinoma	○ Complex cystic mass ○ Cannot reliably differentiate benign/malignant
Lymphoma	○ Infiltrative vs multiple masses ○ Needs biopsy sample in saline for flow cytometry
Metastases	○ Variable (hypodense, hemorrhagic, cystic, etc) ○ Can calcify (mucinous cancers)

## **Differentiating features**

### **I. Cystic appearing**

- a. Hepatic cyst - simple
- b. Biliary hamartoma – simple, multiple
- c. Abscess – complex
- d. Biliary cystadenocarcinoma - complex
- e. Cystic metastases - complex

### **II. Hyperenhancing**

- a. FNH – no washout with Eovist
- b. HCC + washout with Eovist
- c. Hypervascular mets + washout with Eovist, ex: melanoma, neuroendocrine, RCC
- d. Hemangioma – flash-filling subtype

### **III. Retain Eovist at 20 minutes**

- a. FNH
- b. Rarely HCC (only low-grade subtypes)

### **IV. Fat containing**

- a. Steatosis – not mass-like, intervening vessels
- b. HCC - can be either
- c. Adenoma – intra-voxel
- d. Angiomyolipoma – macroscopic
- e. Ablated liver tumors - macroscopic

### **V. Hemorrhagic**

- a. Adenoma
- b. Angiomyolipoma
- c. HCC
- d. Mets (ex: MRCT – melanoma, RCC, choriocarcinoma, thyroid)

### **VI. Scar**

- a. FNH – usually delayed enhancement
- b. Fibrolamellar HCC – usually no enhancement
- c. Giant hemangioma – usually no enhancement

### **VII. Calcified**

- a. Cholangiocarcinoma
- b. Biliary cystadenocarcinoma
- c. Mucinous metastases
- d. Osteosarcoma metastases
- e. HCC (less commonly)