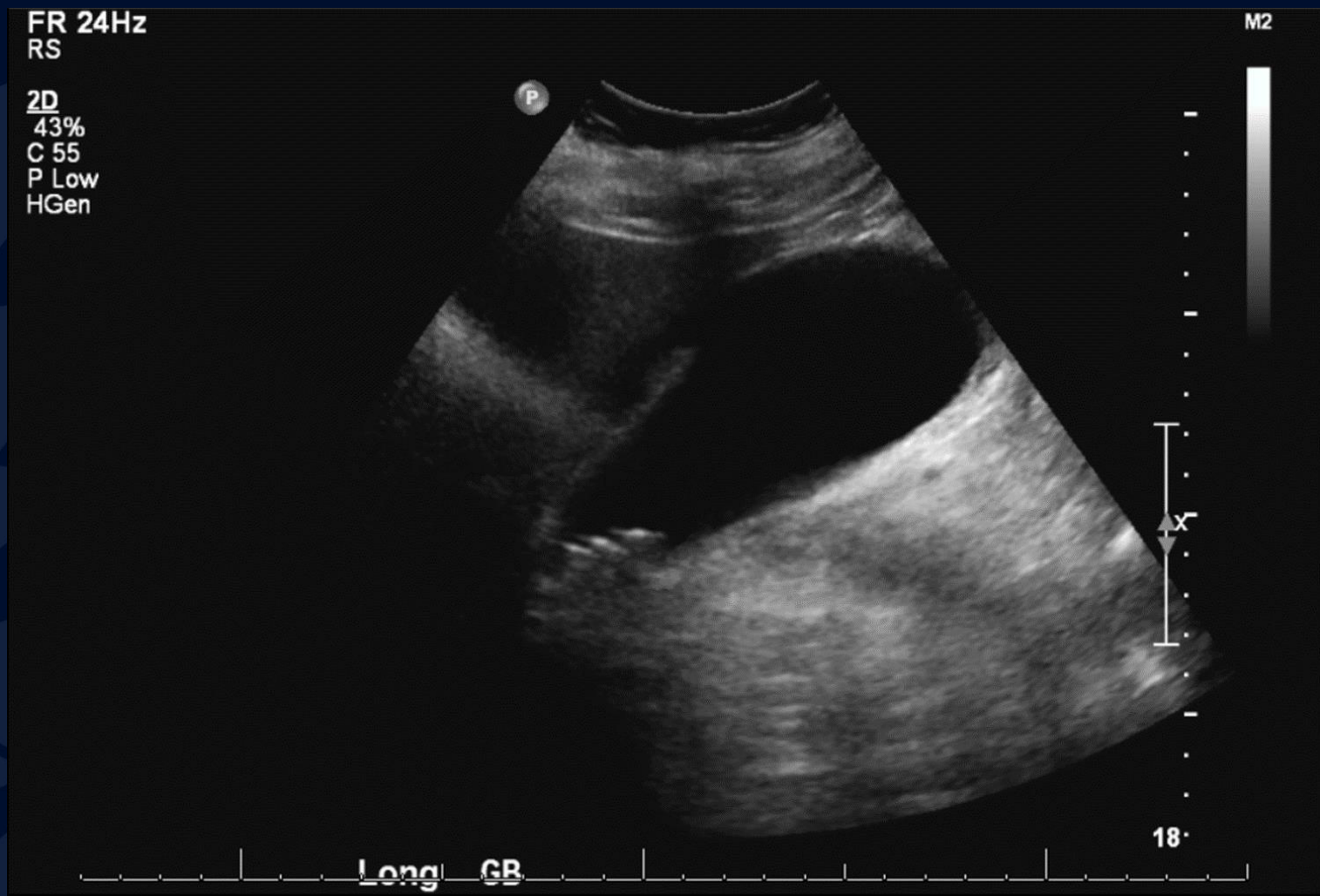


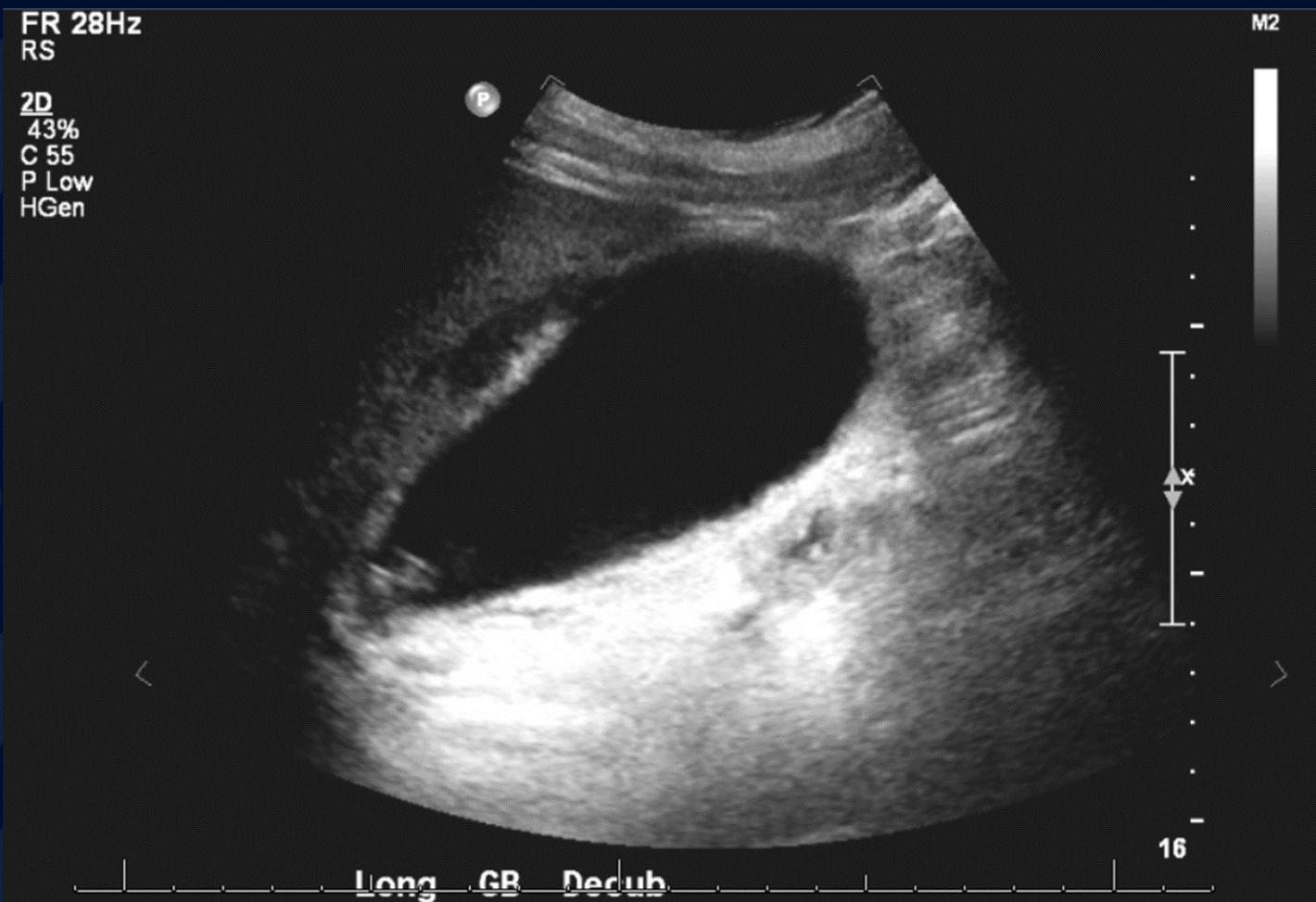
# 54-year-old female with RUQ abdominal pain

Joseph Ryan, MS4  
Edward Gillis, DO  
Mark Kane, MD  
Charan Singh, MD

A large, stylized oak leaf graphic in a dark blue color, positioned on the left side of the slide, partially overlapping the title text.

# RUQ ultrasound

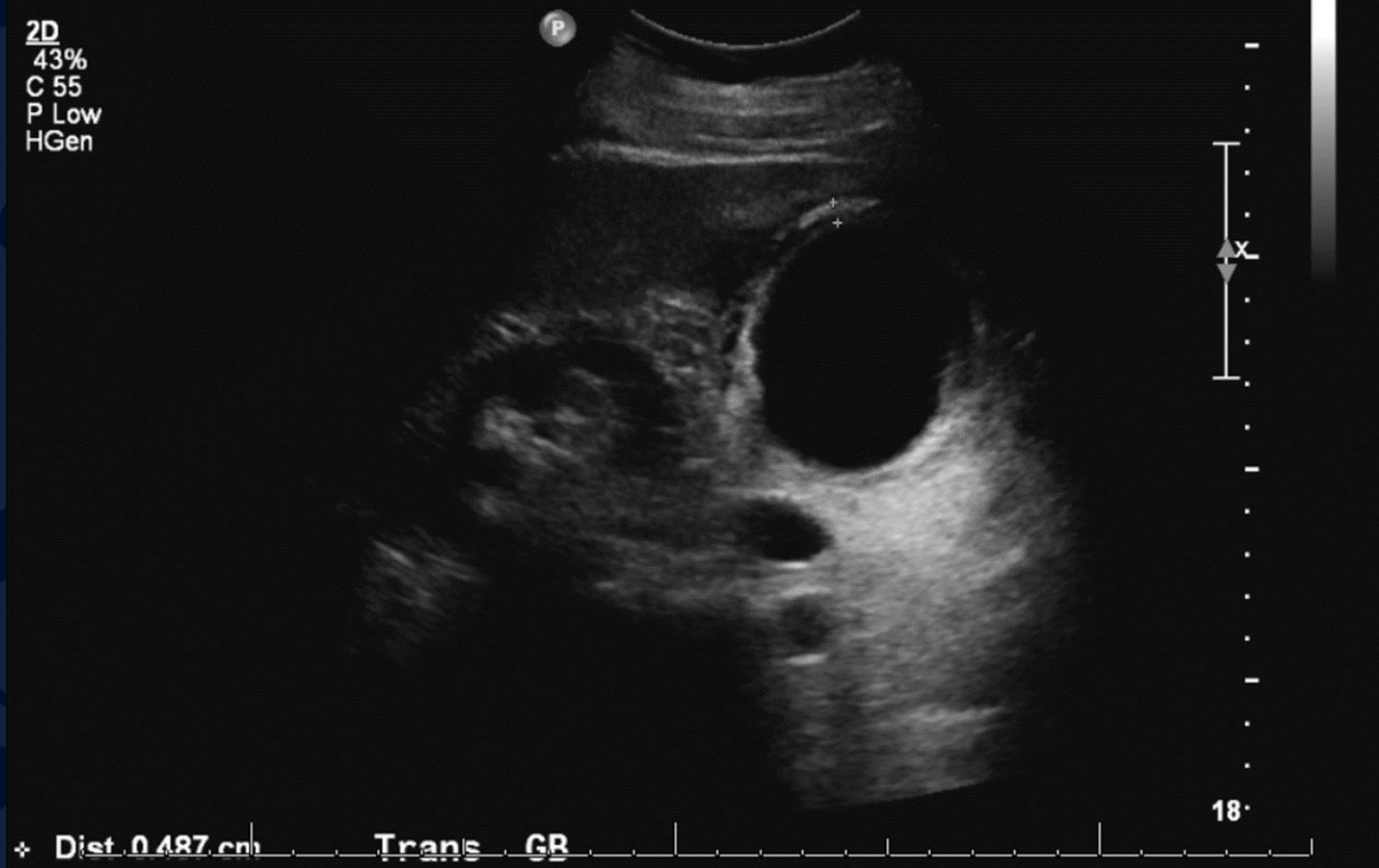




FR 24Hz  
RS

2D  
43%  
C 55  
P Low  
HGen

M2



**UConn**  
**HEALTH**

RADIOLOGY

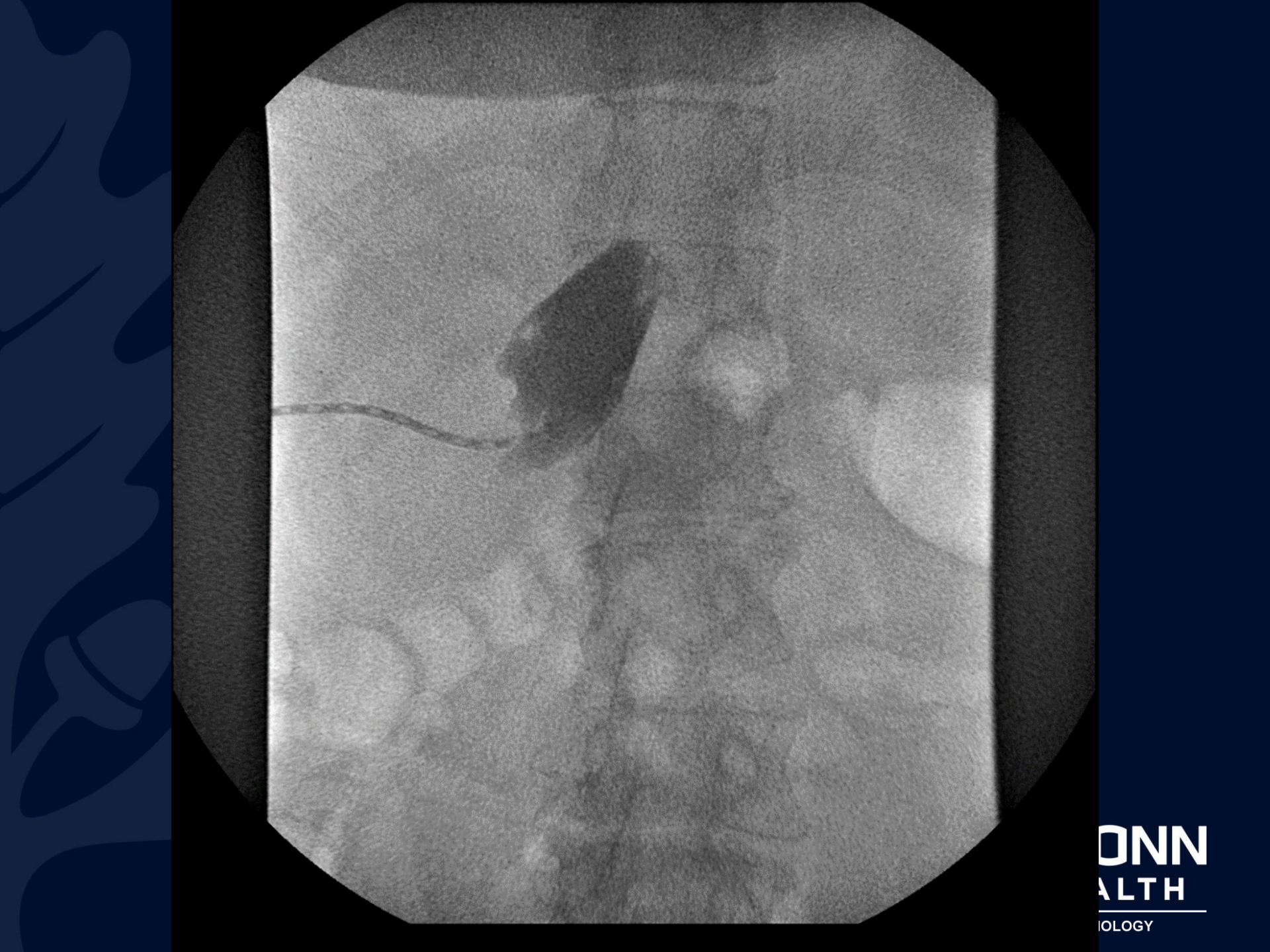
# CT abdomen/pelvis with IV contrast

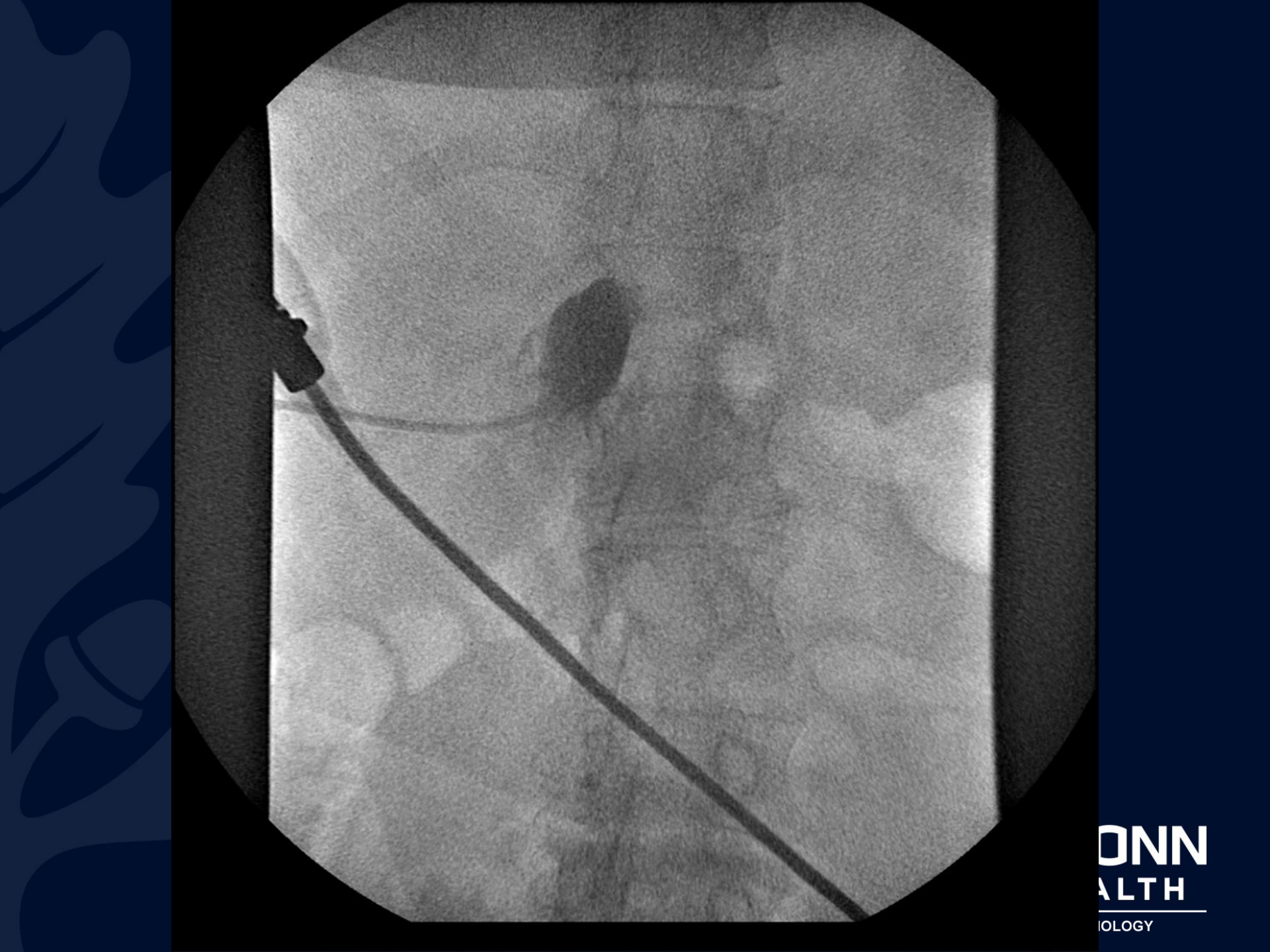






Percutaneous cholecystostomy  
tube placement with ultrasound  
and fluoroscopic guidance, with  
antegrade cholangiogram

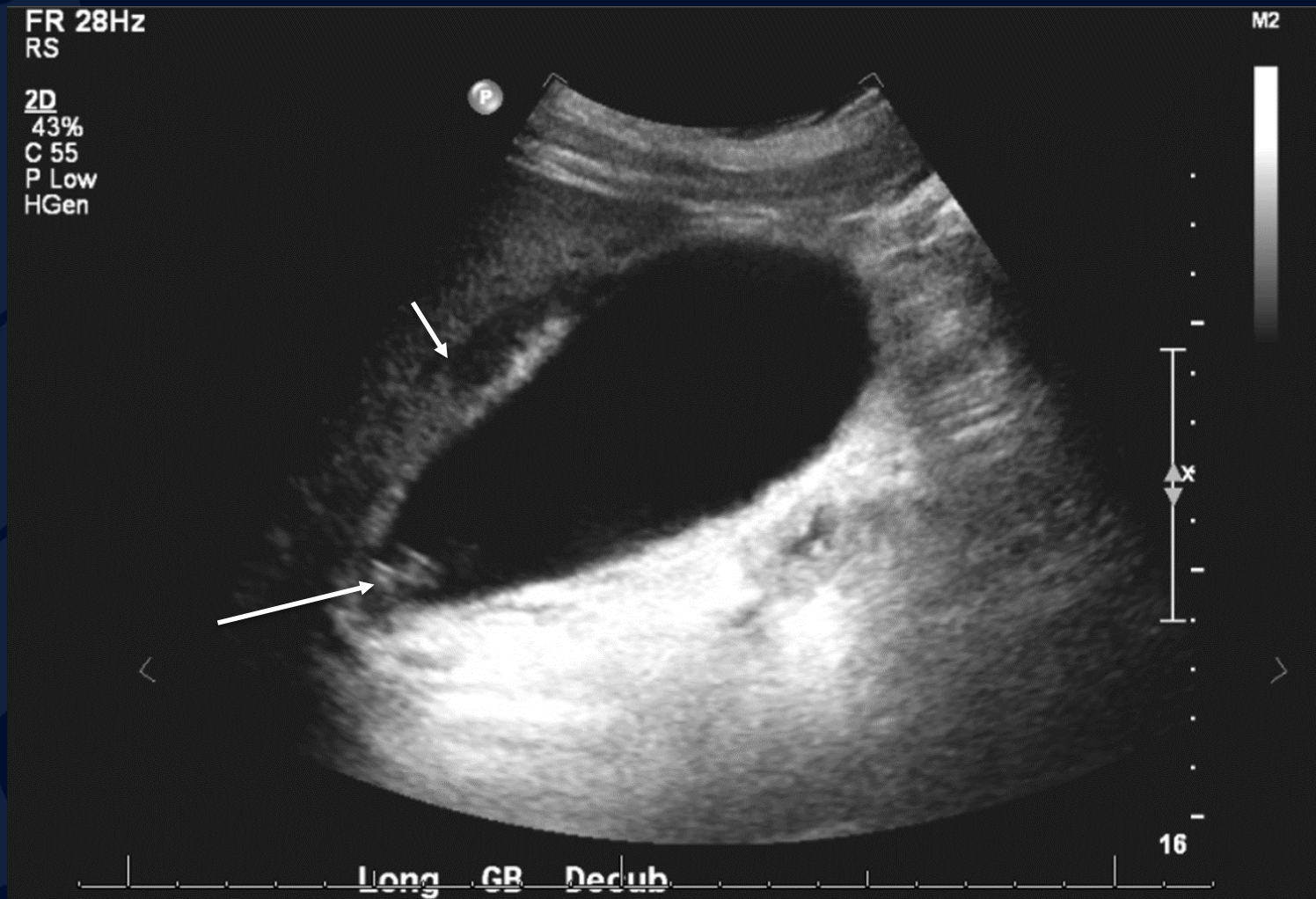




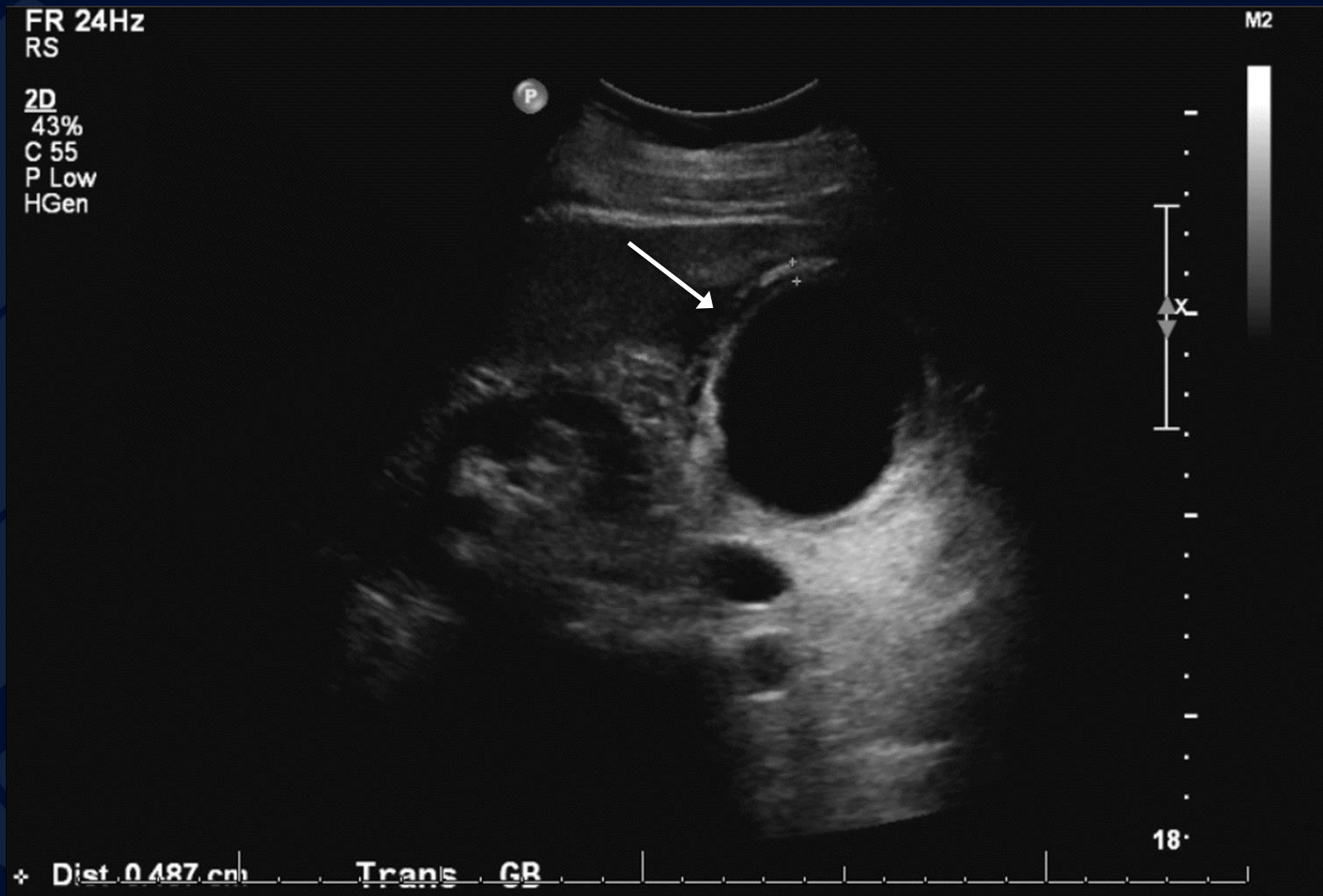


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# Acute cholecystitis, with placement of cholecystostomy tube



Longitudinal grayscale ultrasound image of the gallbladder demonstrates a distended gallbladder with pericholecystic fluid (short arrow) and gallstones in the gallbladder neck (long arrow). Gallbladder measured 12.2 cm in length (calipers not shown).



Transverse grayscale ultrasound image of the gallbladder showing increased gallbladder wall thickness (calipers) and pericholecystic fluid (arrow).



Axial CECT image through the gallbladder shows a distended gallbladder with a markedly thickened wall (white dashed line, 1.5 cm).



Intraoperative fluoroscopic spot image showing the percutaneous cholecystostomy tube with gallbladder intraluminal contrast, confirming tube placement.

# Background

- Cholelithiasis (gallstones)
  - Hard, solid accumulations of material (“stones”) located in the biliary system
    - Cholesterol (10%), pigment stones (10%), mixed (80%)
    - Risk factors include sex (female>male), advanced age, obesity, multiparity and race (Native Americans most affected)
  - Symptoms include RUQ/epigastric colicky pain (sometimes with radiation to the right shoulder), usually after fatty meals
    - Other nonspecific symptoms include nausea, heartburn, bloating and gas (belching/flatulence)
  - Overall prevalence of ~10%; asymptomatic in 70-80% of cases
    - Patients with recurrent symptoms can have prophylactic cholecystectomy
    - Non-surgical candidates can be treated with ursodeoxycholic acid
- Acute cholecystitis
  - Inflammation of the gallbladder, usually presenting as a complication of cholelithiasis, when a gallstone obstructs the cystic duct
    - Most common cause of RUQ pain
  - RUQ pain will usually be constant, rather than the colicky pain of cholelithiasis
  - Often presents with mild fever, leukocytosis and positive Murphy’s sign

# Diagnosis

- Ultrasound is the gold standard for diagnosing biliary disease
  - Gallstones will be seen as reflective, echogenic foci with prominent posterior acoustic shadowing
    - These findings are independent of stone composition
    - Stones should also move when patient changes position, as they are freely mobile within the lumen
  - CT is less reliable and appearance of stones varies based on composition
    - Cholesterol stones are hypoattenuating, calcified stones are hyperattenuating, and mixed stones can be anywhere in between
- Acute cholecystitis imaging is used primarily to look for evidence of inflammation and complications, as well as the presence of stones
  - Ultrasound is the most sensitive
    - The combination of stones and a positive sonographic Murphy's sign is highly suggestive
    - Additional findings include GB wall thickening (>3 mm), pericholecystic fluid, gallbladder distension (>8-10 cm) and biliary sludge
  - CT findings include GB wall thickening, distension, pericholecystic fluid, as well as inflammatory fat stranding adjacent to the gallbladder
- HIDA scan is useful if other imaging modalities are equivocal
  - Will determine the presence of obstruction if radiotracer fails to fill the gallbladder

# Management

- Cholelithiasis is symptomatic in only 20-30% of patients
  - These patients may benefit from cholecystectomy for symptomatic relief, as well as to avoid the risk of developing acute cholecystitis
    - Non-surgical candidates can be treated with ursodeoxycholic acid
- Acute cholecystitis
  - Patients diagnosed with acute cholecystitis clinically, with or without imaging confirmation, should be made NPO, given IV fluids, antibiotics and pain control
  - Urgent cholecystectomy (laparoscopy preferred) should be performed within 72 hours of developing symptoms
  - Poor surgical candidates can get percutaneous cholecystostomy tube drainage
    - This involves image-guided insertion of a drainage catheter into the gallbladder to relieve obstruction
    - Reasons for cholecystostomy include symptoms present for >72 hours, extensive GB wall thickening, WBC >18,000 and localized abscess
    - Surgery is typically performed after patient has been stabilized and inflammation has subsided
  - Complications include gallbladder necrosis, perforation, abscess or fistula formation

# References

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- 6) Vollmer CM, Zakko SF and Afdhal NH. Treatment of acute calculous cholecystitis. Ashley SW and Chen W, ed. UpToDate. Waltham, MA: UpToDate Inc. <https://www.uptodate.com> (Accessed on 6/15/19)
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