Ascending Cholangitis

- Pyogenic infection of biliary tree as a result of biliary obstruction.
- Pathology
  - Pathogenesis: Stone/stricture → obstruction → bile stasis → ↑ biliary pressure → infection
  - Source of infection is usually bacteria from duodenum, which ascend biliary tree
  - Obstruction due to gallstones accounts for 80% of cases
  - Other common causes include biliary strictures (benign or malignant), recent intervention, and hepatobiliary surgery
- Clinical Issues
  - Treatment with broad spectrum parenteral antibiotics and biliary drainage (usually via ERCP)
  - Patients classically present with Charcot triad (pain, fever, jaundice)

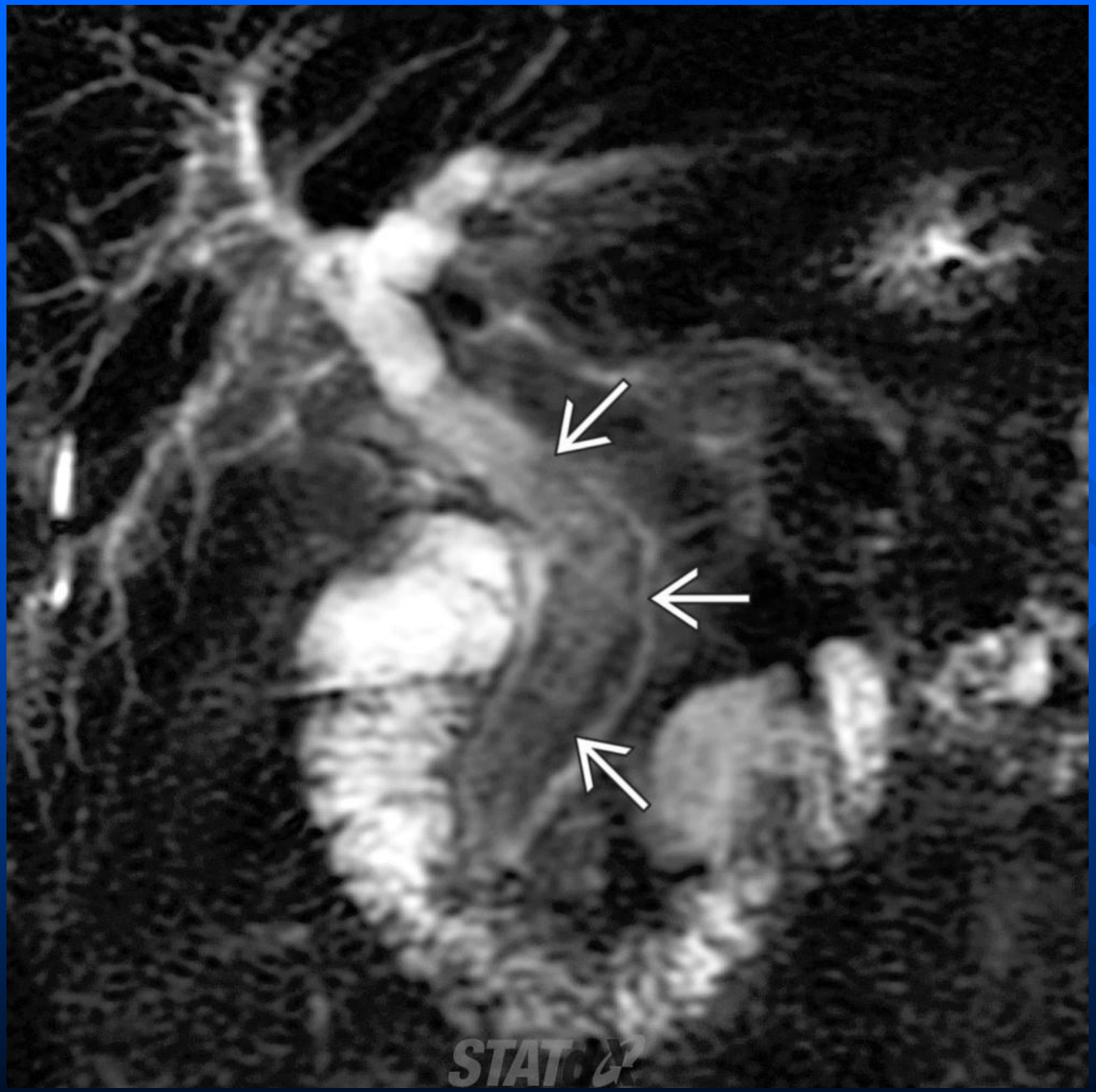
General Features

- **Best diagnostic clue**
  - Multifocal biliary strictures, segmental ductal dilation, bile duct wall thickening, and irregular beading of intra- and extrahepatic bile ducts
- **Location**
  - Common bile duct (CBD) involved in > 90% of patients
  - Involvement of both intra- and extrahepatic ducts in 87%
    - » Isolated involvement of intrahepatic (11%) or extrahepatic (2%) ducts is unusual
  - Most severely affected segments of biliary tree are usually main right and left bile ducts
  - Strictures can affect cystic duct and pancreatic duct
- **Morphology**
  - In patients with PSC-induced end-stage cirrhosis, liver is markedly deformed (to much greater extent than with other common causes of cirrhosis)
    - » Contour is grossly lobulated and rounded with peripheral atrophy and central hypertrophy
    - » Enlargement of central liver and caudate with peripheral atrophy described as "pseudotumoral" enlargement of caudate
    - » Atrophy/hypertrophy complex may even occur in absence of cirrhosis

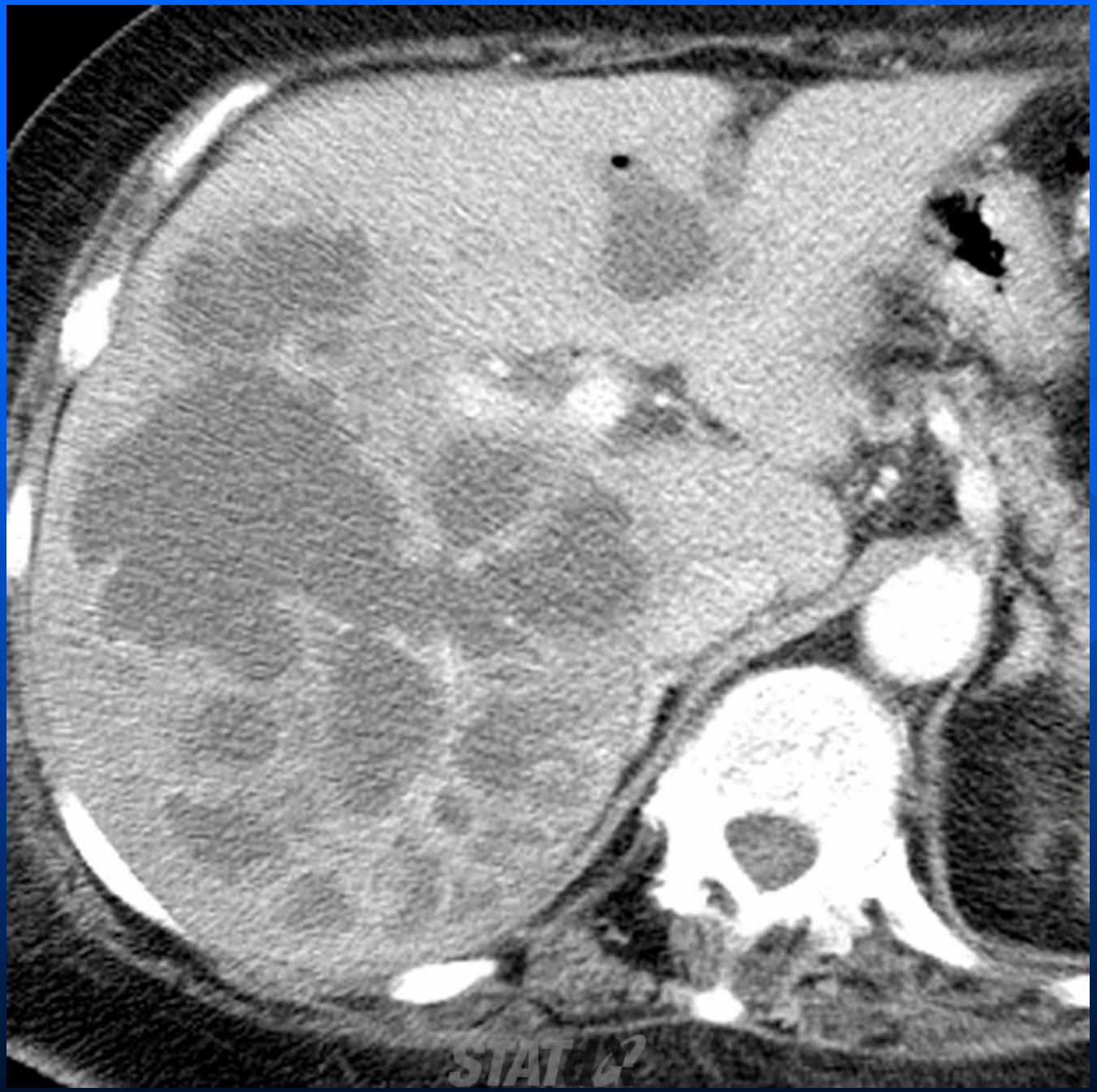
Imaging

- CT and MR findings
  - Dilation of intrahepatic ± extrahepatic ducts with abrupt cut off at site of obstruction
    - » Biliary dilatation may be central, diffuse, or segmental
  - Bile duct wall thickening with hyperenhancement
  - Intraductal purulent bile or pus: High density on CT, intermediate to low signal on T1 and T2WI MR
  - Heterogeneous liver enhancement, which can be wedge-shaped, peribiliary, patchy, or diffuse
  - Can be associated with liver abscesses (1/4 of cases) or portal vein thrombosis
- Ultrasound findings
  - Dilatation, stenosis, and thickening of bile duct walls with intraluminal echogenic debris (purulent bile)
- Cholangiography: Strictures, dilatations, intraluminal filling defects

Coronal CECT in a patient with fever and leukocytosis after Whipple procedure shows the common bile duct anastomosed to the Roux limb with thickening and hyperenhancement of the bile duct wall (white curved arrow) and adjacent free fluid (white solid arrow), characteristic of ascending cholangitis.



Coronal MRCP in a patient with markedly elevated liver function tests and leukocytosis shows intra- and extrahepatic biliary dilatation. Note the relatively low signal pus and infectious debris within the mid and distal common duct (white solid arrow).



Axial CECT in a 75-year-old woman with fever, RUQ pain, & large complex right lobe hepatic abscess shows that this complication of documented ascending cholangitis was treated successfully with biliary stenting & percutaneous drainage.