

AMSER Rad Path Case of the Month:

78-year-old male presents with indeterminate liver lesion



Allegheny
Health Network



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Patient Presentation

- **HPI:** 78-year-old male presents with incidental liver mass picked up on outside CT
- **PMH:** Hepatic steatosis, HTN, CAD, HLD, gout, BPH, DJD, overactive bladder, b/l hearing loss
- **PE:** ABD – soft non-distended, non-tender; small reducible umbilical hernia, no appreciable inguinal hernia on PR; diastasis recti present
- **Labs:** LFTs within normal range, AFP <1.8
 - AST 25, ALT 27, alk phos 73, total bilirubin 0.5, albumin 4.4

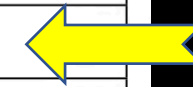
What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

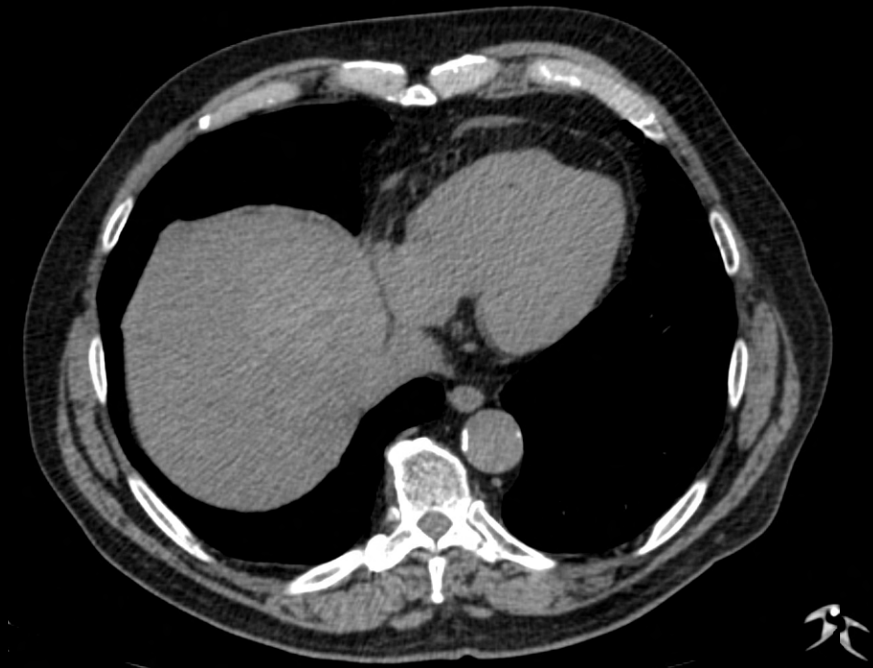
Variant 5: Incidental liver lesion, greater than 1 cm on US, noncontrast or single-phase CT, or noncontrast MRI. Known chronic liver disease.

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	☢☢☢
Image-guided biopsy liver	May Be Appropriate	Varies
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	☢☢☢☢

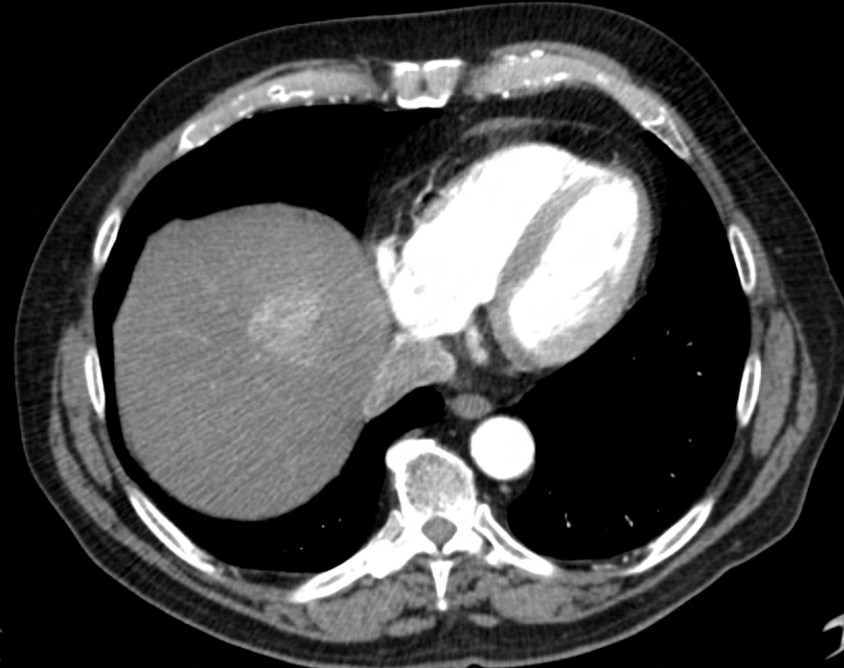
This imaging modality was ordered by the primary care physician



Findings (unlabeled)



Axial, non-contrast

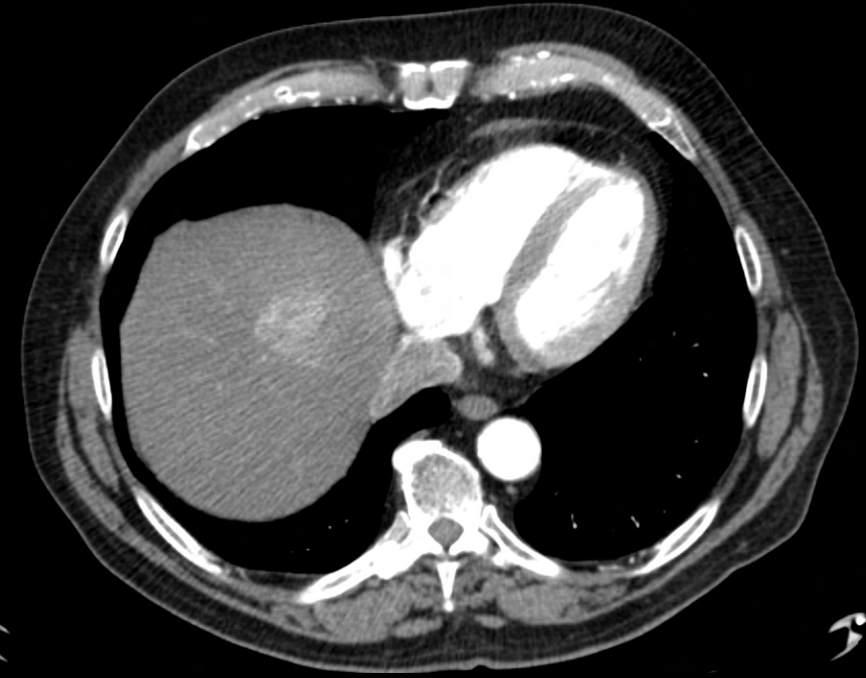
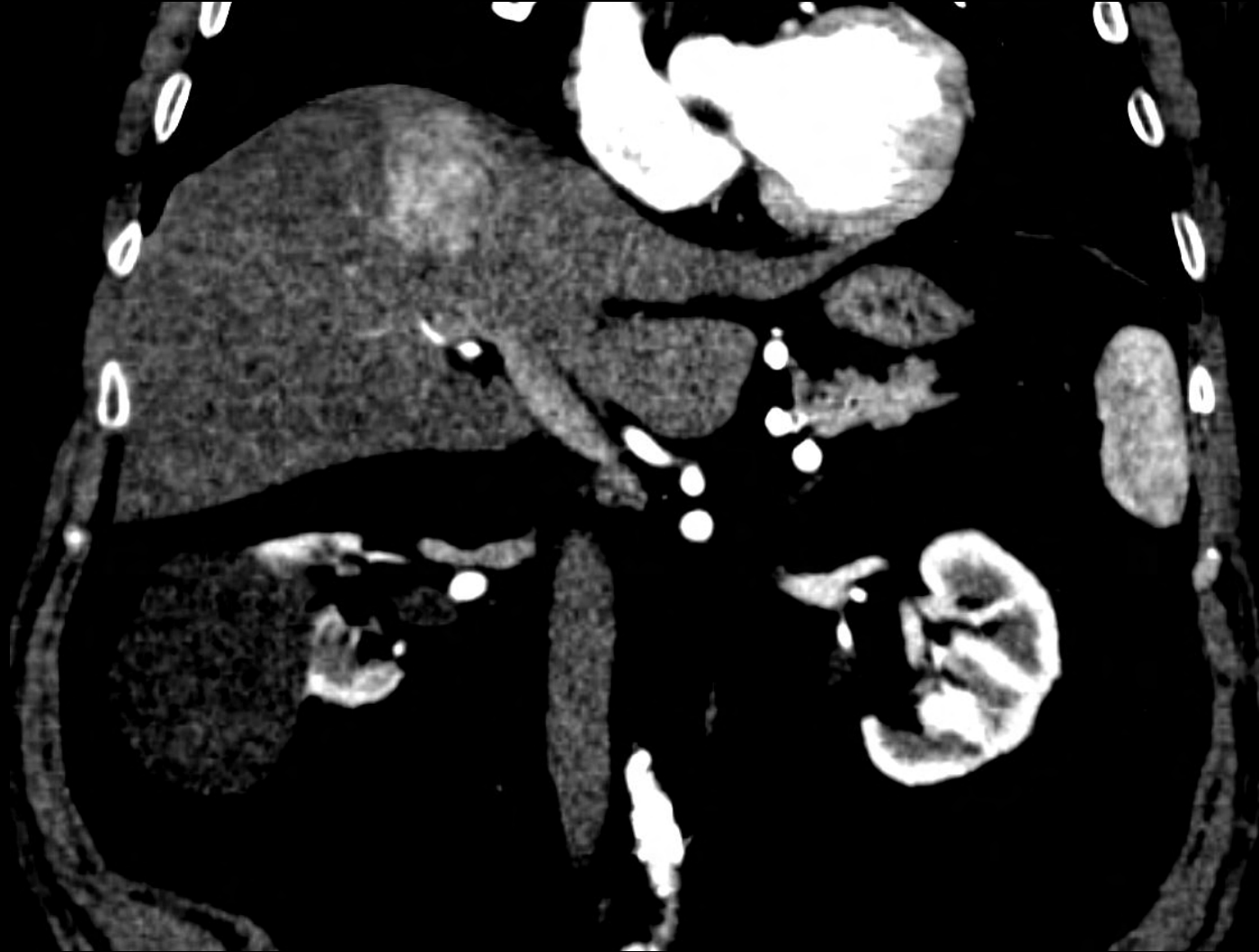


Axial, arterial phase



Axial, portal venous phase

Findings (unlabeled)



Axial, arterial phase

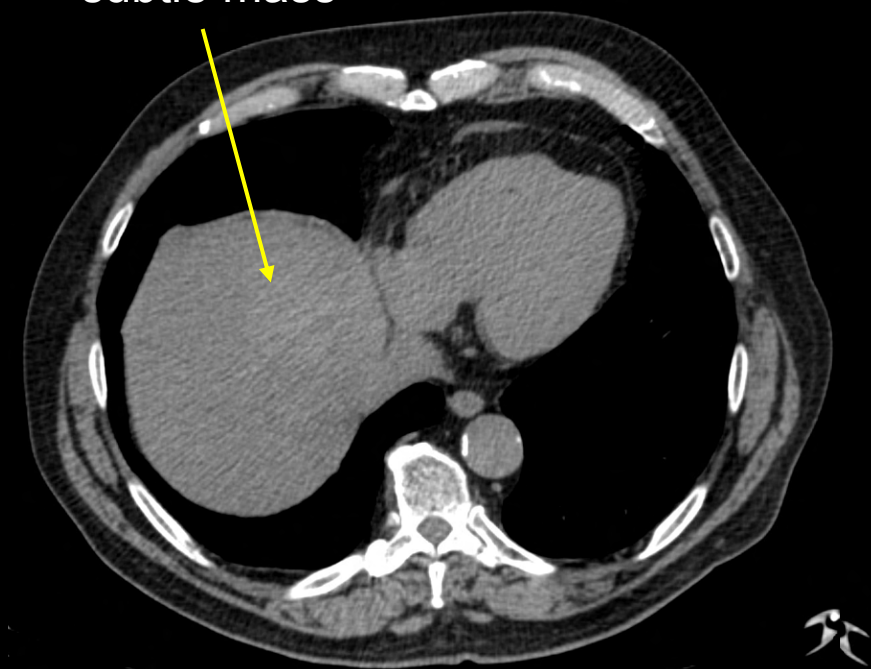
Coronal, arterial phase

Findings (labeled)

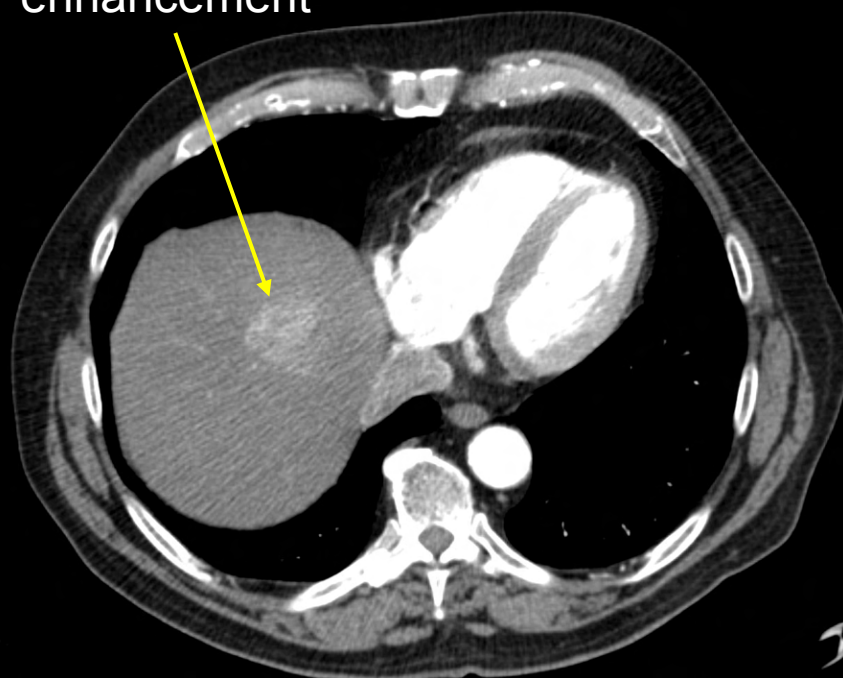
subtle mass

rapid arterial
enhancement

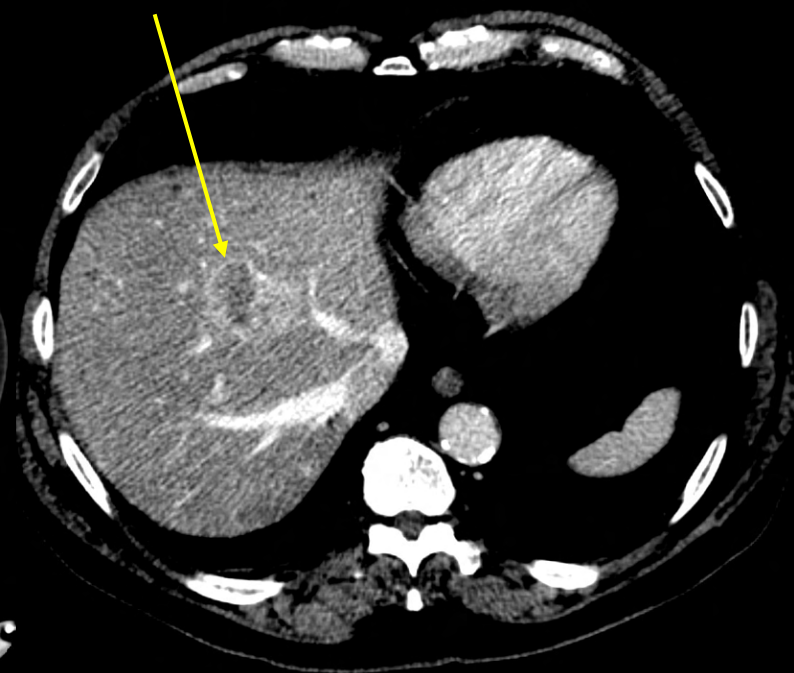
Lesion shows washout with
peripheral rim enhancement



Axial, non-contrast



Axial, arterial phase



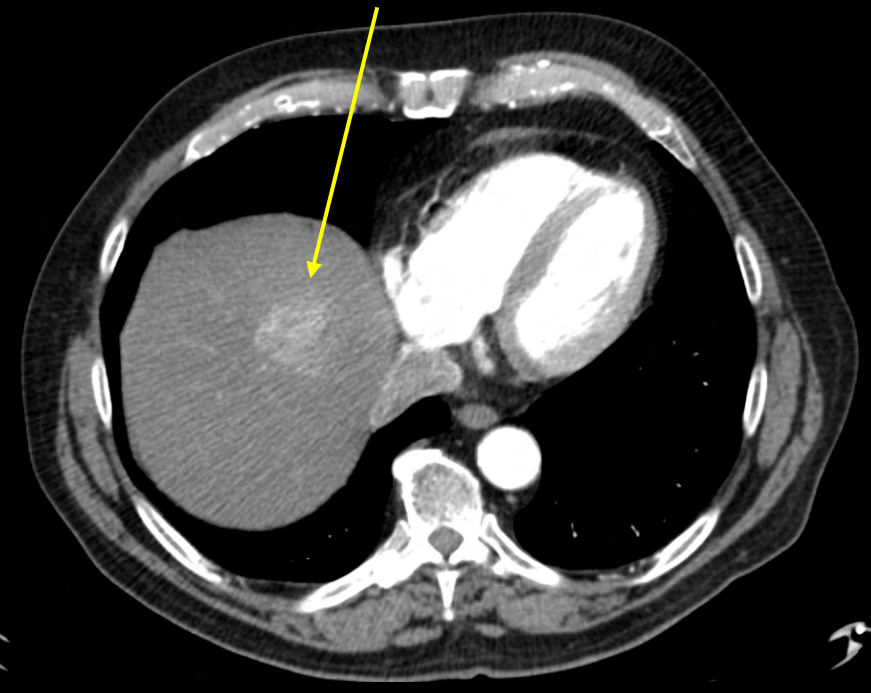
Axial, portal venous phase

Findings (labeled)

rapid arterial enhancement



rapid arterial enhancement



Axial, arterial phase

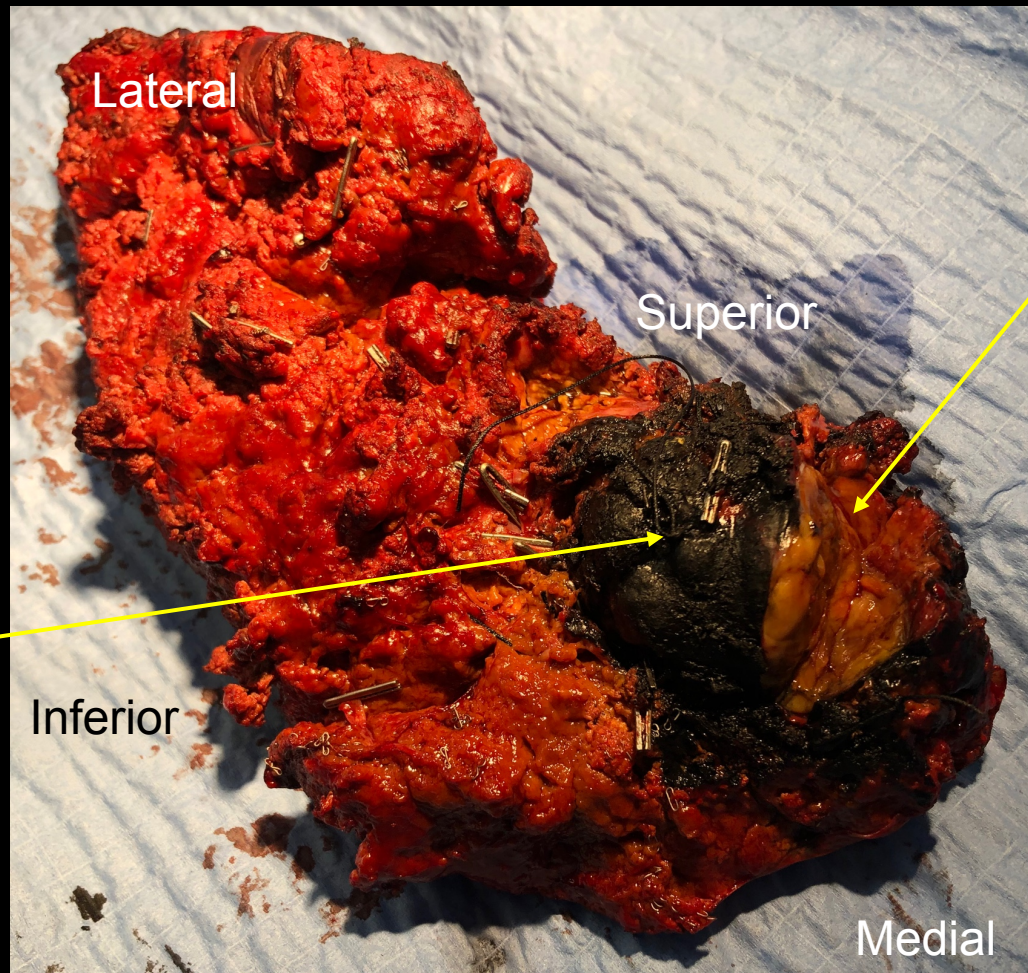
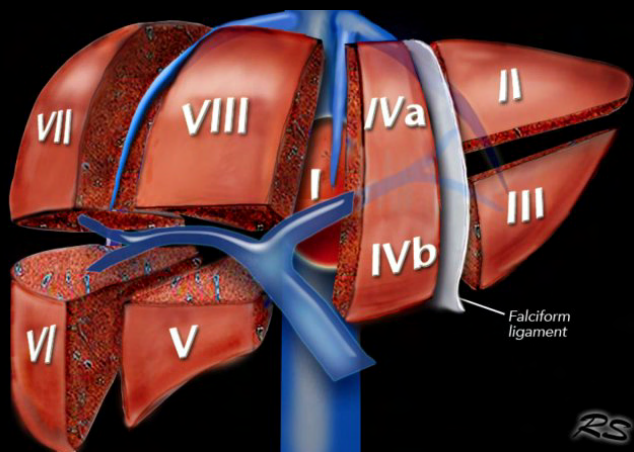
Coronal, arterial phase

Differential Based on Imaging

- Hepatocellular carcinoma
- Focal nodular hyperplasia
- Adenoma
- Metastasis (melanoma, renal cell, neuroendocrine)

Gross Findings:

s/p partial hepatectomy (segments V & VIII)

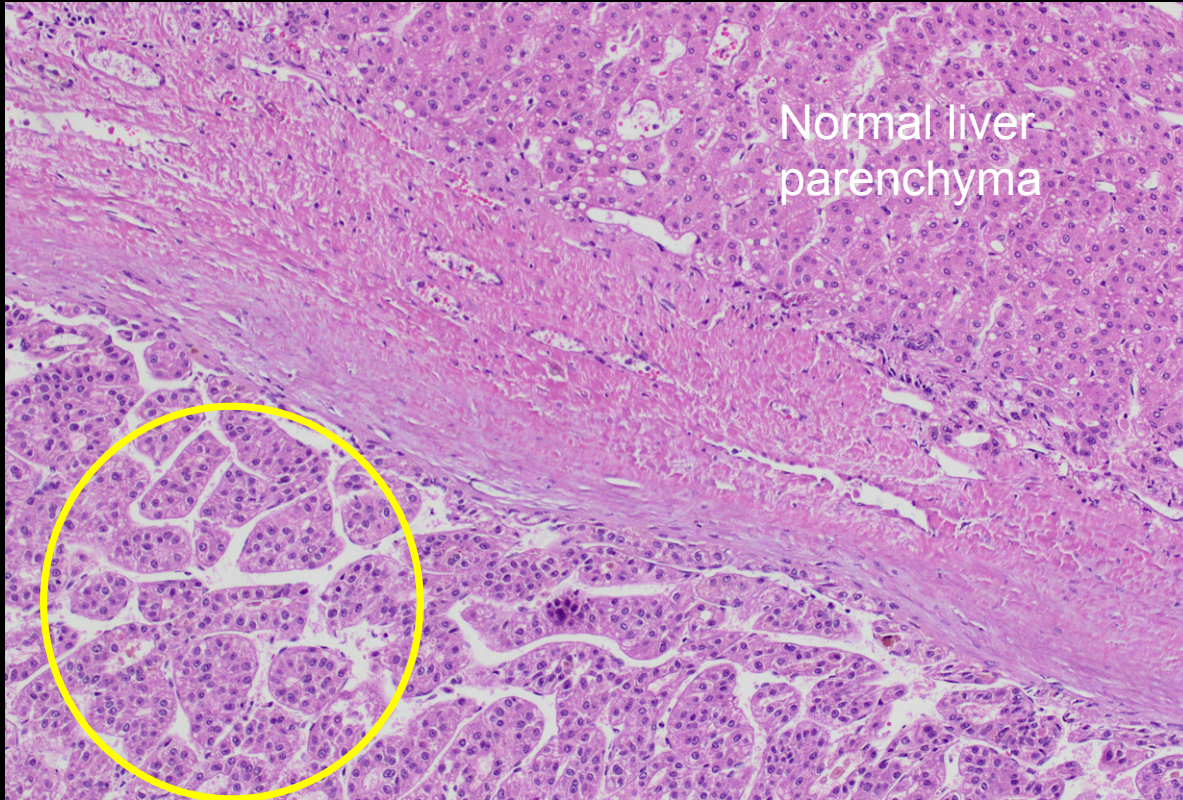


Liver lesion sitting on the middle hepatic vein (Black ink coating lesion)

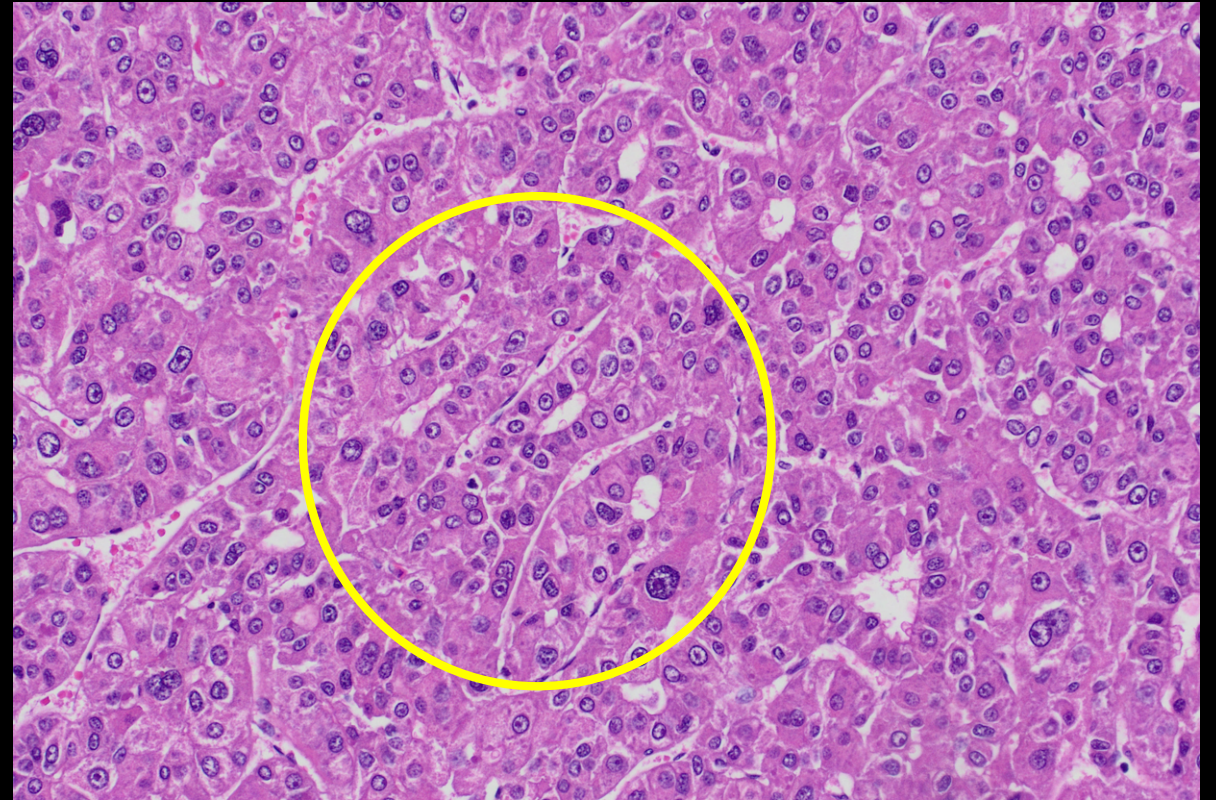
Well circumscribed yellow-tan centrally necrotic appearing lesion measuring 4 x 3.5 x 3.5 cm and approaches to within 2 mm of black inked margin and 2-3 mm of the liver capsule

Middle Vein Groove

Histopathology Findings (H&E Stain)



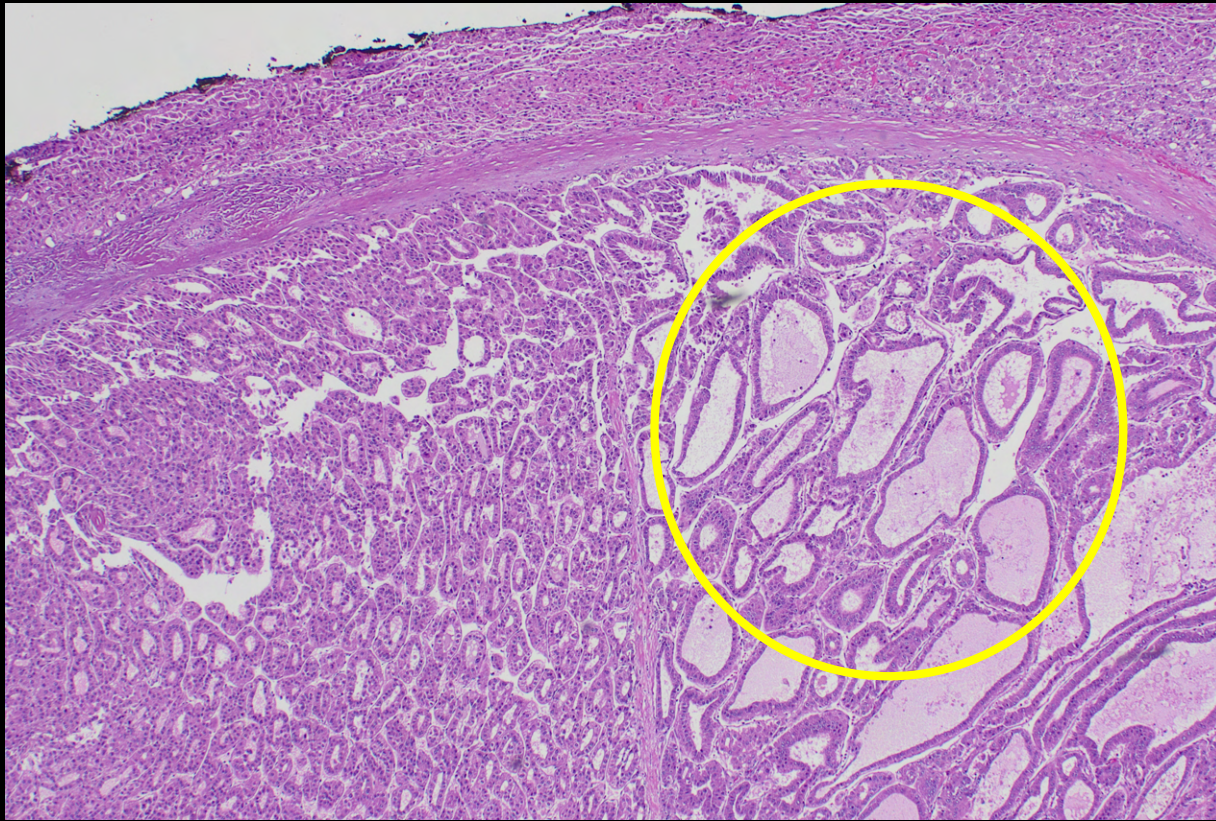
10X



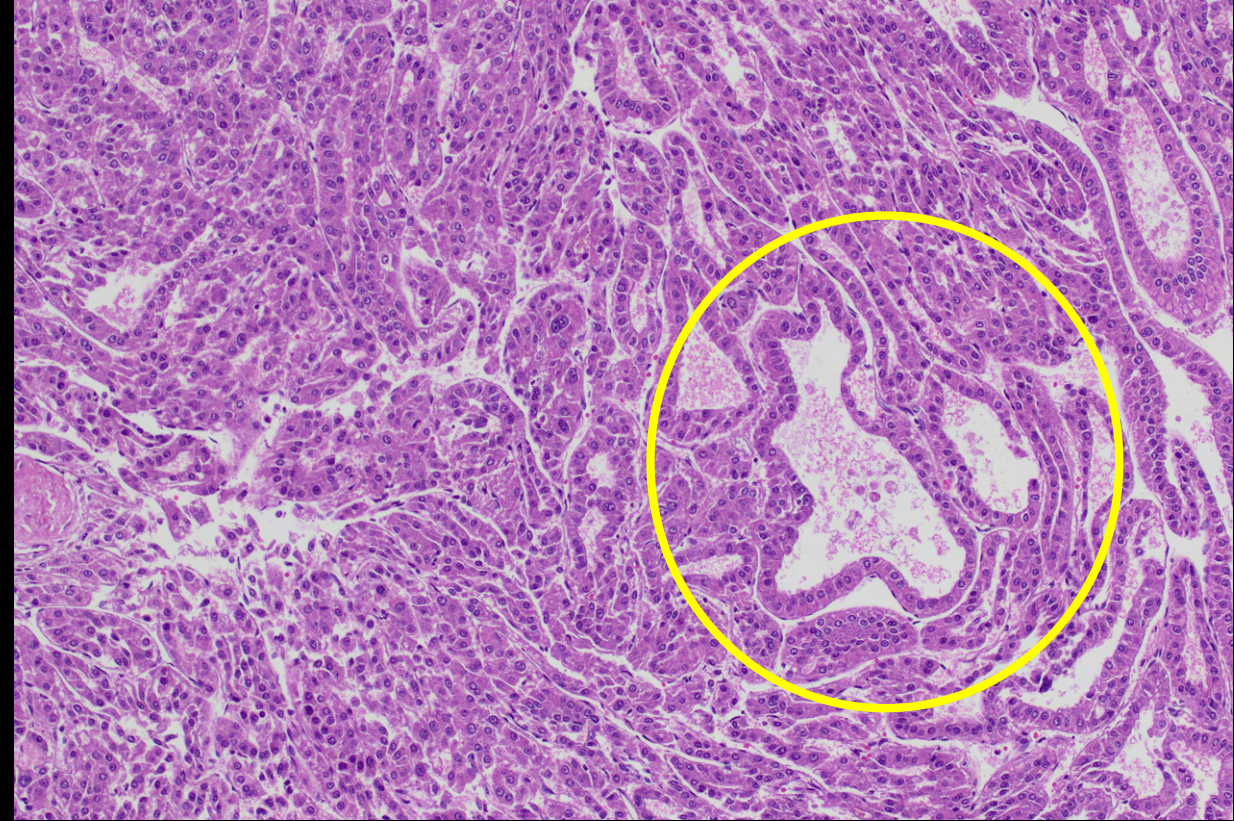
20X

Trabecular pattern: thin tumor trabeculae with no more than ten cells in thickness
Most often HCC grows in a trabecular pattern (cords of cells separated by vascular sinusoids that are lined by endothelial cells) mimicking the cell plates and sinusoids of normal liver

Histopathology Findings (H&E Stain)



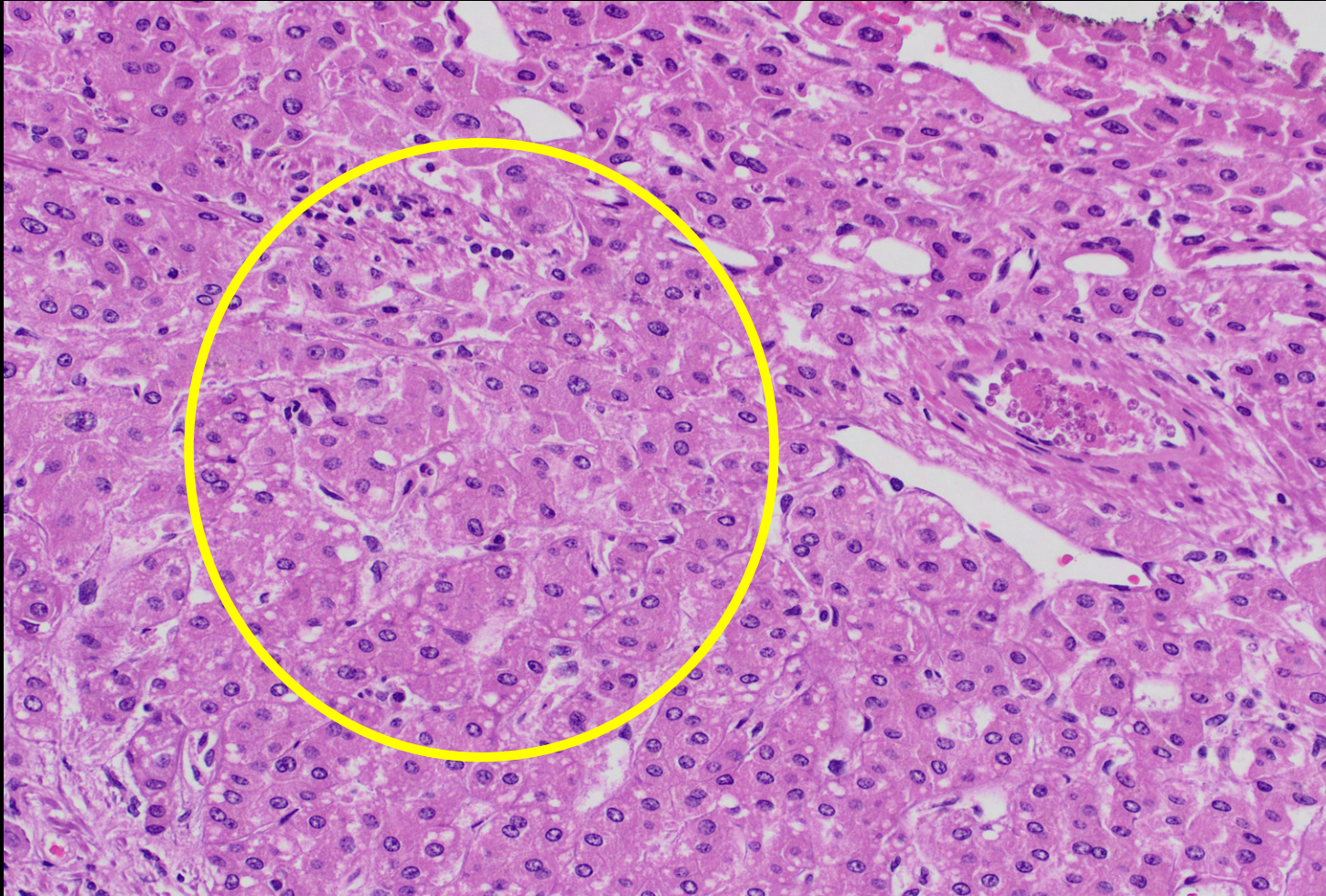
4X



10X

Pseudoglandular pattern: glandular-like or acinus-like structures with minimal atypia
Moderately differentiated HCC often contain frequent pseudoglandular patterns

Histopathology Findings (H&E Stain)



Solid Growth Pattern:
Poorly differentiated HCCs are composed of pleomorphic tumor cells in a solid or compact growth pattern

20X

Final Dx:

Hepatocellular Carcinoma

Case Discussion

- Hepatocellular Carcinoma (HCC) is the most common primary liver malignancy. It is strongly associated with cirrhosis.
- HCC receives most of its blood supply from branches of the hepatic artery, this accounts for the characteristic early arterial enhancement with early “washout”
 - Rim enhancement on delayed post-contrast images with a capsule-appearance is relatively specific for HCC
- Clinical presentation of HCC is variable but may include constitutional symptoms, jaundice, portal HTN from invasion of the portal vein, hepatomegaly/mass, hemorrhage from tumor
- Most common tumor marker: alpha-fetoprotein (AFP)

Case Discussion: Diagnosis and Treatment

- On CT with contrast, enhancement is the key to HCC assessment. Usually, the mass enhances vividly during late arterial phase and then exhibits rapid washout, becoming isodense in comparison to the rest of the liver in the portal venous phase (often with peripheral rim enhancement).
- Treatment:
 - Resection – Child-Pugh Class A or no cirrhosis
 - Liver Transplant – Child-Pugh Class B/C, or significant portal hypertension, or otherwise unresectable
 - Consider systemic chemotherapy or radiofrequency ablation if unresectable and not liver transplant candidate

Child-Pugh Classification

Parameter	Points assigned		
	1	2	3
Ascites	Absent	Slight	Moderate
Bilirubin	<2 mg/dL (<34.2 micromol/L)	2 to 3 mg/dL (34.2 to 51.3 micromol/L)	>3 mg/dL (>51.3 micromol/L)
Albumin	>3.5 g/dL (35 g/L)	2.8 to 3.5 g/dL (28 to 35 g/L)	<2.8 g/dL (<28 g/L)
Prothrombin time (seconds over control) or INR	<4 <1.7	4 to 6 1.7 to 2.3	>6 >2.3
Encephalopathy	None	Grade 1 to 2	Grade 3 to 4

Modified Child-Pugh classification of the severity of liver disease according to the degree of ascites, the serum concentrations of bilirubin and albumin, the prothrombin time, and the degree of encephalopathy.

A total Child-Pugh score of 5 to 6 is considered Child-Pugh class A (well-compensated disease), 7 to 9 is class B (significant functional compromise), and 10 to 15 is class C (decompensated disease).

These classes correlate with one- and two-year patient survival:

class A: 100 and 85%; class B: 80 and 60%; and class C: 45 and 35%.

References:

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