

MRI of liver tumors

Liverspecific contrast

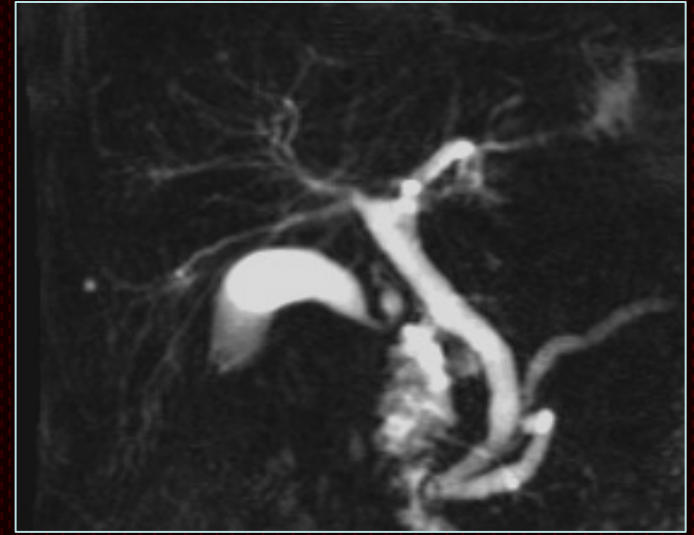
Diffusion

Eva Fallentin

Rigshospitalet

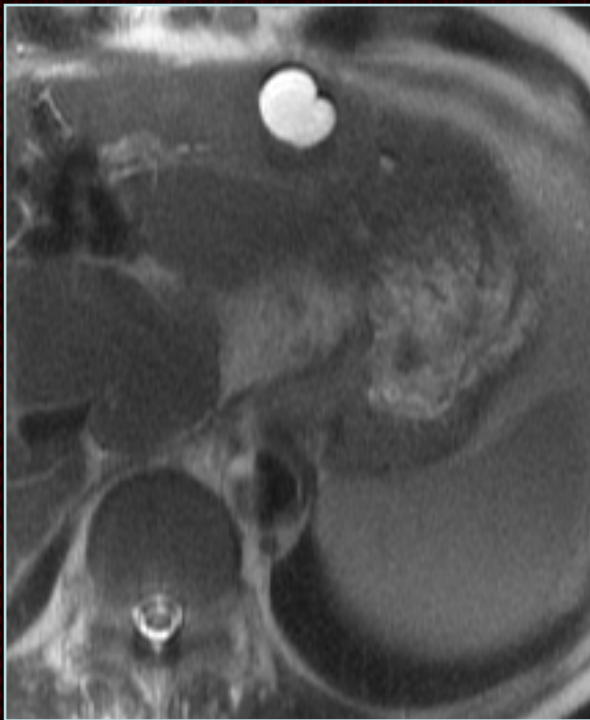
København

Benign focal liver lesions

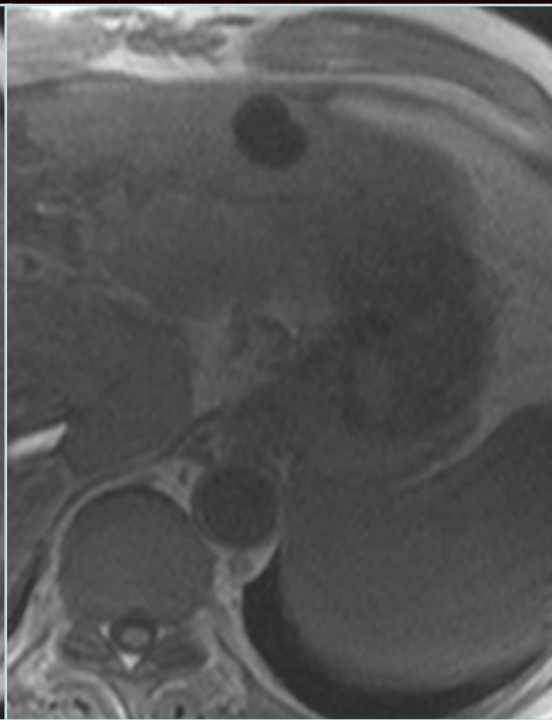


- Cysts, very frequent
- Hemangiomas, frequent (5-20%)
- Focal nodular hyperplasia, FNH (2-5%)
- Liver adenoma

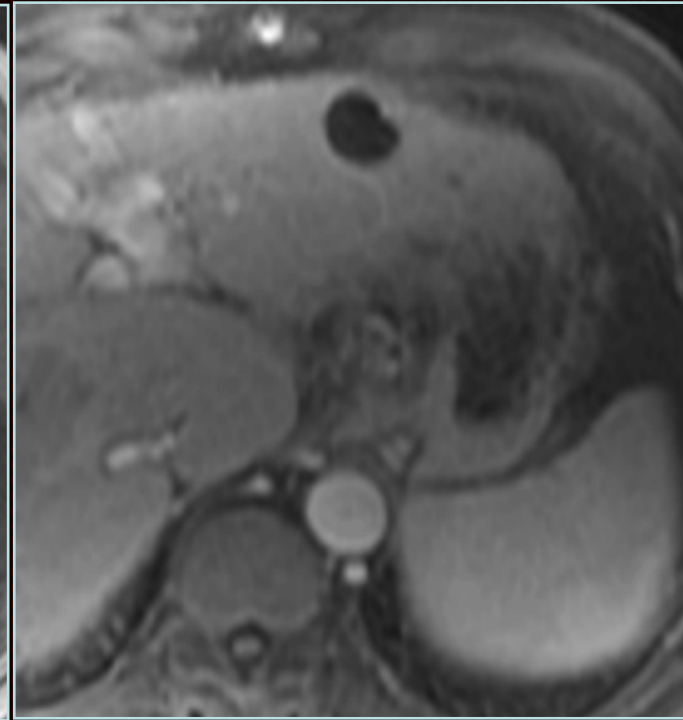
LIVER CYSTS



T2 + VERY T2

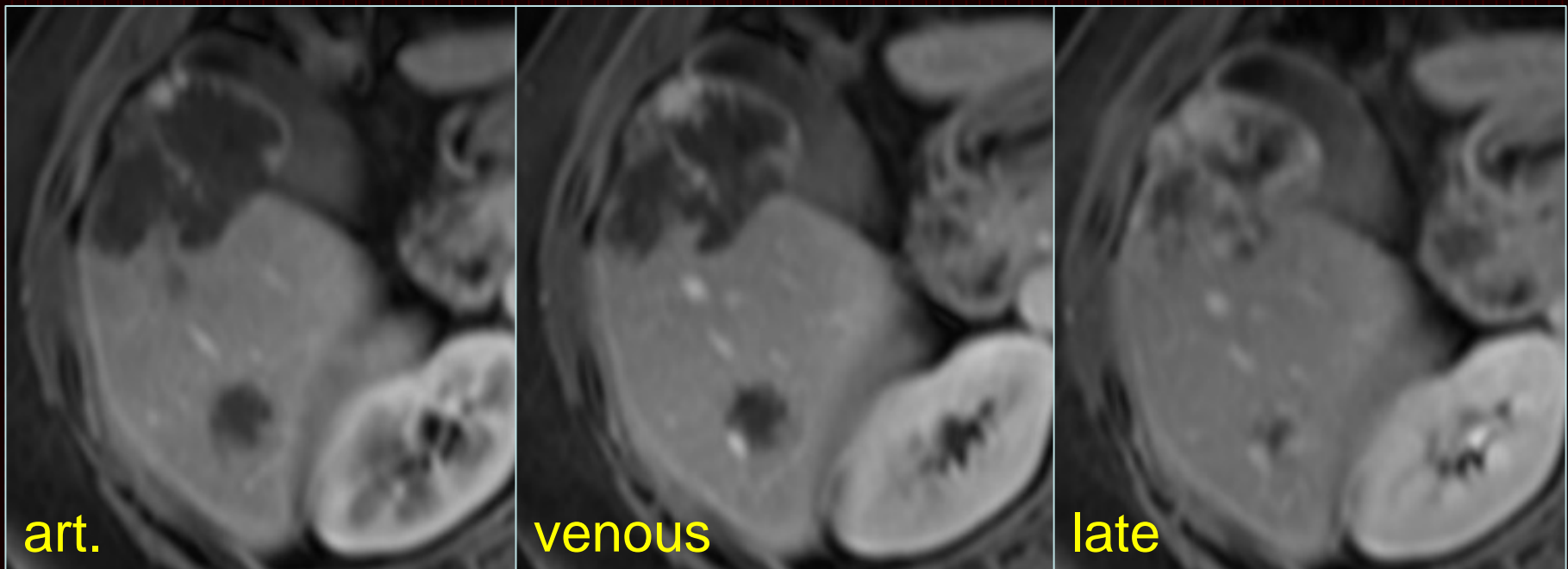
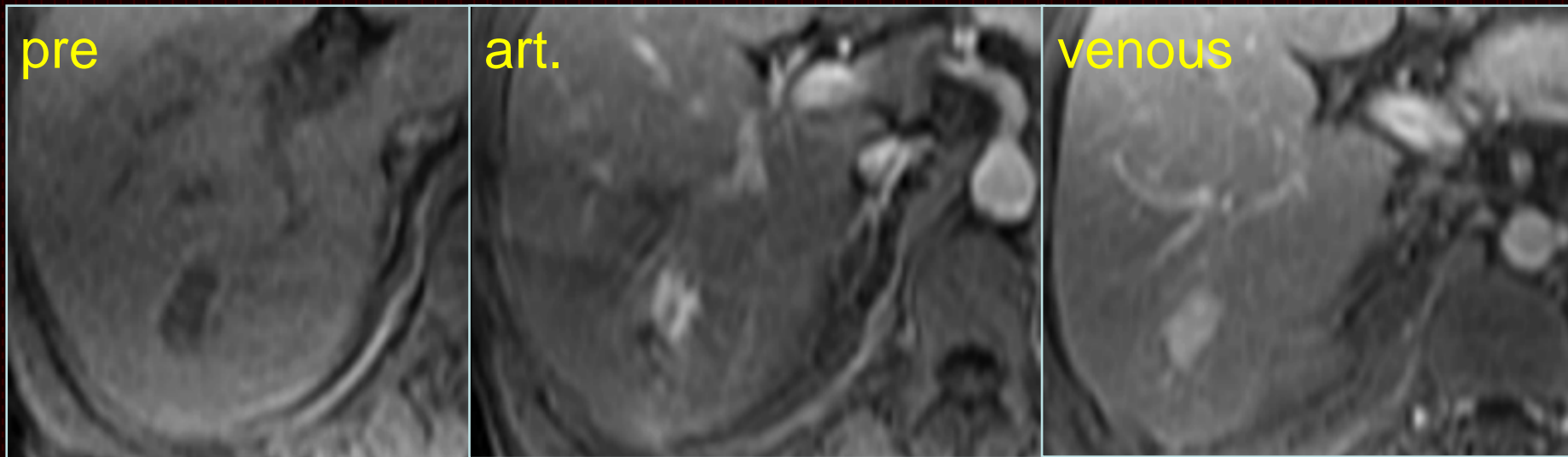


T1



T1 + C

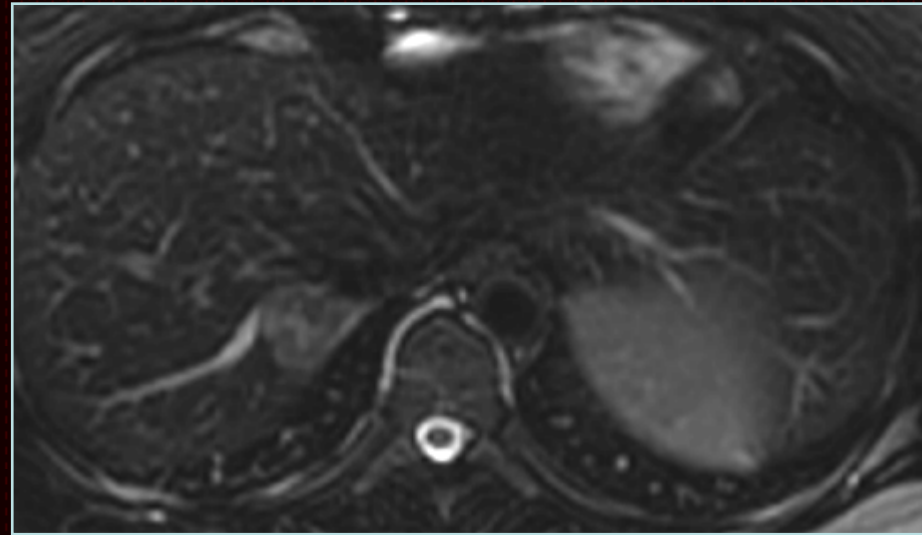
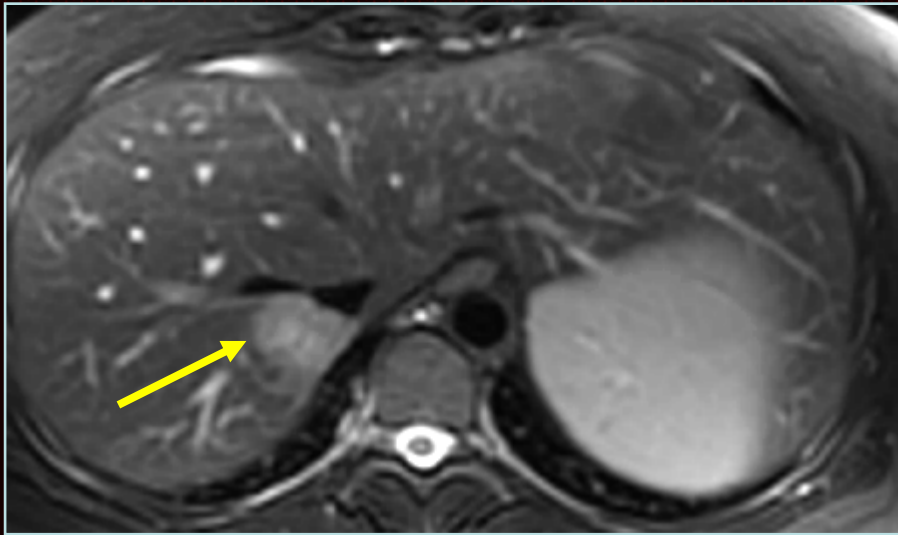
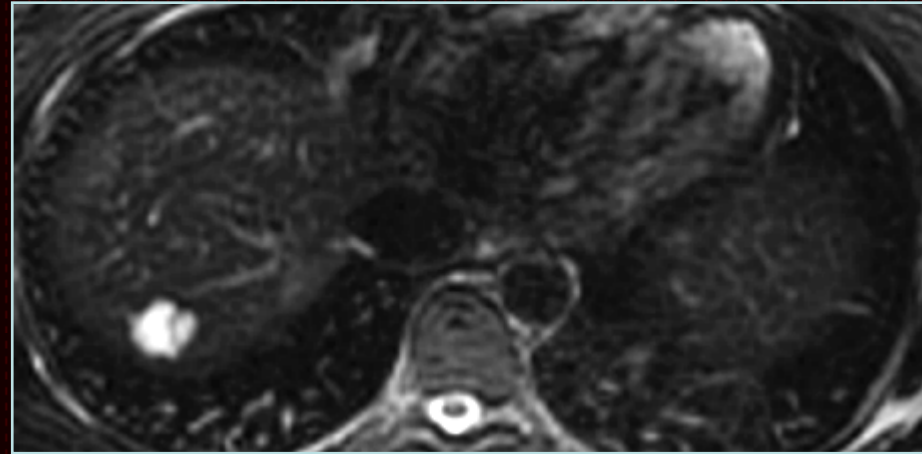
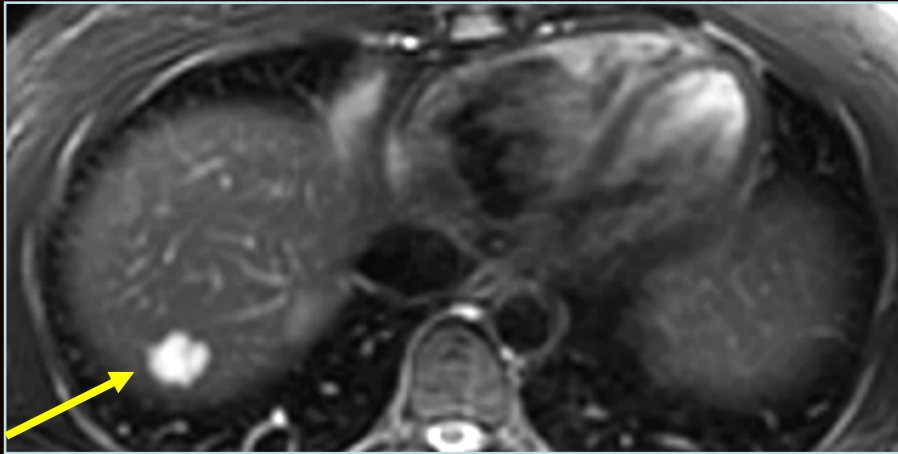
HEMANGIOMA i.v. contrast



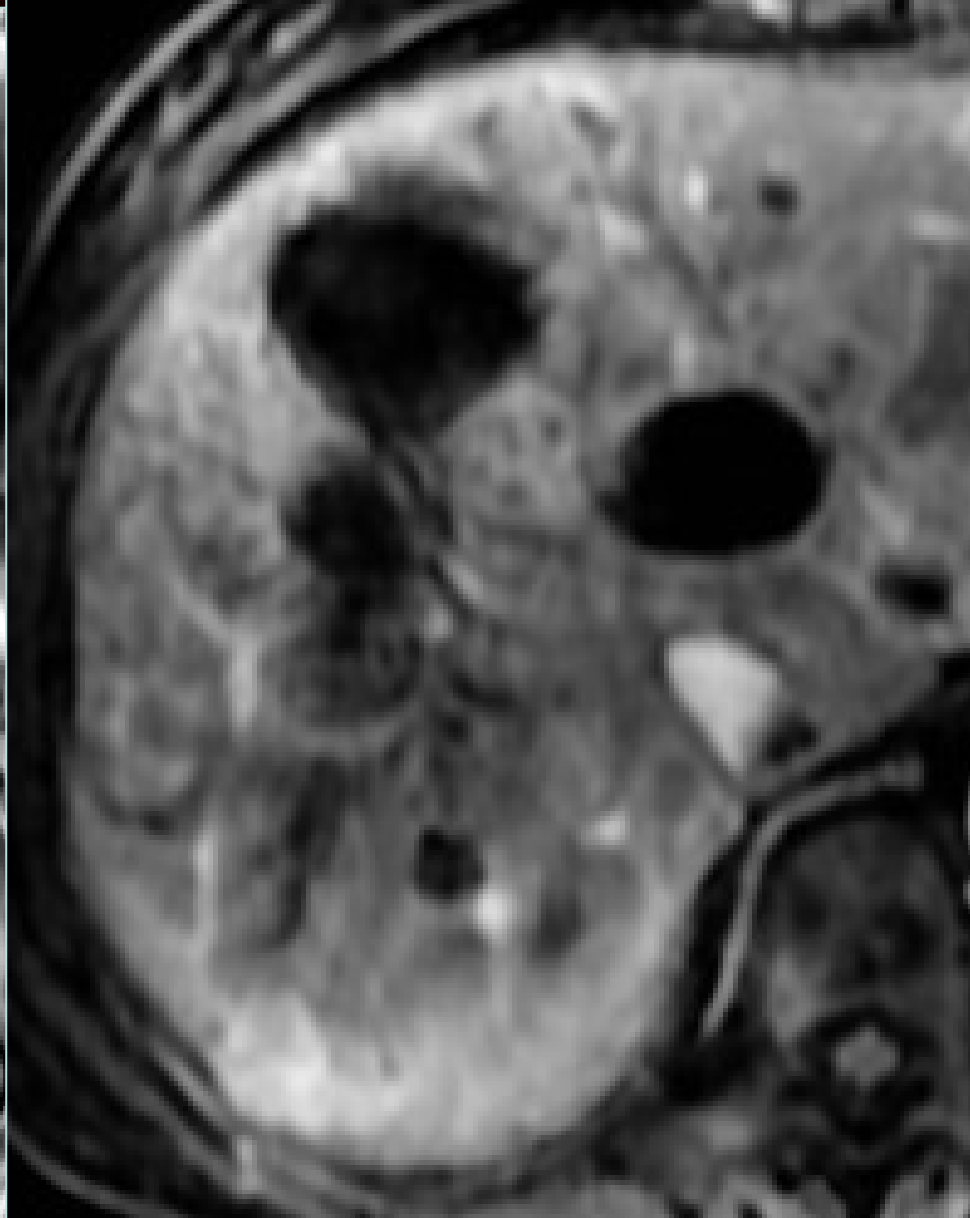
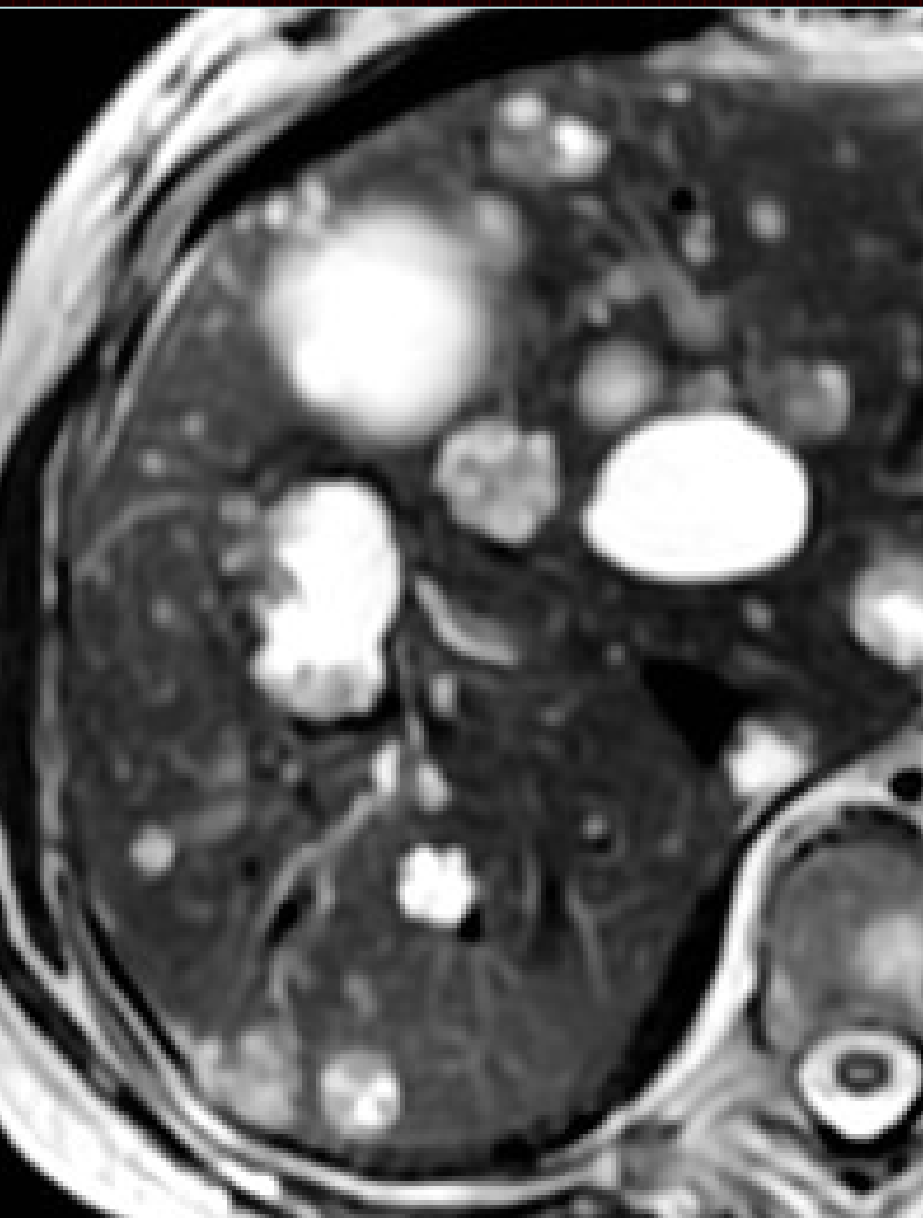
Hemangioma vs. metastases

T 2

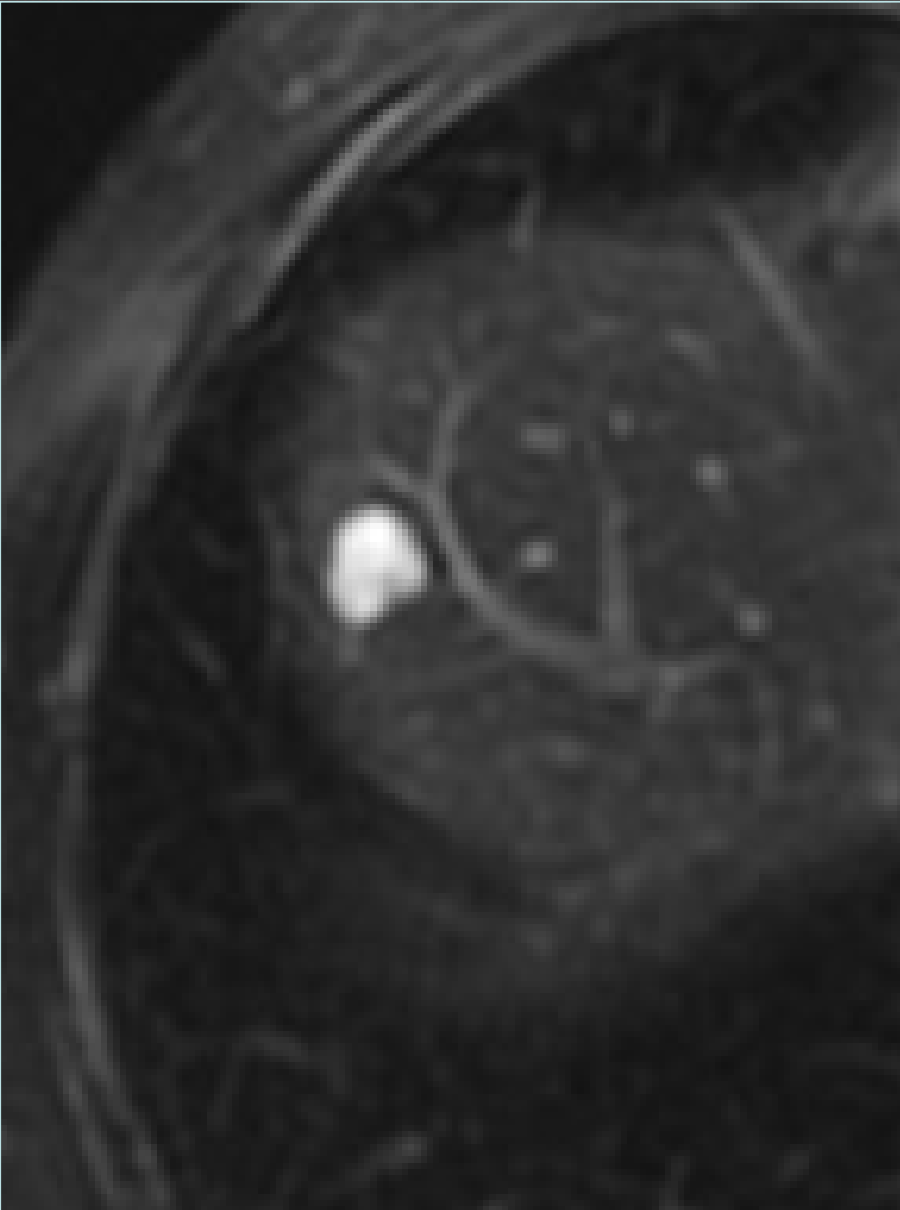
Heavily T 2, TE > 120 ms



NET metastases



Mucinous metastases

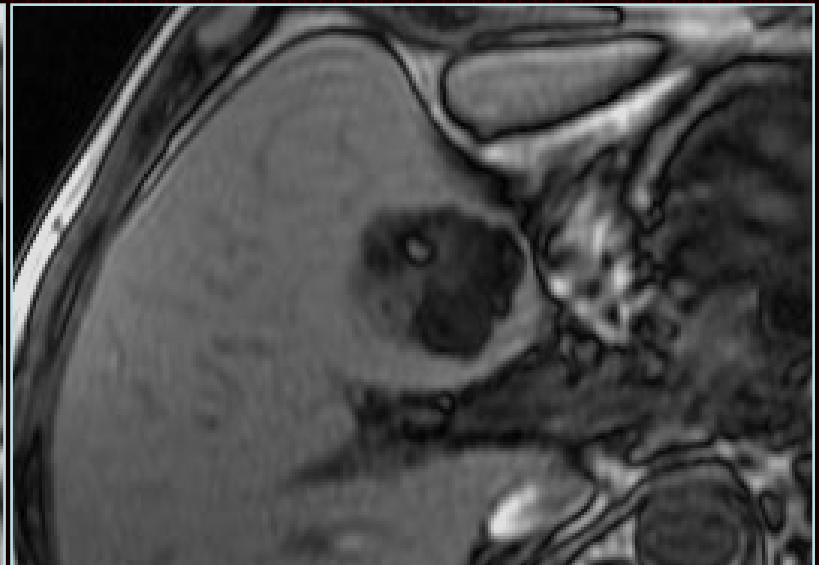
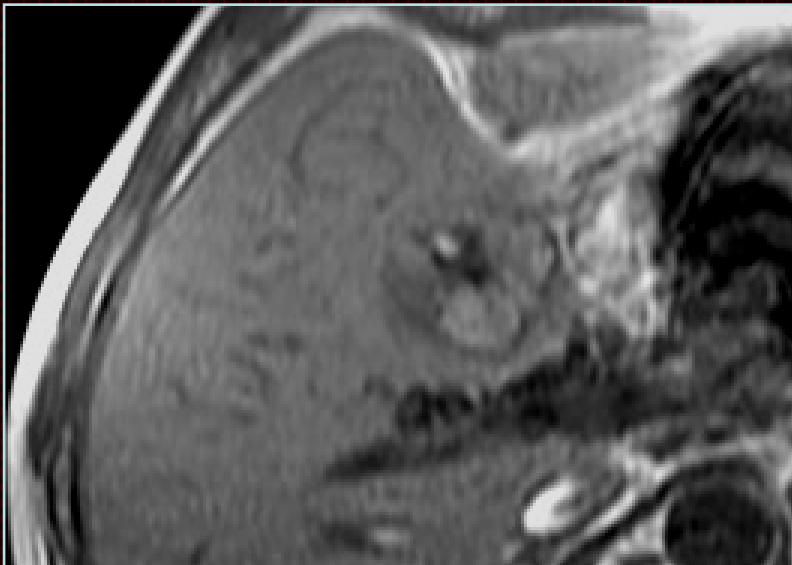


Fatty tumor, hepatocellular

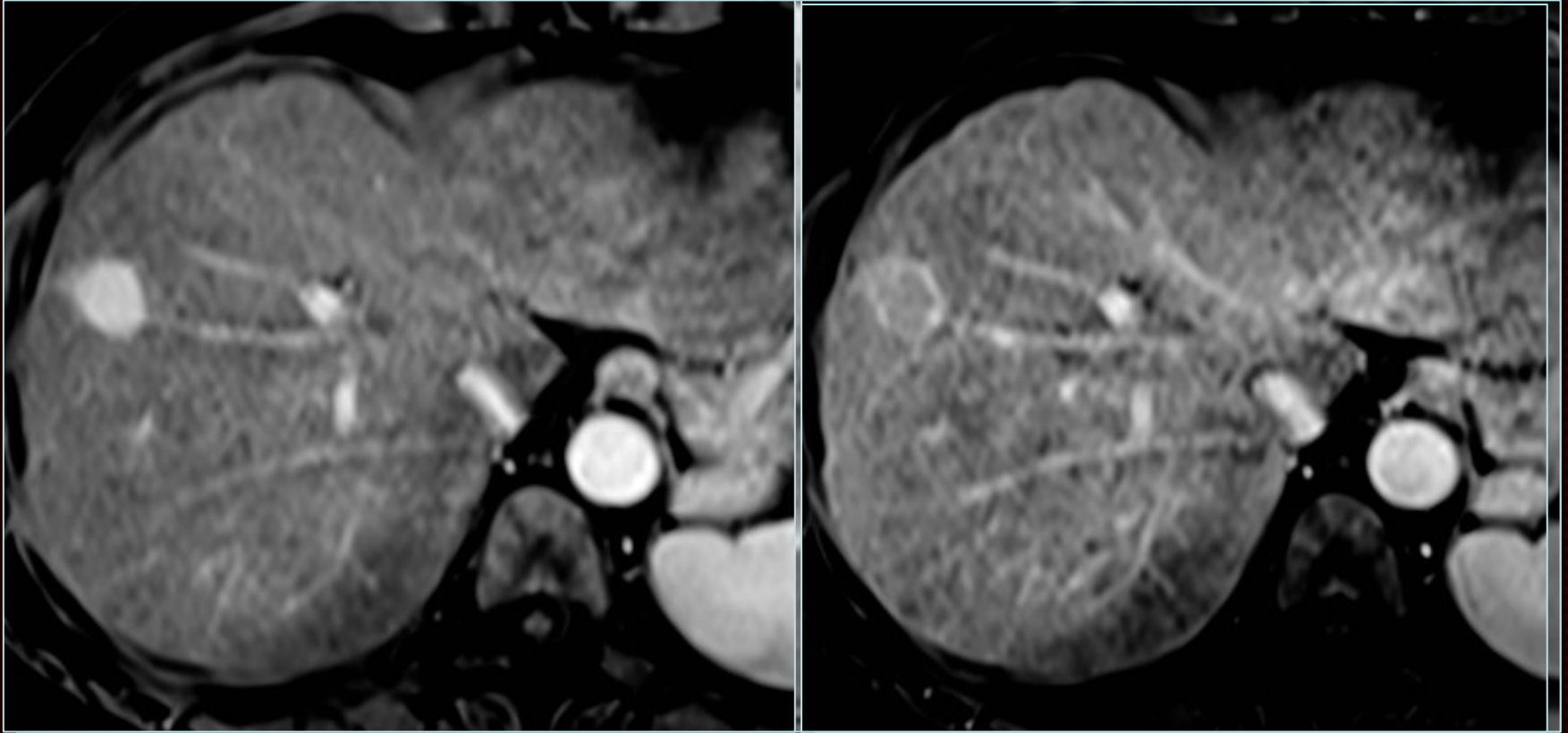
IN PHASE



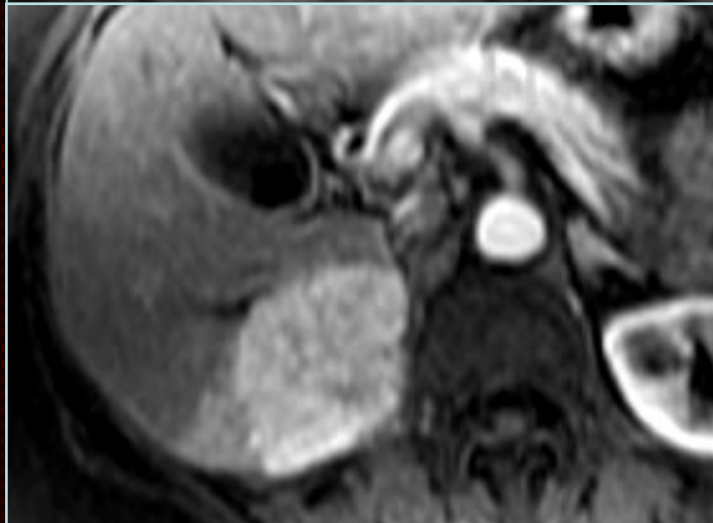
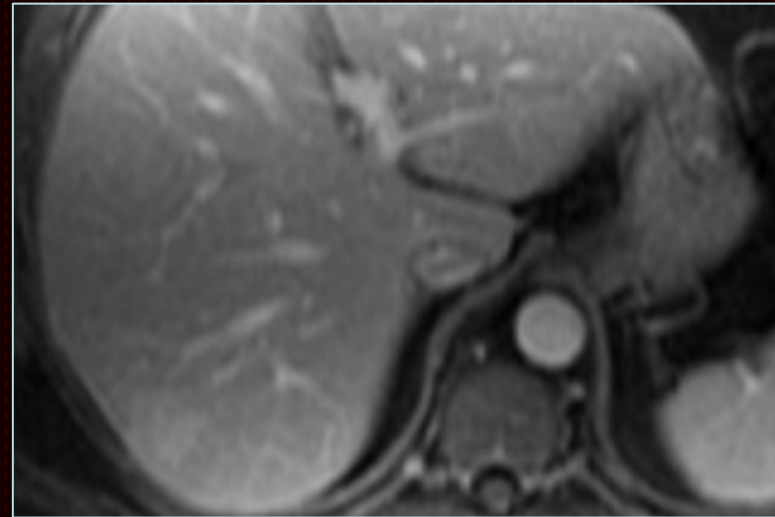
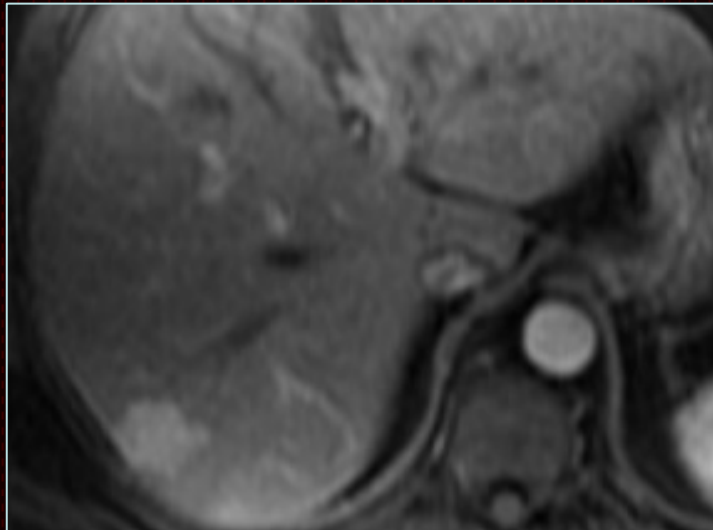
OPPOSED PHASE



Glycogen containing nodule in cirrhotic liver

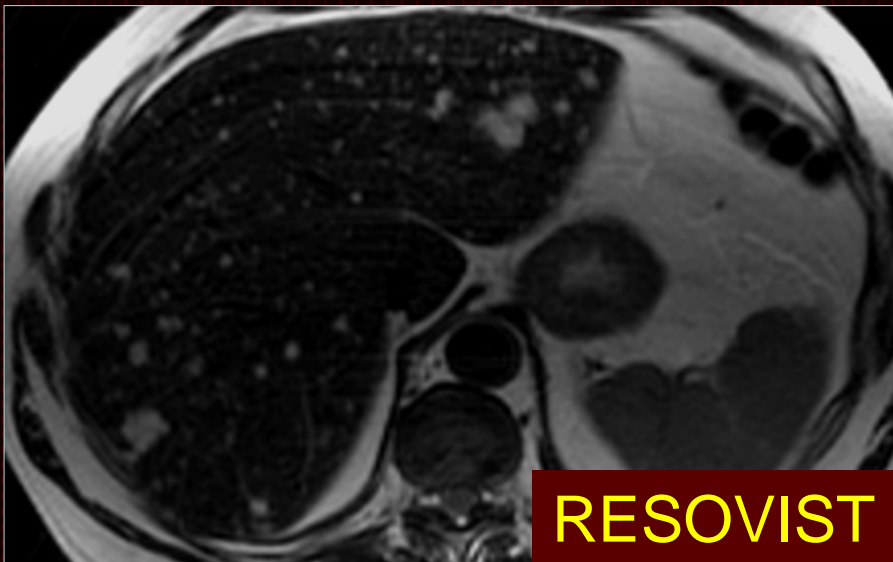
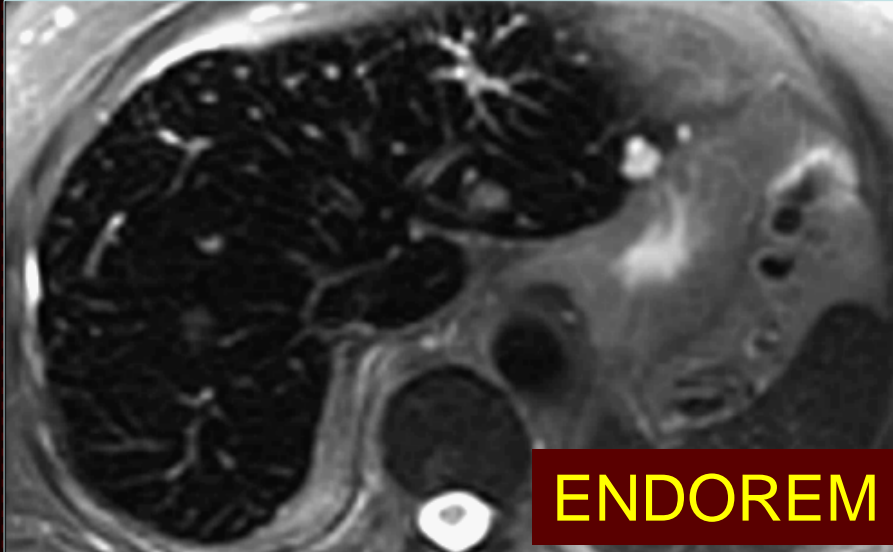


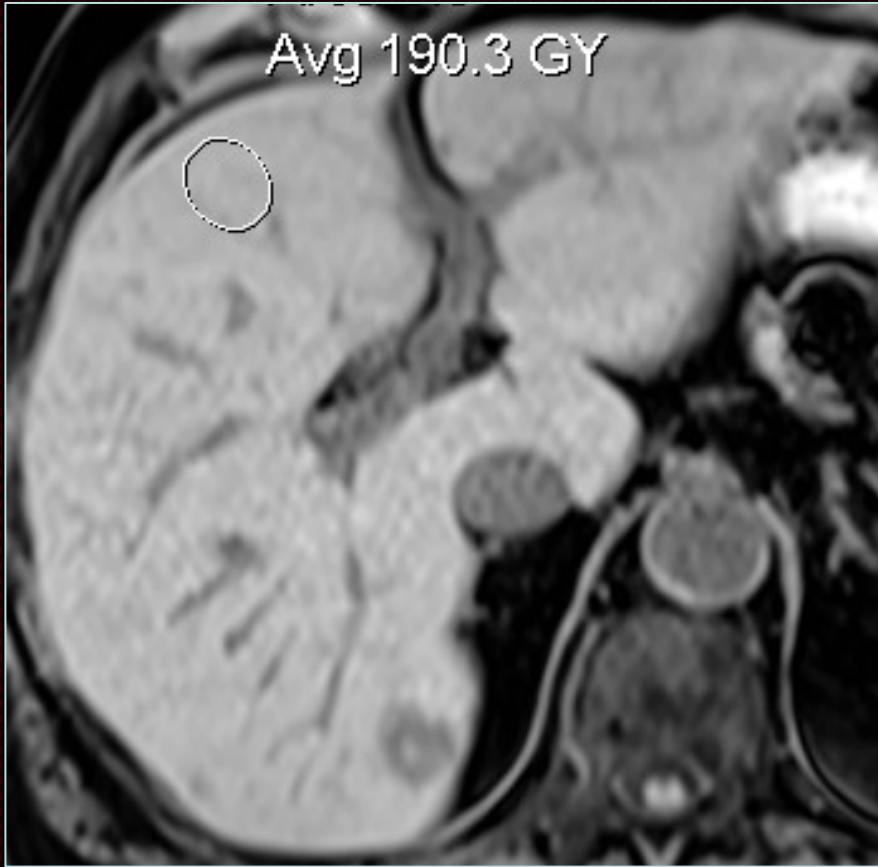
Benign / malignant ? Based on enhancement pattern



LIVER SPECIFIC CONTRAST

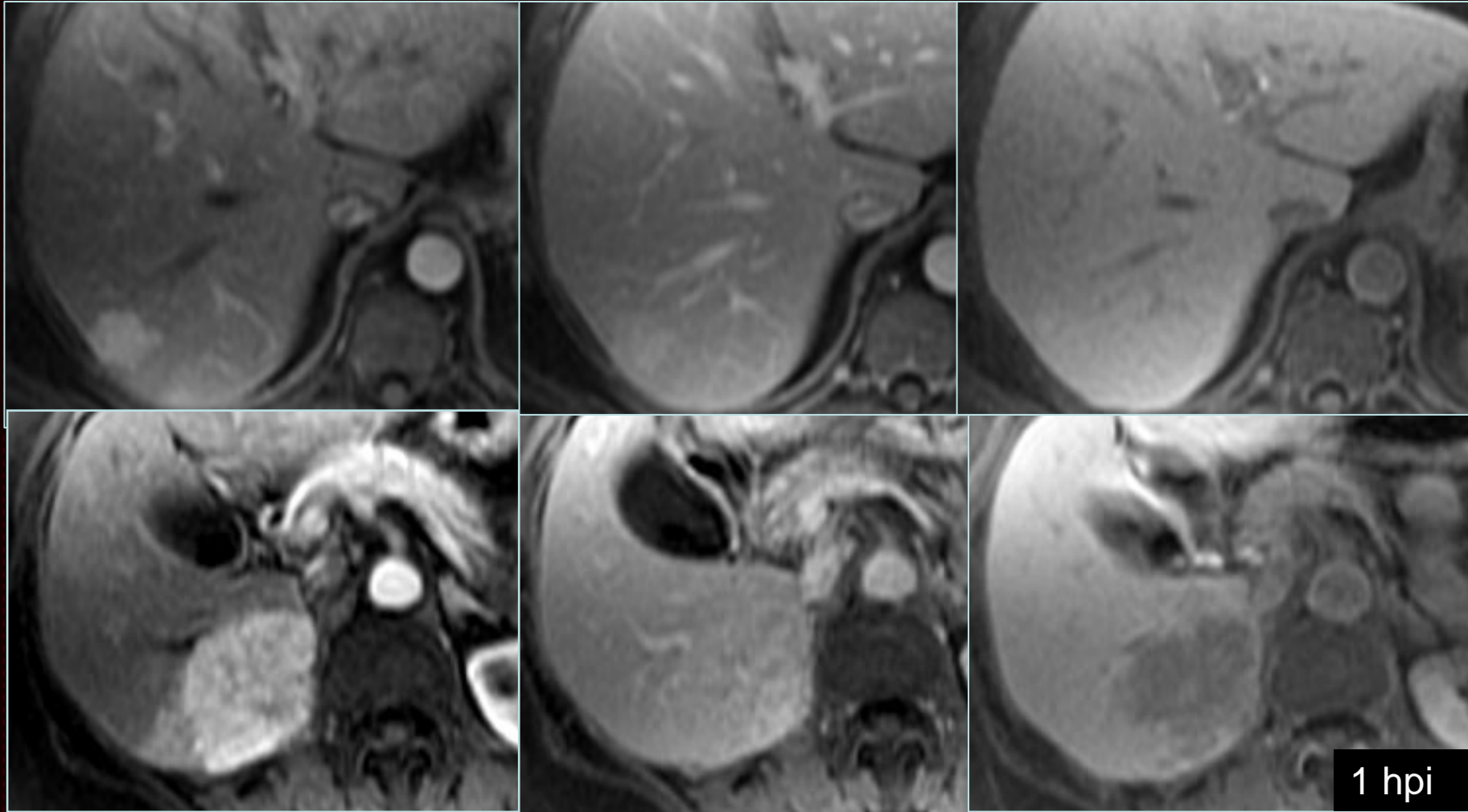
SPIO or hepatobiliary agents





**Primovist , gadoxetic acid
precontrast and 15 min
postcontrast**

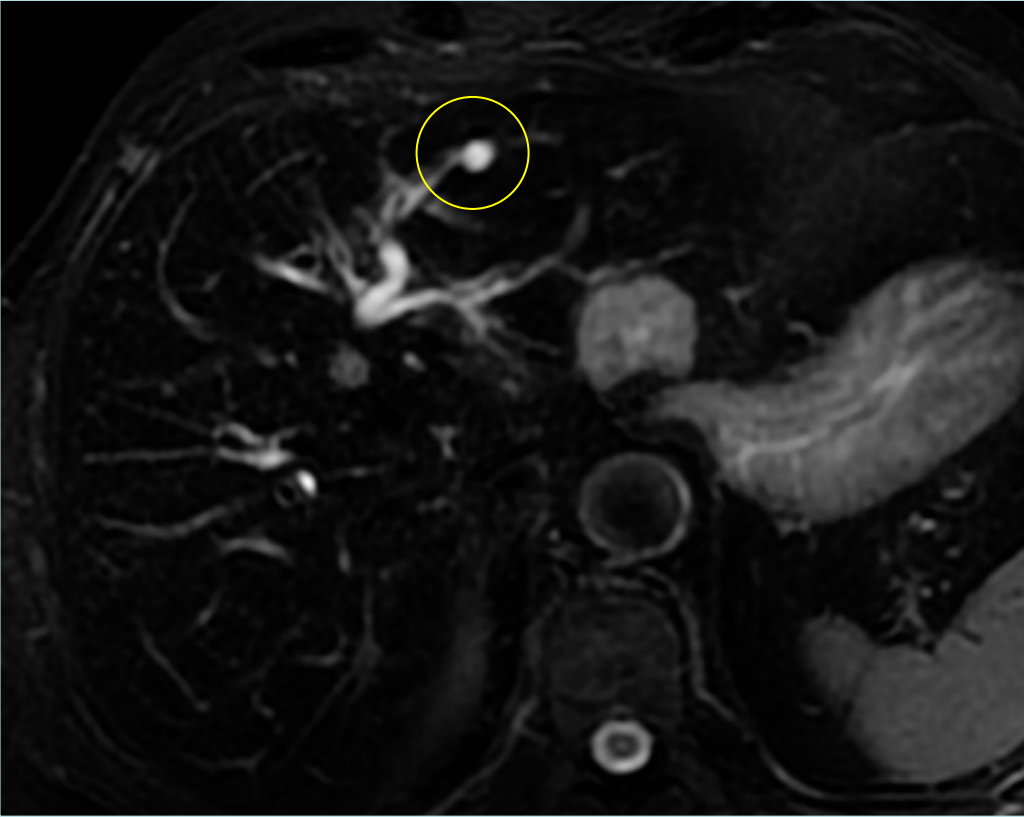
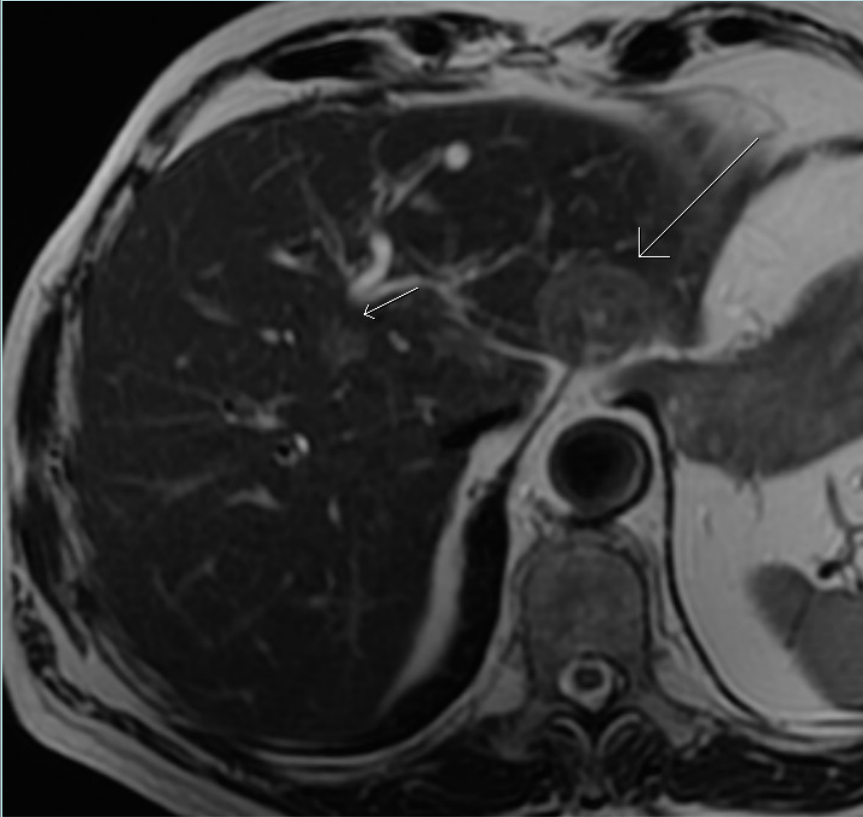
Benign / malignant, enhancement and liver specific phase



Why liver specific contrast for metastases

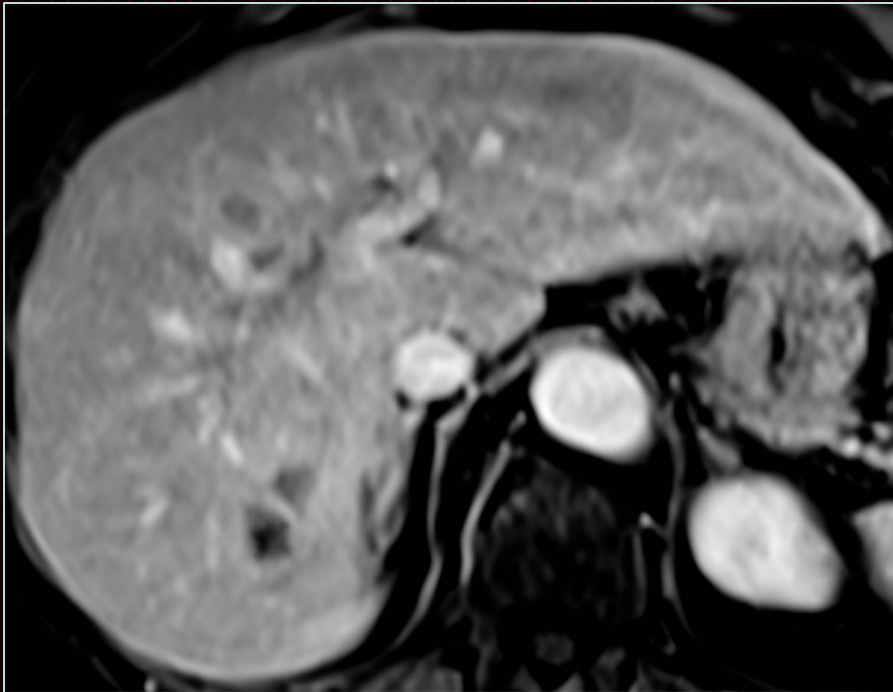
- Increased contrast between normal liver tissue and metastases
- Increase detection rate and sensitivity
- Discard benign lesions with functioning hepatocytes/Kupffercells, increase specificity
- Discard small cysts, increase specificity

LIVER SPECIFIC CONTRAST, Resovist ®



Liver specific Multihance®

Portal-venous phase

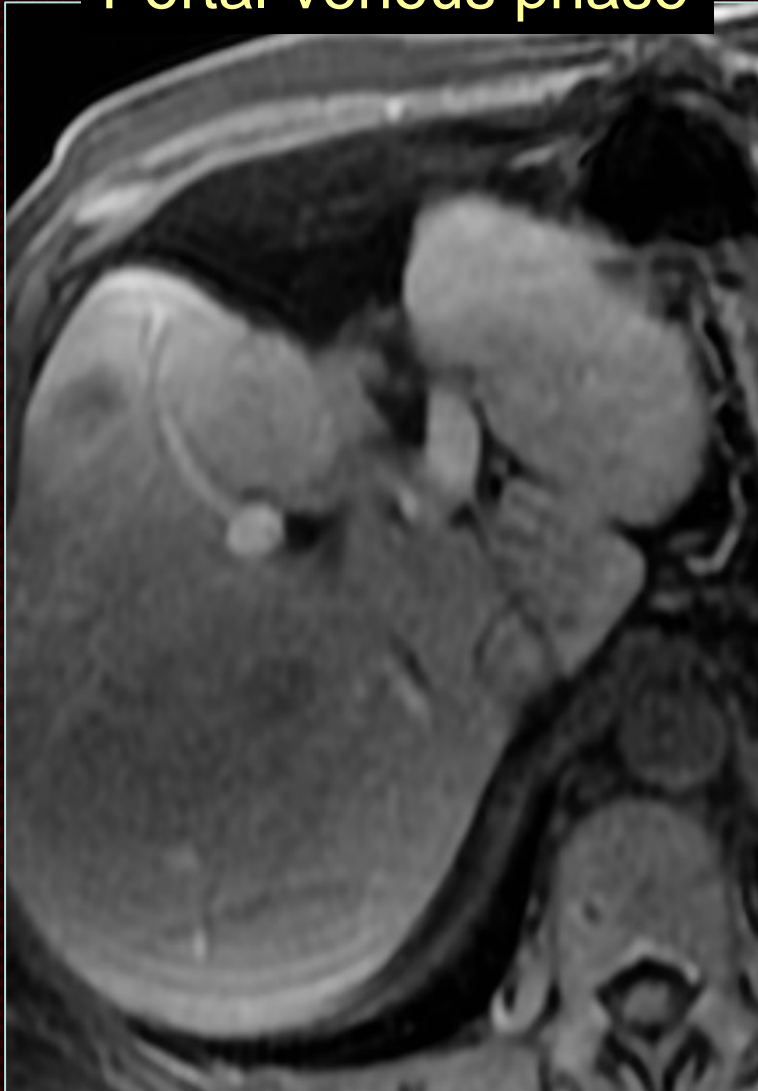


Hepato-biliary phase



Liver specific Primovist®

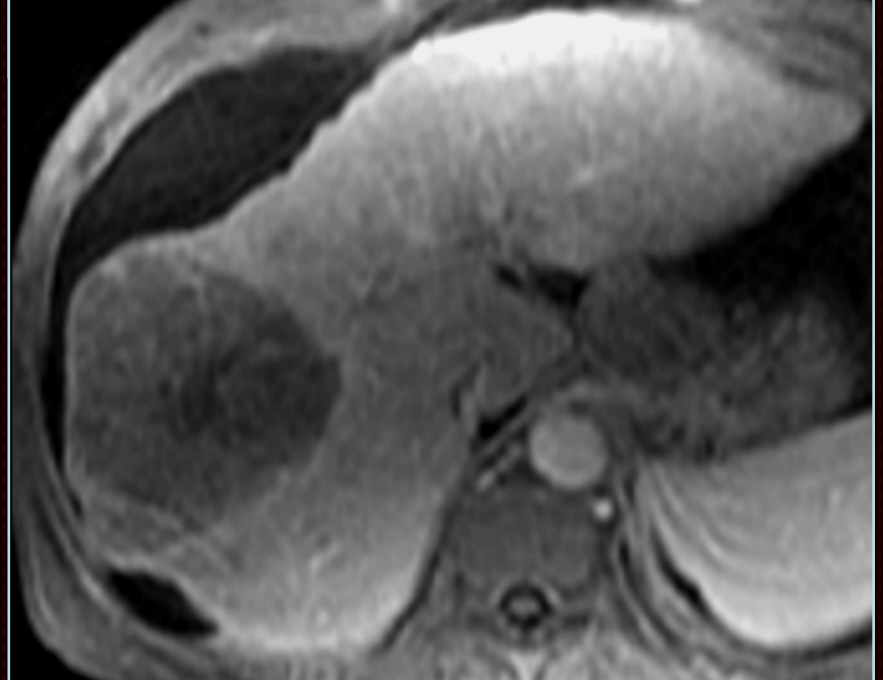
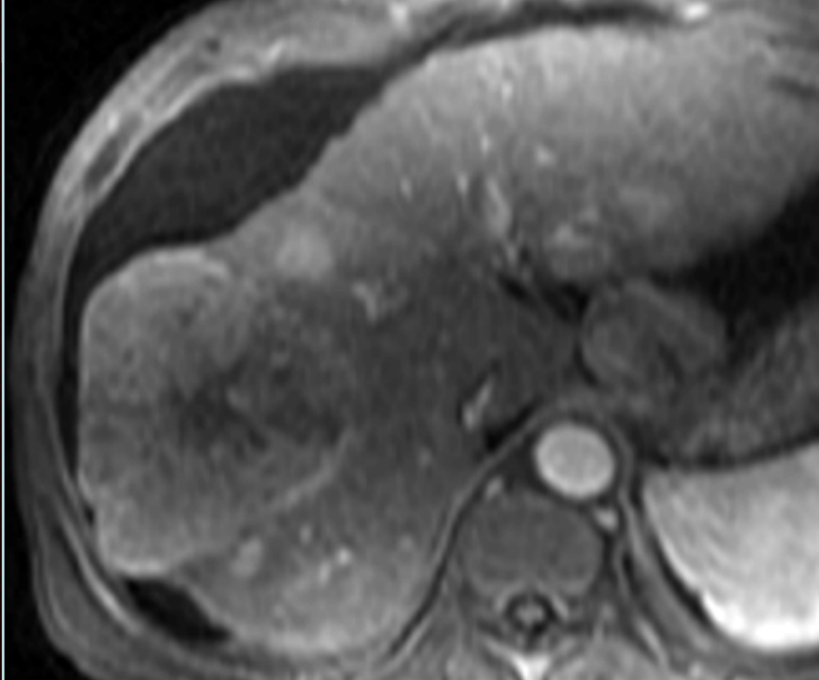
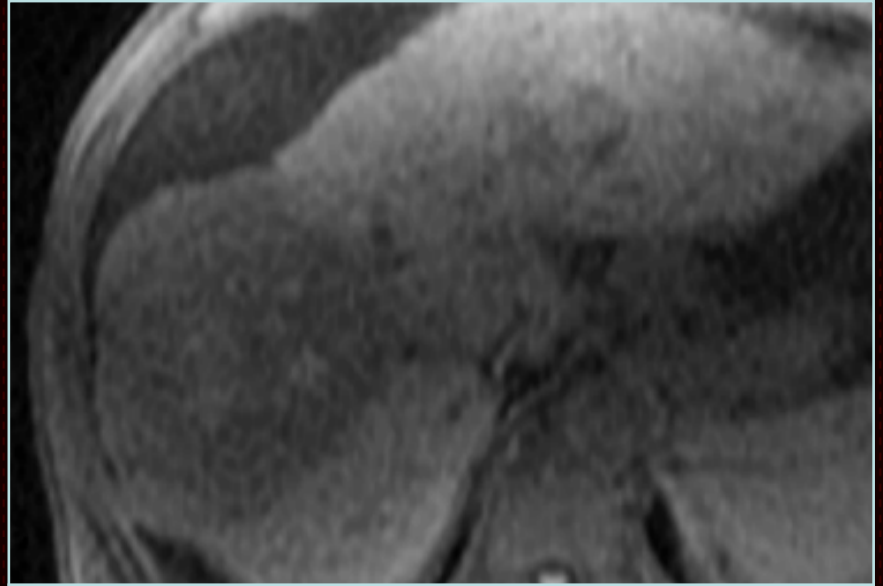
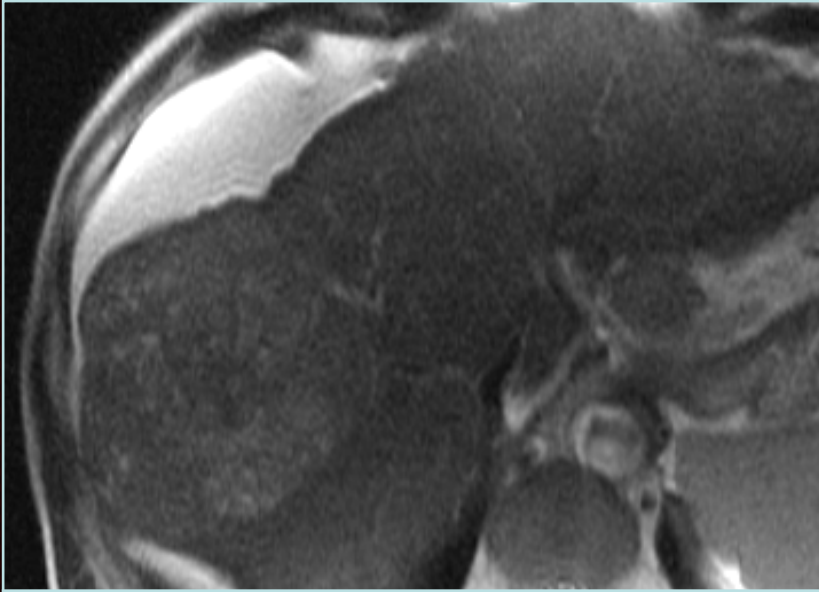
Portal-venous phase



Hepato-biliary phase



Hepatocellular Carcinoma, HCC

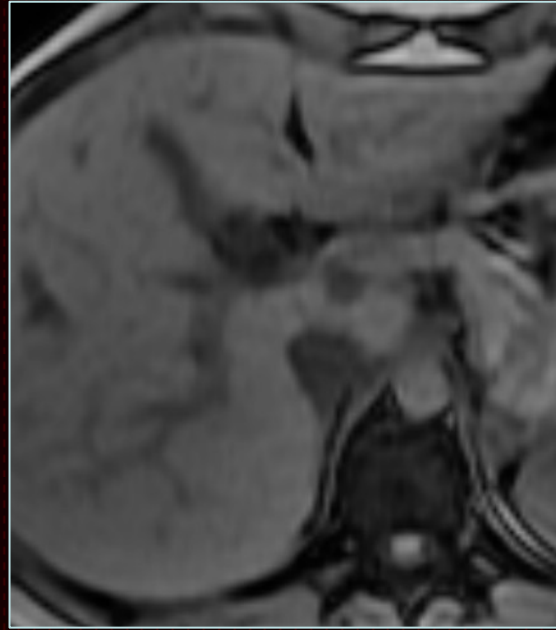
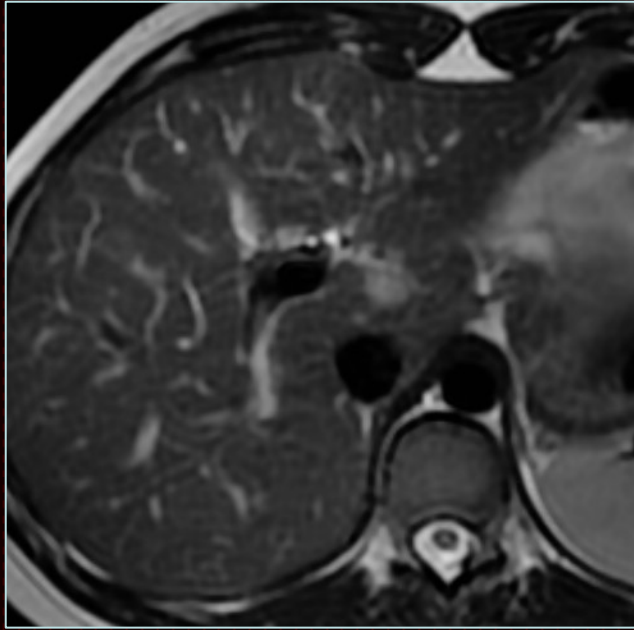


CIRRHOTIC NODULES / HCC

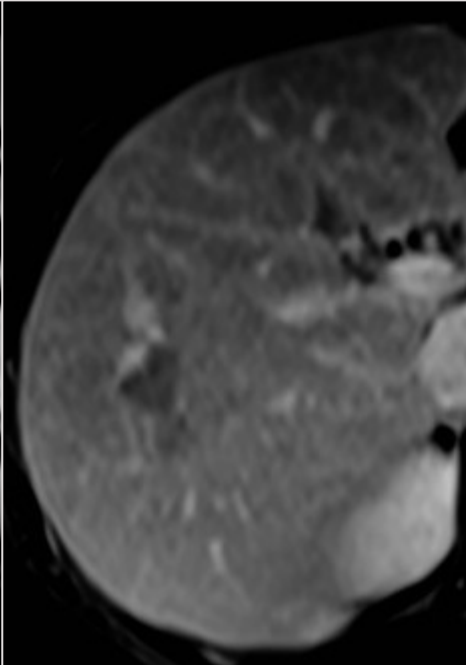
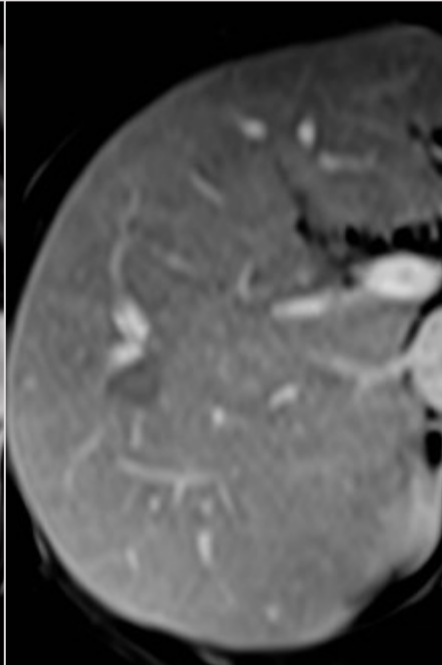
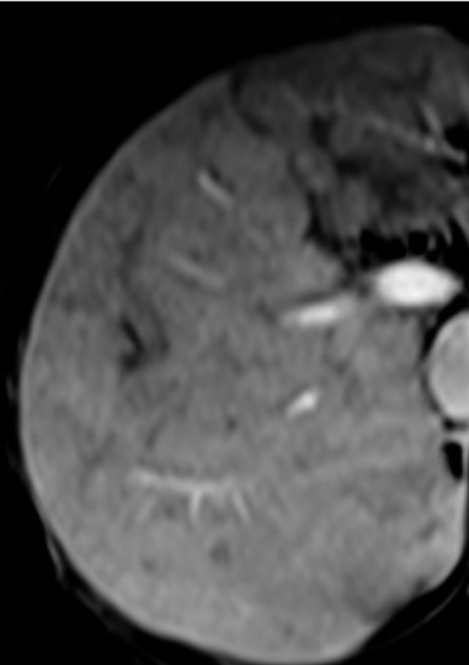
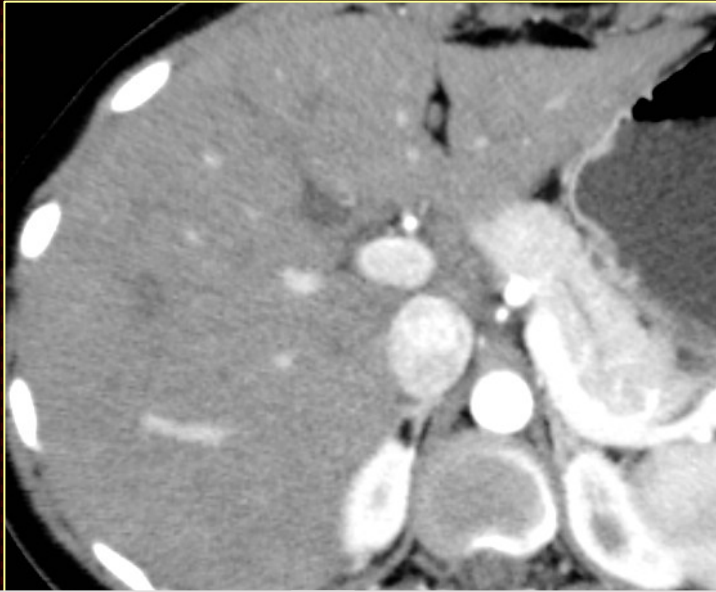
MRI signs of HCC:

- high signal T2
- arterial enhancement,
- wash-out in venous or late phase
- capsule
- no uptake of liver specific contrast

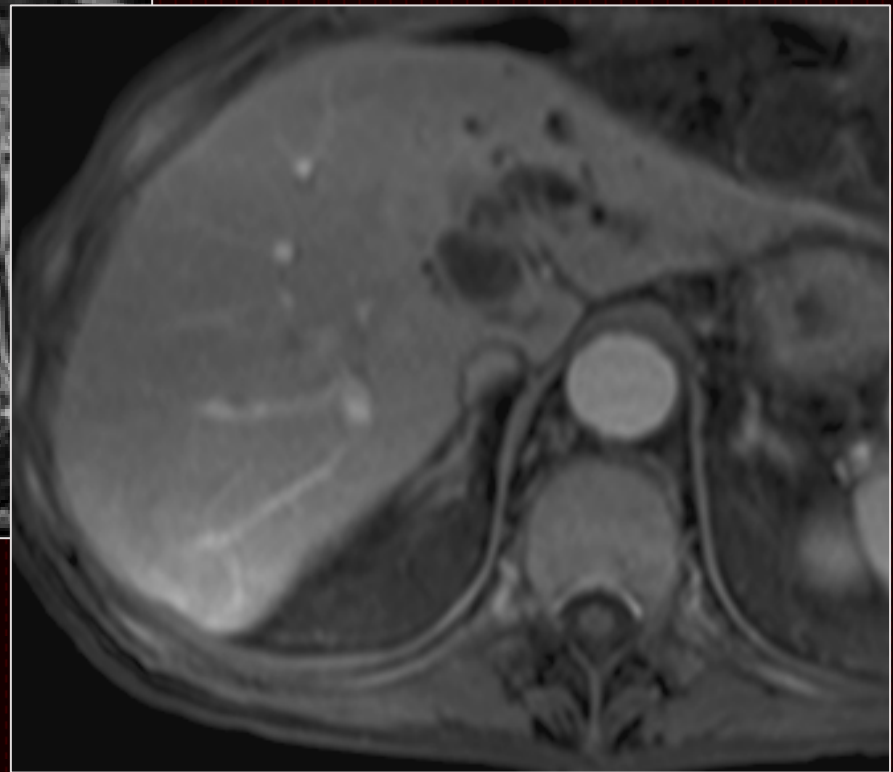
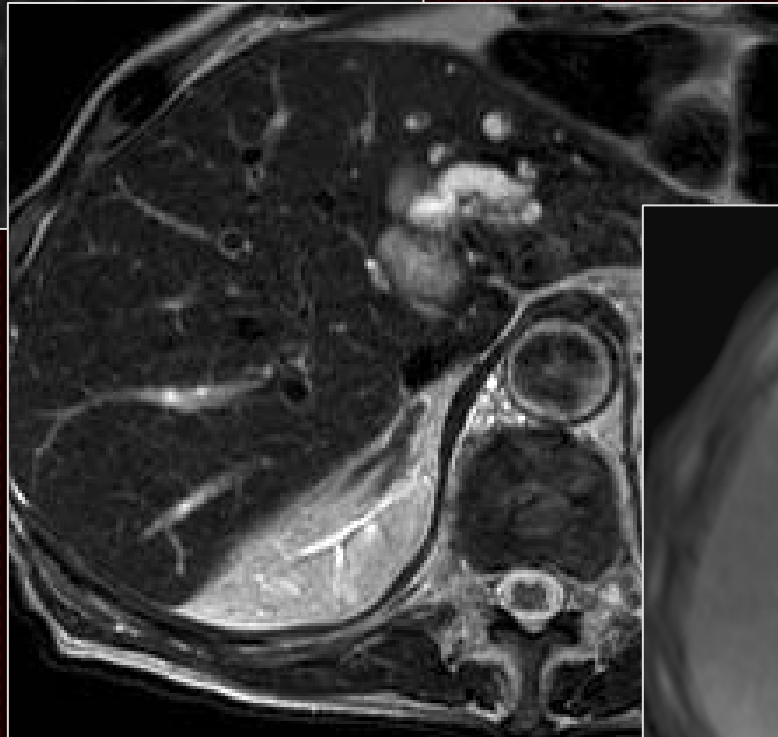
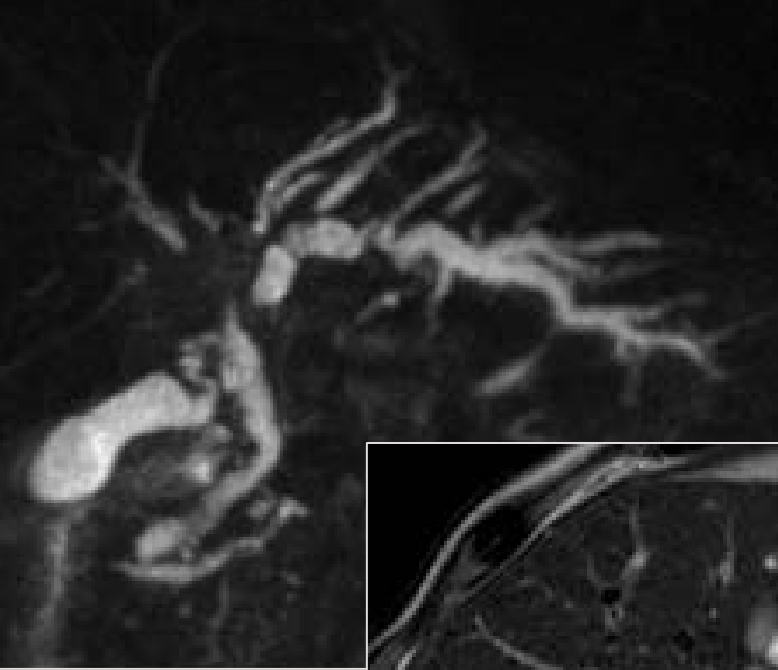
MRI for small HCC

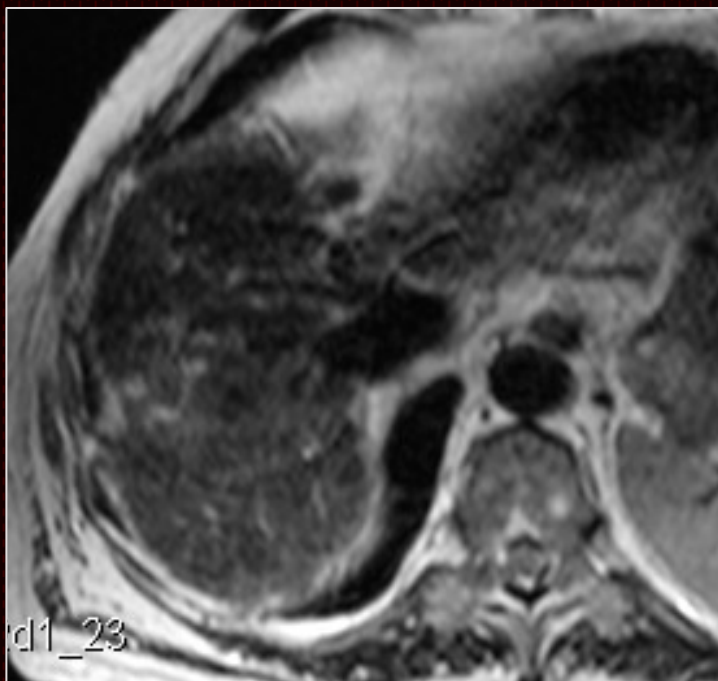
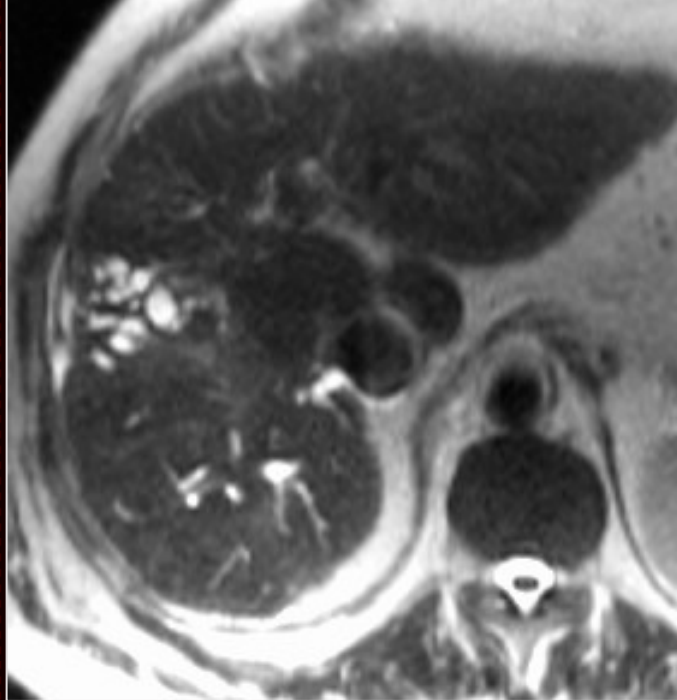
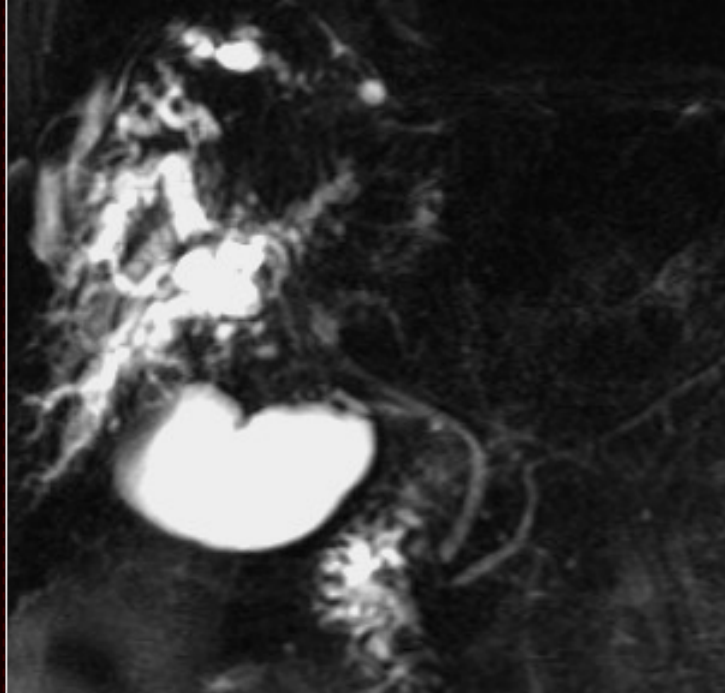


Hypovascular HCC

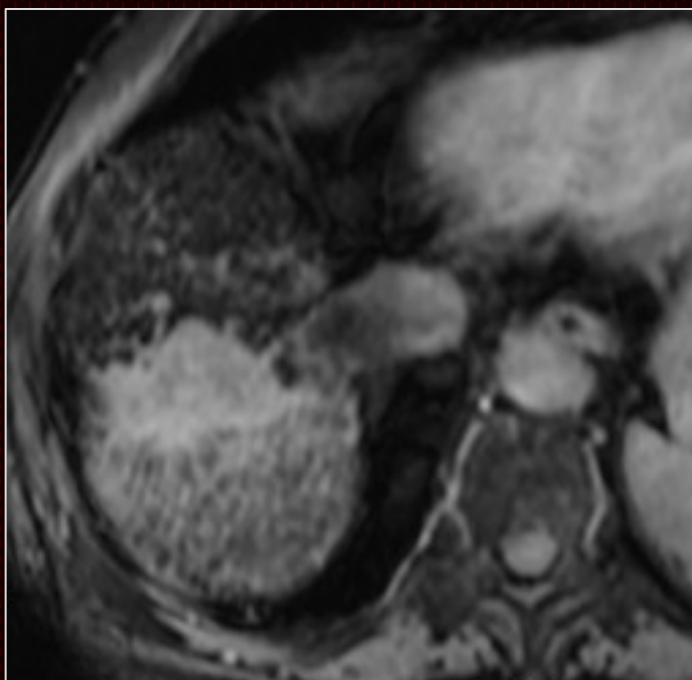


HILAR CHOLANGIOCARCINOMA



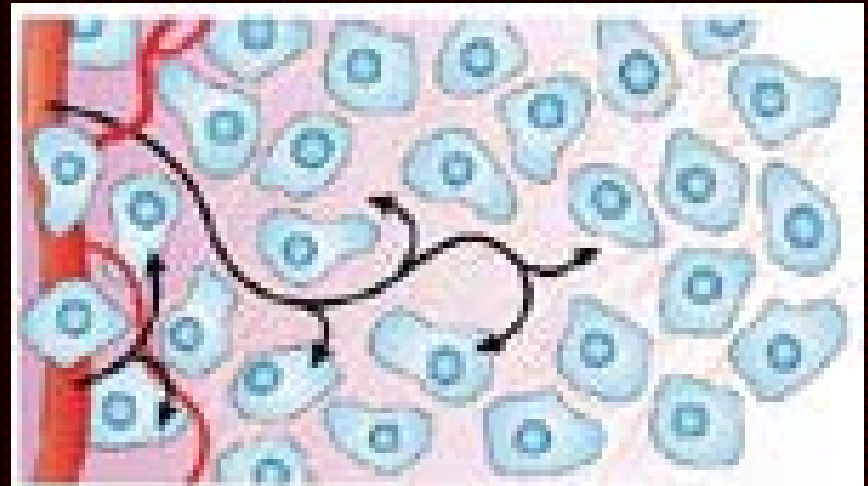


d1_23

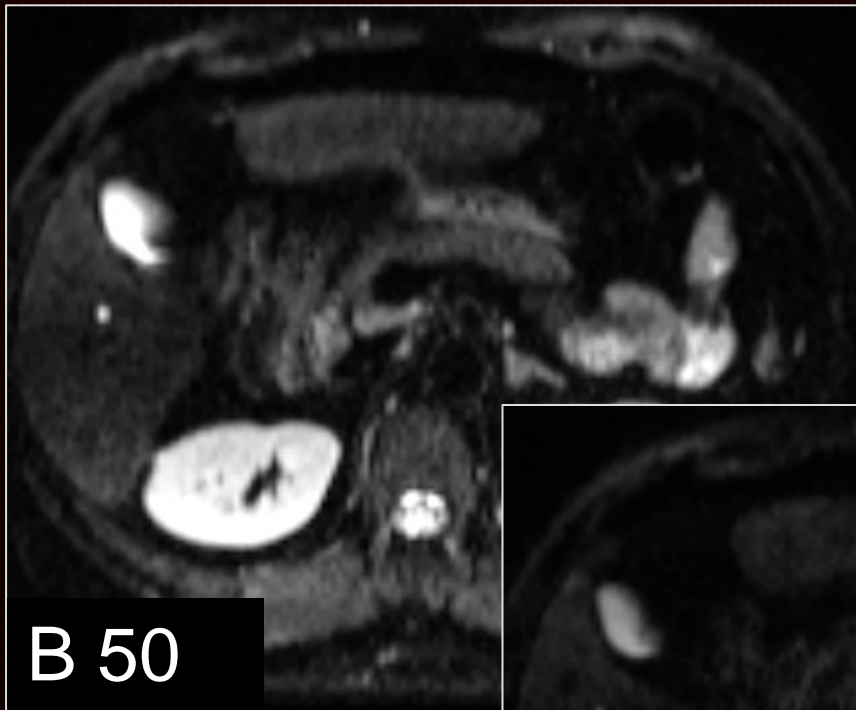


Liver diffusion

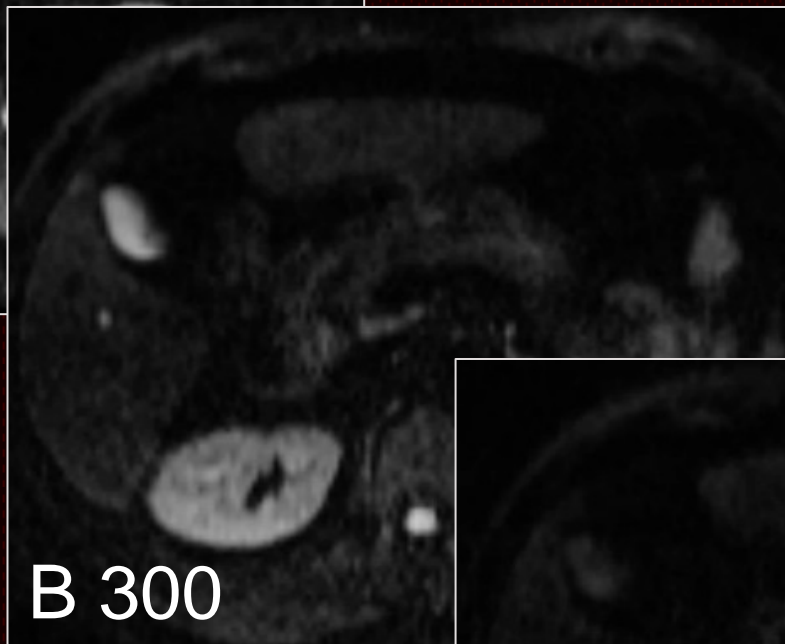
- Theory: Restricted diffusion in malignant tumor due to increased cellularity
- ADC, apparent diffusion coefficient low in malignant tumor



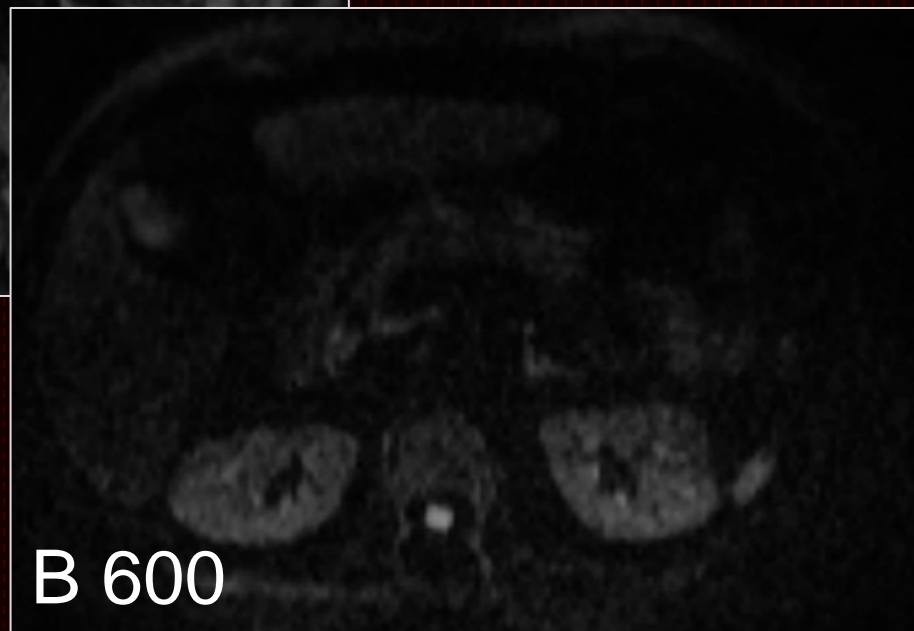
Diffusion



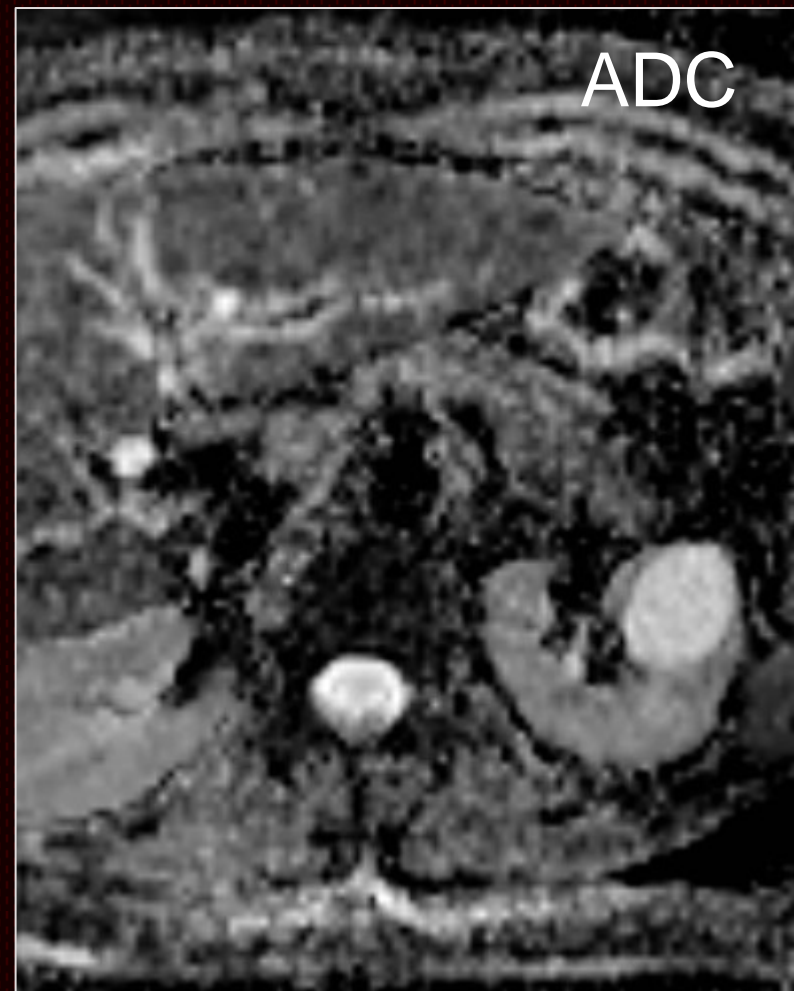
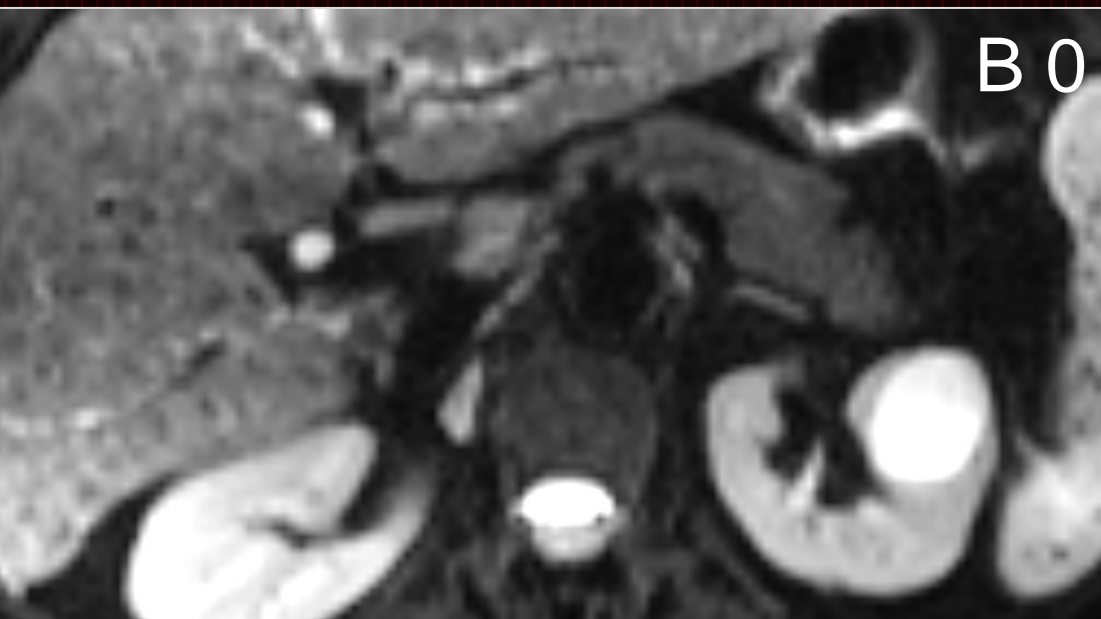
B 50

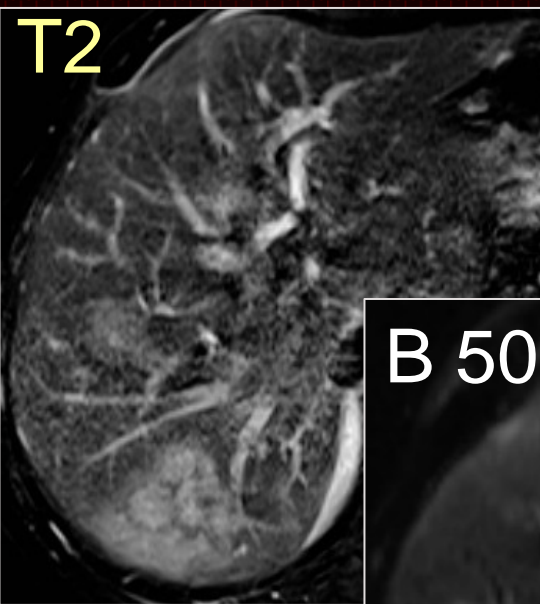


B 300

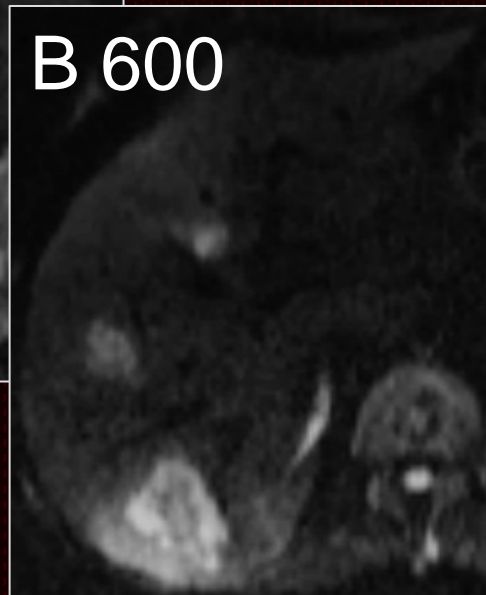
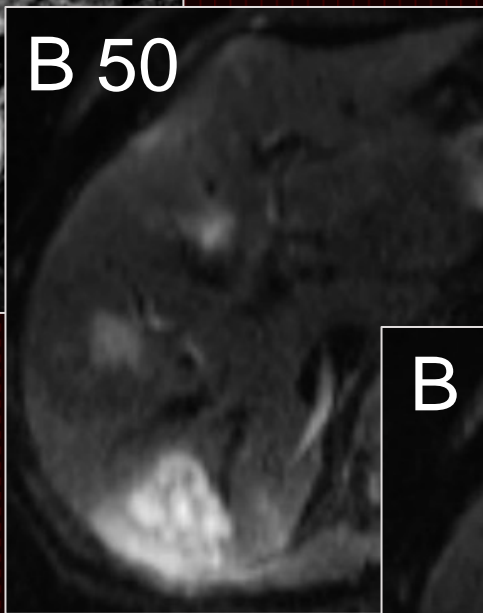
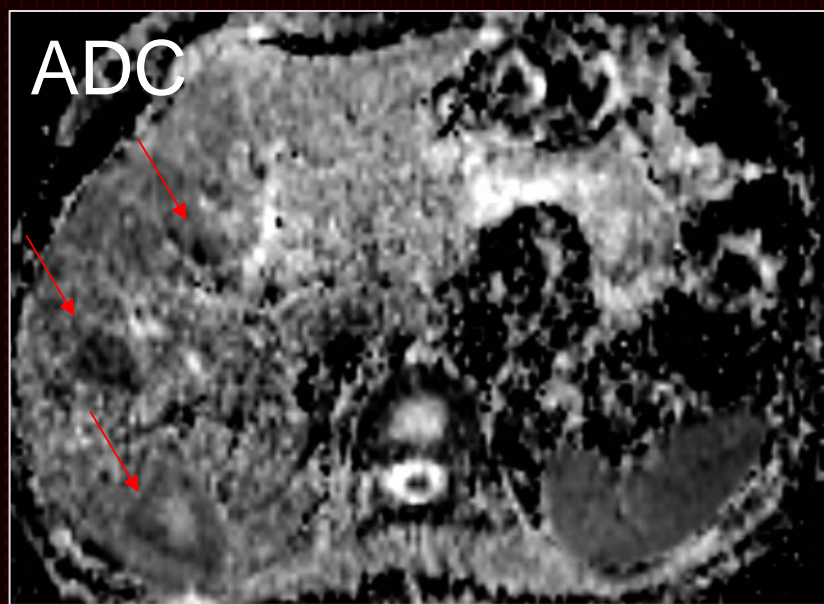


B 600

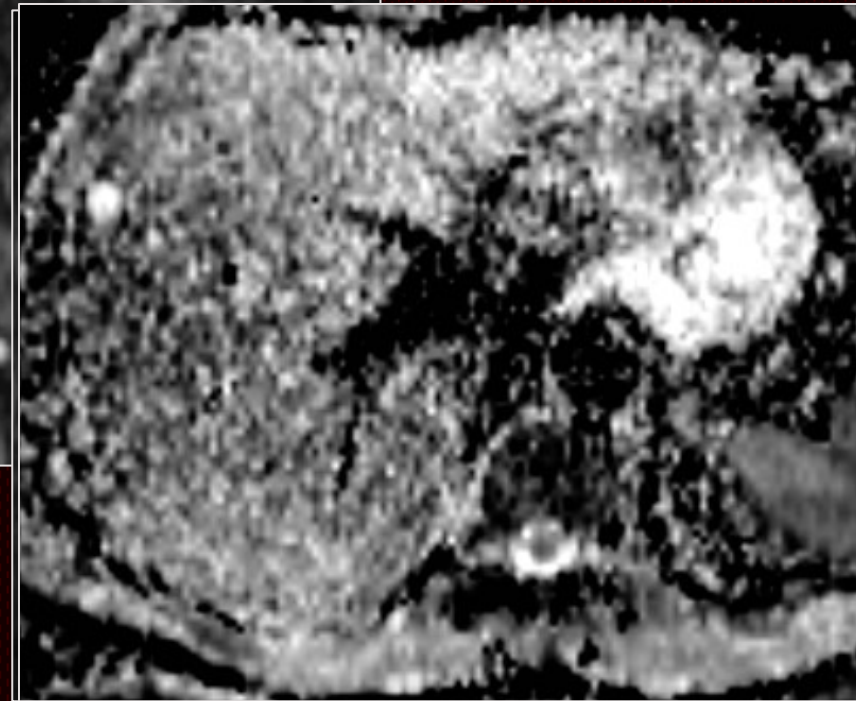
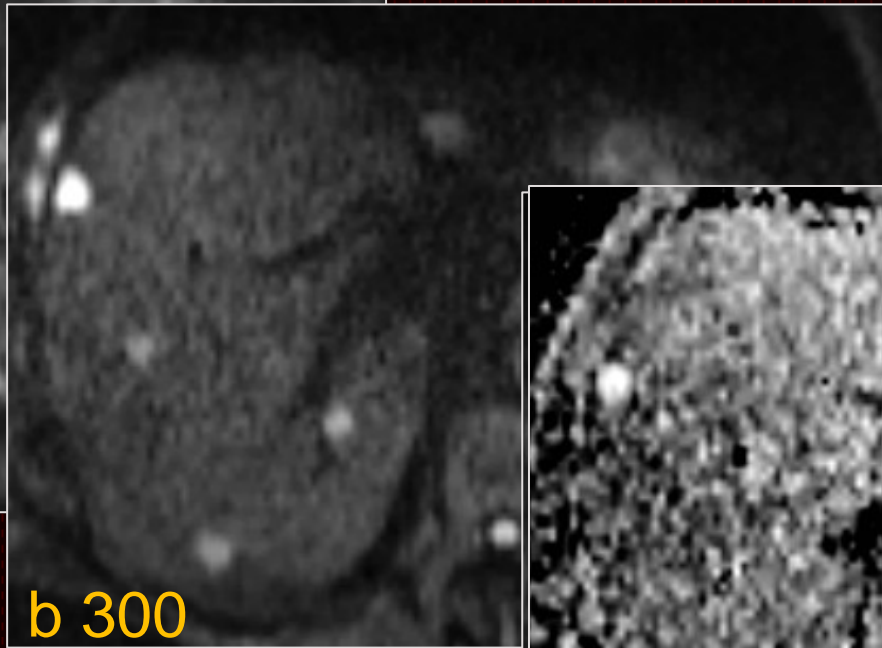
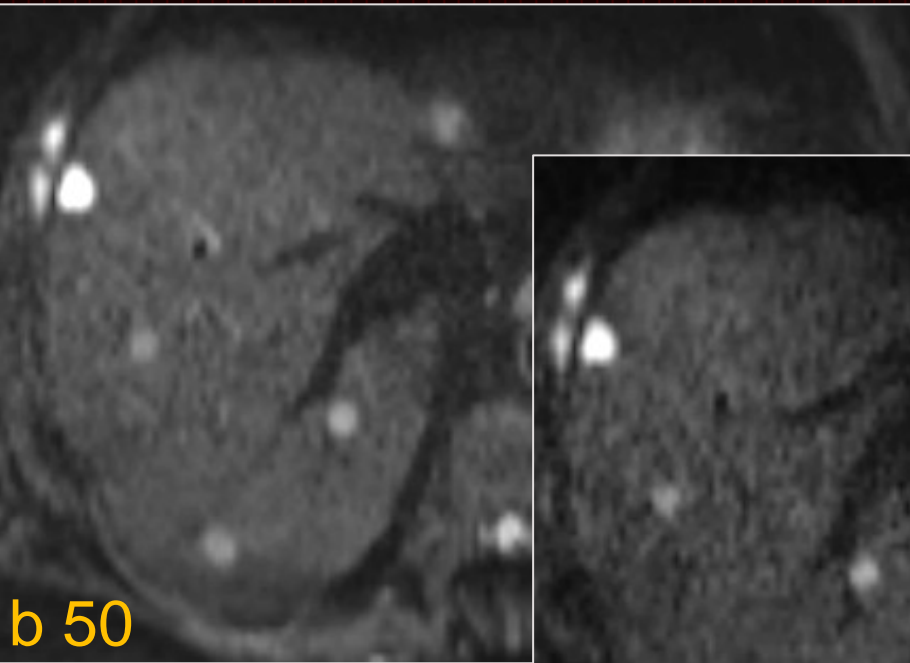




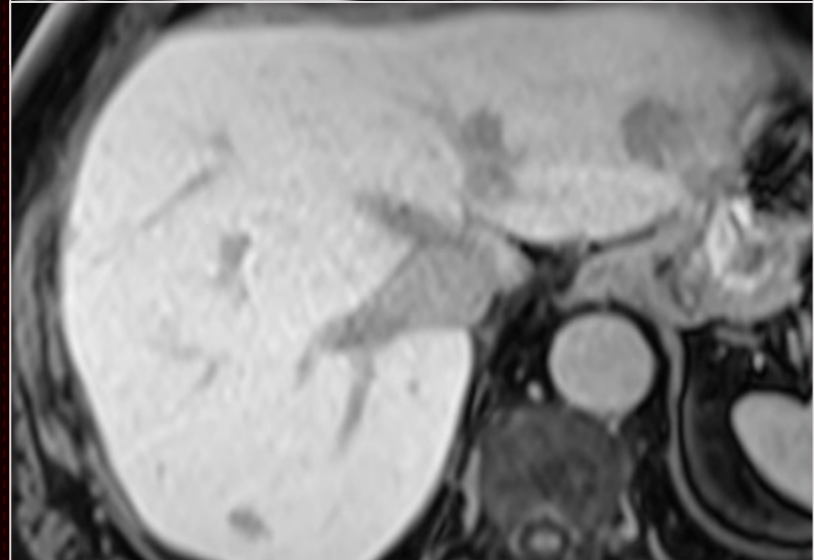
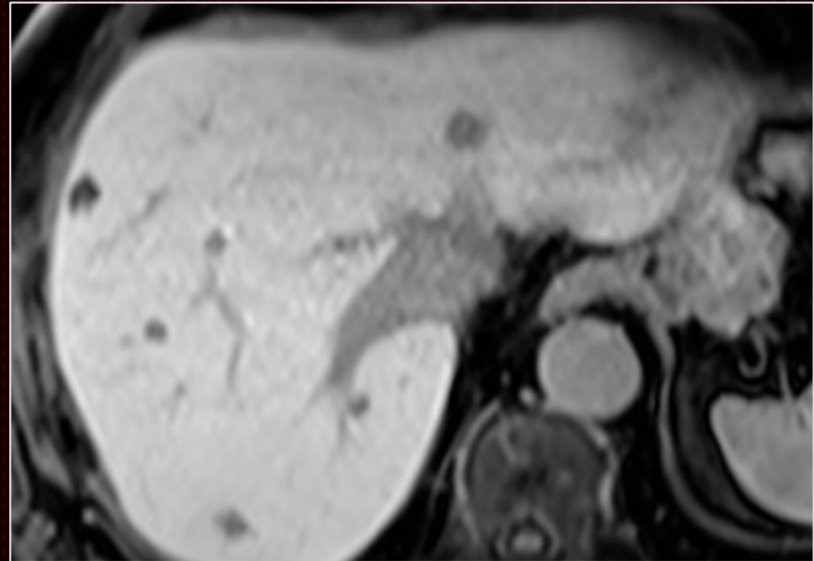
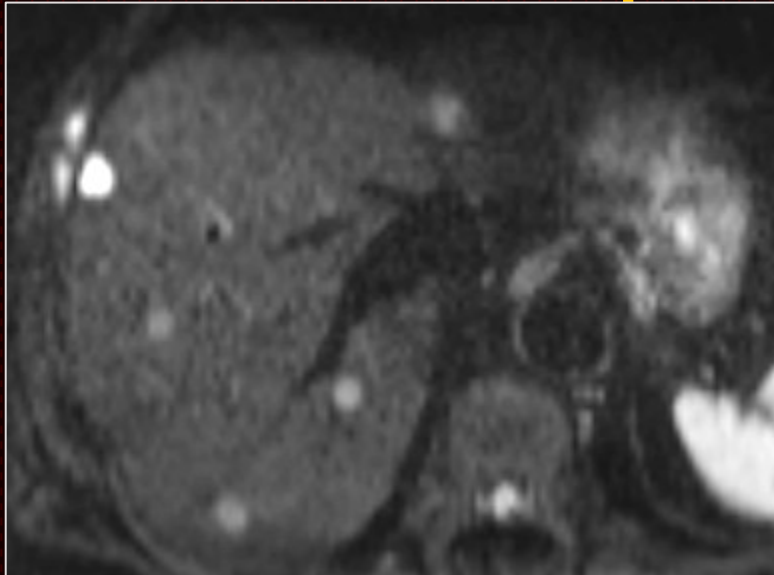
Diffusion



T2 shine through

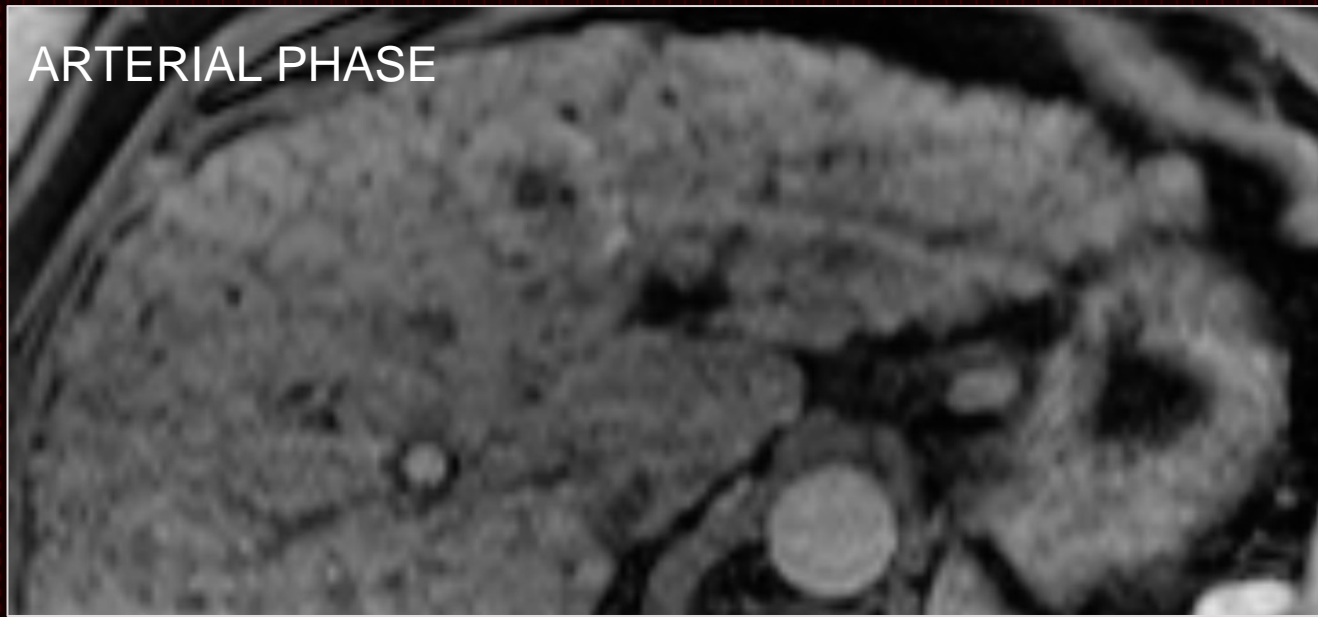


Diffusion combined with liverspecific contrast

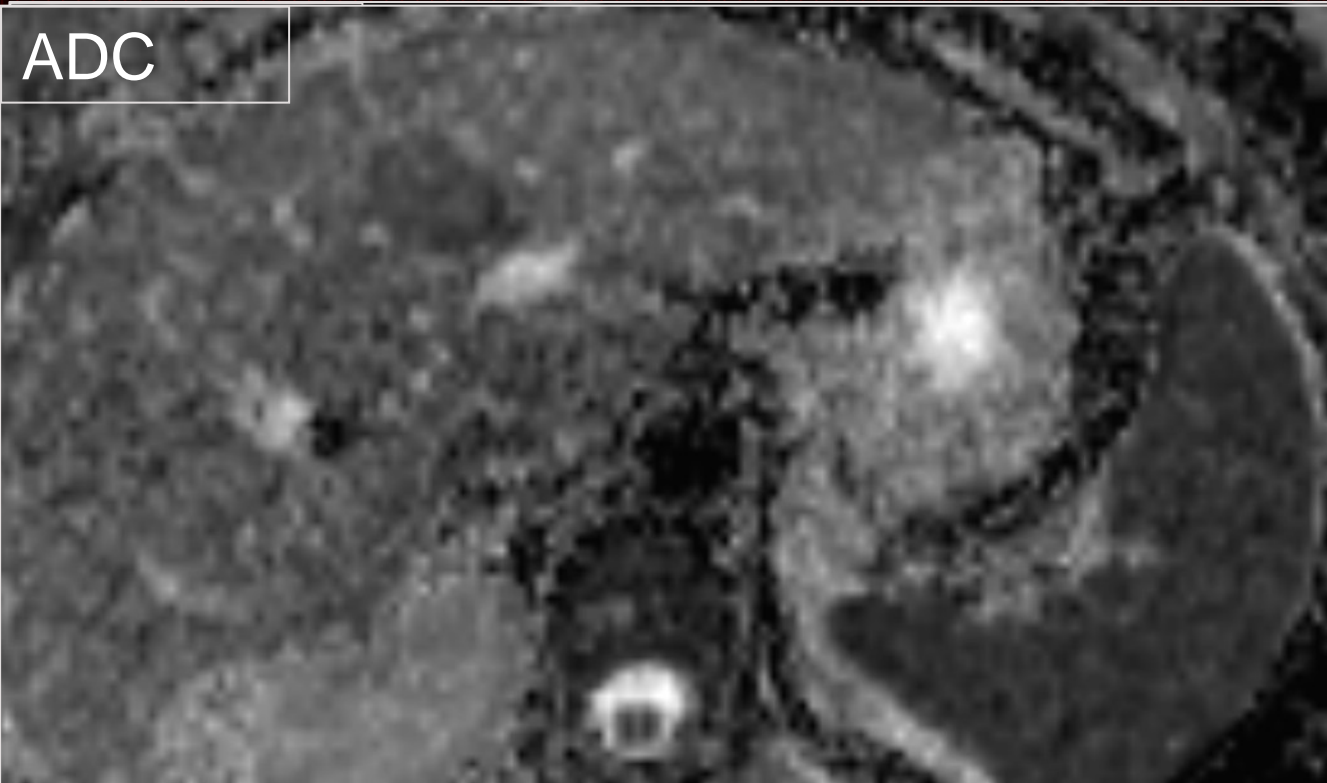


Diffusion for HCC ?

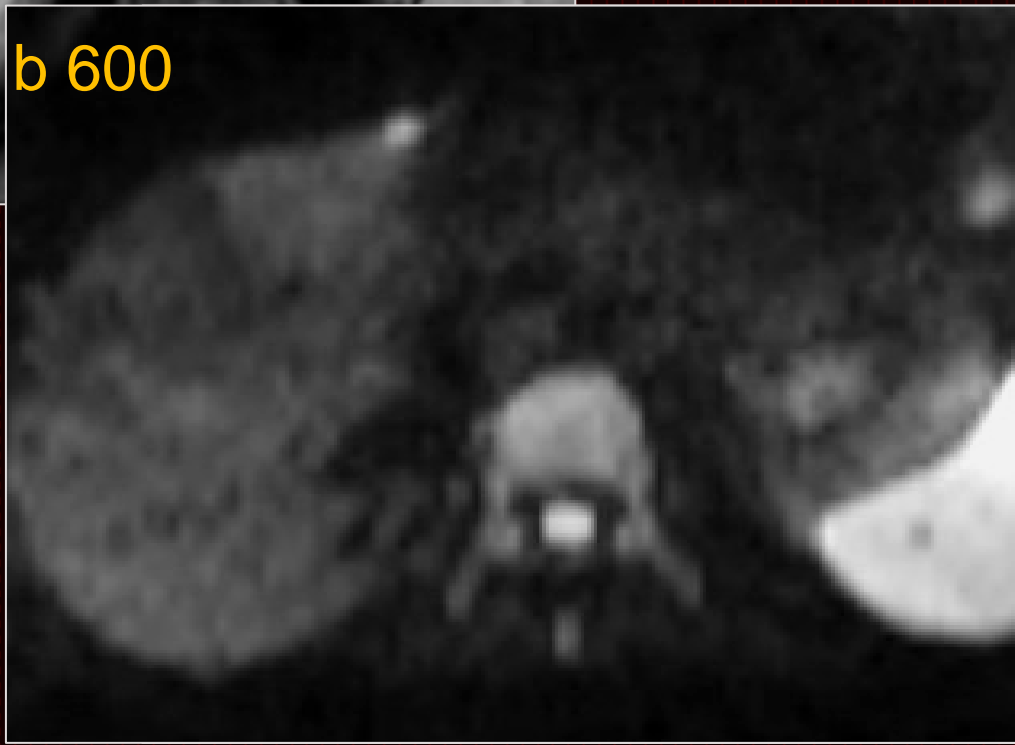
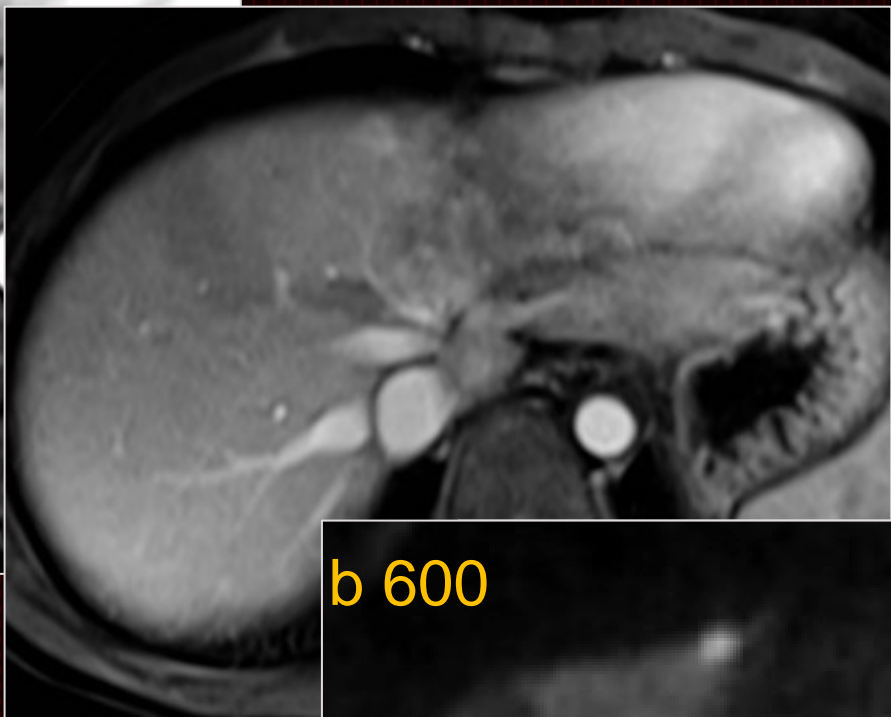
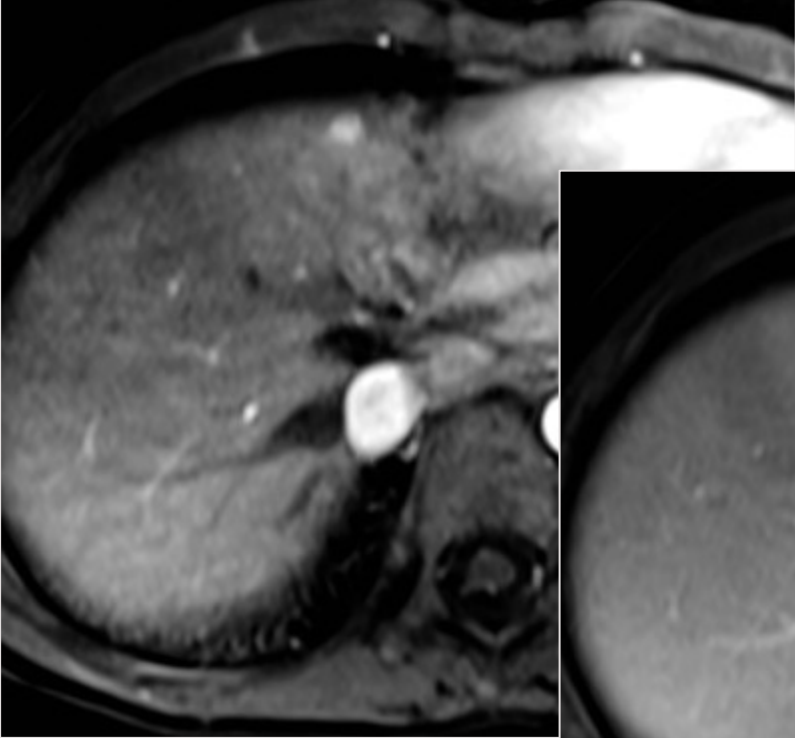
ARTERIAL PHASE



ADC



Small HCC



INDICATIONS FOR LIVER-MRI

- Characterization of benign focal liver lesions: fatty infiltration, hemangioma, FNH
- Mapping metastases with liver specific contrast for planning liver surgery, especially in patients with small metastases or possible cysts at CT
- Suspected malignancy in cirrhotic liver, equivocal US/CT findings
- Suspected cholangiocarcinoma, equivocal CT findings
- Planning liver surgery for cholangiocarcinoma