

AMSER Case of the Month

August 2023

78y female with liver mass

Rob Hagedorn, MS3

Logan Thomas, MS3

Dr. Jeffrey Olpin, MD

University of Utah School of Medicine

Patient Presentation

- **HPI:** Patient presented to her PCP asymptomatic with self-reported remote history of diagnosis of liver hemangioma; no prior imaging
- **PMHx:** diabetes mellitus, atrial fibrillation, squamous cell skin cancer s/p excision
- **PSHx:** carpal tunnel release, cesarean section, corneal transplant, cataracts, tonsillectomy
- **SHx:** no smoking, alcohol, drug
- **ROS:** negative
- **Vitals:** wnl

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

Liver Lesion-Initial Characterization

Variant 1:

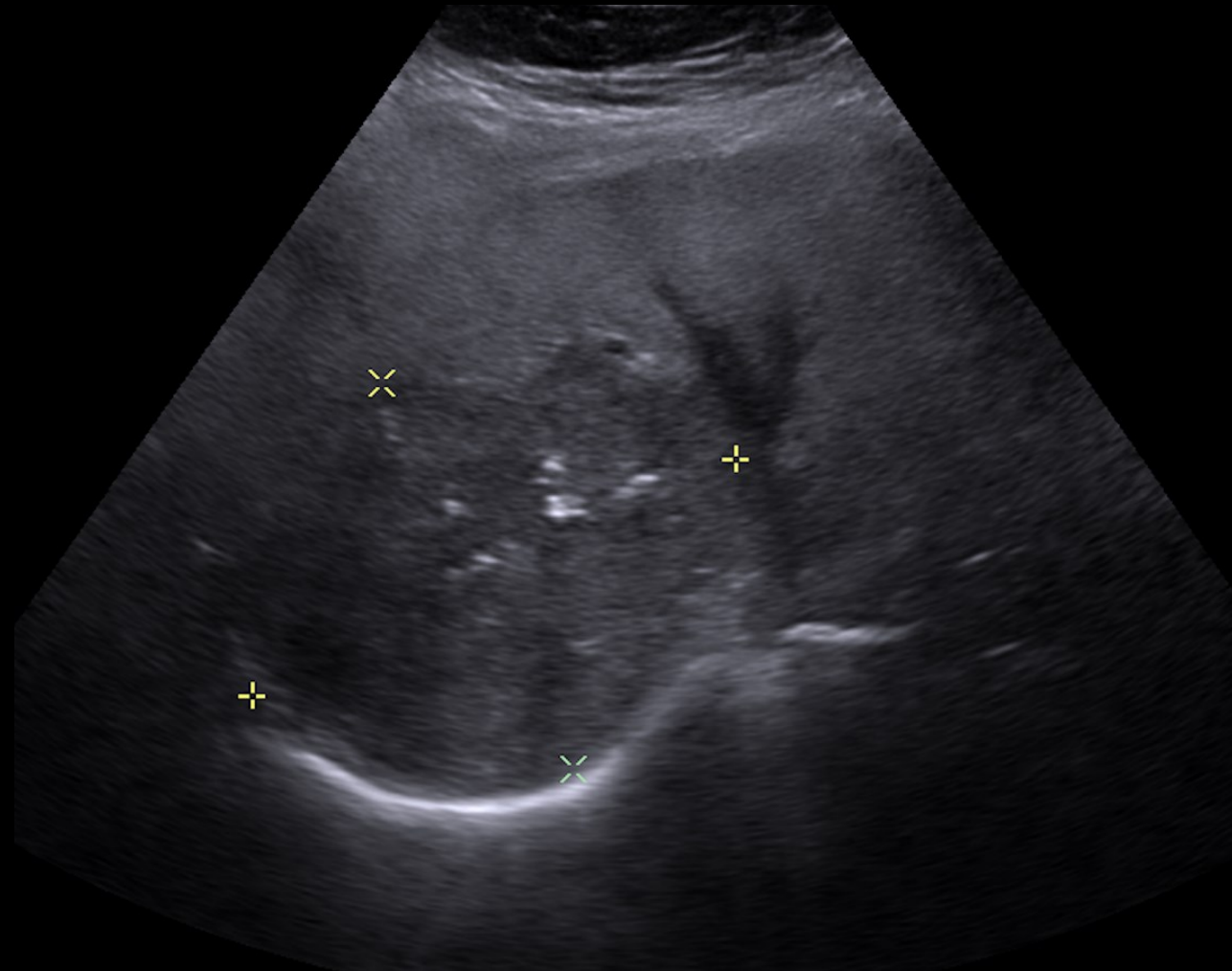
Indeterminate, greater than 1 cm liver lesion on initial imaging with US. Normal liver. No suspicion or evidence of extrahepatic malignancy or underlying liver disease.

Procedure	Appropriateness Category	Relative Radiation Level
US abdomen with IV contrast	Usually Appropriate	○
MRI abdomen without and with IV contrast	Usually Appropriate	○
CT abdomen with IV contrast multiphase	Usually Appropriate	☼☼☼
MRI abdomen without IV contrast	May Be Appropriate	○
Image-guided biopsy liver	Usually Not Appropriate	Varies
CT abdomen without IV contrast	Usually Not Appropriate	☼☼☼
Liver spleen scan	Usually Not Appropriate	☼☼☼
RBC scan abdomen and pelvis	Usually Not Appropriate	☼☼☼
CT abdomen without and with IV contrast	Usually Not Appropriate	☼☼☼☼
DOTATATE PET/CT skull base to mid-thigh	Usually Not Appropriate	☼☼☼
FDG-PET/CT skull base to mid-thigh	Usually Not Appropriate	☼☼☼☼
Octreotide scan with SPECT or SPECT/CT chest and abdomen	Usually Not Appropriate	☼☼☼☼

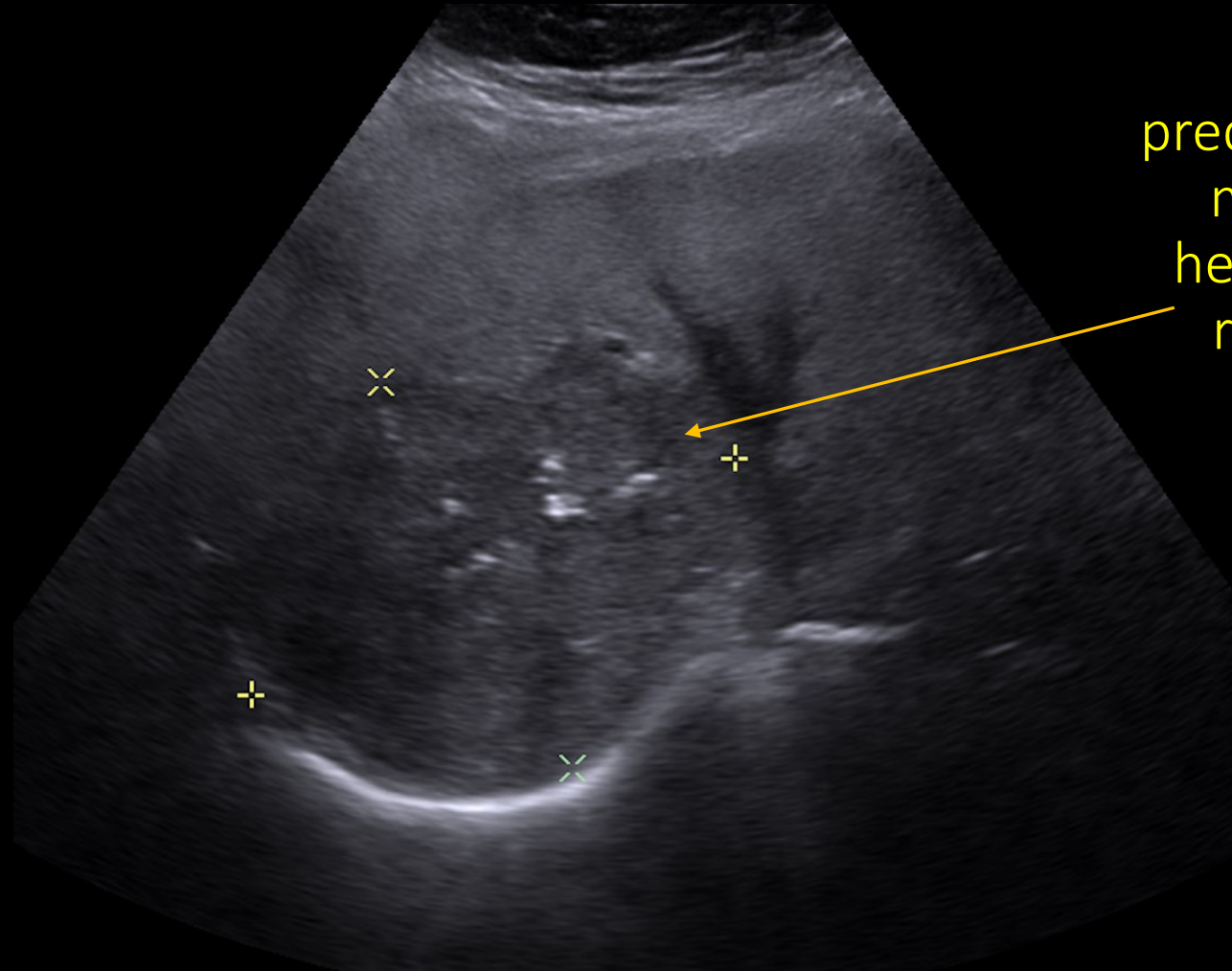
While US with IV was not ordered, as this is not routinely done, a routine US abdomen was ordered by the PCP



Findings (unlabeled)



Findings: (labeled)



Several coarse calcifications noted centrally in this predominantly hypoechoic mass within the right hepatic lobe; radiologist recommends further evaluation

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

Liver Lesion-Initial Characterization

Variant 1:

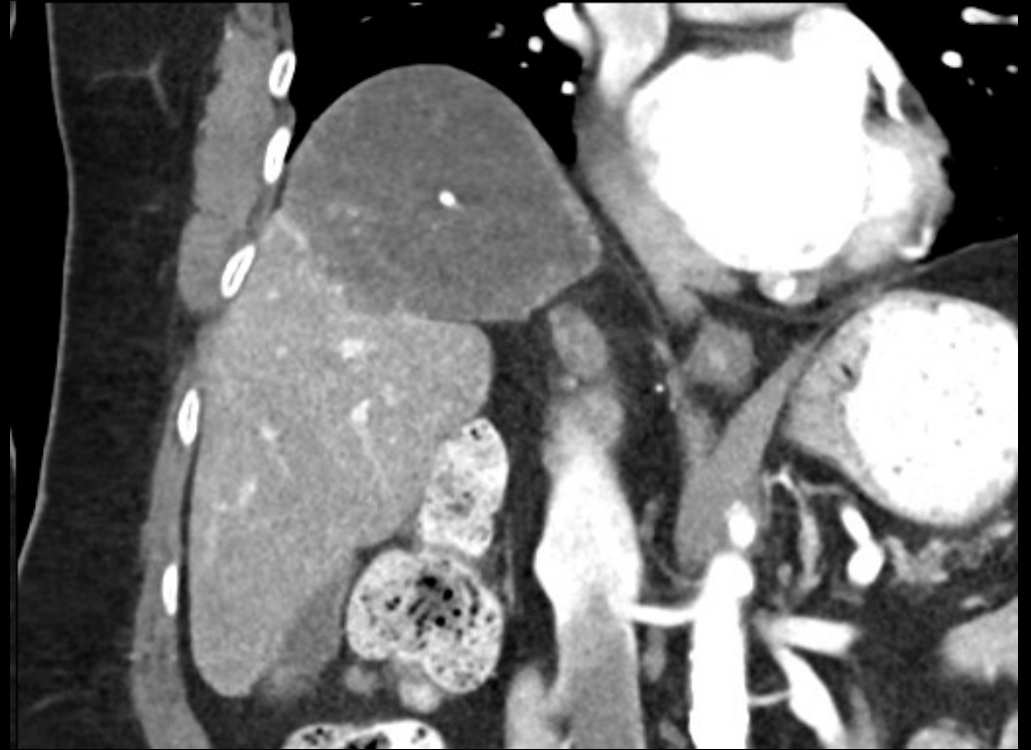
Indeterminate, greater than 1 cm liver lesion on initial imaging with US. Normal liver. No suspicion or evidence of extrahepatic malignancy or underlying liver disease.

Procedure	Appropriateness Category	Relative Radiation Level
US abdomen with IV contrast	Usually Appropriate	○
MRI abdomen without and with IV contrast	Usually Appropriate	○
CT abdomen with IV contrast multiphase	Usually Appropriate	☼☼☼
MRI abdomen without IV contrast	May Be Appropriate	○
Image-guided biopsy liver	Usually Not Appropriate	Varies
CT abdomen without IV contrast	Usually Not Appropriate	☼☼☼
Liver spleen scan	Usually Not Appropriate	☼☼☼
RBC scan abdomen and pelvis	Usually Not Appropriate	☼☼☼
CT abdomen without and with IV contrast	Usually Not Appropriate	☼☼☼☼
DOTATATE PET/CT skull base to mid-thigh	Usually Not Appropriate	☼☼☼
FDG-PET/CT skull base to mid-thigh	Usually Not Appropriate	☼☼☼☼
Octreotide scan with SPECT or SPECT/CT chest and abdomen	Usually Not Appropriate	☼☼☼☼

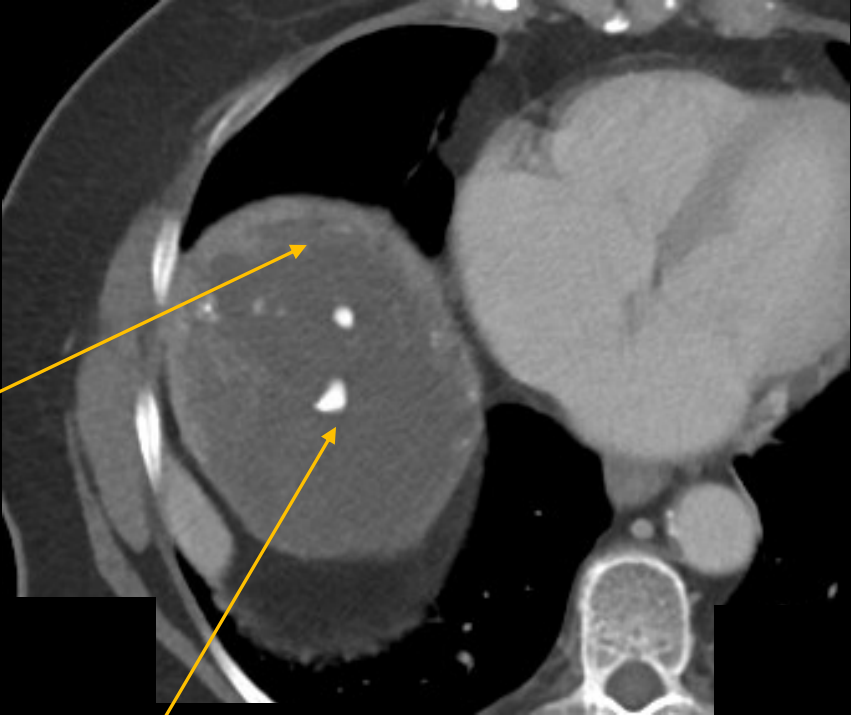
Based on US results, CT multiphase was subsequently recommended by the radiologist for further evaluation



Findings (unlabeled)



Findings (labeled)



Delayed phase demonstrates minimal peripheral discontinuous enhancement of the lesion

Centrally located coarse calcifications

Dimensions:
7.4 cm transverse x
9.3 cm AP x 6.4 cm
craniocaudad

Coronal view demonstrates lesion location in dome of right liver

What Imaging Should We Order To More Fully
Evaluate CT Findings?

Select the applicable ACR Appropriateness Criteria

Liver Lesion-Initial Characterization

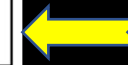
Variant 1:

Indeterminate, greater than 1 cm liver lesion on initial imaging with US. Normal liver. No suspicion or evidence of extrahepatic malignancy or underlying liver disease.

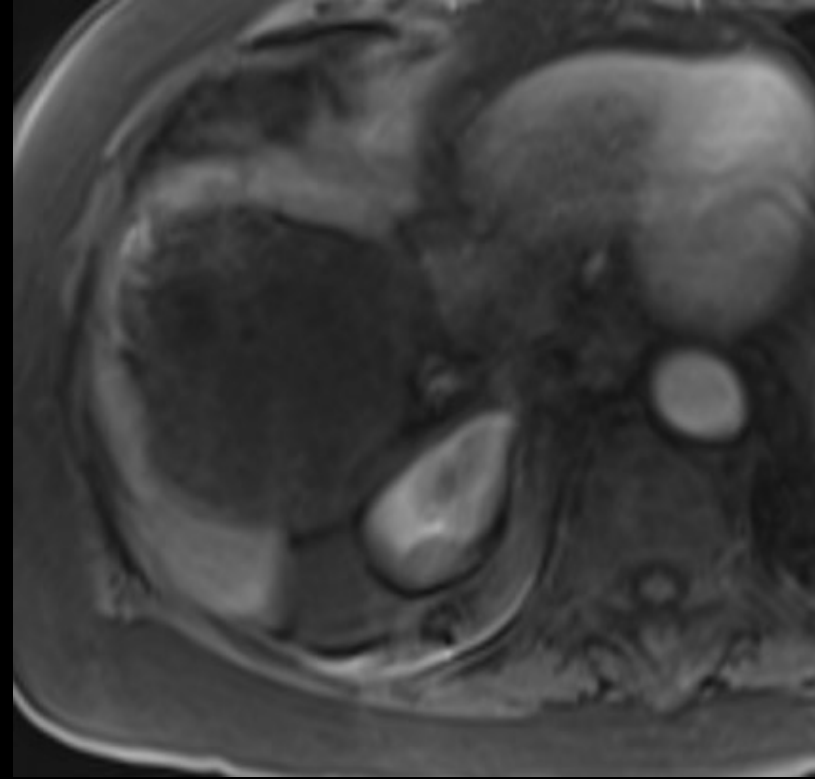
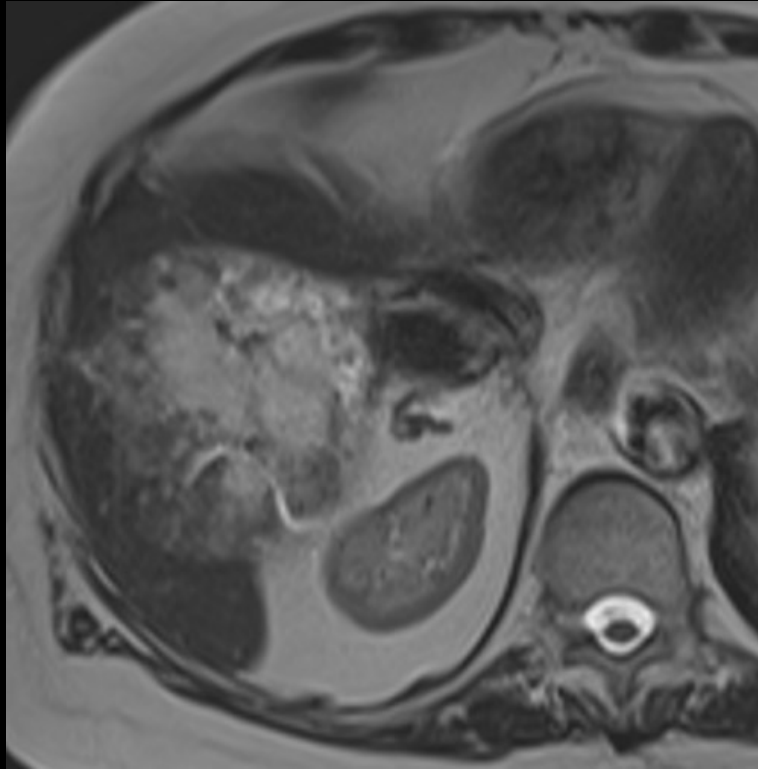
Procedure	Appropriateness Category	Relative Radiation Level
US abdomen with IV contrast	Usually Appropriate	○
MRI abdomen without and with IV contrast	Usually Appropriate	○
CT abdomen with IV contrast multiphase	Usually Appropriate	☼☼☼
MRI abdomen without IV contrast	May Be Appropriate	○
Image-guided biopsy liver	Usually Not Appropriate	Varies
CT abdomen without IV contrast	Usually Not Appropriate	☼☼☼
Liver spleen scan	Usually Not Appropriate	☼☼☼
RBC scan abdomen and pelvis	Usually Not Appropriate	☼☼☼
CT abdomen without and with IV contrast	Usually Not Appropriate	☼☼☼☼
DOTATATE PET/CT skull base to mid-thigh	Usually Not Appropriate	☼☼☼
FDG-PET/CT skull base to mid-thigh	Usually Not Appropriate	☼☼☼☼
Octreotide scan with SPECT or SPECT/CT chest and abdomen	Usually Not Appropriate	☼☼☼☼

MRI was performed next due to:

- patient concern to follow-up on "liver mass"
- prior pancreatitis and evaluation for possible cysts

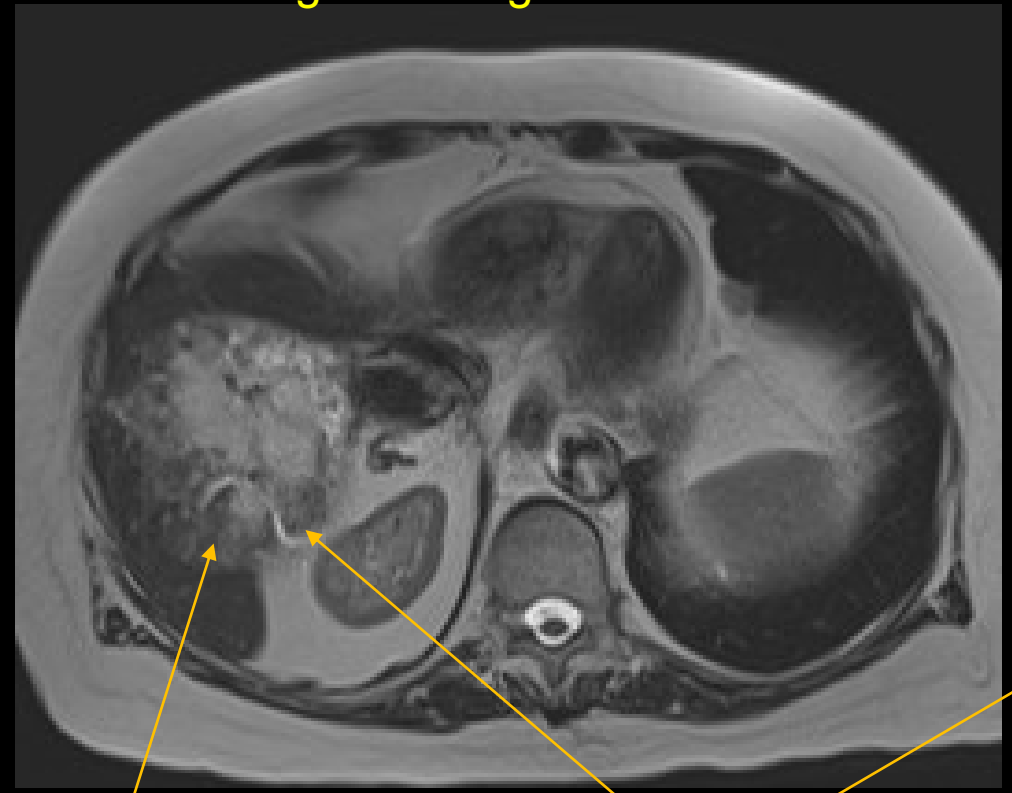


Findings (unlabeled)



Findings (labeled)

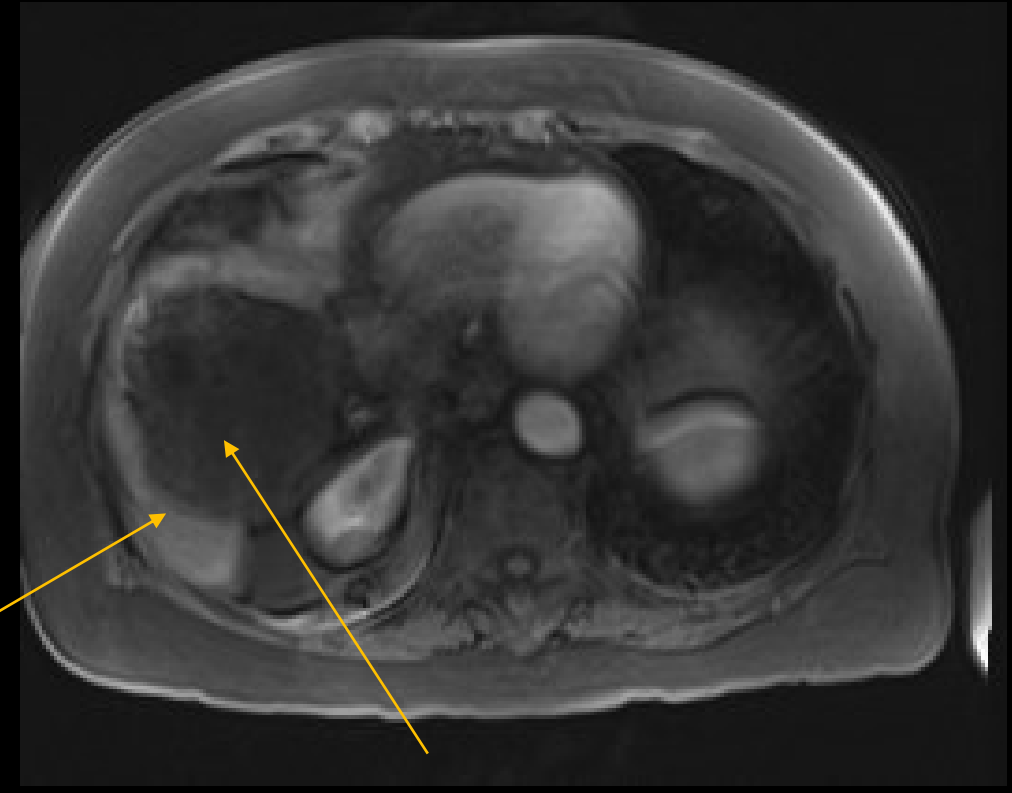
Axial T2-weighted image



Heterogeneously T2
Hyperintense mass

No increase in size since
prior CT imaging

Axial delayed phase gadolinium-enhanced T1-weighted image



Minimally enhancing T1
Hypointense mass

Final Dx:

Sclerosing Hemangioma

Case Discussion

- Liver hemangiomas are the most common benign liver tumor with an estimated prevalence ranging from 1%-20%.¹
- On CT, conventional hemangiomas typically are hypoattenuating lesions with nodular, peripheral, discontinuous enhancement in arterial phase and progressive centripetal filling in portal venous and delayed phases.
- However, sclerosed or hyalinized hemangiomas occur when conventional hemangiomas undergo degeneration, leading to reduction in size and decreased or absent peripheral nodular enhancement.

Case Discussion

- MRI may help further characterize equivocal hepatic lesions, such as suspected sclerosed hemangioma.
- On MR, a sclerosing hemangioma is hypointense on T1-weighted images similar to standard hemangiomas. However, variable signal on T2-weighted images is commonly seen that is usually less hyperintense than that of a conventional hemangioma.²
- Variable imaging features between sclerosing hemangiomas and malignancy, such as presence and degree of arterial vs delayed enhancement, can be difficult to differentiate from malignant hepatic tumors.³

Case Discussion

- Differentiation between sclerosed hemangiomas and hepatic malignancy is difficult with cross-sectional imaging alone as they frequently cannot be reliably differentiated; percutaneous biopsy is typically required for confirmation.
- In this case, given this asymptomatic patient's self-reported, longstanding history of "liver hemangioma" and CT demonstrating minimal delayed phase enhancement, diagnosis of sclerosing hemangioma was established ultimately with MRI.

References:

1. Semelka R.C., Sofka C.M. Hepatic hemangiomas. *Magn Reson Imaging Clin N Am.* 1997;5:241–253.
2. Lee VT, Magnaye M, Tan HW, Thng CH, Ooi LL. Sclerosing haemangioma mimicking hepatocellular carcinoma. *Singapore Med J.* 2005;46:140–143.
3. Doyle D.J., Khalili K., Guindi M., Atri M. Imaging features of sclerosed hemangioma. *AJR Am J Roentgenol.* 2007;189:67–72.