

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:

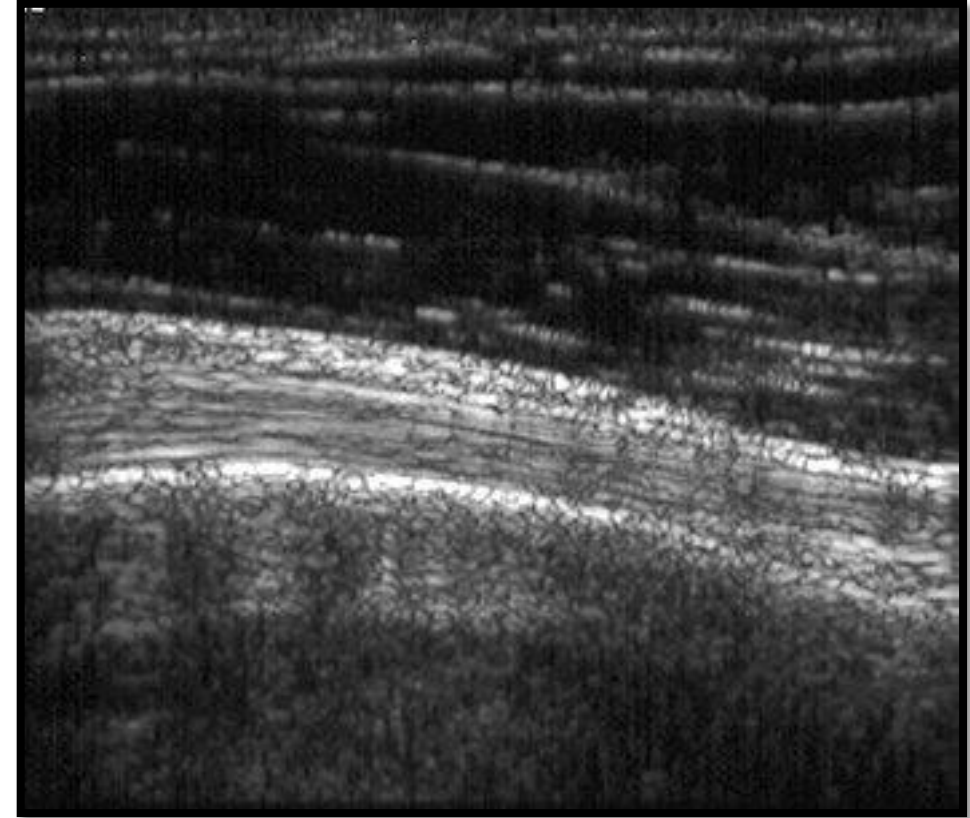
 - Produces heat

 - 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!)

Pros

Real time

Non invasive

Portable

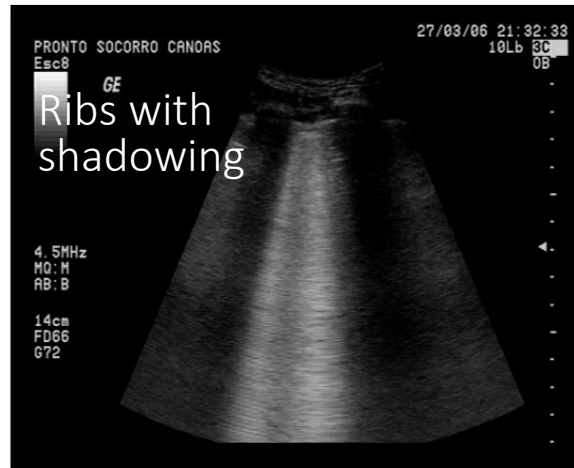
Non ionizing

Relatively lower cost vs CT/MRI

Ultrasound Basics

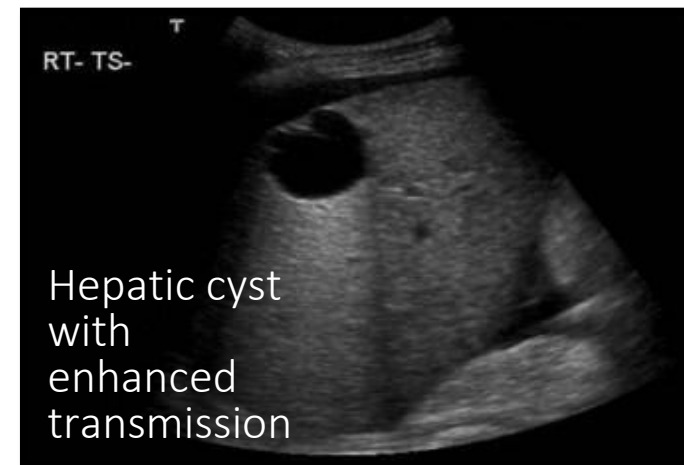
POSTERIOR SHADOWING

- 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

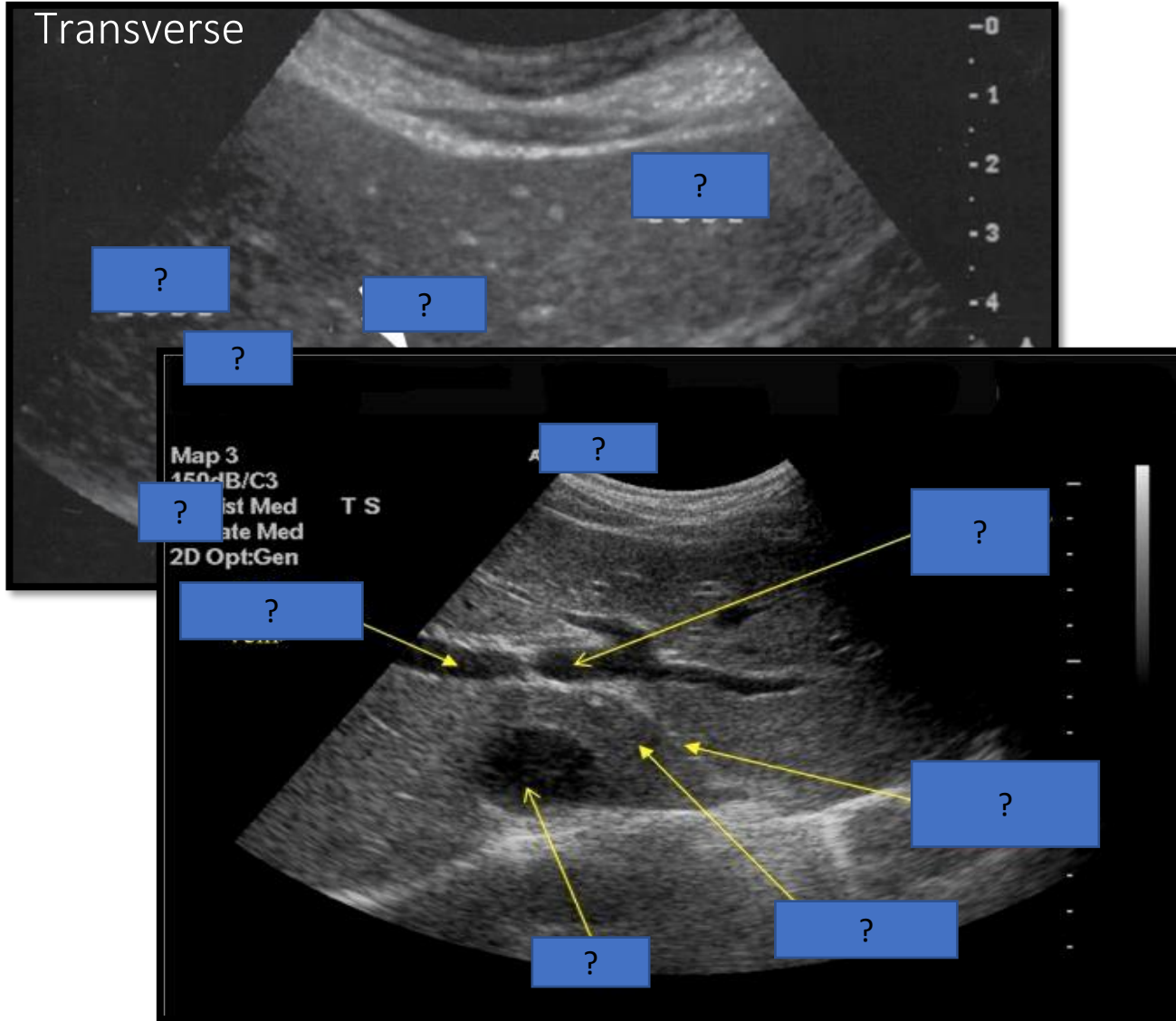
AND THAT'S IT. . . ie order this
for suspected GB pathology

Module Outline

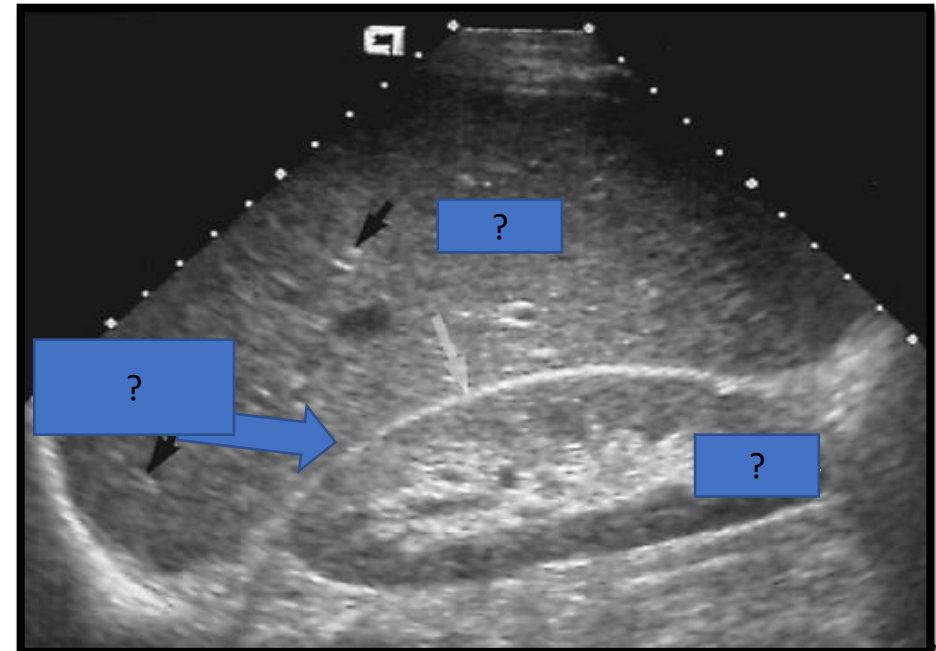
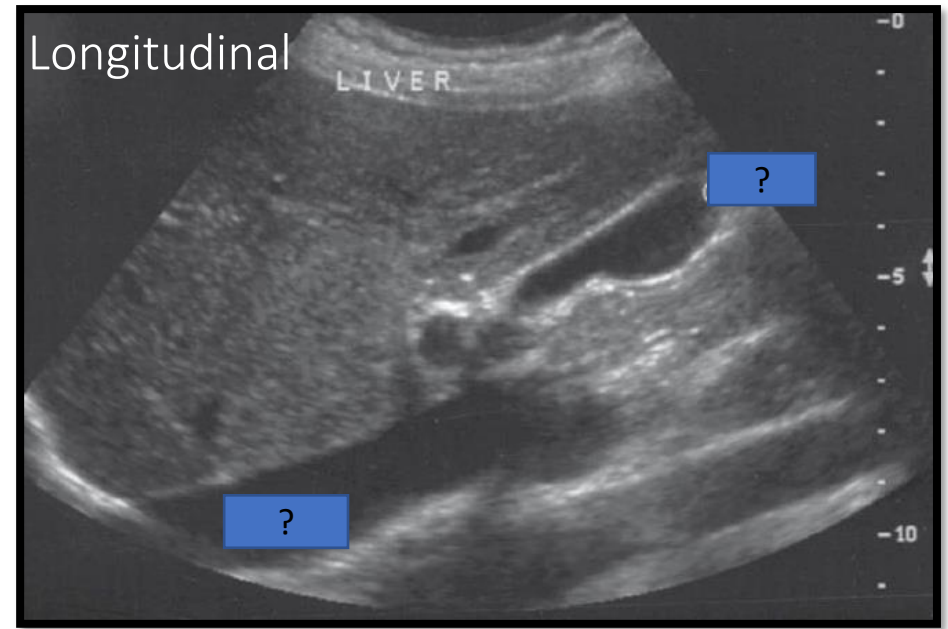
- I. Basics & Indications
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Liver Anatomy

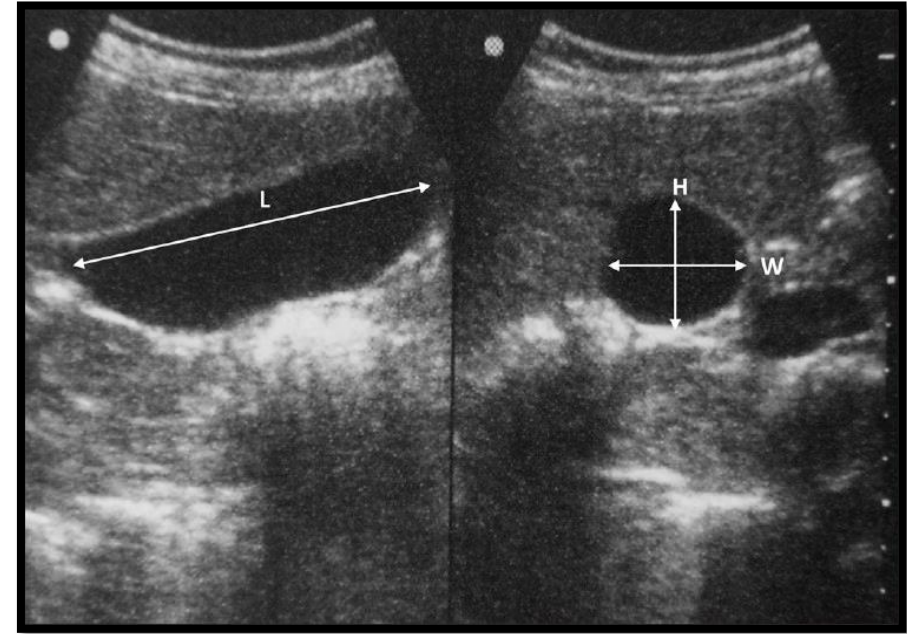
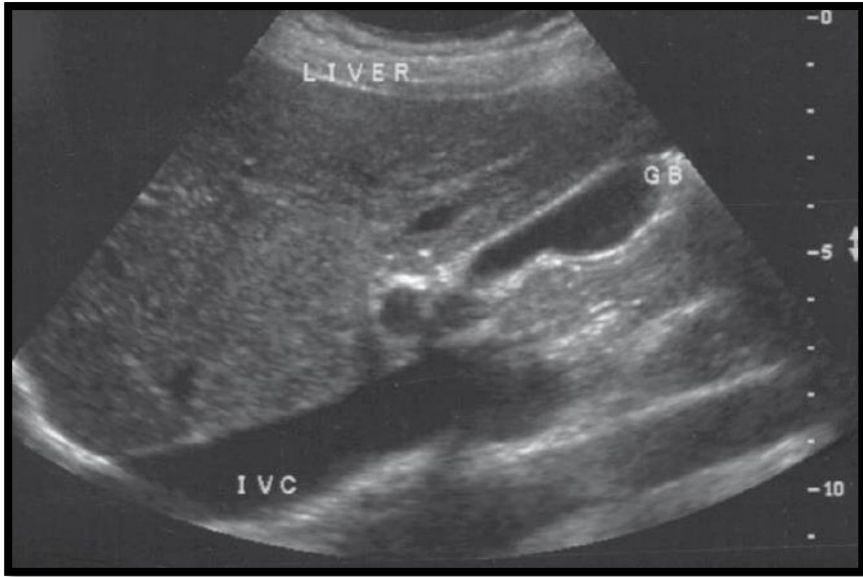
Transverse



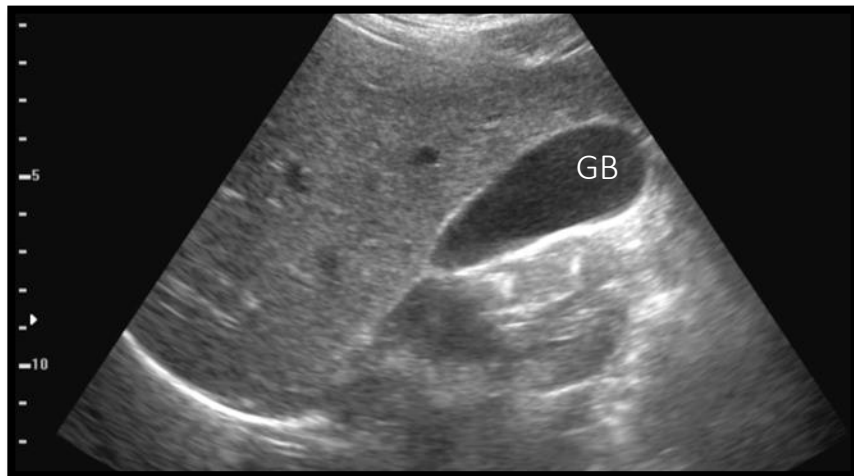
Longitudinal



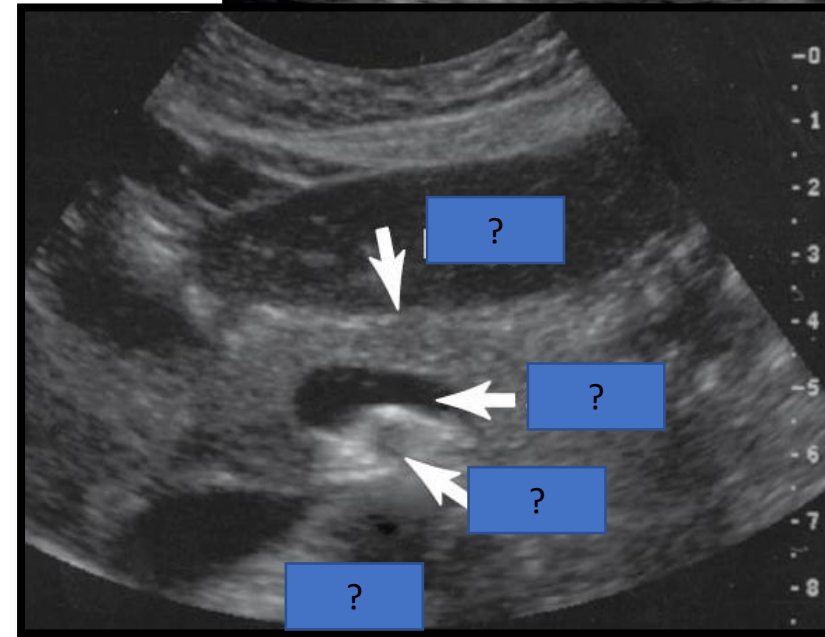
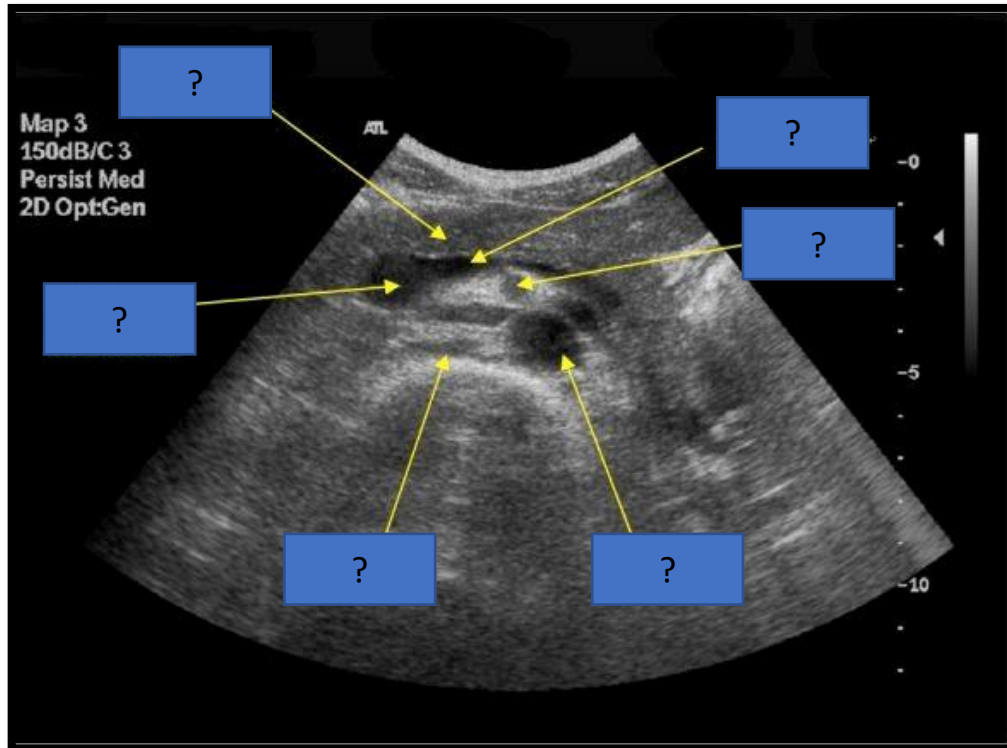
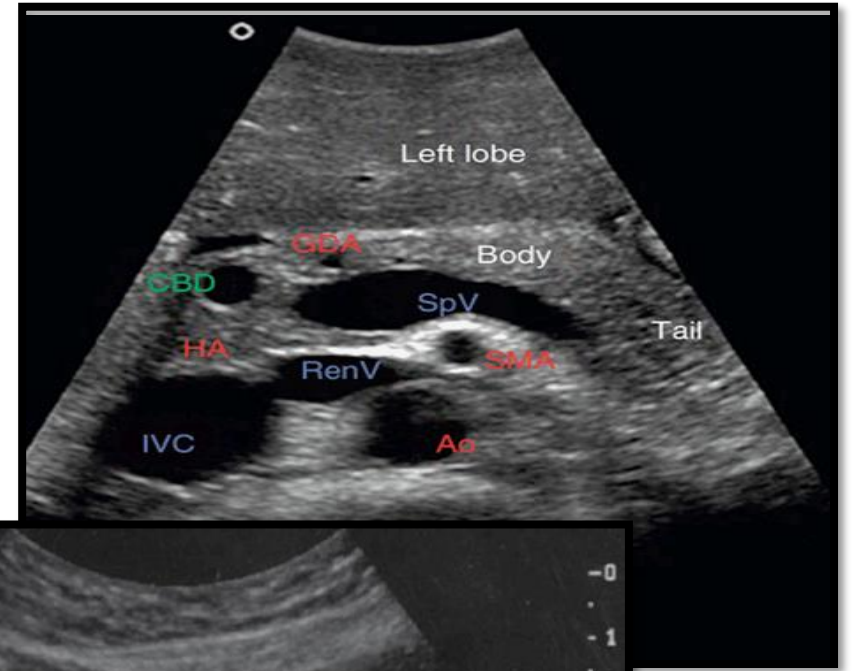
Gallbladder Anatomy



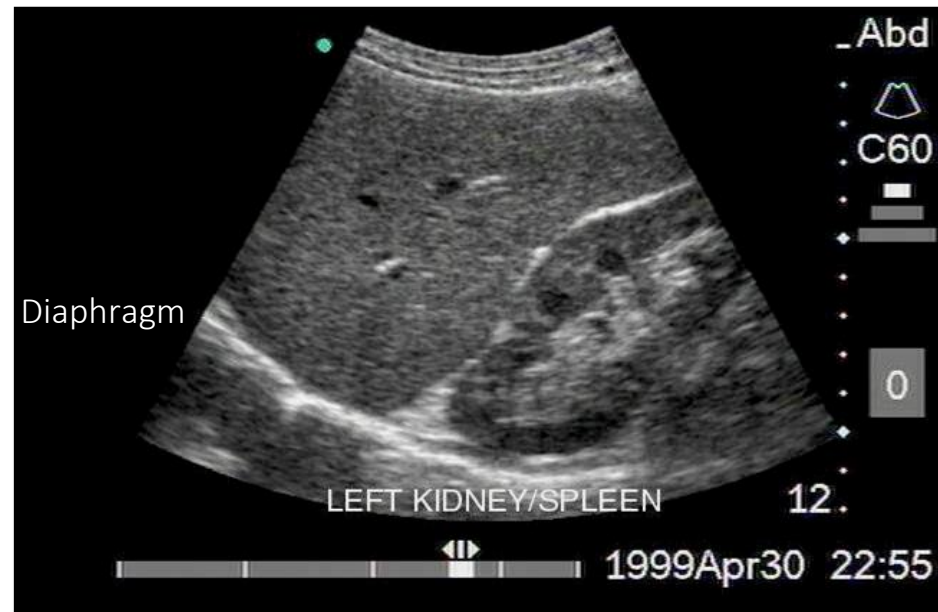
Gallstones



Pancreas Anatomy

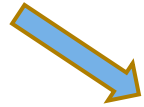


Spleen Anatomy

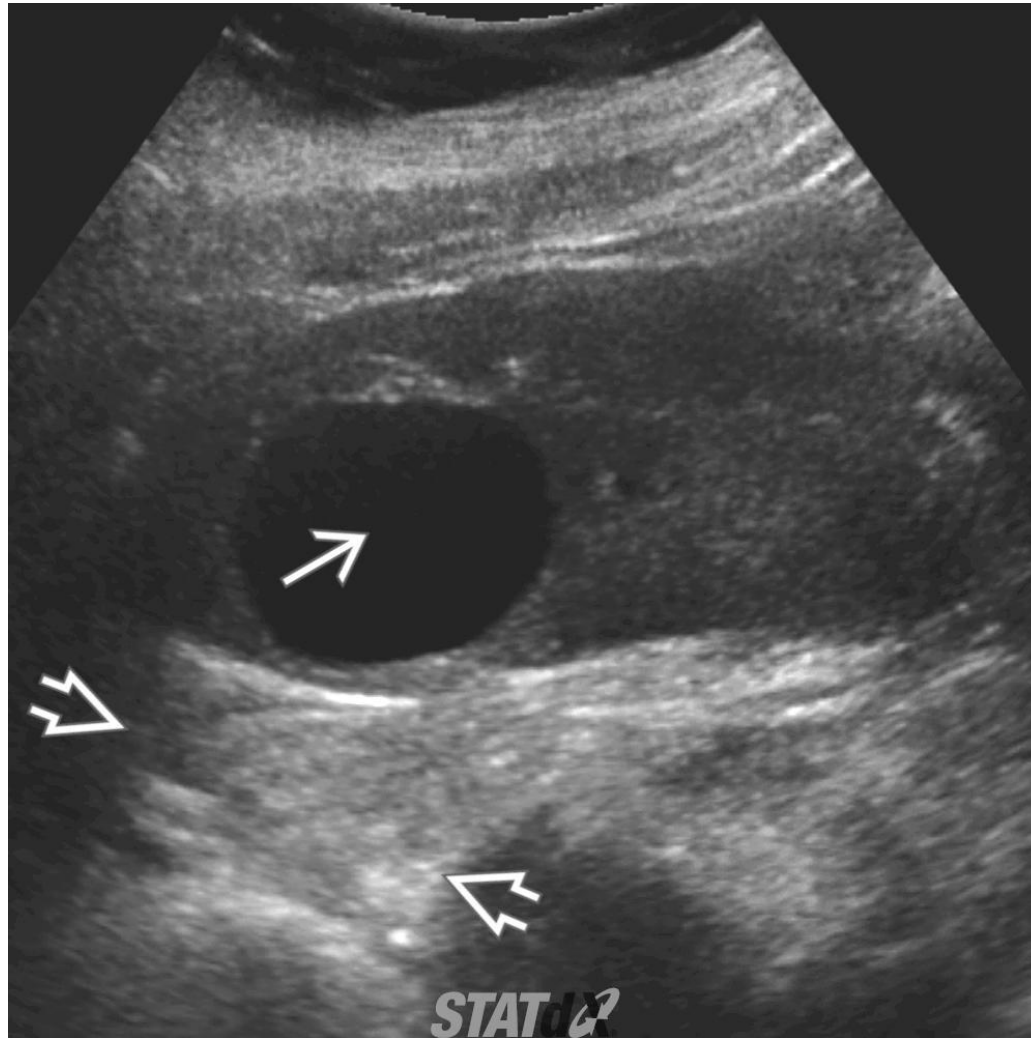


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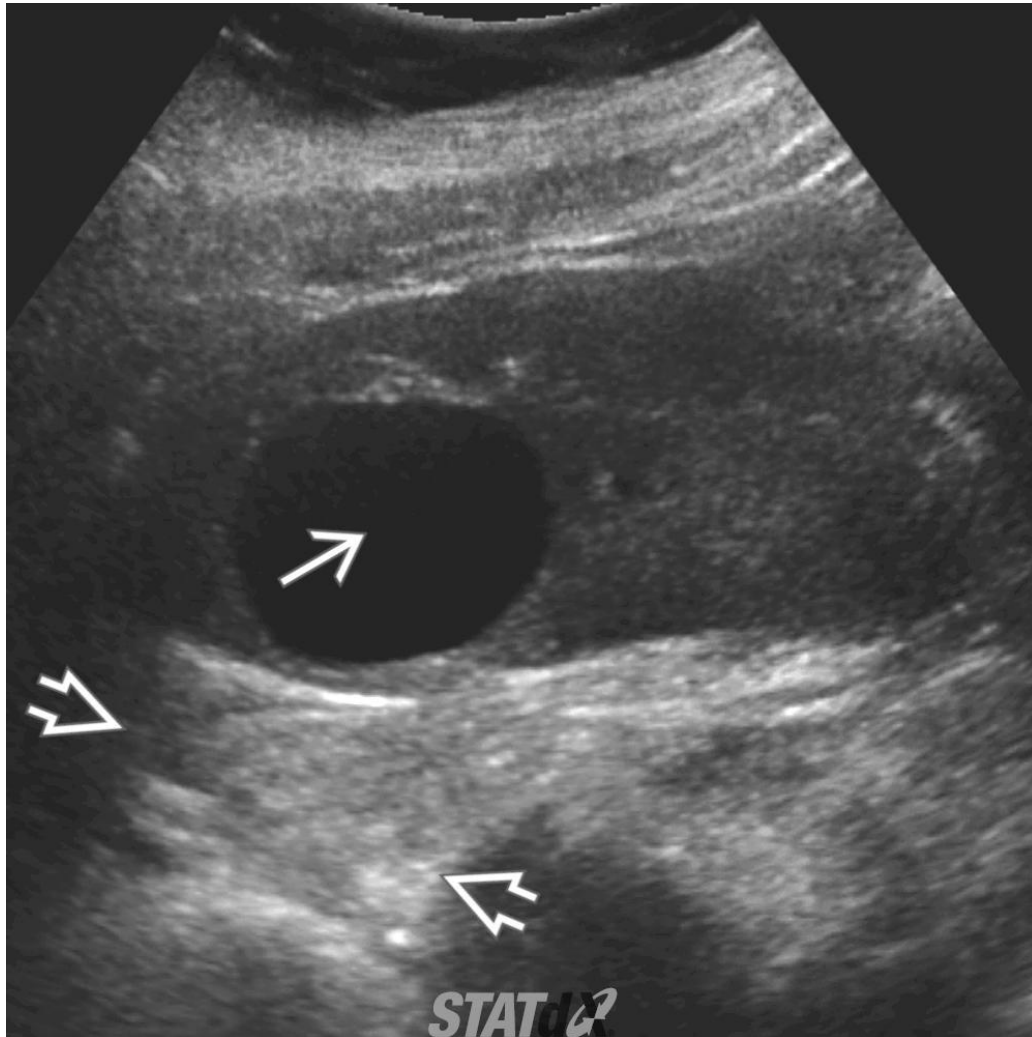


Case #1: 54yo right flank pain



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:

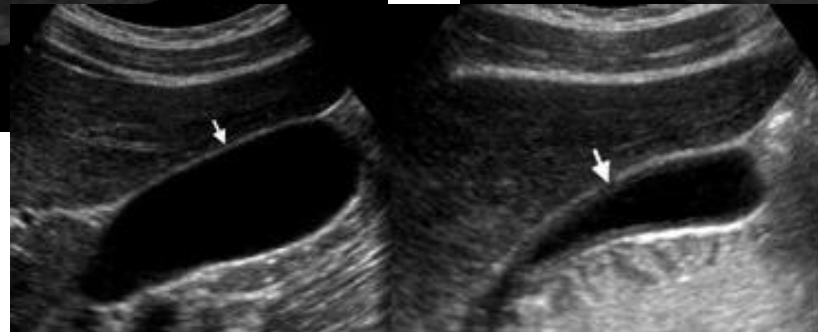
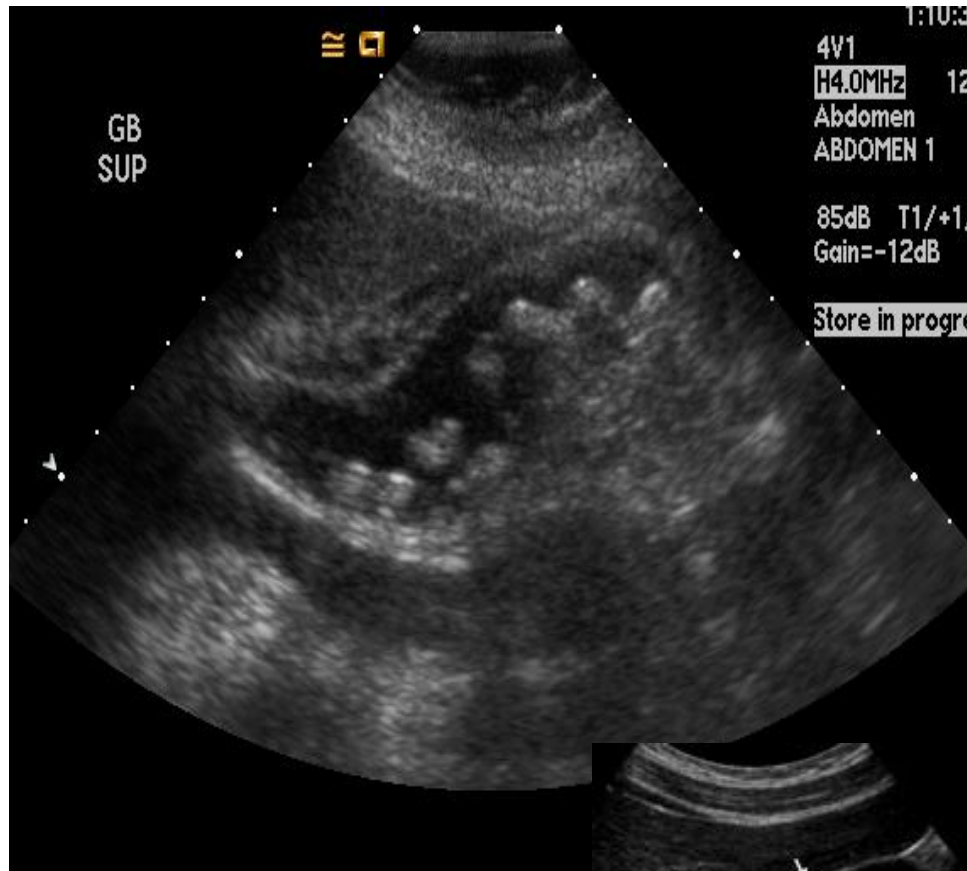
- Anechoic

- Imperceptible walls

- Posterior enhancement

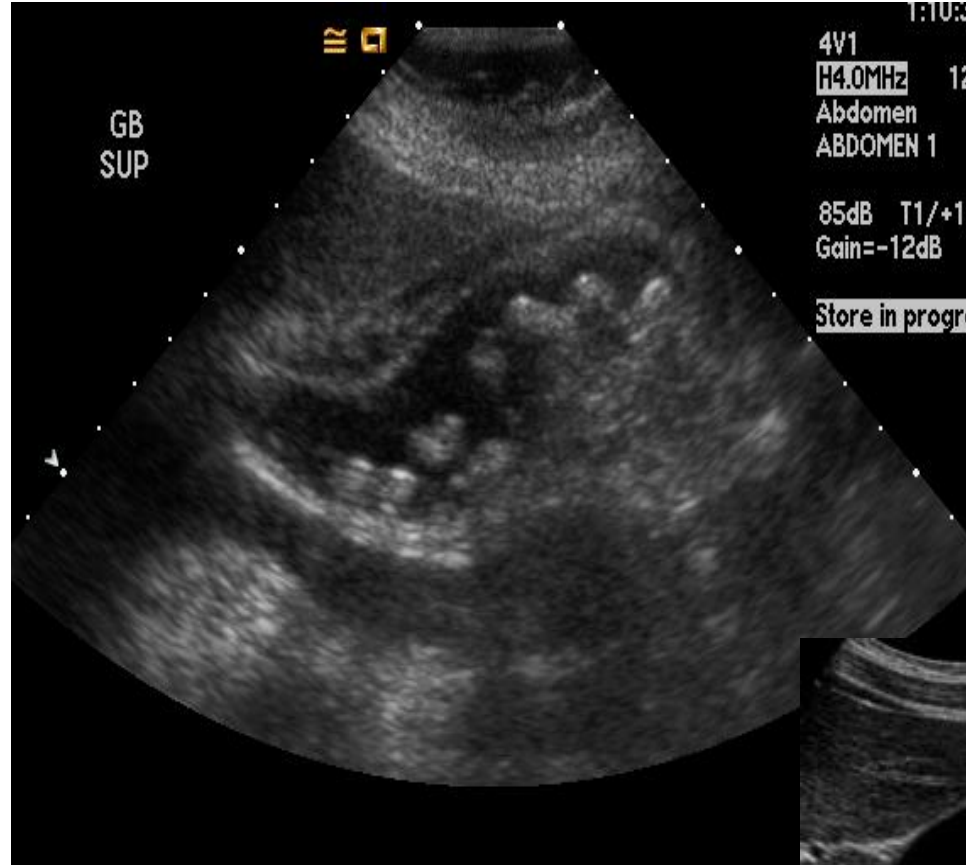
- No solid or vascular components

Case #2: History withheld



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

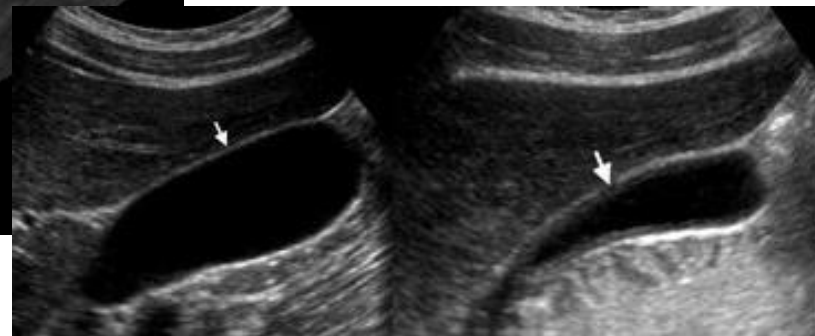
Case #2: History withheld



Acute Cholecystitis

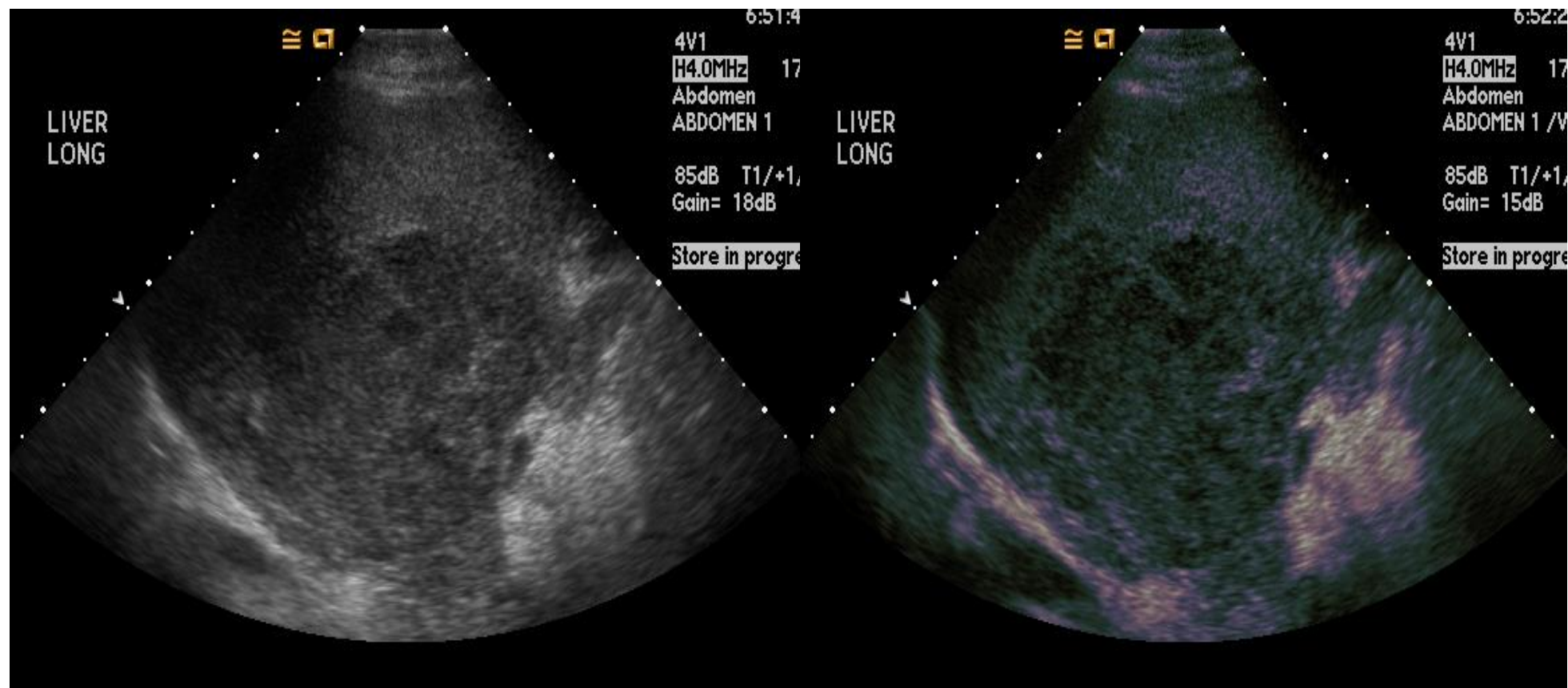
Imaging findings:

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



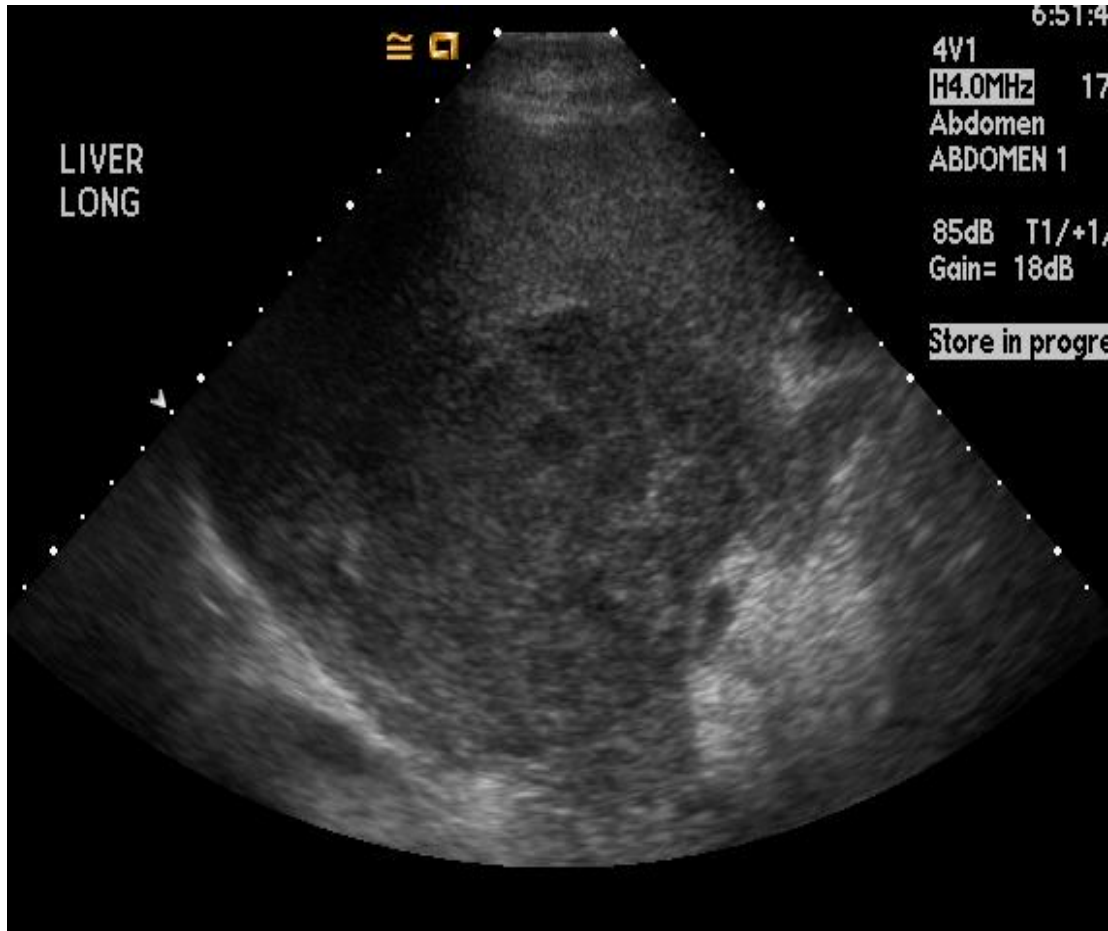
Multiple shadowing stones. Wall thickening, pericholecystic fluid = Acute cholecystitis. Normal on bottom for comparison

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:

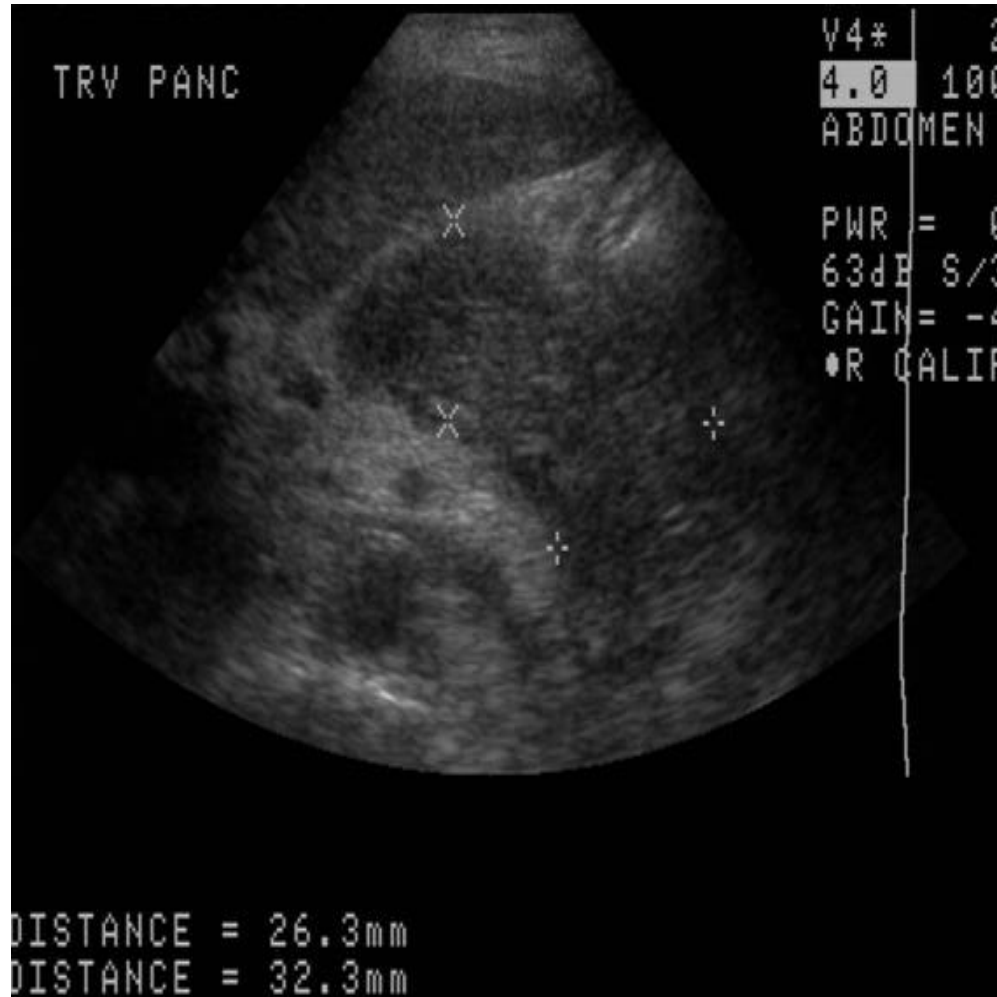
- Hypo or hyperechoic liver mass

- 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



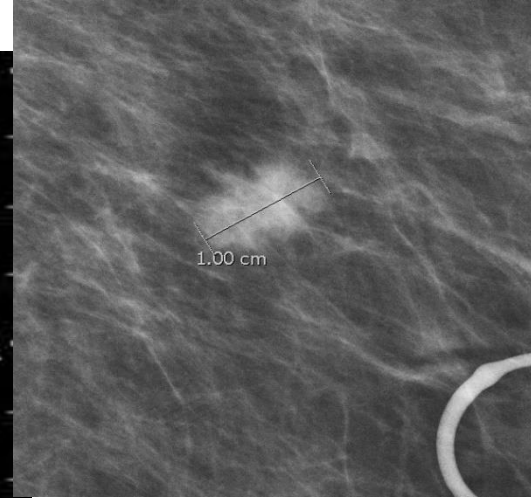
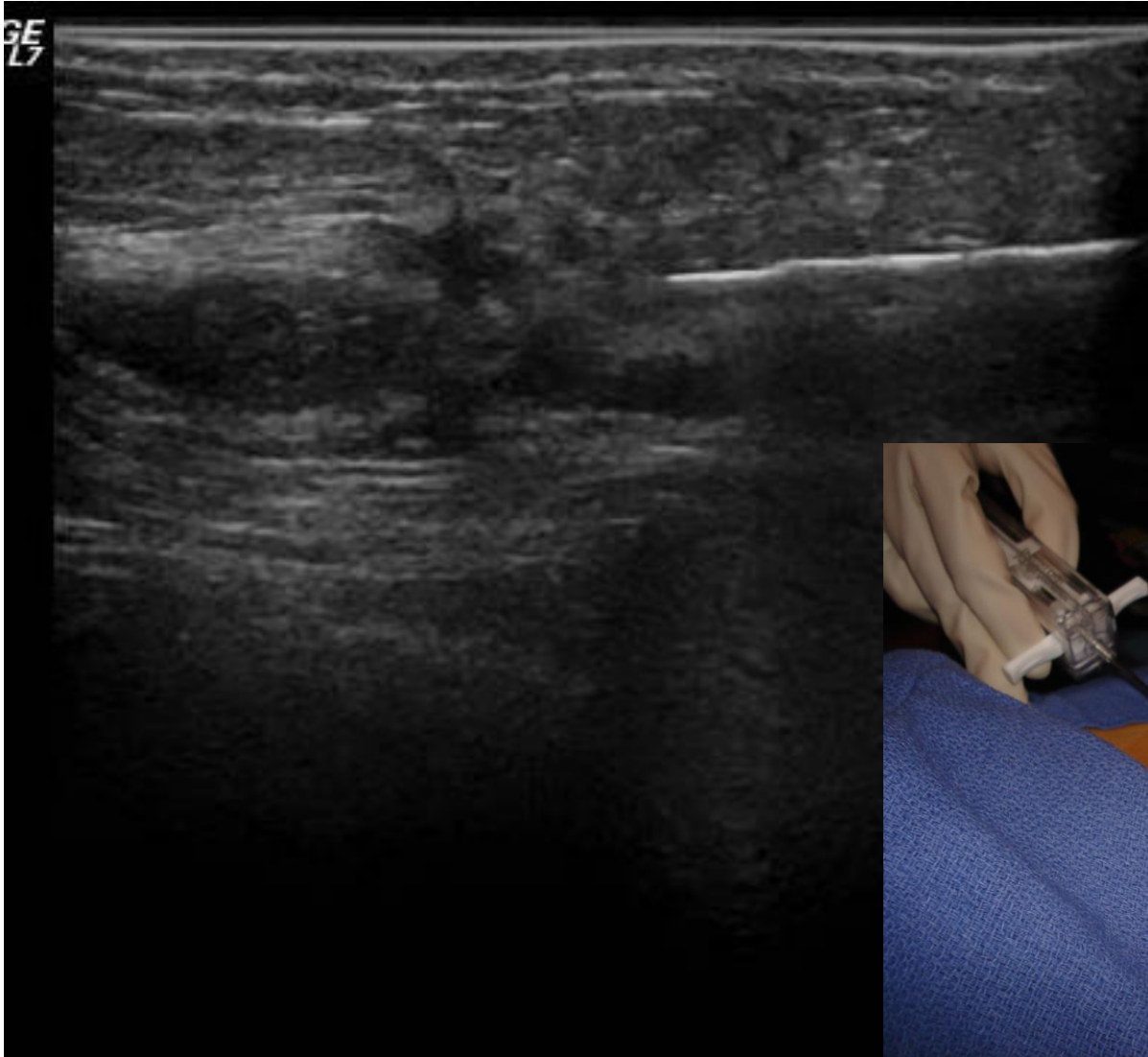
Points for pointing out the nodular liver! Anechoic fluid in the peritoneal spaces around the liver and right kidney = Ascites

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

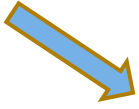
BONUS Case #6: 80yo breast mass



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

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	27	28	29	30	31	Feb 1
	10am RADY 401 Cas 1pm Intro to VIR Dr	2pm Best of Breast 4pm Ms Cluck Sim L	1pm Meet Aunt Minn		TEC Block 11 Ends 10am RADY 401 Fin	
2	3	4	5	6	7	8
	TEC Block 12 begin 11am RADY 401 Intri	RADY Symposium 8am Intro and Apprc 9am CXR #1 in the \ 10am Emergency Ra 11am Head CT Dr Rc	1pm Intro to Cardio;	1pm CXR Unknowns		
9	10	11	12	13	14	15
	1pm Intro to Abdom 2pm Approach to the	RADY Symposium 8am Cervical spine C 9am Body CT Dr Dec		1pm Intro to Muscul	10am RADY 401 Mid	

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

Thank you!