Focal Confluent Fibrosis

- Wedge-shaped lesion in anterior and medial segments with volume loss, delayed enhancement, and capsular retraction
  - 90% of cases involve medial segment of left lobe &/or anterior segment of right lobe, with sparing of caudate and lateral segments
- Retraction of overlying liver capsule (90%)
- Lesions are iso-attenuating to adjacent liver parenchyma on venous phase CECT (80%)
  - May show delayed persistent enhancement like other fibrotic liver lesions
  - **Does not "wash out"** (decrease in enhancement) unlike HCC
- Most commonly in cirrhosis secondary to primary sclerosing cholangitis or alcoholism
- Can be seen on imaging in ~14% of patients with advanced cirrhosis

Imaging

- **Best diagnostic clue**
  - Wedge-shaped lesion in anterior and medial segments with volume loss, delayed enhancement, and capsular retraction
- **Location**
  - Wedge-shaped lesions radiate from porta hepatis and extend to hepatic capsule
  - 90% of cases involve medial segment of left lobe &/or anterior segment of right lobe, with sparing of caudate and lateral segments
  - Peripheral lesions are remote from porta hepatis
- **Size**
  - May range from 2 x 1.5 cm to 15 x 6 cm
- Key concepts
  - Usually wedge-shaped; peripheral isolated foci may be band-shaped or curvilinear
  - Total lobar or segmental fibrosis

MRI

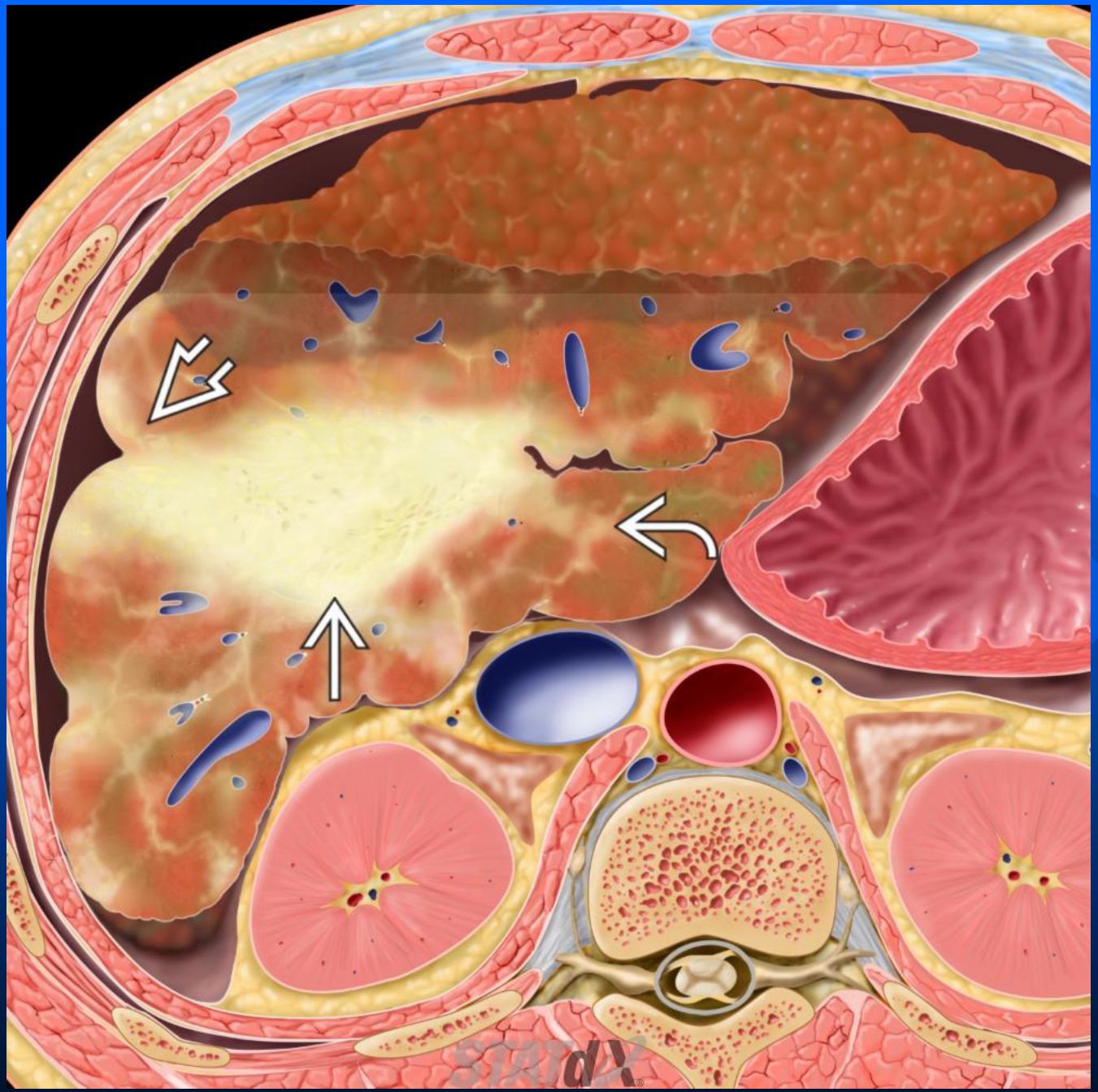
- **T1WI**
  - Hypointense to adjacent liver parenchyma
- **T2WI**
  - Lesions are hyperintense due to edema and compressed remnants of portal triads
- **STIR**
  - Hyperintense lesions
- **DWI**
  - No restricted diffusion (not bright on DWI)
- **T1WI C+**
  - Lesions are slightly hypointense to liver on immediate post-gadolinium sequences (80%)
    - During later dynamic phase, portions of fibrotic lesions may become isointense with liver
    - Delayed, progressive, increased enhancement on portal venous and equilibrium phase images
  - May be slightly hyperintense, due to pooling of contrast material within fibrotic stroma
- Gadoxetate (Eovist)-enhanced MR
  - Confluent fibrosis will be hypointense on hepatobiliary (delayed) phase, due to absence of functioning hepatocytes and bile ducts

DDx:

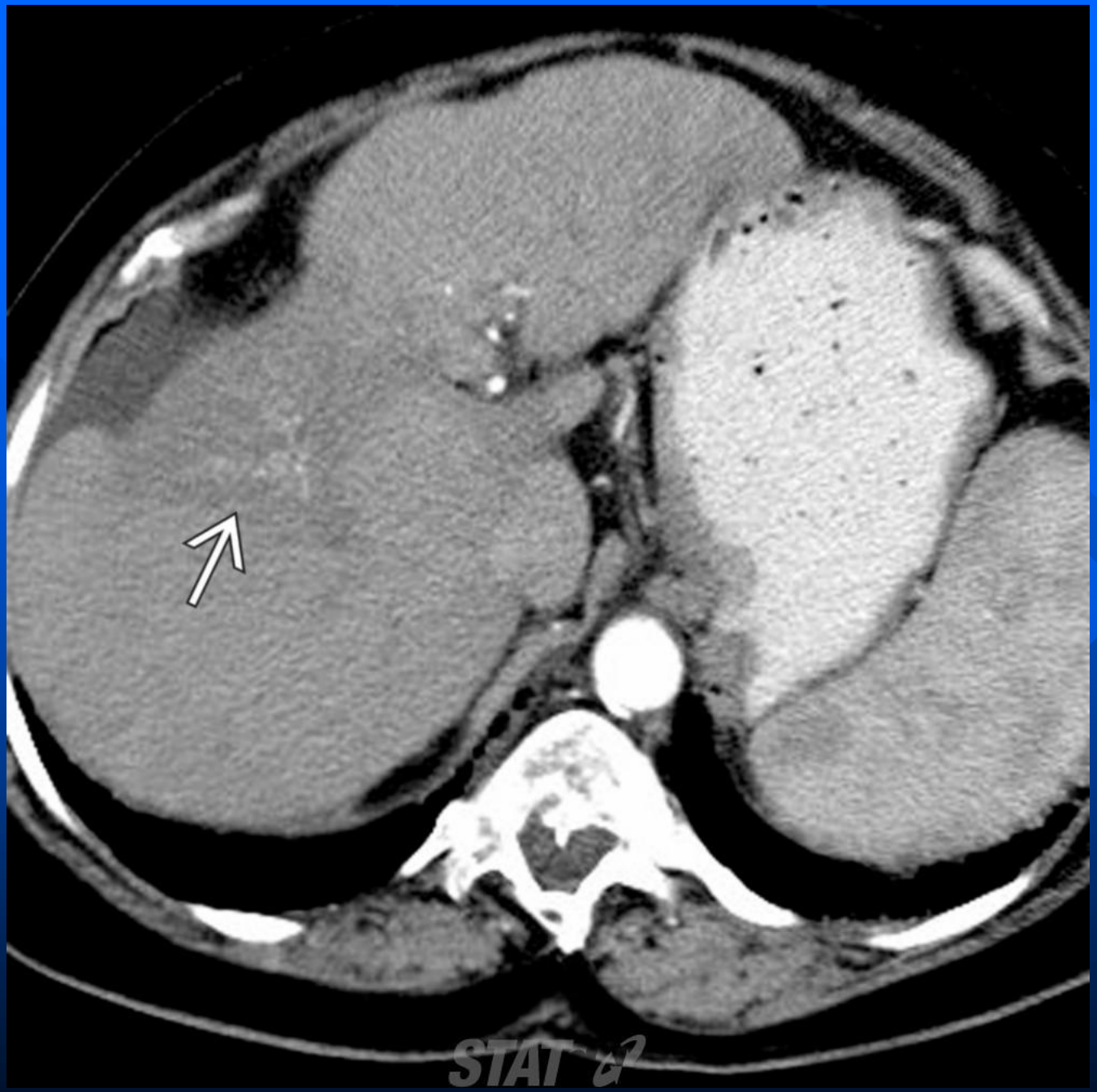
- Cholangiocarcinoma (peripheral)
  - Clinical clues: History of primary sclerosing cholangitis or other chronic bile duct inflammation
  - Dilated bile ducts upstream of tumor
- Treated malignancies
  - May be indistinguishable from confluent fibrosis
  - Check for prior imaging or clinical evidence of tumor
- Hepatic cavernous hemangioma (sclerosed)
  - Especially within cirrhotic liver
- Hepatic epithelioid hemangioendothelioma
  - Multiple peripheral, coalescent tumors

Checklist

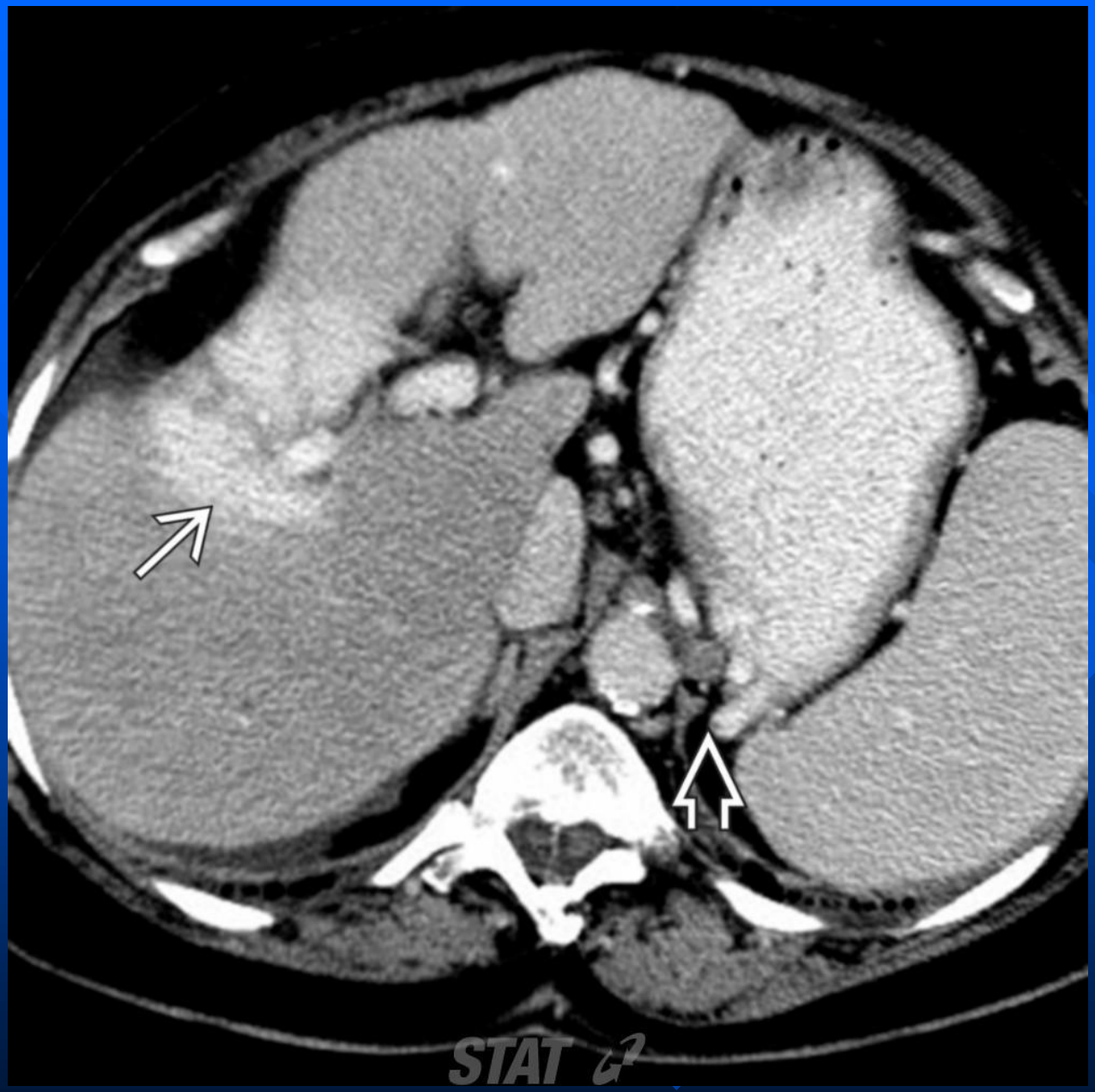
- **Consider**
  - Fibrosis is present in all cirrhotic livers
    - » Confluent is just 1 pattern evident on imaging and gross pathology
    - » Notable because it may simulate tumor, especially cholangiocarcinoma
  - CT and MR shows features of confluent fibrosis well
- **Image Interpretation Pearls**
  - Characteristic location (medial segment of left lobe, anterior segment of right lobe, or both) and shape (wedge-shaped with capsular retraction and volume loss) enables correct diagnosis and may prevent unnecessary biopsy
    - » Review of sequential CT (or MR) over long period of surveillance for cirrhosis will often make diagnosis apparent
  - Consider cholangiocarcinoma or treated malignancy in differential diagnosis



Graphic shows a nodular cirrhotic liver. Fibrosis is prominent, including band-like foci (white curved arrow) and larger, confluent "masses" (white solid arrow) with retraction of the overlying liver capsule (white open arrow).

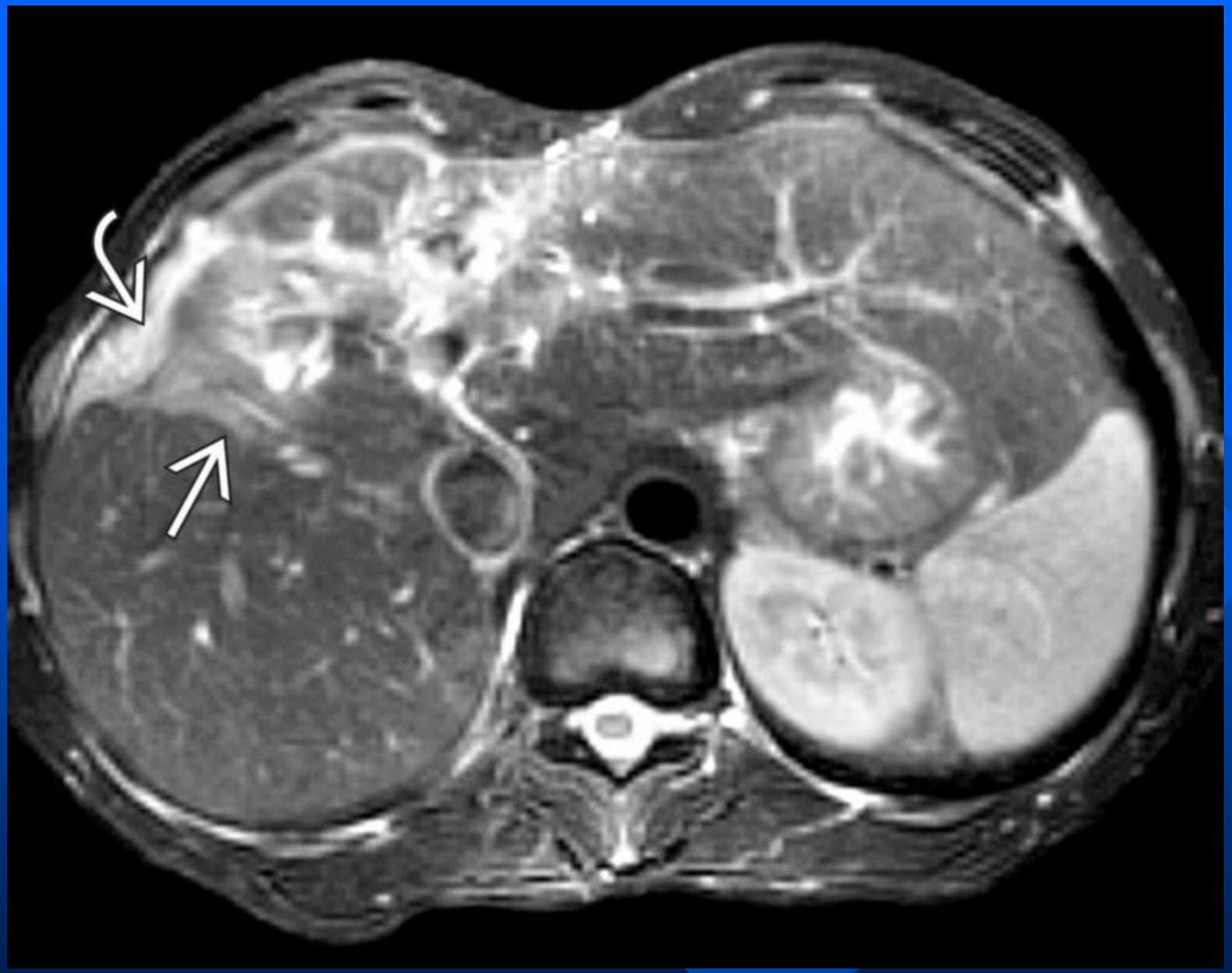


Axial arterial phase CECT shows minimal enhancement of the lesion (white solid arrow) but a suggestion of crowded and distorted hepatic arterial branches within.



Axial delayed phase CECT in the same patient shows persistent increased enhancement of the confluent hepatic fibrosis (white solid arrow). Note the varices (white open arrow), widened fissures, and splenomegaly as signs of cirrhosis.

Axial T1WI MR shows a hypointense focus (white solid arrow) in the anterior and medial segments with overlying capsular retraction.



Axial T2WI MR in the same patient shows hyperintensity of the focal confluent fibrosis (white solid arrow). Volume loss and fibrosis are limited to the anterior and medial segments in this patient. Note the ascites (white curved arrow) in the perihepatic space.