

GB
SUP

12 9

4V1
H4.0MHz 13
Abdomen
ABDOMEN 1

85dB T1/+1,
Gain=-16dB

Store in progr

RADY Resident Symposium: Ultrasound

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Jeremy Kim, MD

University of North Carolina School of Medicine
Department of Radiology

Dist = 0.76

Learning objectives

By the end of this activity, participants will be able to:

- I. Describe basic functions of ultrasound and common indications
- II. Identify basic abdominal US anatomy
- III. Recognize classic ultrasound cases

Module Outline

- I. Basics & Indications
- II. Abdominal US Anatomy
- III. Cases
- IV. Wrap up/Questions

Ultrasound Basics

Uses sound waves

(don't worry about the physics ... that's my job!)

Pros

Real time

Non invasive

Portable

Non ionizing

Relatively lower cost vs CT/MRI

Ultrasound Basics

Cons

- Obese patients

- Can't see through air or bowel

- Smaller field of view

- Operator dependent

- NPO for abdominal US

Safety

- Does not emit ionizing radiation BUT:

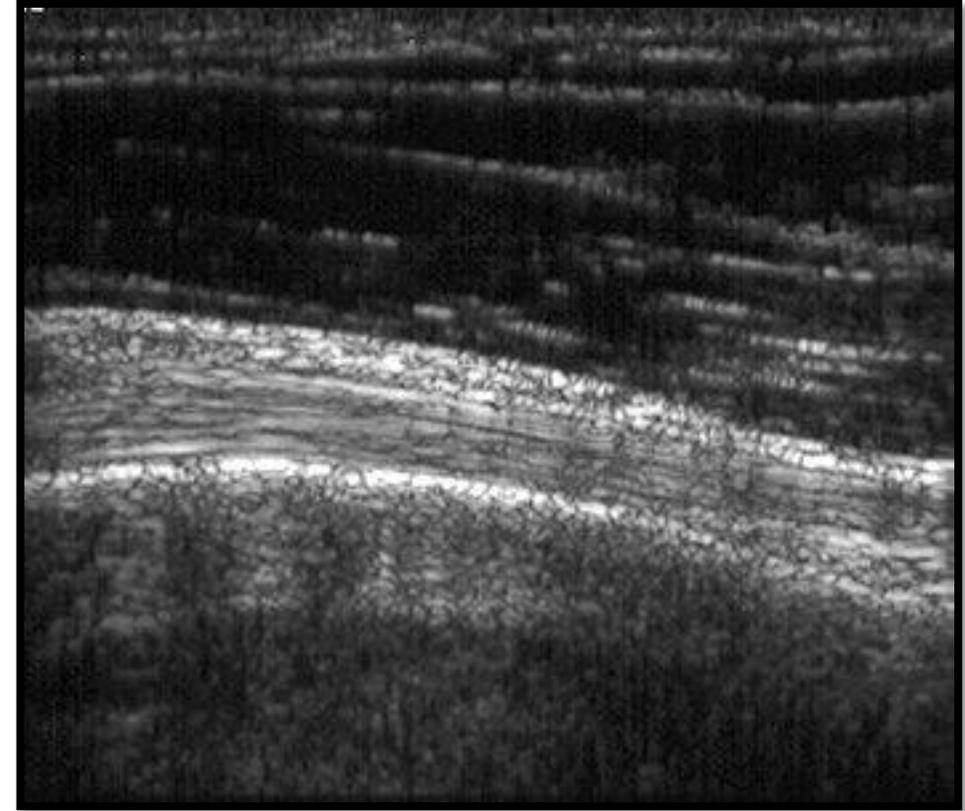
 - Produces heat

 - Can make tissues 'cavitate'

Ultrasound Basics

Echogenicity - Amount of echoes an organ/structure has, ie the ability to return the signal in ultrasound examinations

A structure is echogenic if it has internal echoes, ie it is capable of reflecting sound waves. The term echogenic is used in comparison to other imaged/surrounding structures



Hyperechoic - brighter
Isoechoic - same
Hypoechoic - darker
Anechoic - black

Ultrasound Basics

Uses sound waves

(don't worry about the physics ... that's my job!)

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Non invasive

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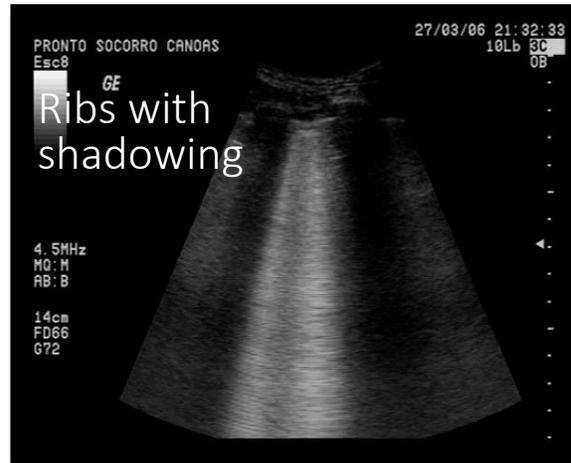
Non ionizing

Relatively lower cost vs CT/MRI

Ultrasound Basics

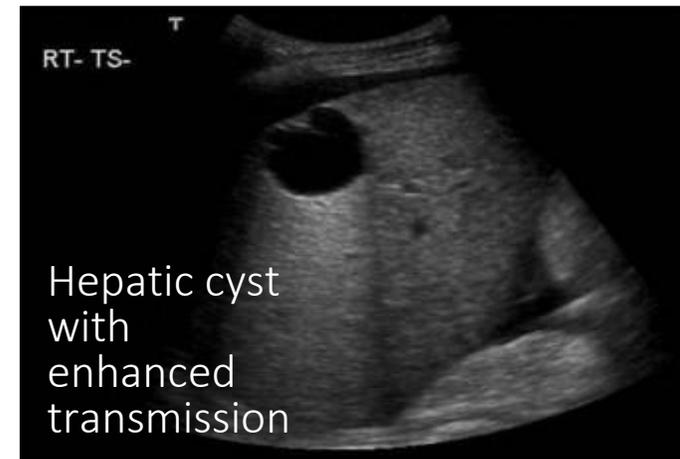
POSTERIOR SHADOWING

- Hyperechoic structures reflect a majority of sound waves, leaving a dark shadow behind them



POSTERIOR ENHANCEMENT

- Increased echogenicity posterior to a structure. Implies fluid containing such as a cyst



Ultrasound Indications

Characterize mass

Fluid search/abscess

RUQ or abdominal pain

Jaundice

Splenomegaly

Flank pain

AAA screening

US-guided procedures

AND SO MANY MORE . . .

What's Included?

ABDOMEN COMPLETE

Pancreas (if visible)

Liver

Gallbladder

Bile ducts

Kidneys

Spleen

RUQ US

Some liver

Gallbladder

Bile ducts

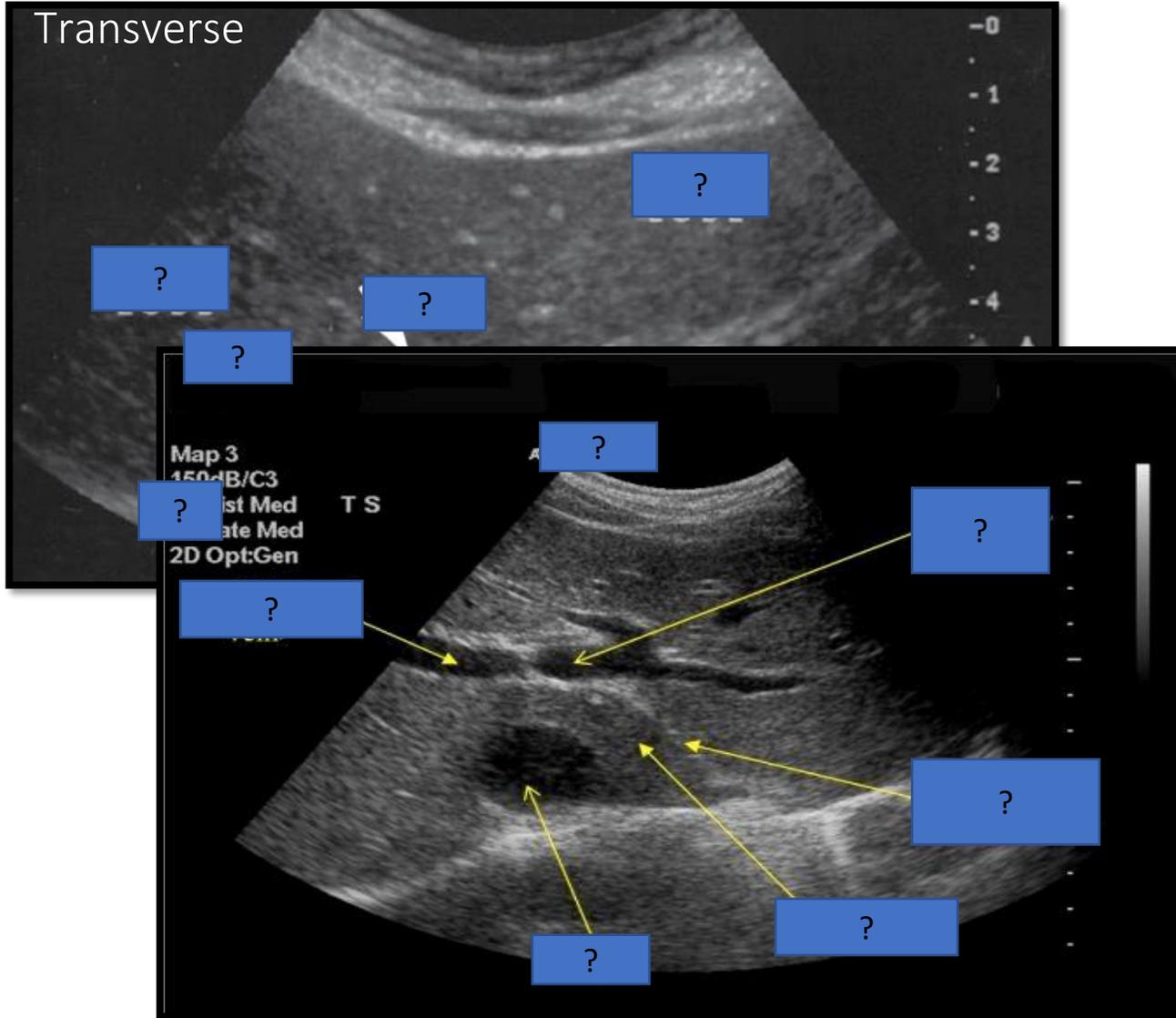
AND THAT'S IT. . . ie order this
for suspected GB pathology

Module Outline

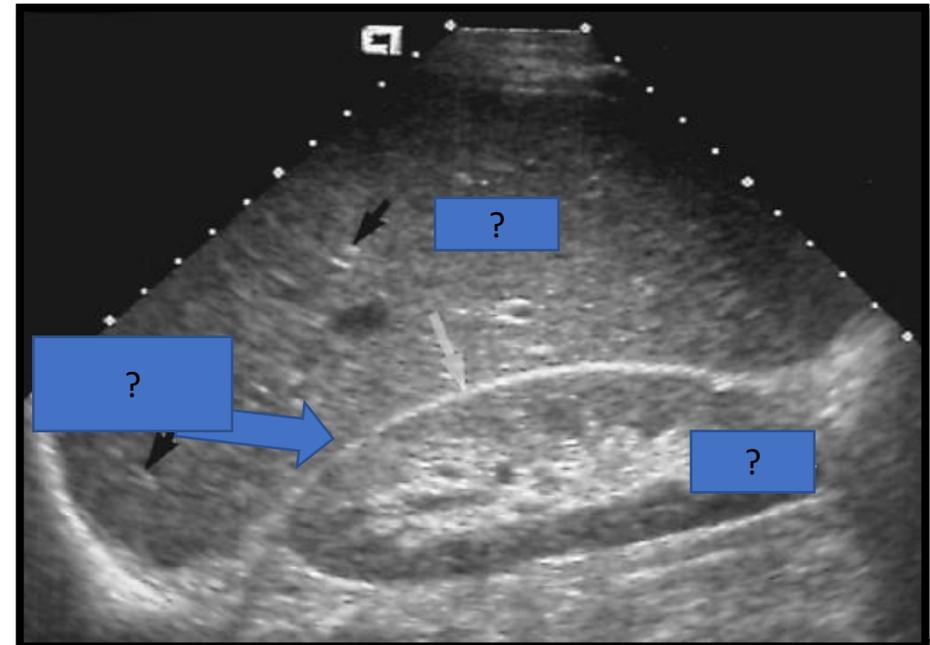
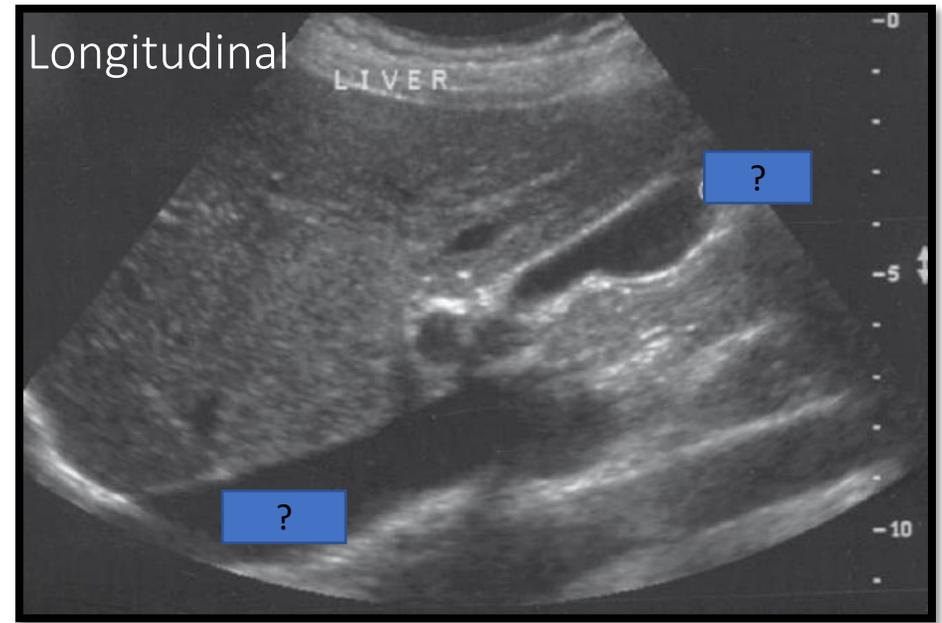
- I. Basics & Indications
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Liver Anatomy

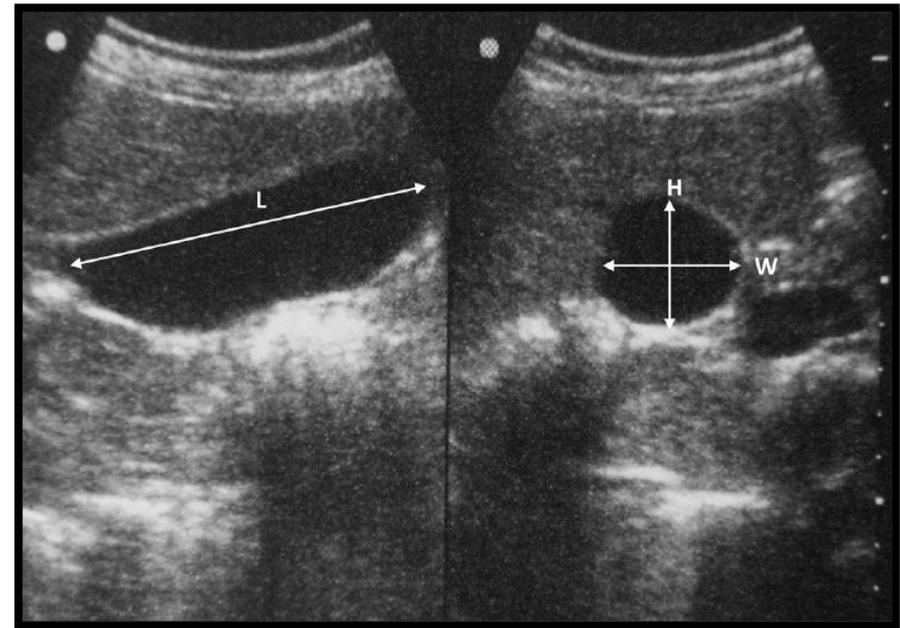
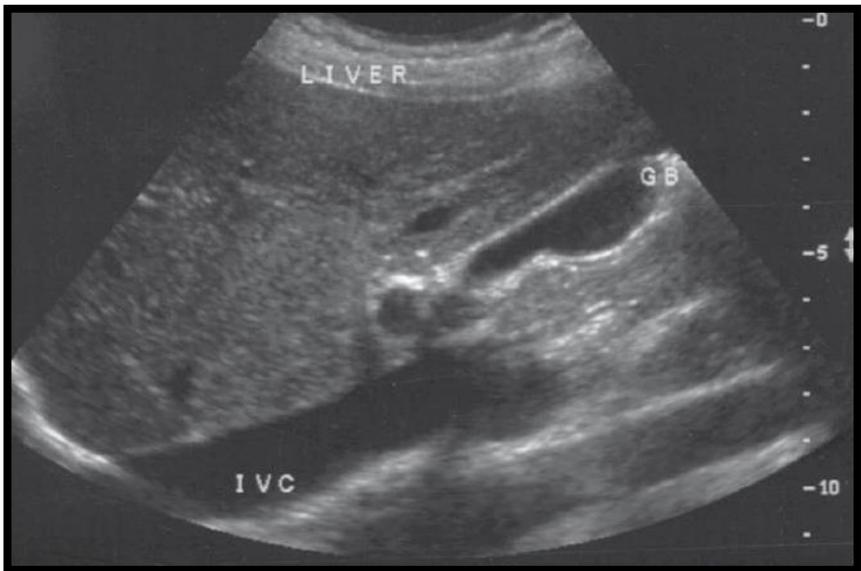
Transverse



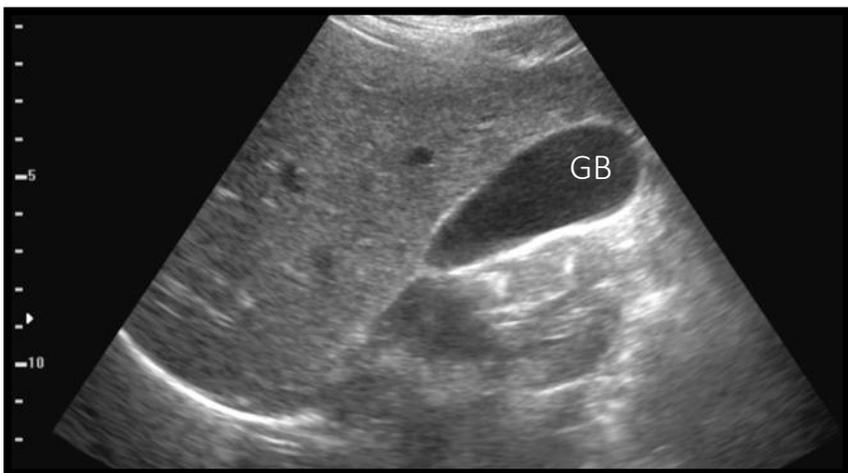
Longitudinal



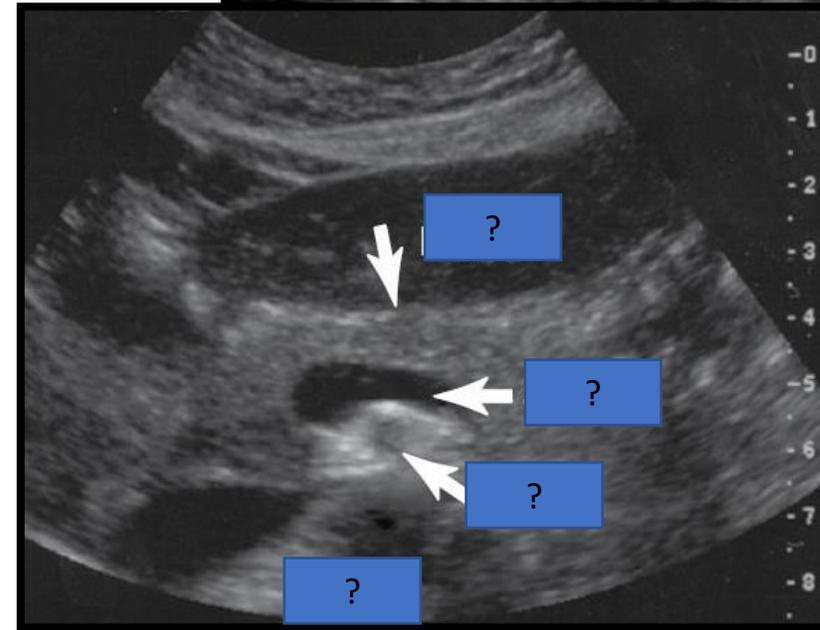
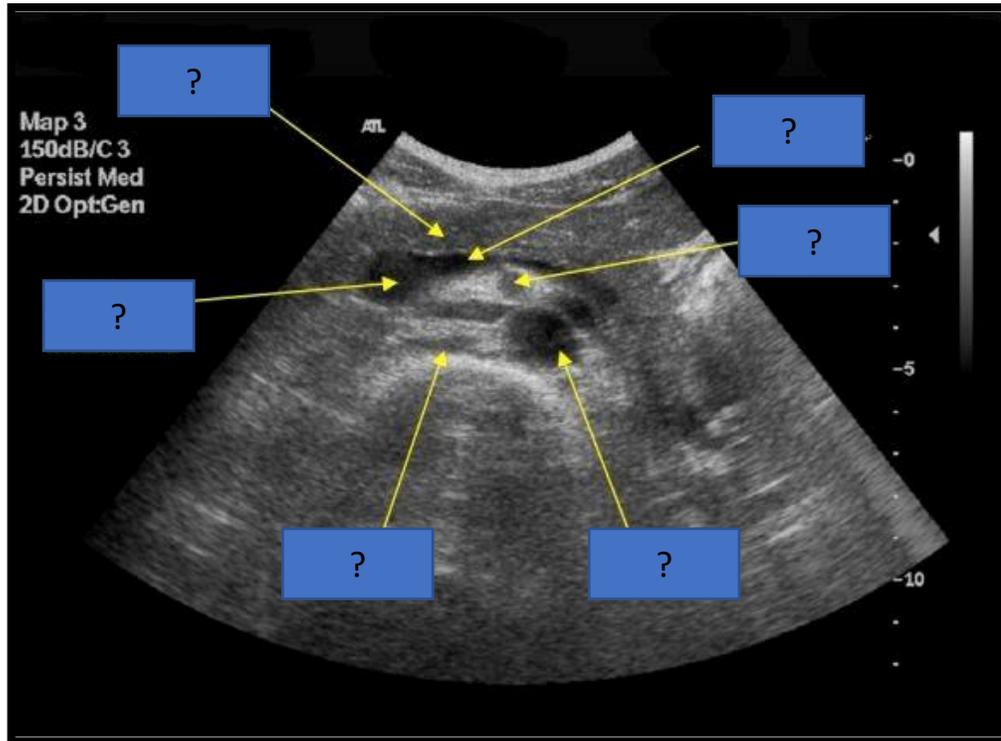
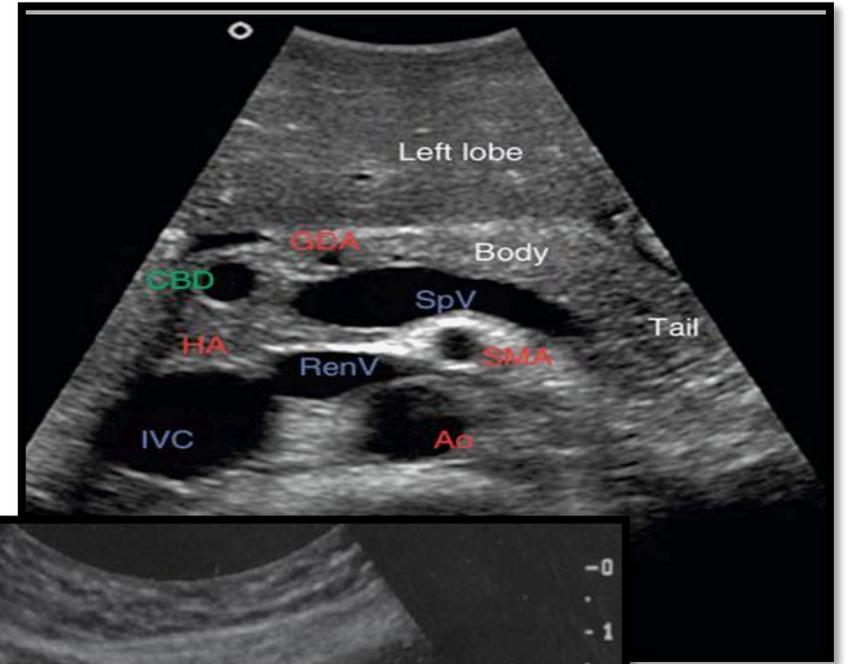
Gallbladder Anatomy



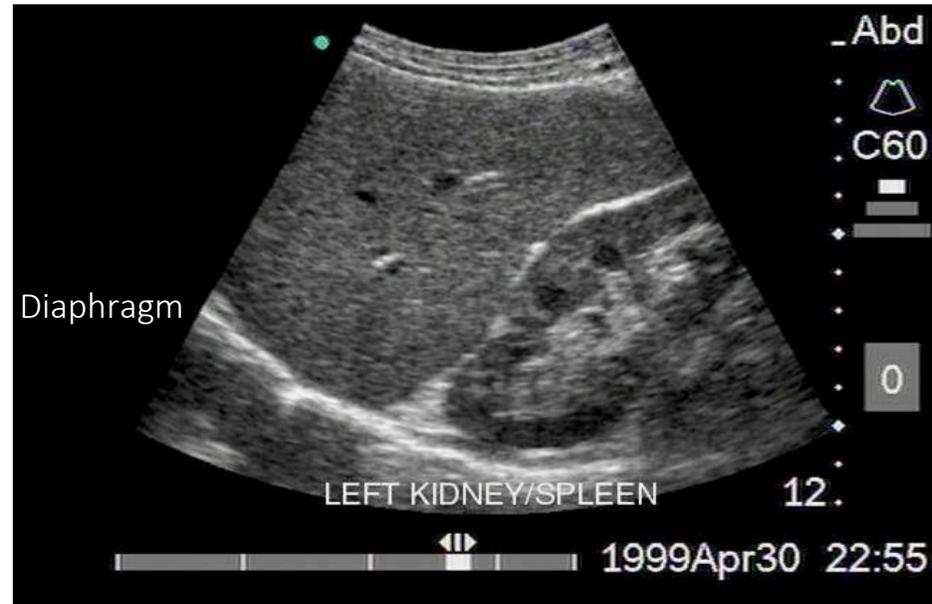
Gallstones



Pancreas Anatomy

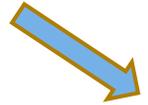


Spleen Anatomy

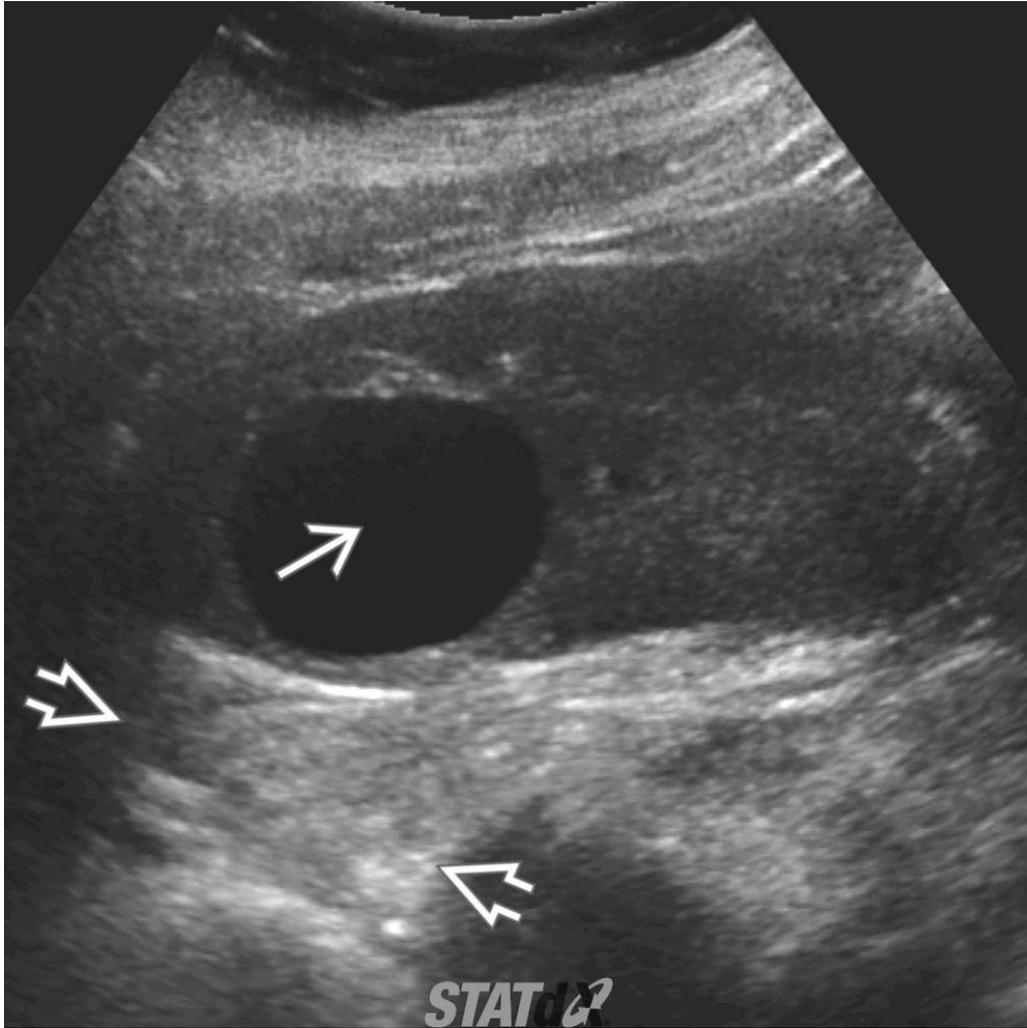


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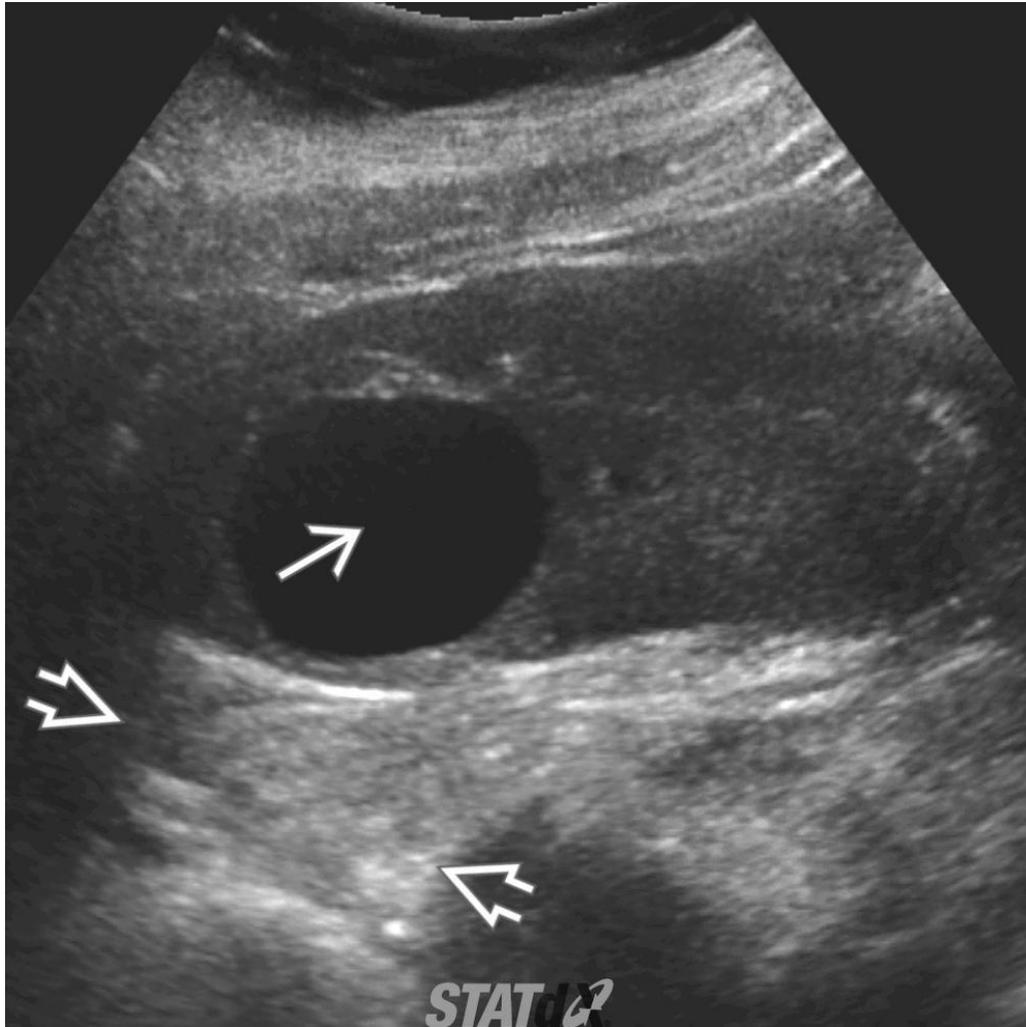


Case #1: 54yo right flank pain



Round anechoic lesion with imperceptible walls and posterior enhancement = Simple cyst

Case #1: 54yo right flank pain



Round anechoic lesion with imperceptible walls and posterior enhancement = Simple cyst

Renal simple cyst is very common finding

CYST requires:

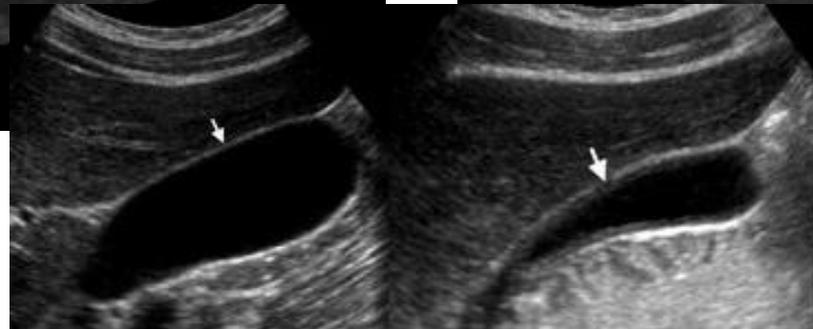
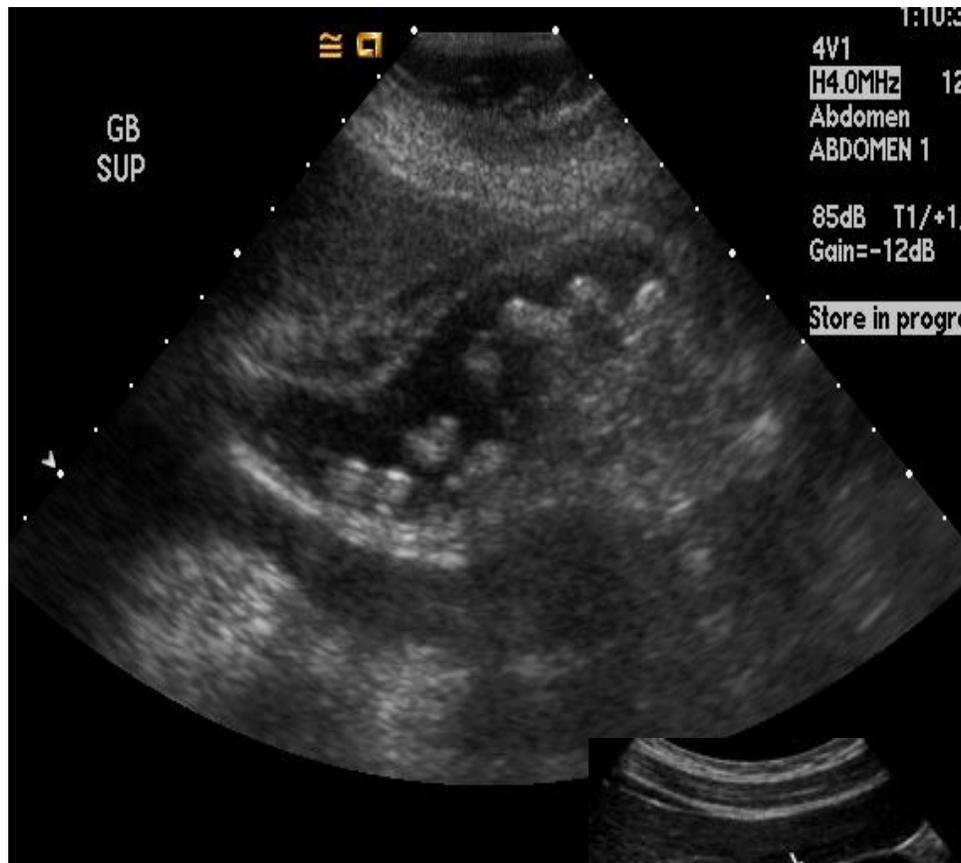
- Anechoic

- Imperceptible walls

- Posterior enhancement

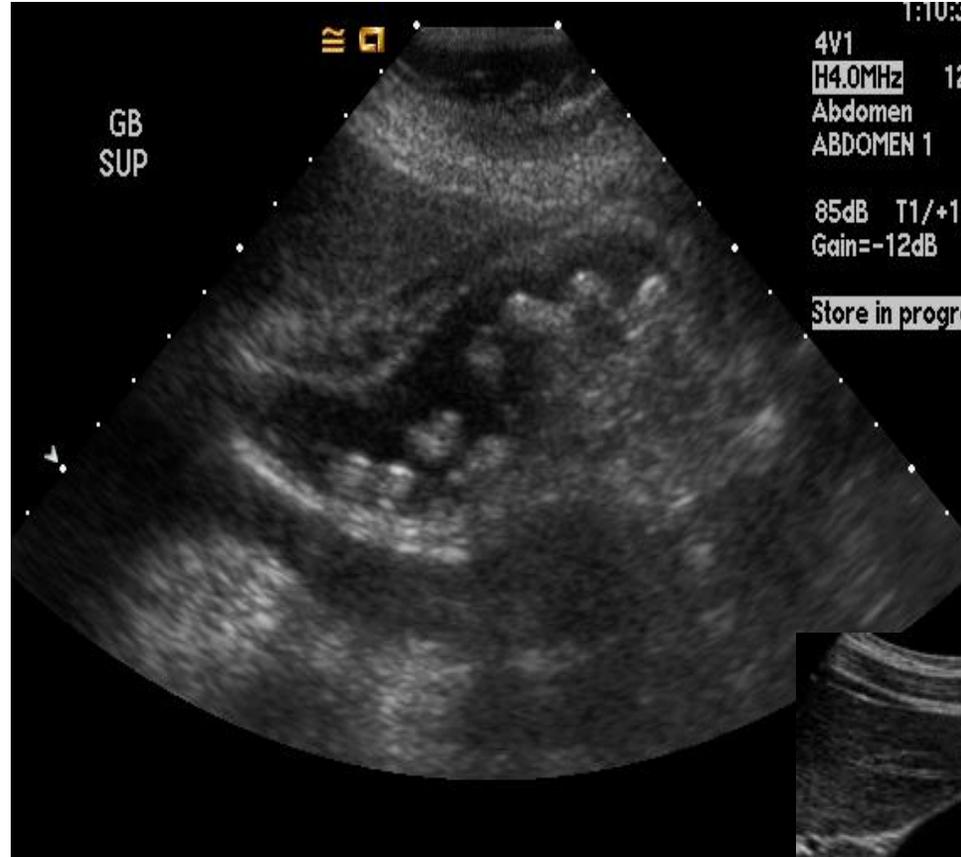
- No solid or vascular components

Case #2: History withheld



Multiple shadowing stones. Wall thickening, pericholecystic fluid = Acute cholecystitis. Normal on bottom for comparison

Case #2: History withheld

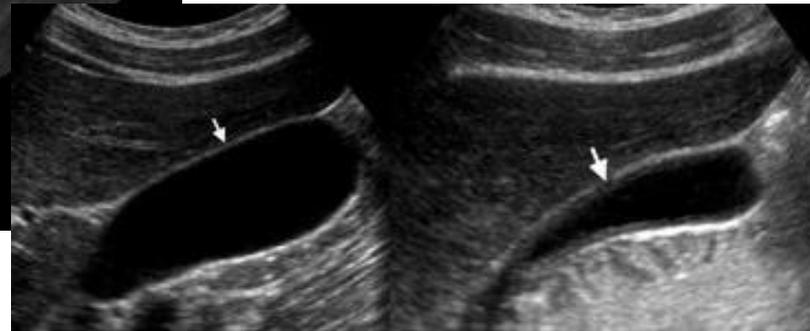


Acute Cholecystitis

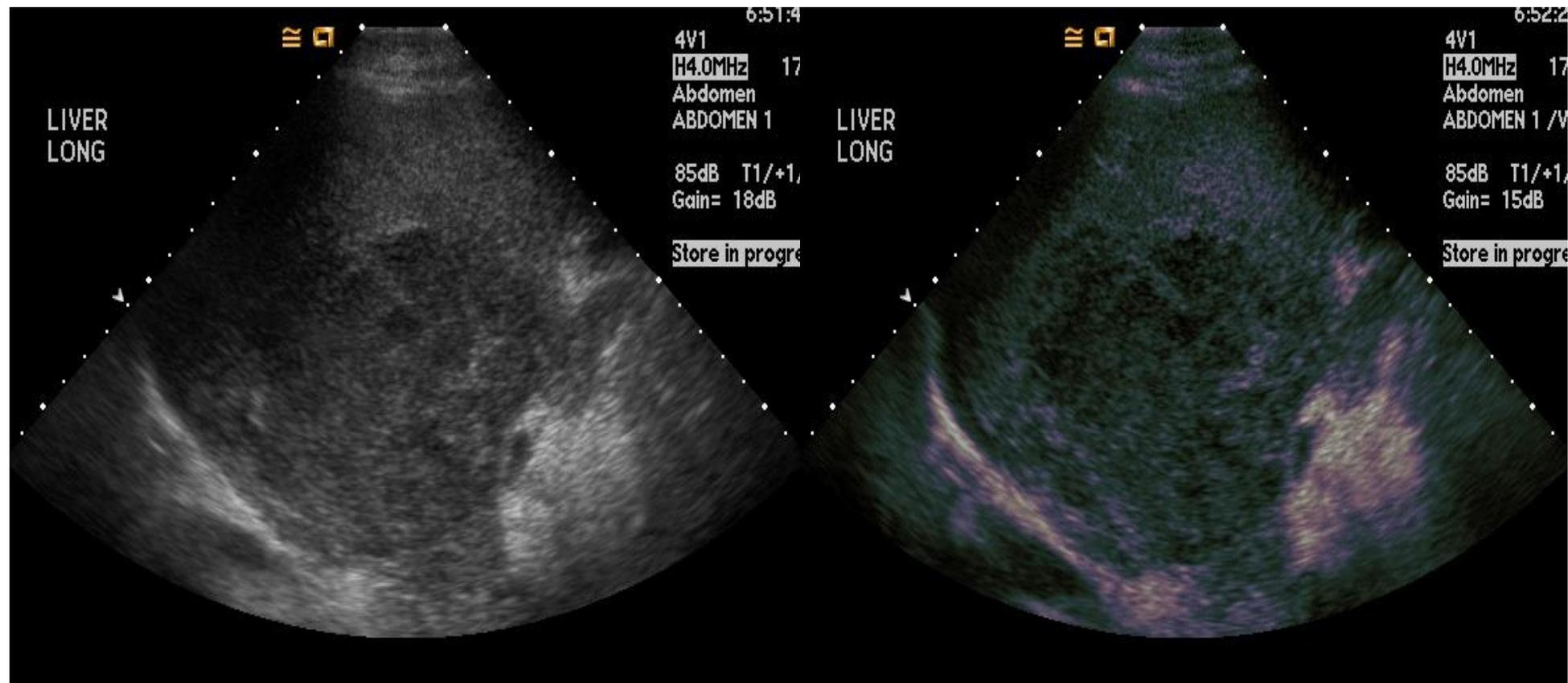
Imaging findings:

- Gallstones
- Thickened GB wall
- Pericholecystic fluid
- Murphy's sign
- +/- perforation

Multiple shadowing stones. Wall thickening, pericholecystic fluid = Acute cholecystitis. Normal on bottom for comparison

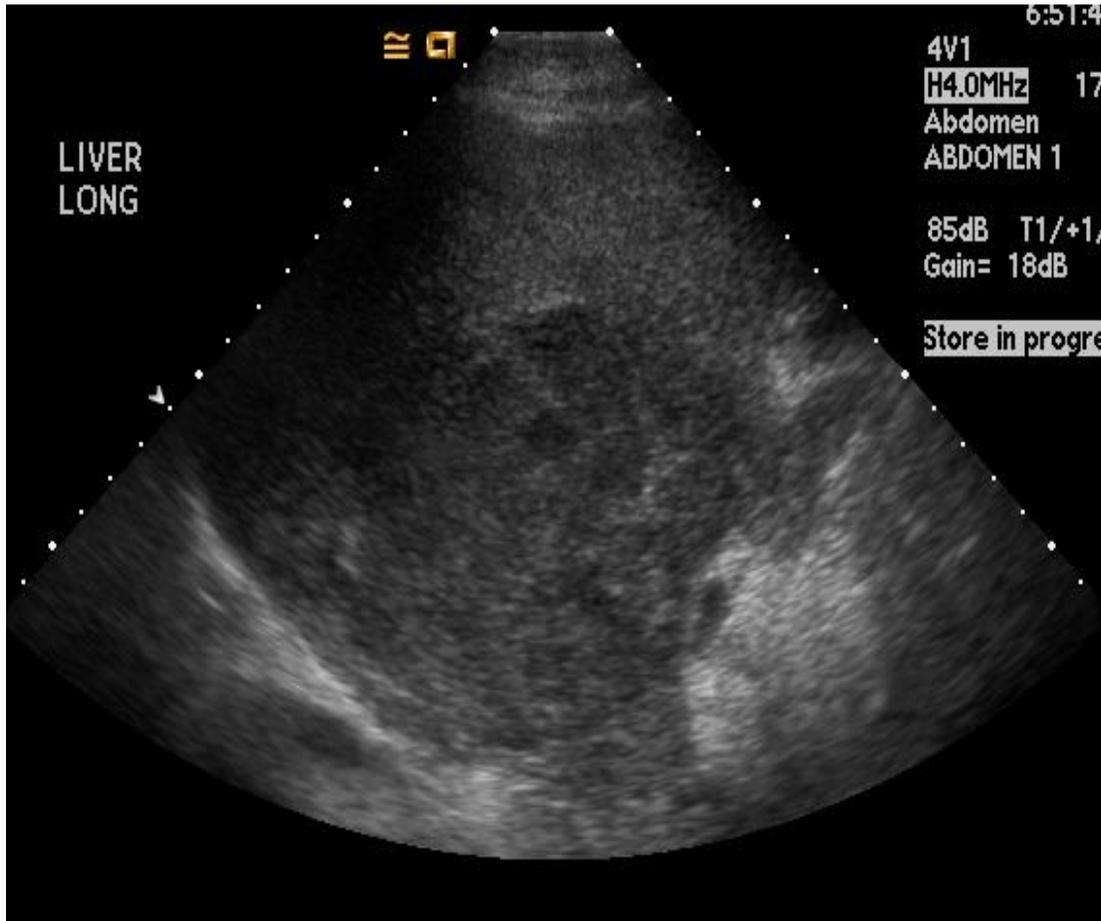


Case #3: 60yoM jaundice, history of hepatitis C



Heterogeneous hypoechoic liver mass. Ill defined

Case #3: 60yoM jaundice, history of hepatitis C



Heterogeneous hypoechoic liver mass. Ill defined

Hepatocellular CA

Differential includes primary liver tumor or metastasis.

Remember history of HCV, thus more likely HCC

Imaging findings:

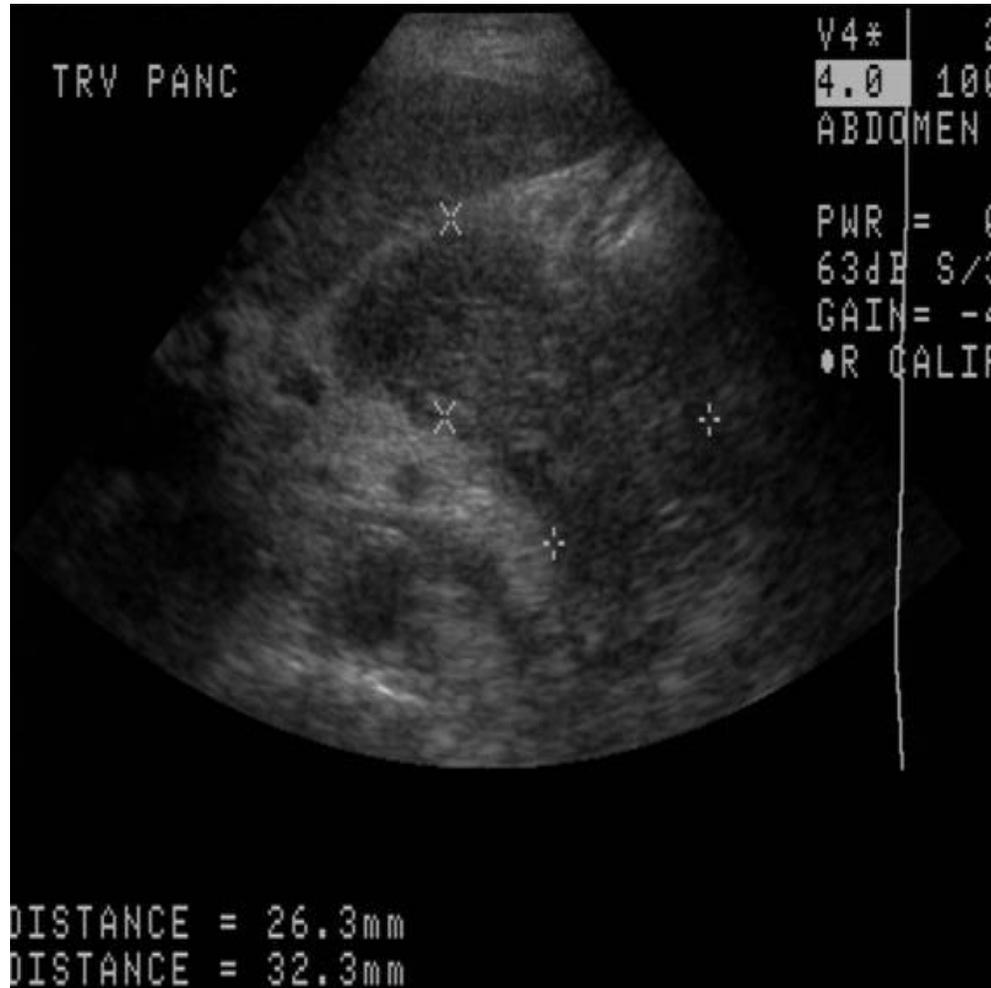
- Hypo or hyperechoic liver mass

- Internal vascularity

- Can be ill defined

- Better characterized on MRI

Case #4: 45yoM midline pain hx of gallstones



Heterogeneous hypoechoic enlarged pancreas. Ill defined. Patient tender when scanning over this region = Acute pancreatitis

Case #4: 45yoM midline pain



Heterogeneous hypoechoic enlarged pancreas. Ill defined. Patient tender when scanning over this region = Acute pancreatitis

Acute Pancreatitis

Imaging findings:

- Enlarged pancreas
- Ill defined borders
- Peripancreatic fluid
- Hypoechoic on US

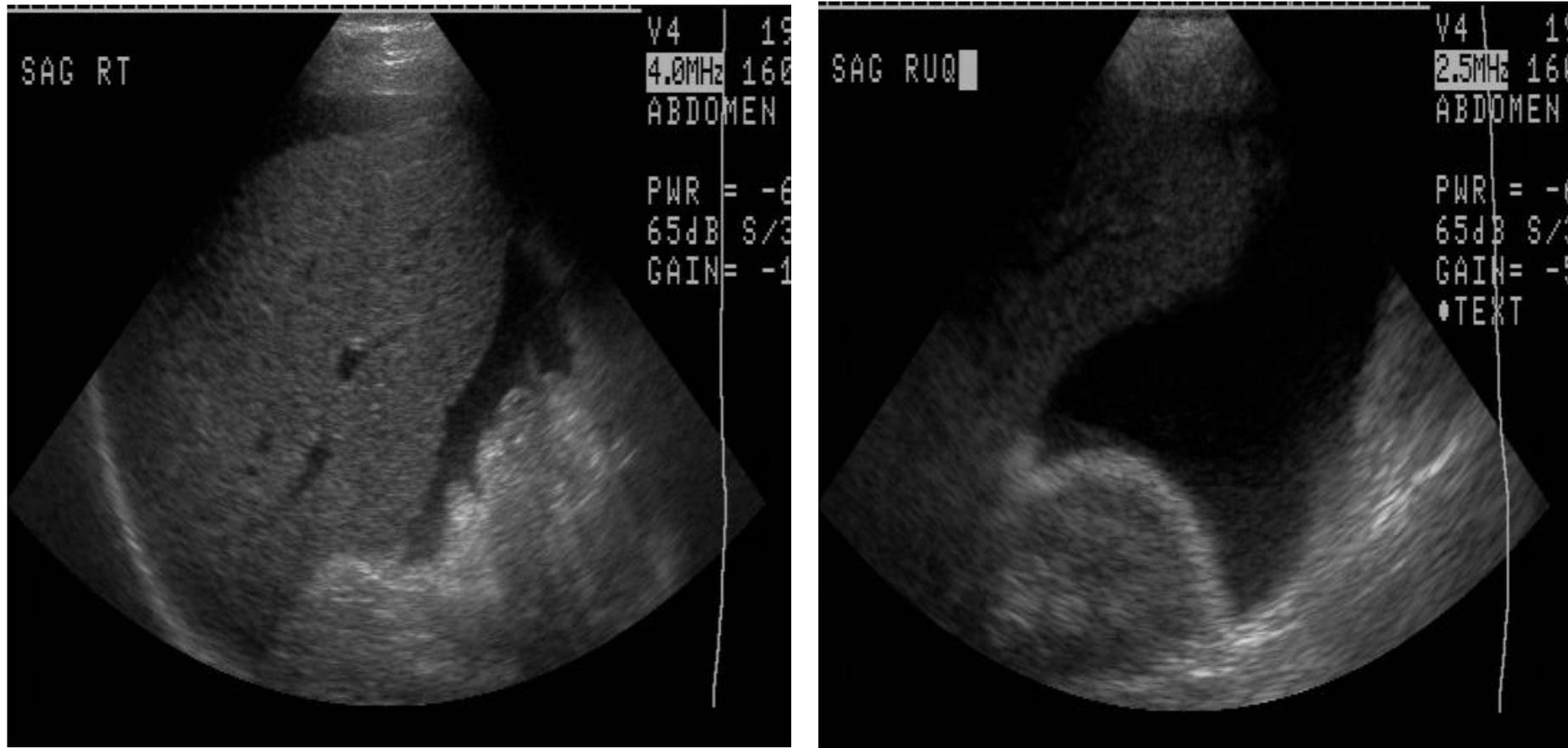
Pancreas often not well visualized on ultrasound (bowel gas)

Remember pancreatitis is clinical diagnosis!

CT can be helpful for complications

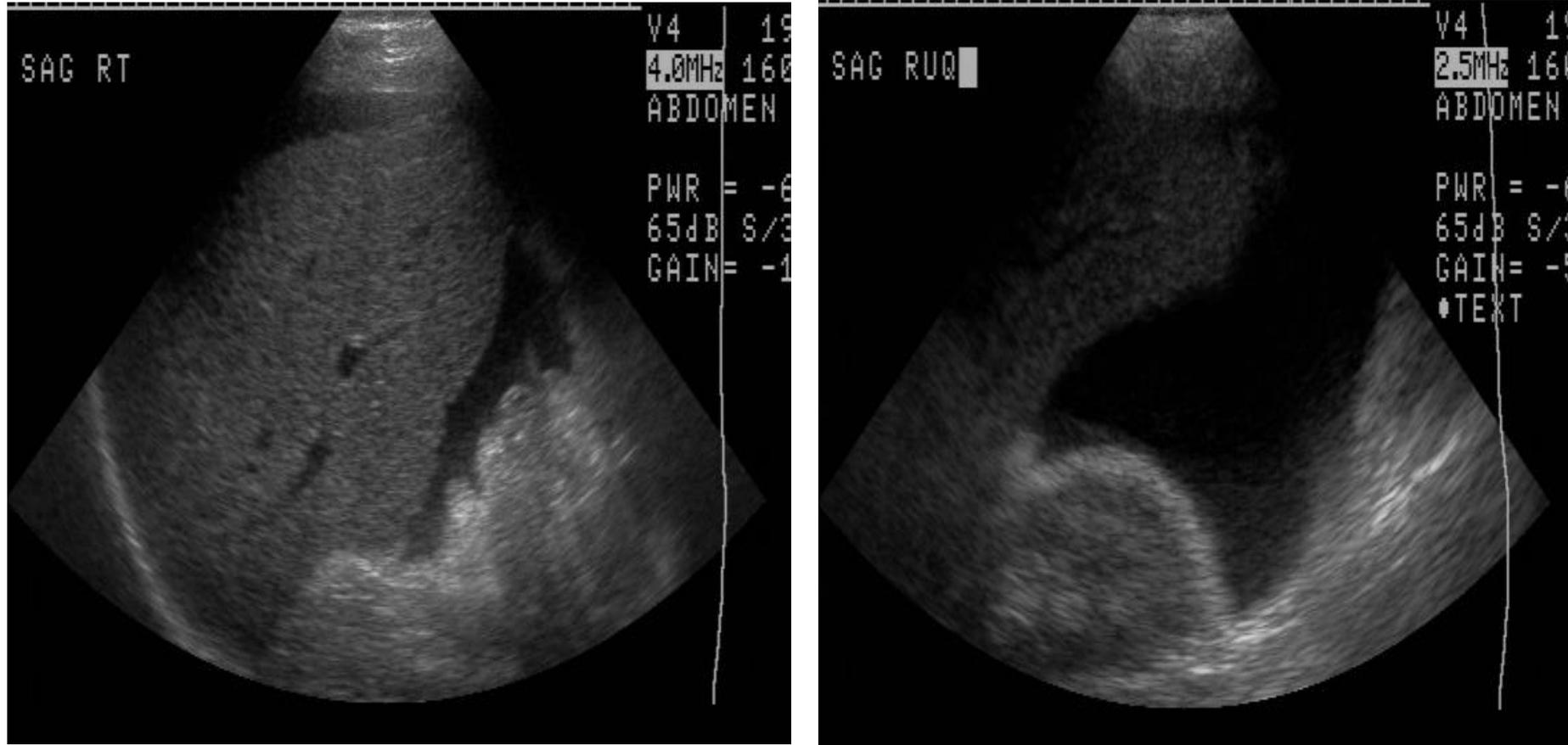
- Necrosis, fluid collections, pseudocyst, walled-off necrosis

Case #5: 38yo cirrhosis



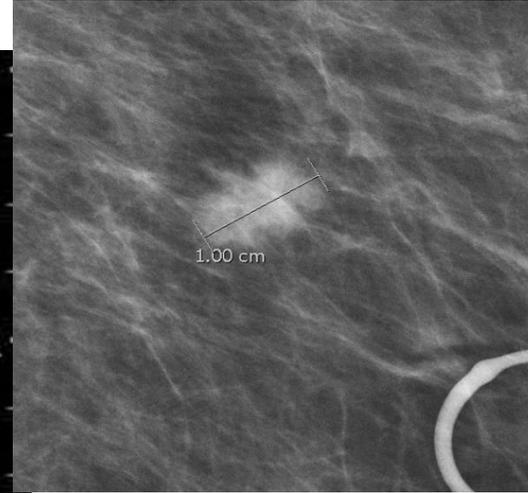
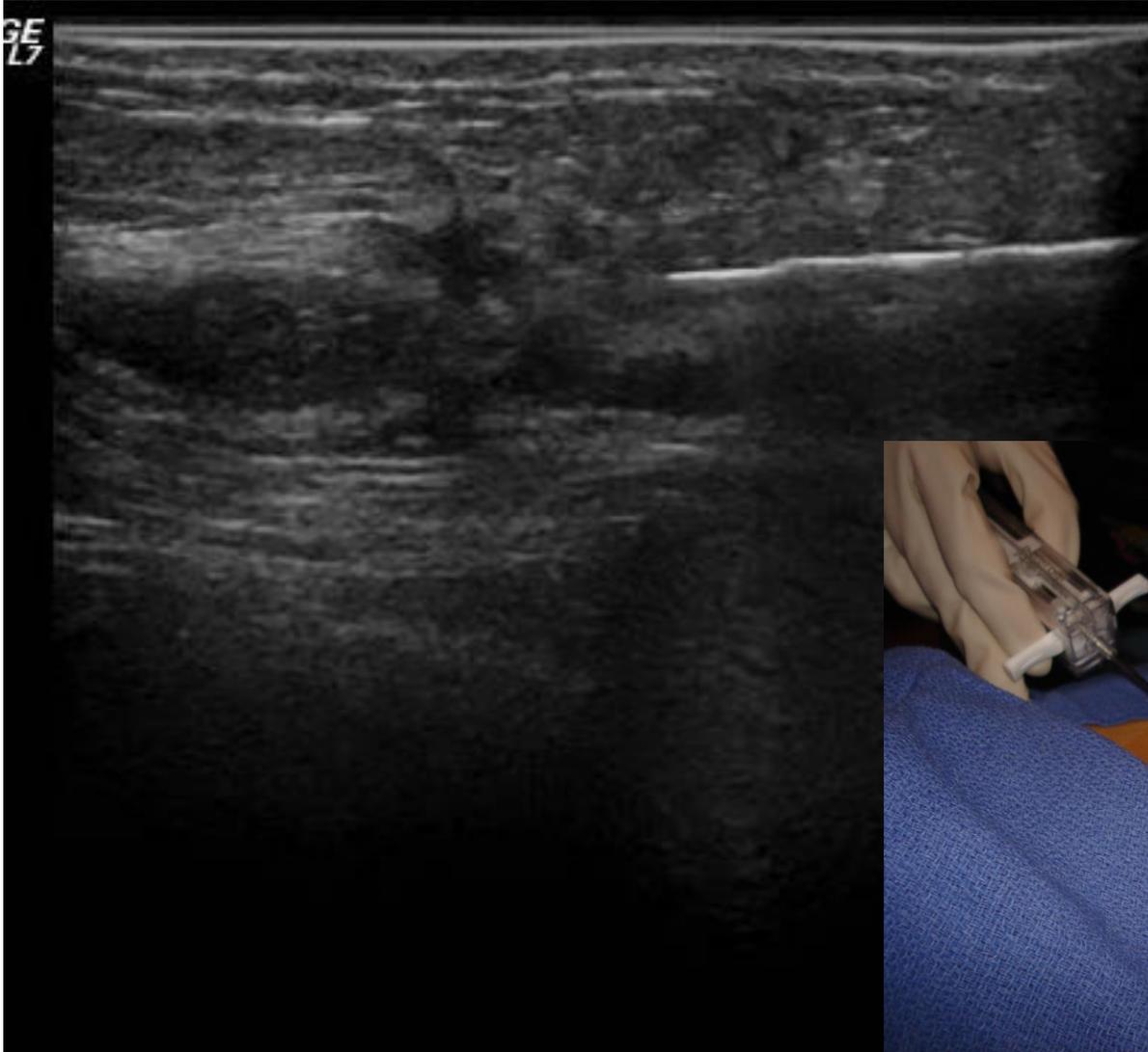
Points for pointing out the nodular liver! Anechoic fluid in the peritoneal spaces around the liver and right kidney = Ascites

Case #5: 38yo cirrhosis



US is EXCELLENT to search for & measure ascites/fluid
Can also use US guidance to drain ascites
Avoid bowel and other organs

BONUS Case #6: 80yo breast mass



US is EXCELLENT in biopsy & drainage procedure guidance, to include breast, thyroid, lymph node

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Think Back!

Sound waves - no ionizing rads

Hyper- iso- hypo- anechoic

Full abdominal US (Pancreas, liver, gallbladder, bile ducts, kidneys, spleen) VS.
RUQ US (some liver, gallbladder, bile ducts)

Simple cyst: anechoic, imperceptible wall, posterior enhancement

CT for pancreatitis complications; US great for ascites and paracentesis

UNCRADRES

Tweets by @UNCRadRes

UNC Rad Residency @UNCRadRes

Neuroradiology resident field trip to the art museum to check out the beautiful brain art. #RadioActivity @THMMD @DavidMauroMD @SJordanMD



UNC Rad Residency @UNCRadRes

We had a blast presenting all of our work at #SIRATX19! Thanks to @UNCRadiology for the opportunity. #RadioActivity @BDixonMD @JessieStewartMD @mcbreamy @CharlesBurkeMD @SJordanMD @THMMD

Embed View on Twitter

Welcome to the UNC Radiology Residency Education Website!

We are pleased to provide this educational resource for our residency program!

UNC Rad Q&Genda, subspecialty block ed resources, Phone Numbers, HSL custom build e-books, helpful hints can be found on this site.

ABR Core exam intel

Block 10 Schedule

Chief's Survey

RadExam

RSNA Physics Modules

UNC Radiology Conference schedule 18-19

Today March 2019

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	24 7am Cardiac Cases - 12pm Body: US Reni	25 7am Hot Seat - Phys 8am CVI Family Med 12pm Breast - Kuzm	26 12pm Health Care Ec	27 7am Hot Seat - Phys 12pm Radiology Jour	28 7am Hot Seat - Phys 12pm Neuro - Pediat	Mar 1 2
	3 12pm Body: Modern	4 7am Hot Seat - White 12pm VIR: Yu - Dialy	5 12pm Peds Interactiv	6 7am Hot Seat - White 12pm MSK: Maetani	7 12pm Chest: Sakthiv	8 9
	10 7am Chest Cases - E 12pm Body: HSG - C	11 7am Hot Seat - Phys 8am CVI Family Med 12pm Resident Conf	12 12pm Body: Solid an	13 7am Grand Rounds - 12pm Neuro - White	14 12pm NM: Oldan - N	15 16
	17 12pm Body: MRI/MR	18 7am Hot Seat - Core 12pm VIR: Dixon - R	19 12pm Peds: Fordhan	20 7am Hot Seat - Core 12pm MSK: Nissman 12pm MSK: Robert J	21 7am Grand Rounds: 12pm MSK: Robert J	22 23
	24 7am Chest Cases - E 12pm Body: US Live	25 7am Hot Seat - Core 8am CVI Family Med 12pm Breast - Fellow	26 12pm Fellow Panel:	27 7am Hot Seat - Core 12pm Neuro - Neuro	28 12pm Cardiac Hyslop	29 30

Home



Welcome to our UNC Medical Student Radiology website!

Custom built HSL website for Radiology - e-Anatomy, UpToDate, PubMed and reference books

UNC Radiology Teaching Files

URMC Radiology Teaching Files

ACR Appropriateness Criteria: What Test Applies?

Department career goal advisers are available to counsel radiology-bound students!

RADY Formal Didactic Curriculum

Today February 2020

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	26 10am RADY 401 Cas 1pm Intro to VIR Dr	27 2pm Best of Breast 4pm Ms Cluck Sim L	28 1pm Meet Aunt Minn	29	30 TEC Block 11 Ends 10am RADY 401 Fin	31 Feb 1
	2 TEC Block 12 begin	3 RADY Symposium	4 1pm Intro to Cardio; 1pm CXR Unknowns	5	6 7	8
	9 1pm Intro to Abdom 2pm Approach to the	10 11am RADY 401 Intri 8am Intro and Apprc 9am CXR #1 in the \ 10am Emergency Ra 11am Head CT Dr Rc	11 RADY Symposium	12	13 1pm Intro to Muscul 2pm Radiologic Eval	14 10am RADY 401 Mid

More at www.rads.web.unc.edu www.msrad.web.unc.edu and @UNCRadRes

Thank you!