

SONOGRAPHIC LIVER PATTERNS

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- Normal
- Centrilobular
- Fatty-fibrotic



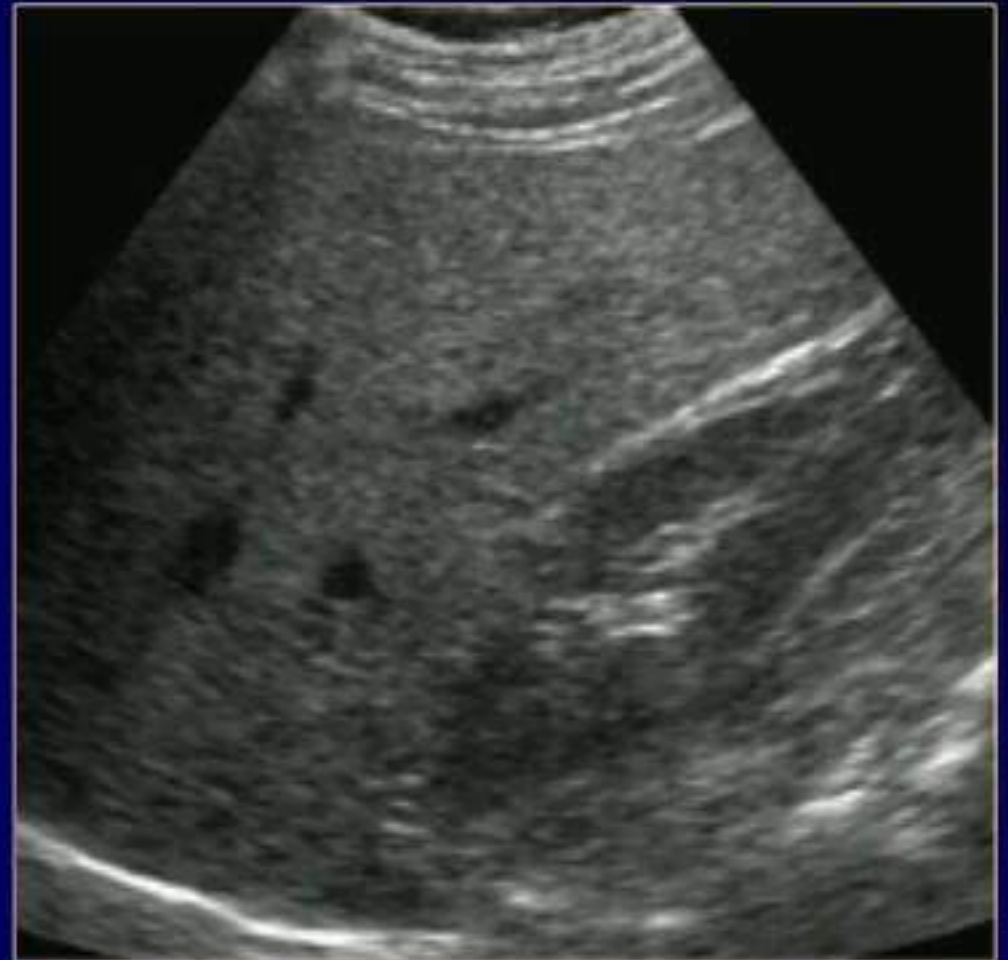
CENTRI-LOBULAR PATTERN

- Decreased echogenicity of liver parenchyma
- Increased visualization of PV walls
 - increased brightness
 - increased number
- Acute hepatitis, acute RT heart failure, leukemia/lymphoma, toxic shock, 2% normals



FATTY-FIBROTIC PATTERN

- Increased echogenicity of liver parenchyma
- Decreased definition of PV walls
- Echotexture
 - homogeneous (fine)
 - heterogeneous (coarse)
- Posterior sound attenuation
- Fatty infiltration, chronic hepatitis, cirrhosis, acute alcoholic hepatitis



FATTY - FIBROTIC PATTERN

Echotexture



Homogeneous



Heterogeneous

FATTY LIVER

- Posterior sound attenuation
- Enlarged liver
- Tends to have fine homogeneous echotexture



FOCAL FATTY LIVER CHANGES

- Focal fatty infiltration
- Focal fatty sparing



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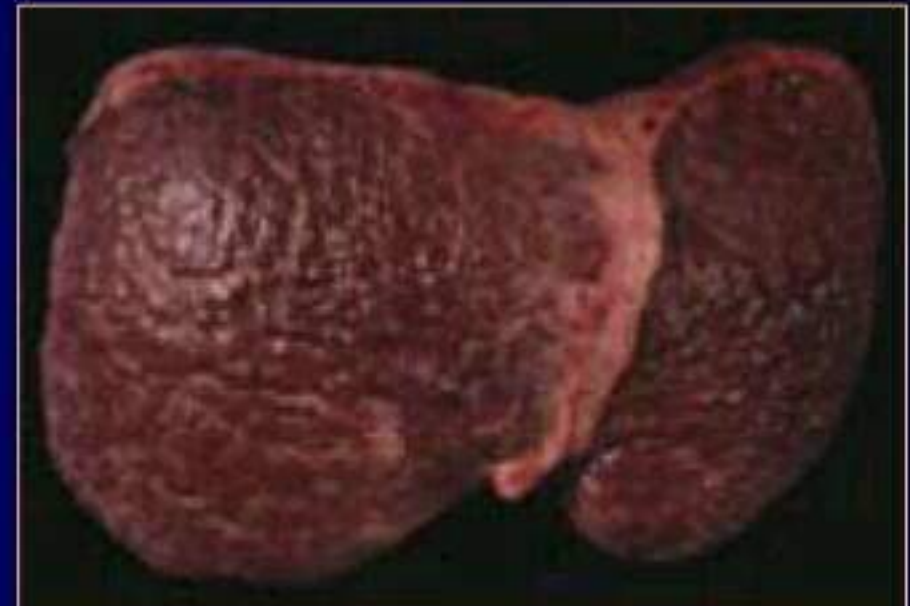
LIVER CIRRHOSIS

- Fatty-fibrotic pattern
 - heterogeneous echotexture
(coarse “motheaten”)
 - almost no posterior attenuation
- Shrunken liver
- Nodular surface
- Elevated caudate:right lobe ratio (>0.73 has 99% specificity for cirrhosisS)

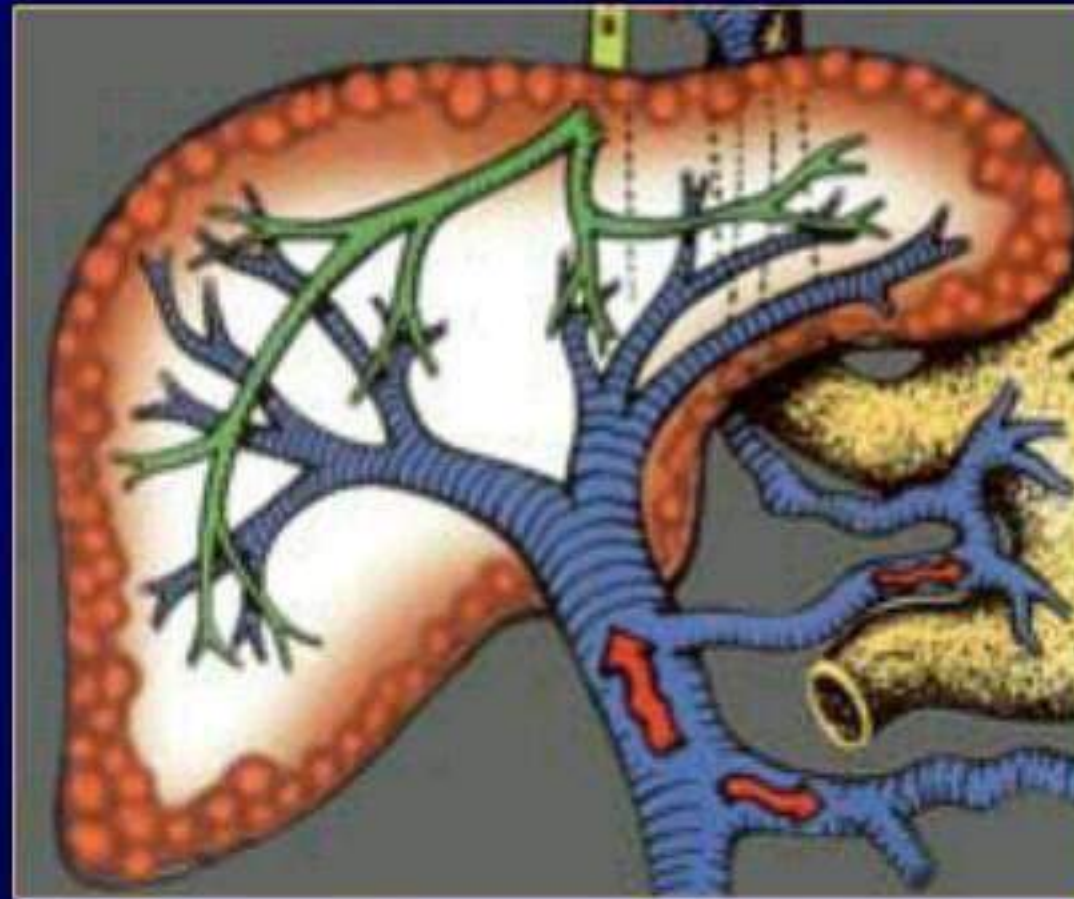


LIVER CIRRHOSIS

- Accounts for > 90% of all portal hypertension
- Distorted liver architecture
 - Fibrosis
 - Regenerating nodules
 - Distorted vascular channels



PORTAL HYPERTENSION



↑ hepatic resistance, ↑ portal venous pressure,
eventually ↓ portal flow, reversed portal flow
Prognostication for risk of hemorrhage

PORTAL HYPERTENSION

Sonographic Signs

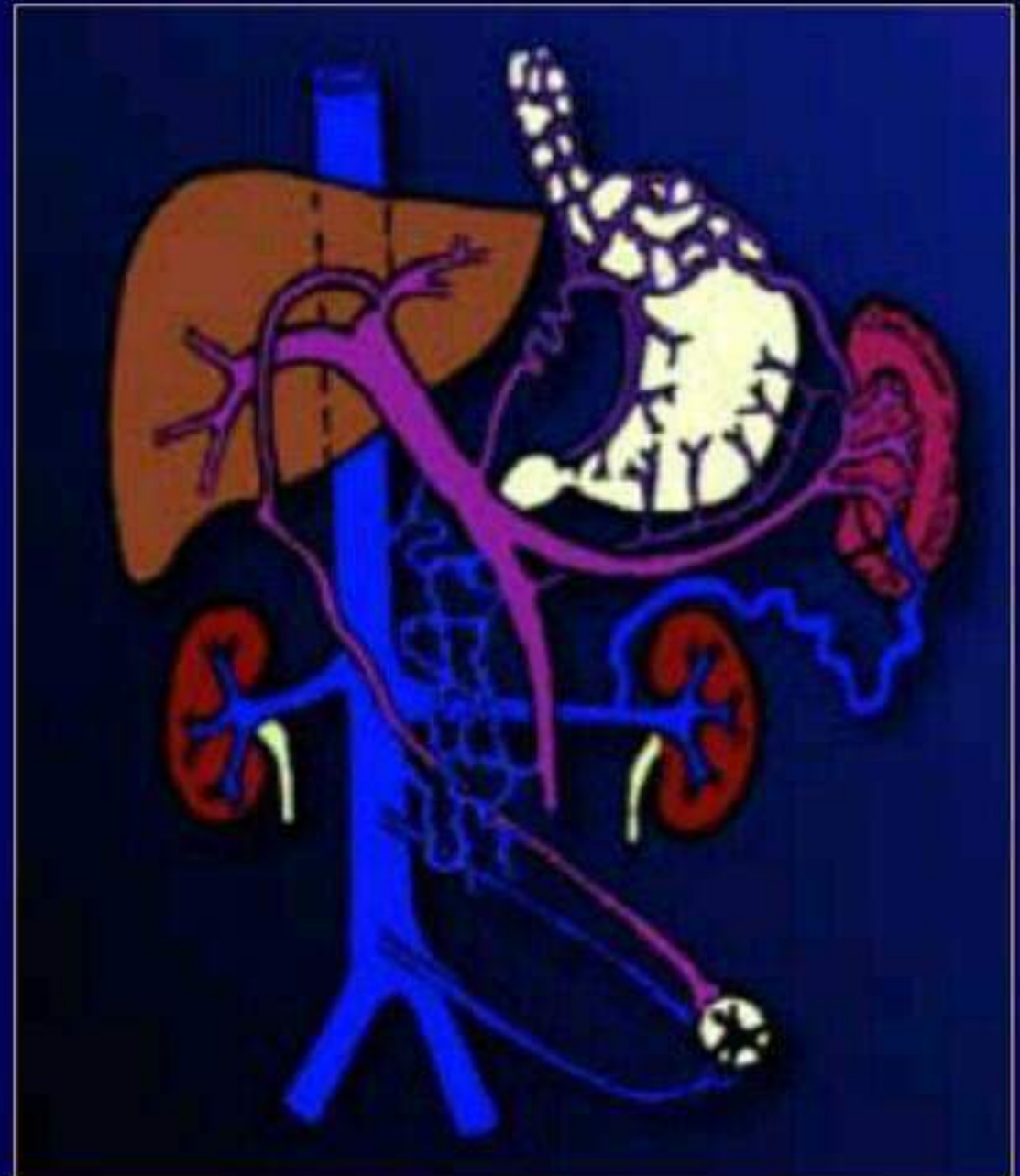
- Ascites
- Dilated MPV, SV, SMV
- Collaterals
- Splenomegaly
- Various Doppler findings



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COLLATERAL VEINS

- Gastroesophageal
- Coronary
- Umbilical
- Gastrosplenic
- Splenorenal/gastrorenal
- Perisplenic
- Intestinal
- Retroperitoneal



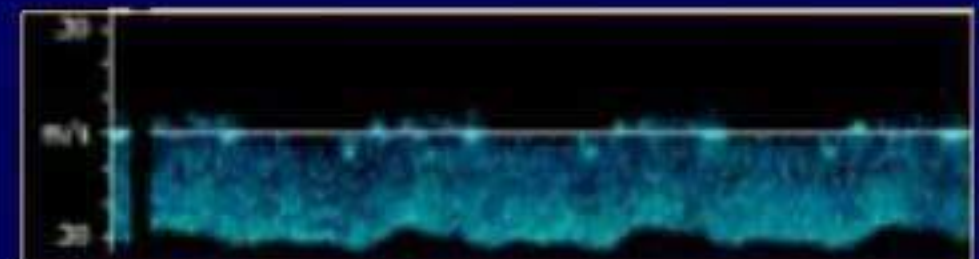
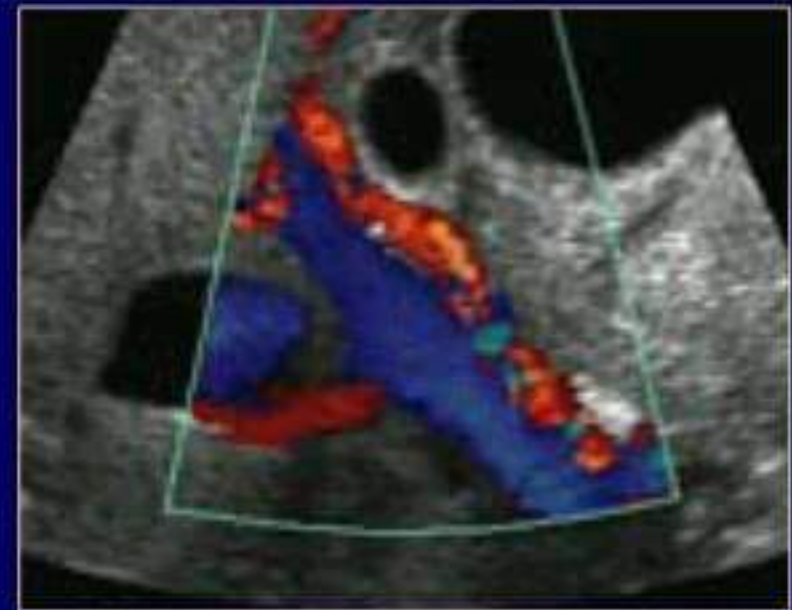
PORTAL HYPERTENSION

Collateral Vessels



DOPPLER in PORTAL HYPERTENSION

- Portal veins:
 - loss of respiratory variation
 - decreased velocity MPV
 - hepatofugal (reversed) flow
- Hepatic veins:
 - loss of normal pulsatility
 - non-triphasic flow
 - flattened waveform
- Hepatic arteries:
 - enlarged hepatic arteries



PORTAL HYPERTENSION

Enlarged Hepatic Arteries

A cause of intraparenchymal “double duct” sign

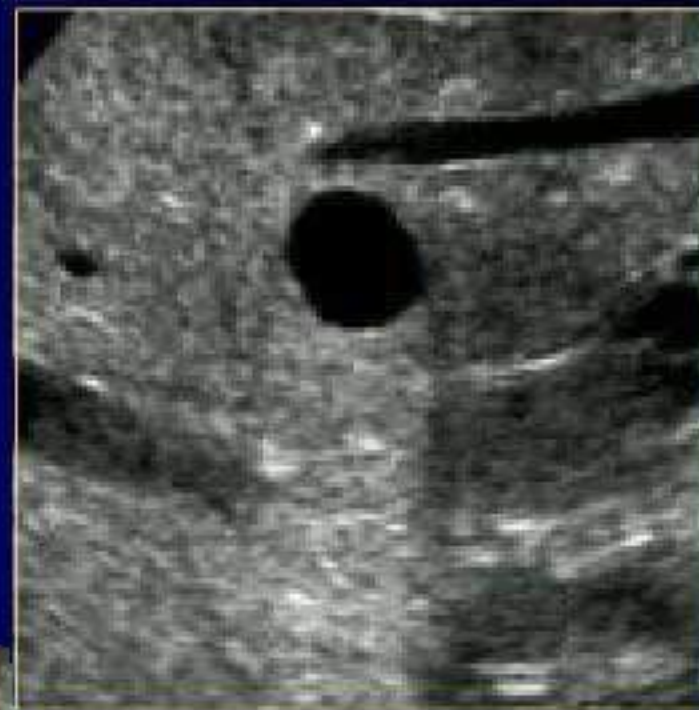


FOCAL LIVER MASSES

- US is excellent in detecting focal liver lesions
- US is specific for liver cysts > 1 cm
- Not good in differentiating among pathologic entities
 - Very few US features are characteristic
- Not good in distinguishing between benign and malignant masses
- Triple phase Liver CT and MRI are excellent
- US is very helpful for diagnosis in the proper clinical setting, for follow-up and as guidance for biopsy

SIMPLE CYSTIC LESIONS

- Cyst
- Old hematoma
- Abscess (hydatid)
- Biloma / seroma
- Vascular
 - aneurysm
 - fistula (a-pv, p-hv)



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COMPLEX CYSTIC LESIONS

- Hemorrhagic cyst
- Infected cyst
- Hematoma
- Abscess
- Biloma / seroma
- Biliary cystadenoma
- Cystic/necrotic malignant tumors



LIVER ABSCESS

- May cause difficulty in diagnosis



CHARACTERISTIC LESION

Echinococcal cyst with laminated membrane



COMPLEX CYSTIC LESIONS

Benign versus Malignant



Echinococcal cyst



Metastases

HYPOECHOIC MASS

BENIGN

Abscess

Adenoma

Focal nodular
hypoplasia

Hemangioma

Microabscesses

Focal fatty sparing

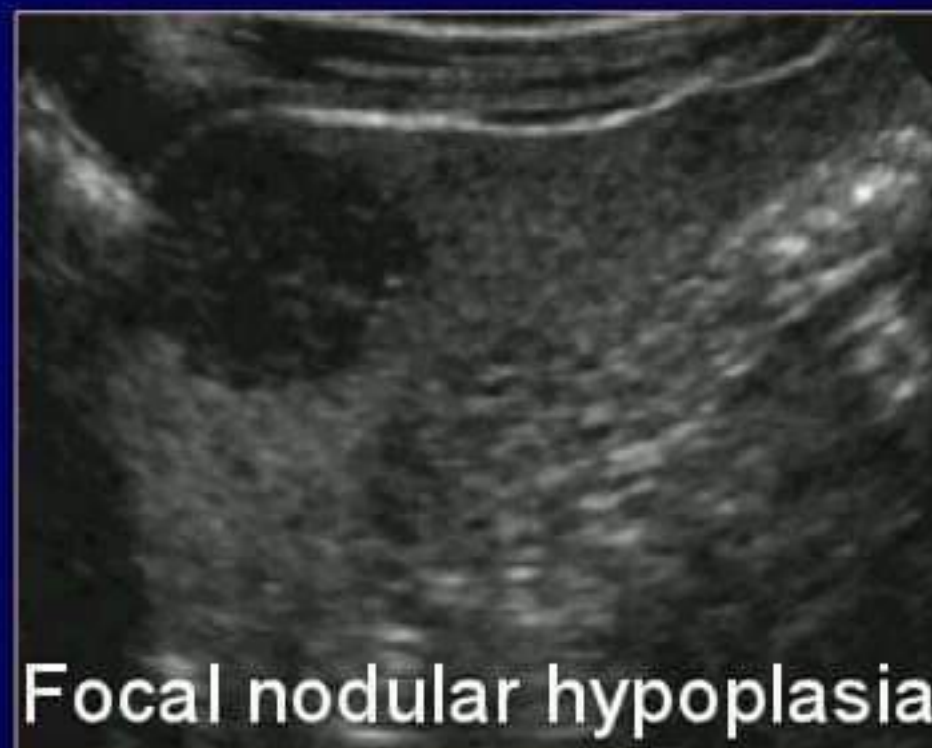
MALIGNANT

Metastasis

Hepatocellular
carcinoma

Lymphoma

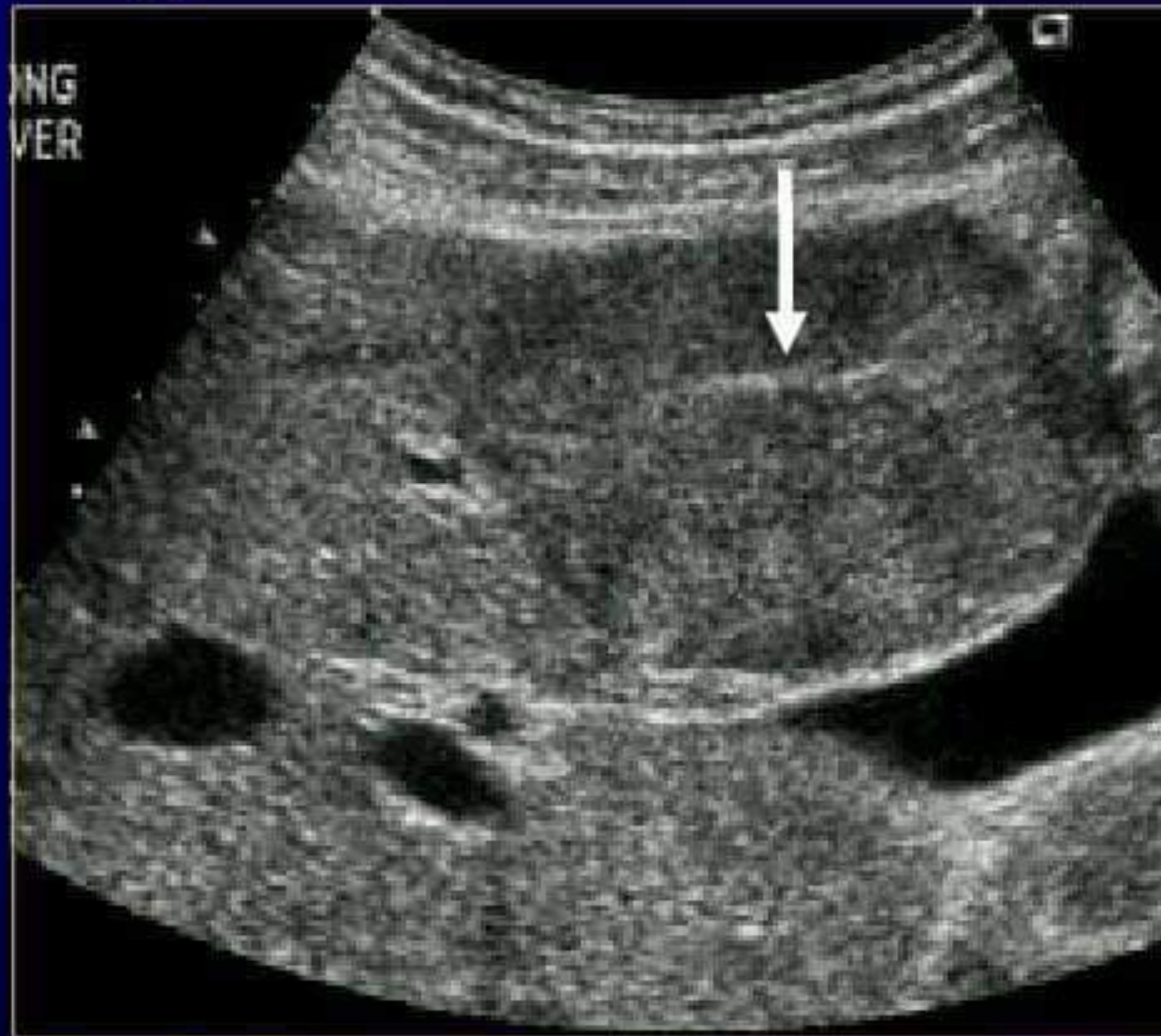
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Focal nodular hypoplasia

CHARACTERISTIC LESION

- Focal nodular hyperplasia with a central scar
- But not diagnostic



CENTRAL SCAR IN LESION

Hepatocellular carcinoma,
Fibrolamellar type



Giant hemangioma

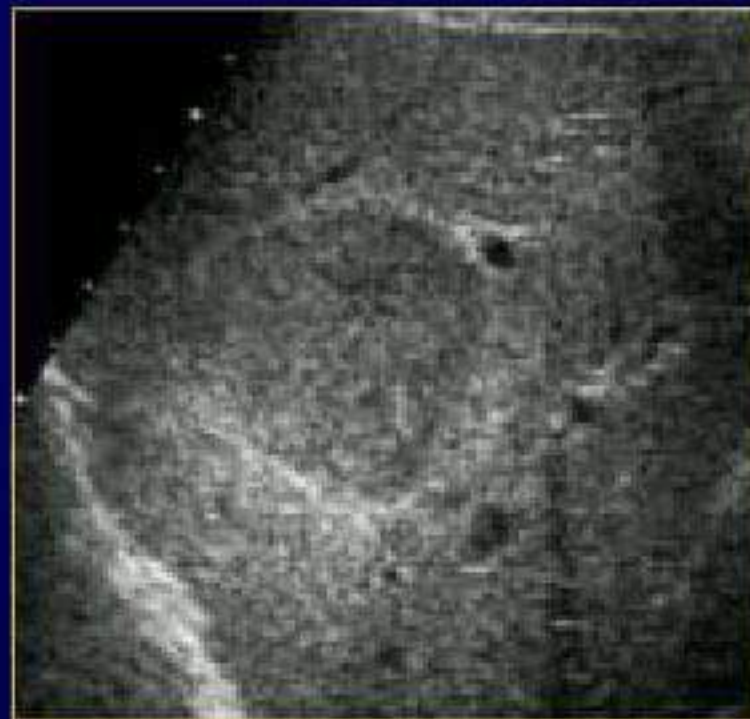
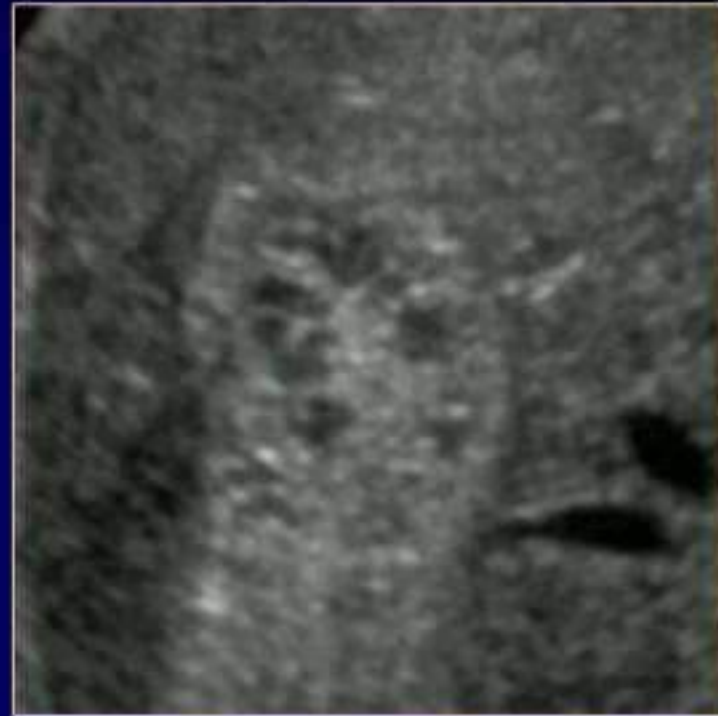


CHARACTERISTIC LESION

- Hyperechoic hemangioma



ATYPICAL HEMANGIOMAS



HYPERECHOIC MASS

BENIGN

Hemangioma

Abscess

Adenoma

Focal nodular
hypoplasia

Focal fat

Hemorrhagic cyst

MALIGNANT

Metastasis

Hepatocellular
carcinoma

Lymphoma



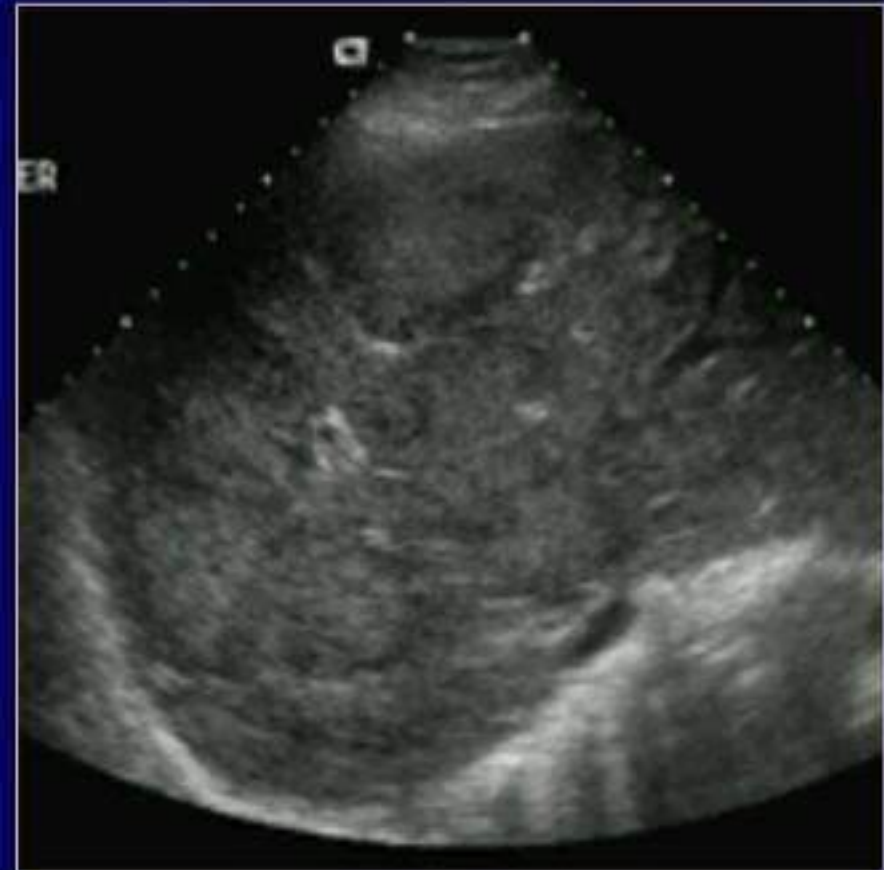
Thyroid cancer metastasis

MULTIPLE SOLID MASSES

- Metastases



Regenerating nodules
in cirrhosis



Lymphoma

MULTIPLE SOLID MASSES

- Multifocal HCC, Multiple hemangiomas, microabscesses



Multiple hemangiomas



Microabscesses

CHARACTERISTIC METASTASES

- Colon metastases



Also seen with cancers of ovary, breast, stomach, pancreas, osteosarcoma, leiomyosarcoma, chondrosarcoma, teratocarcinoma

US GUIDANCE

- Usefulness of sonography
- For aspiration, biopsy and drainage

