

Gallbladder Point-of-Care Ultrasound

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Learning Objectives

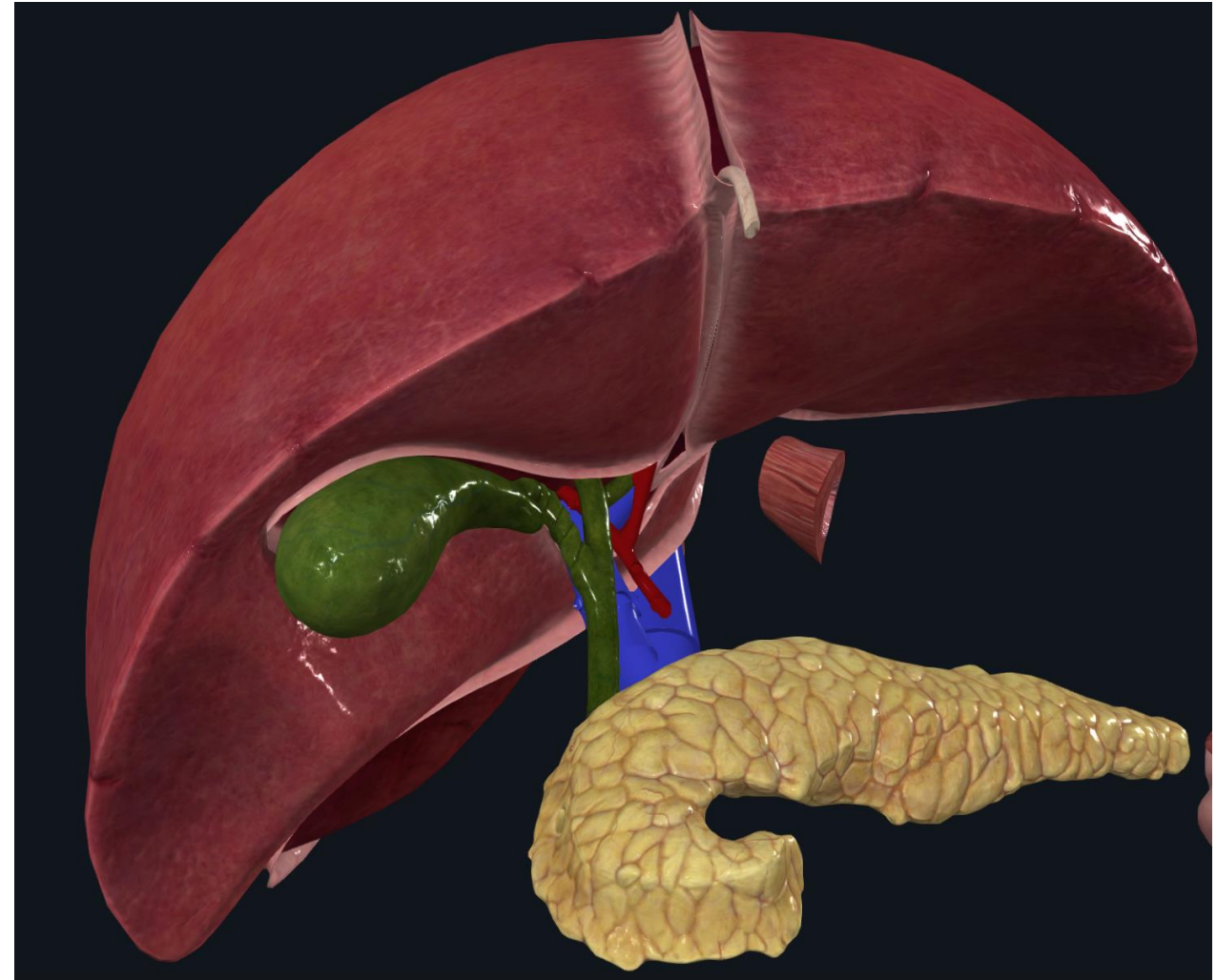
- Acquire gallbladder images using point-of-care ultrasound (POCUS)
- Identify cholelithiasis and differentiate gallstones from edge refraction artifact
- Assess gallbladder wall thickness
- Evaluate common bile duct (CBD) size

Gallbladder Point-of-Care Ultrasound

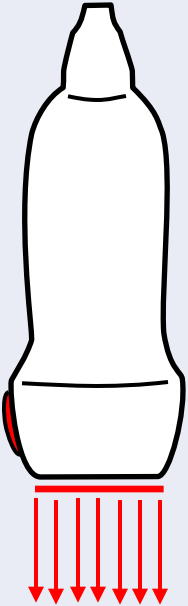
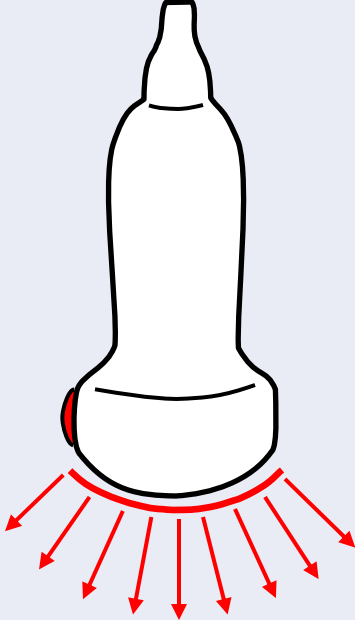
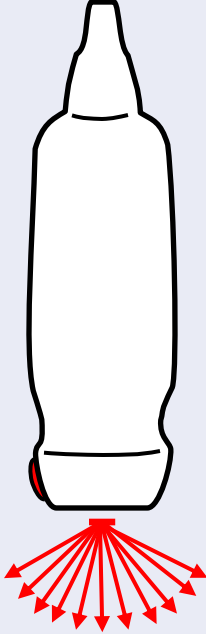
- Valuable tool for evaluating right upper quadrant abdominal pain suspicious for gallbladder disease
- Quick, avoids ionizing radiation, has high sensitivity, specificity
- Assess for **cholelithiasis**, gallbladder wall thickening, CBD dilation and ascites

Normal Gallbladder Anatomy

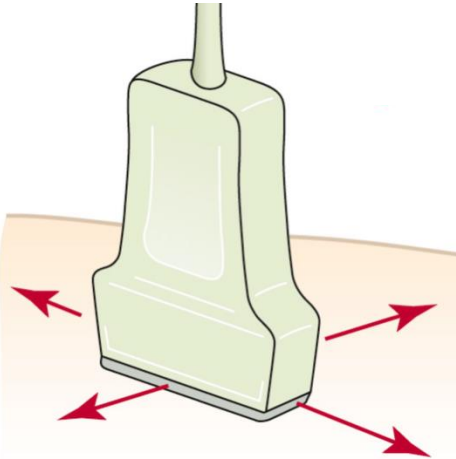
- Located on the posterior-inferior edge of the liver
- Lies along the main lobar fissure
- Fundus lies anterior and inferior
- Neck tapers cranially and posteriorly



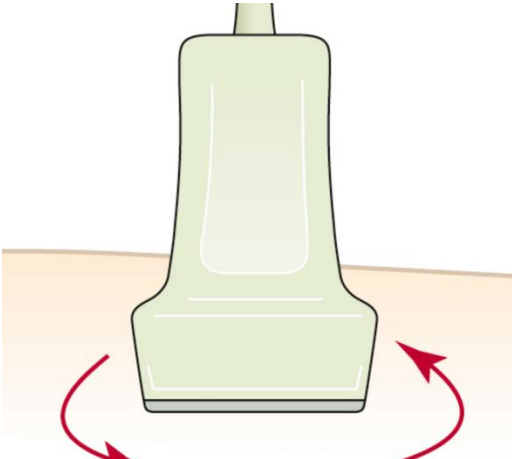
Transducer Selection

Higher Frequency	Lower Frequency	
Linear	Curvilinear (Convex)	Phased-Array
		
Up to 6 cm	Greater than 6 cm	

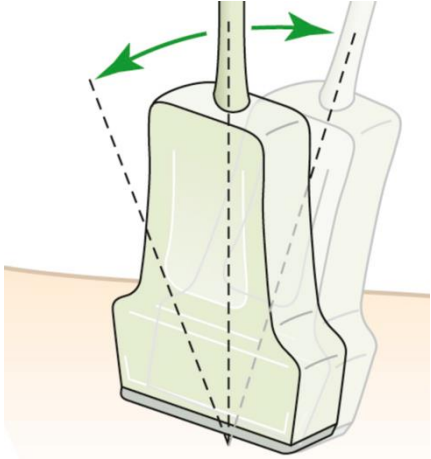
Transducer Manipulation



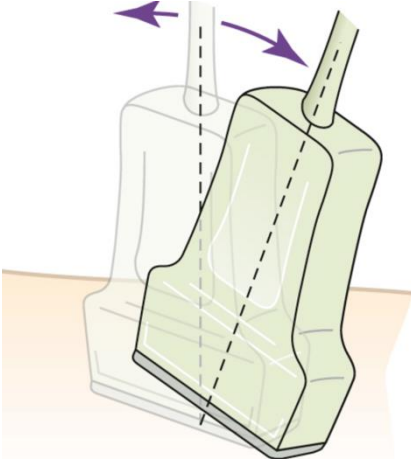
Sliding



Rotating



Fanning/Tilting



Rocking

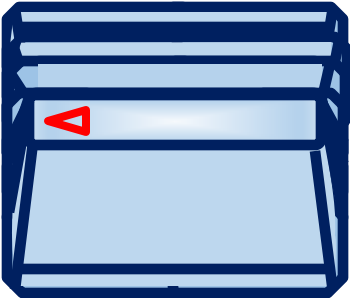
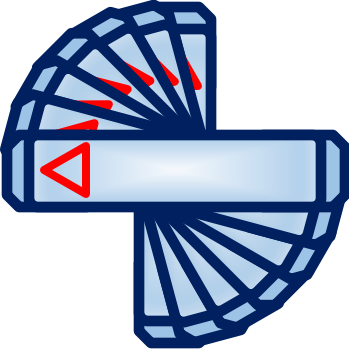


Image Acquisition: Longitudinal View

- **Patient:** Supine
- **Transducer:** inferior costal margin, lateral to midline
- **Marker:** Toward patient's head
- Slide laterally to visualize the gallbladder
- Rotate/fan with fine movements
- Sweep through the entire gallbladder

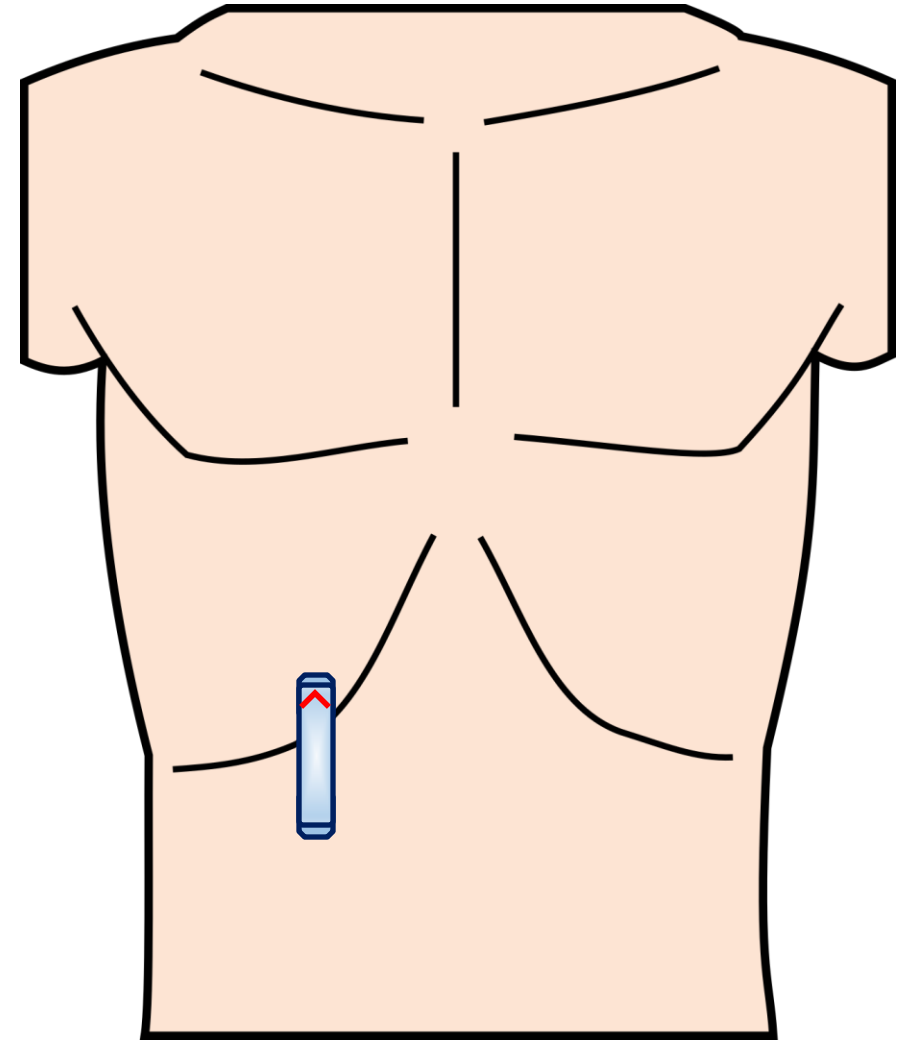
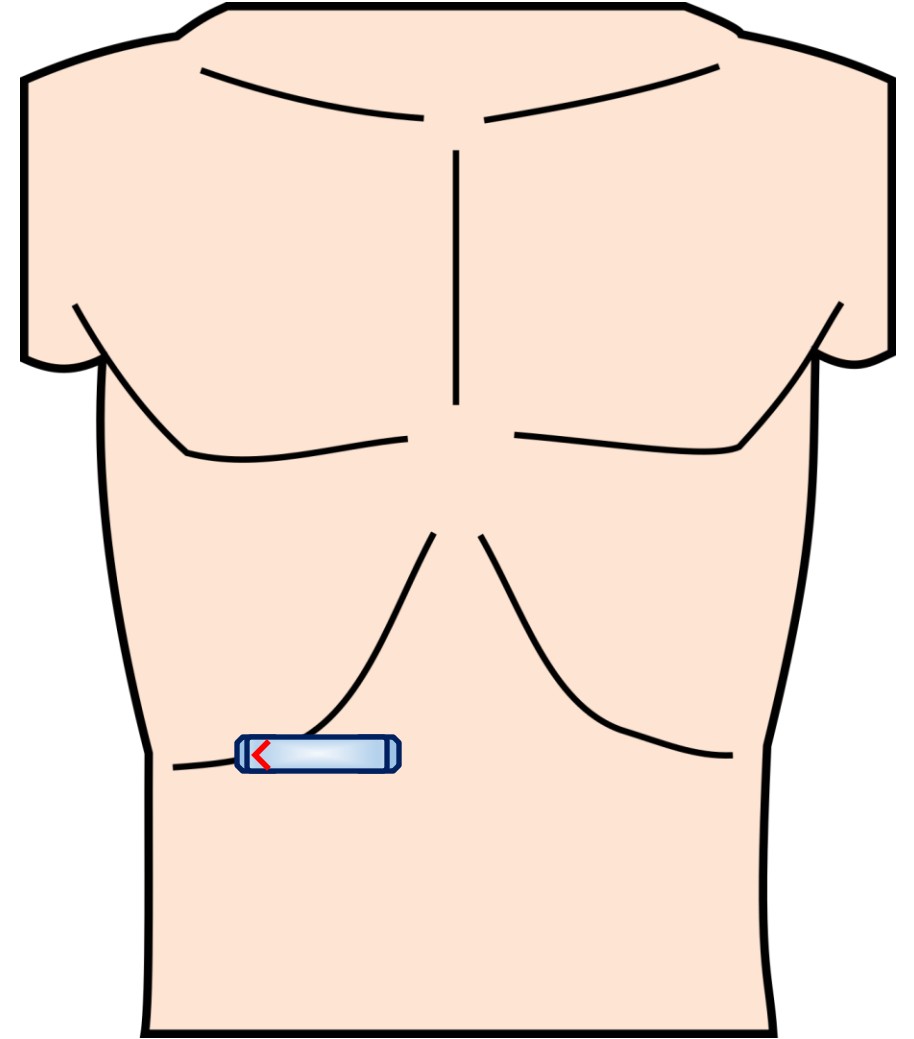


Image Acquisition: Transverse View

- Rotate the transducer 90° counterclockwise from longitudinal view
- Sweep through the entire gallbladder in transverse view



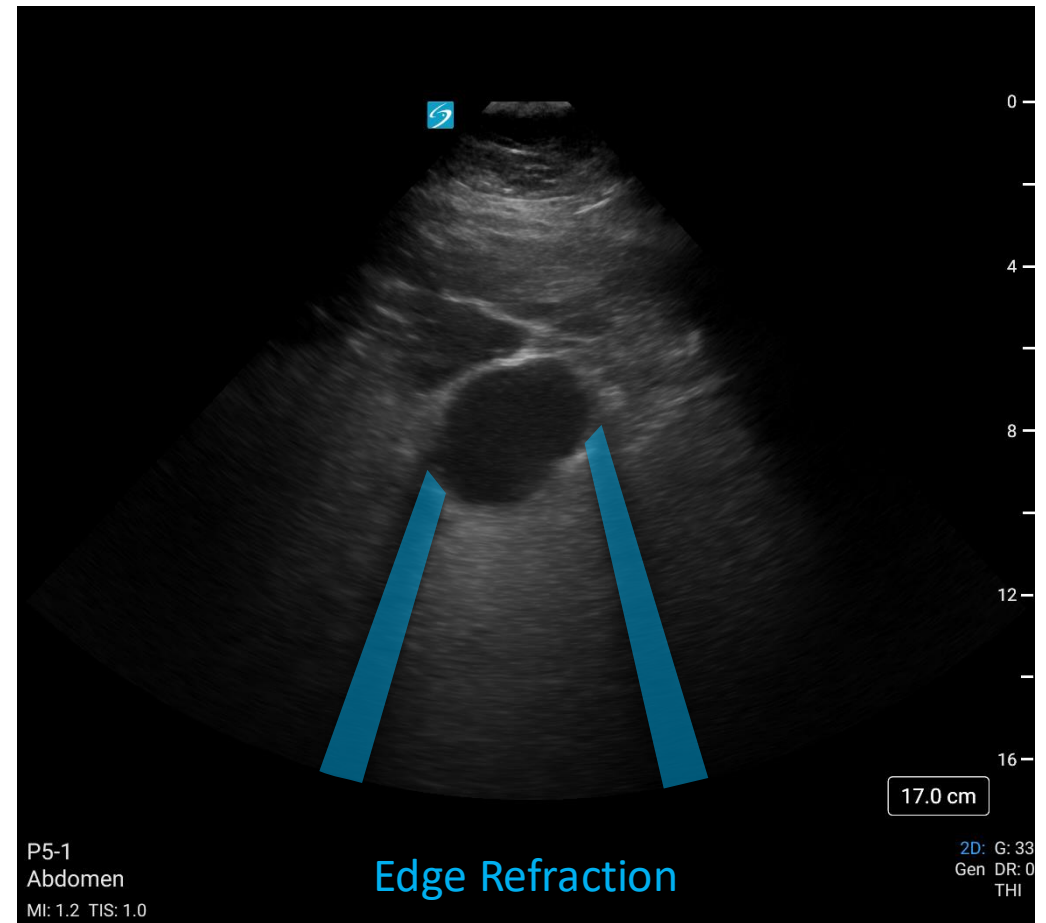
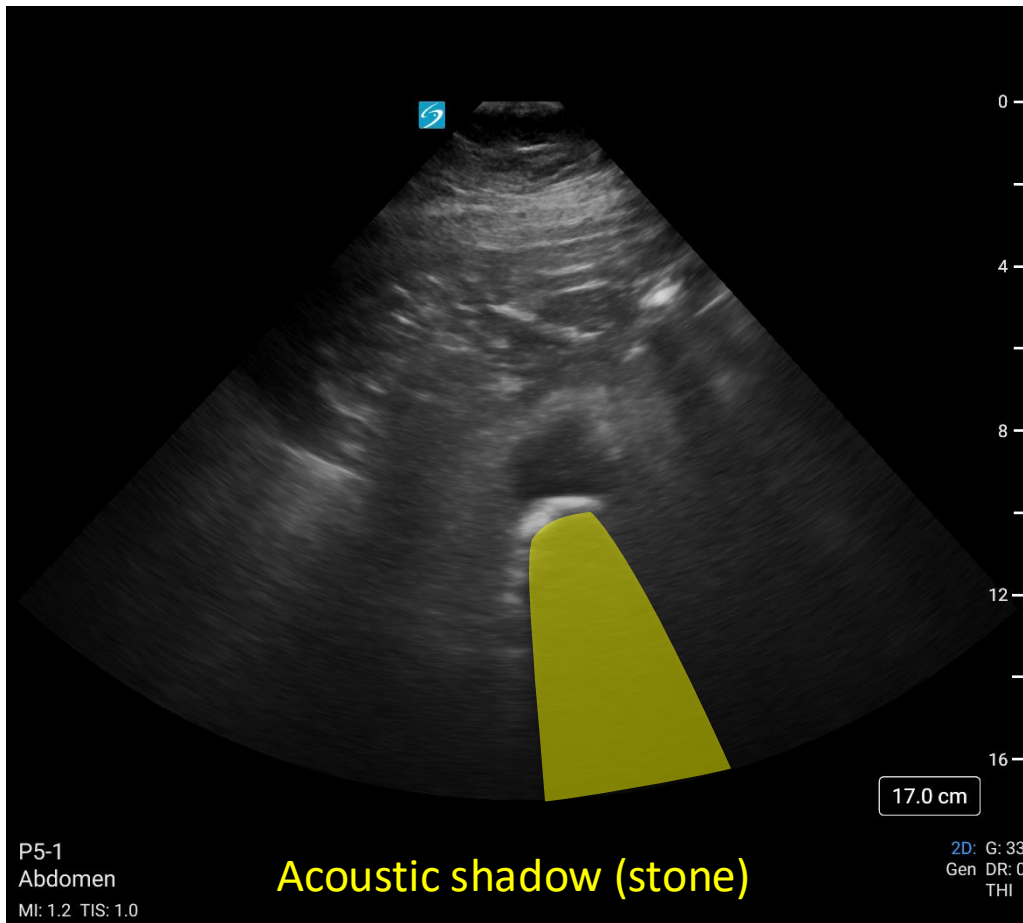
Cholelithiasis

- Gallstones appear as echogenic structures with posterior acoustic shadowing



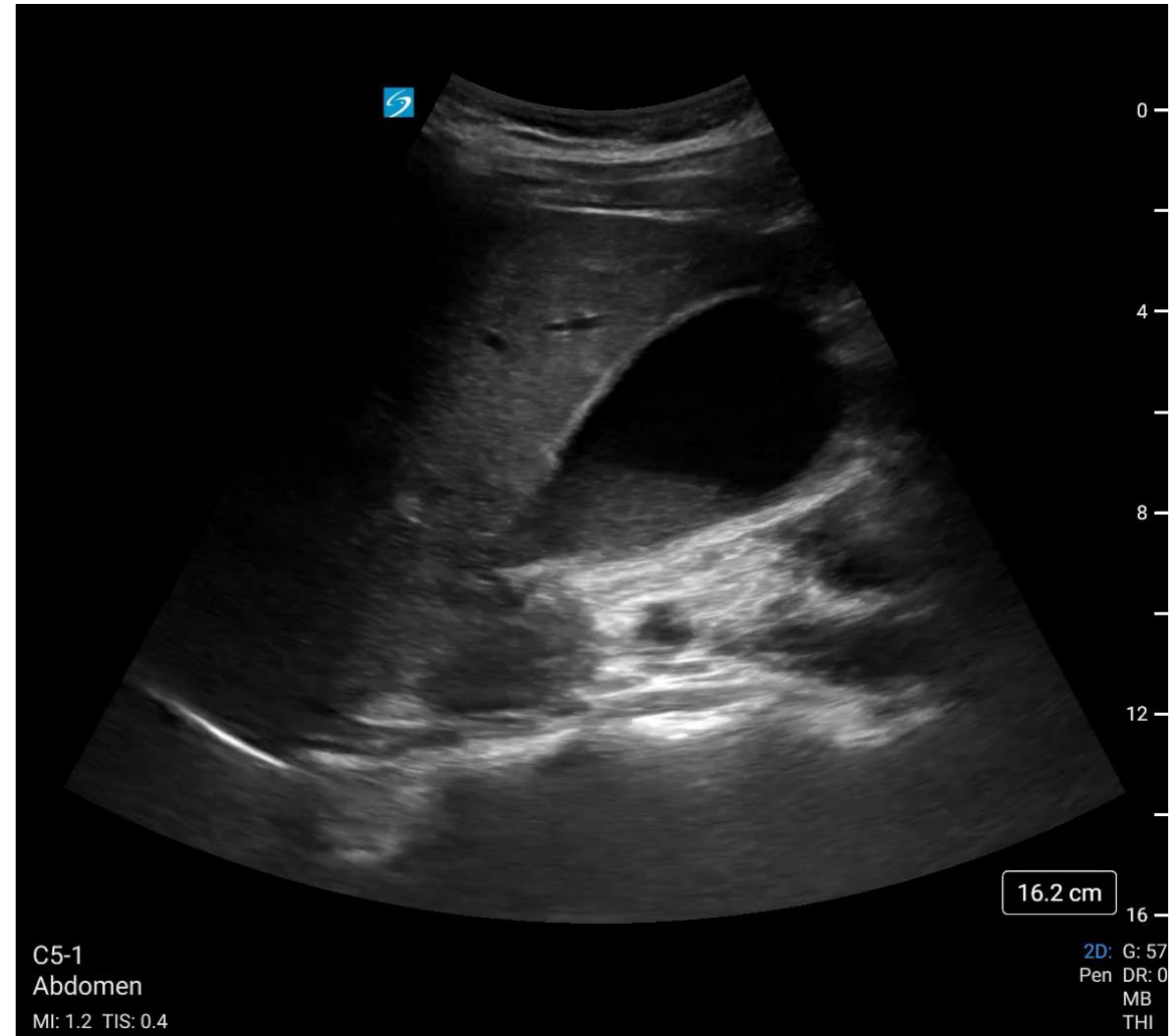
Edge Refraction Artifact: Pseudo-Shadowing

- Occurs when ultrasound bend at curved surfaces, creating an artifact



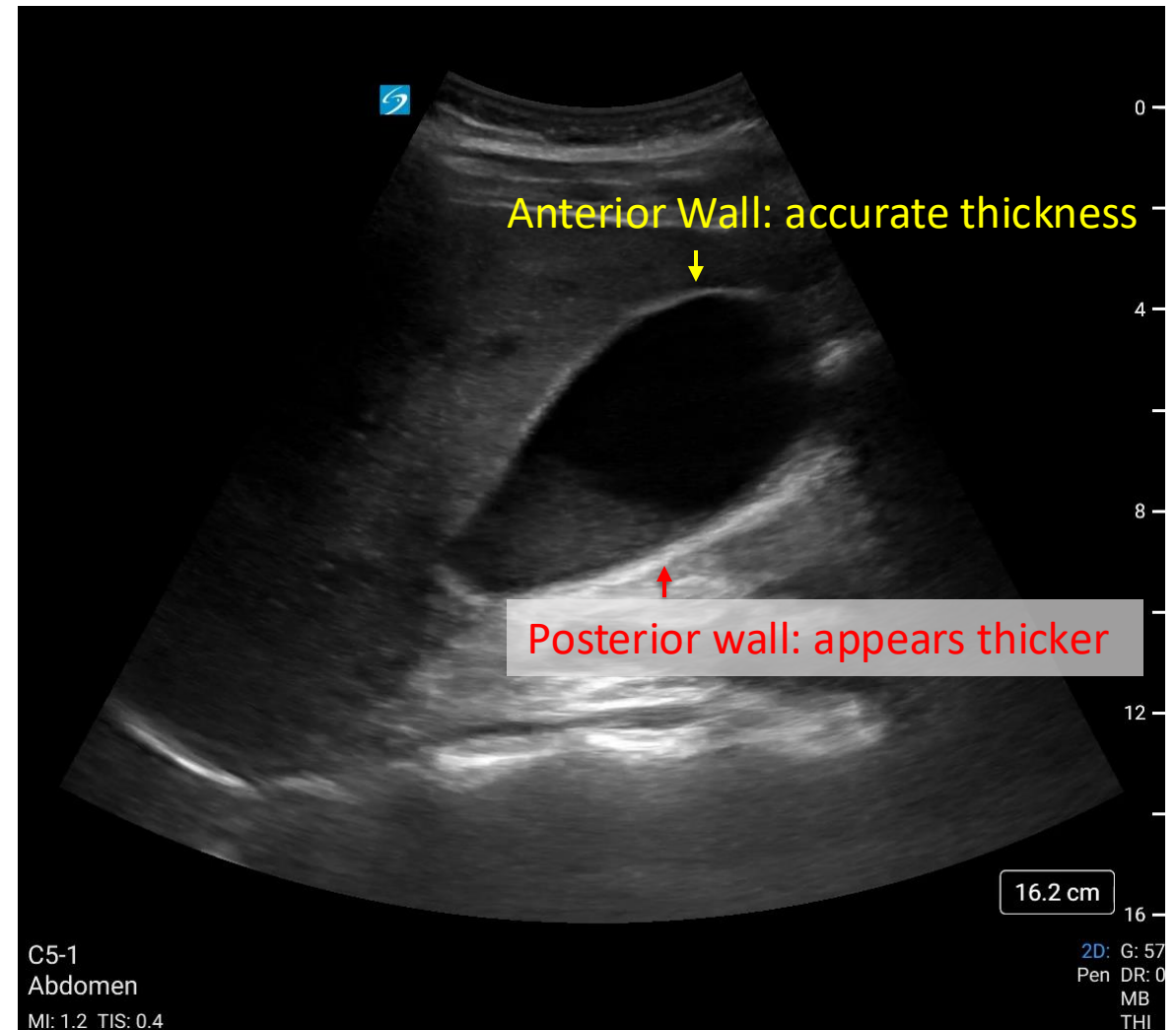
Gallbladder Sludge

- Echogenic material that layers dependently within the gallbladder
- May shift with repositioning
- Lacks shadowing



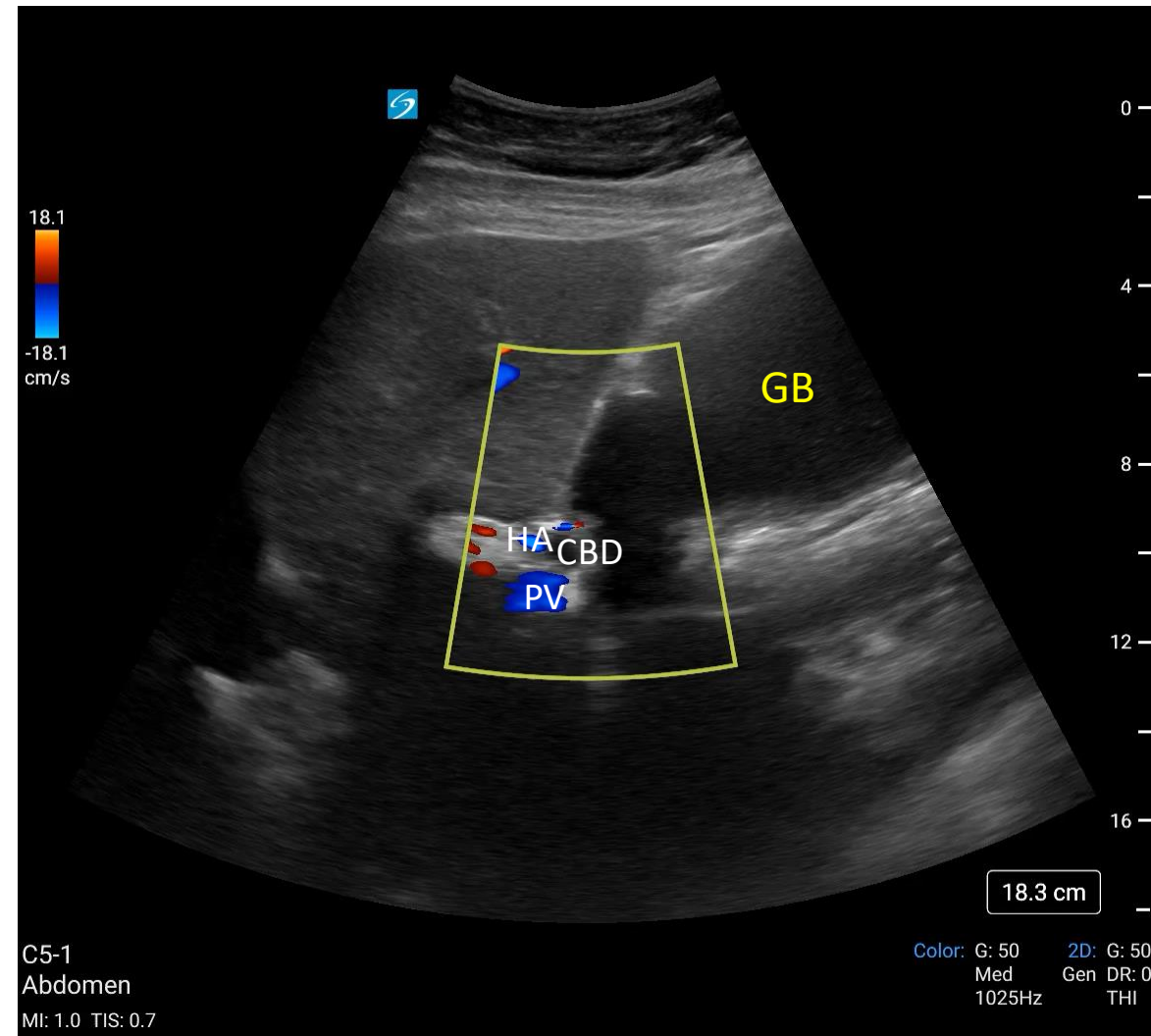
Gallbladder Wall Thickness

- Gallbladder wall thickening can be associated with acute cholecystitis
- Normal thickness: <3 mm
- Measure at the most anterior portion of the gallbladder wall
- Causes of false positive: Non-fasting state, ascites, hepatitis



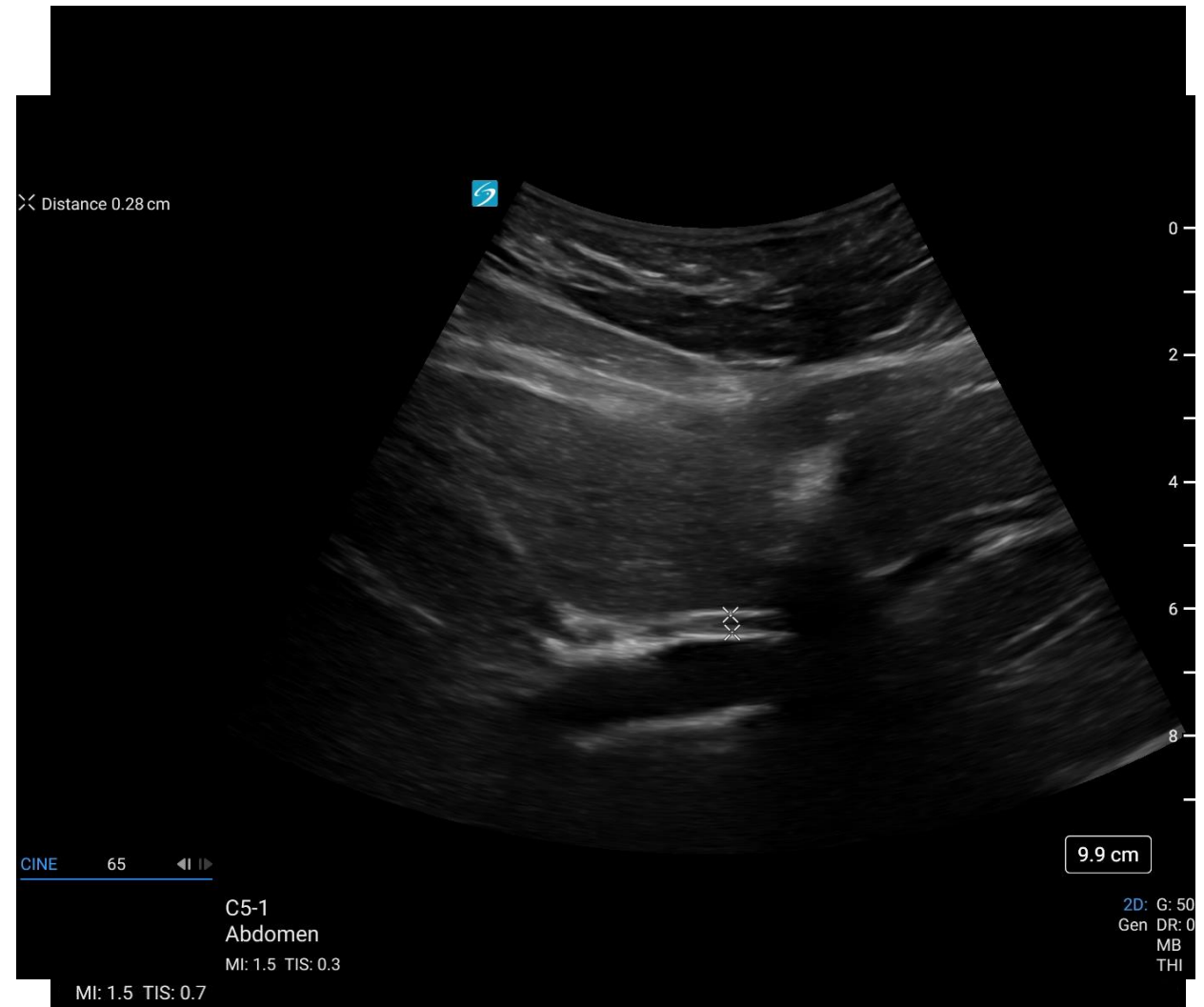
Common Bile Duct: Transverse

- Visualize gallbladder in long axis
- Locate the portal triad (CBD, hepatic artery, portal vein)
- Use Doppler: CBD does not have flow
- Measure diameter inner wall to inner wall
- Normal: <6 mm



Common Bile Duct: Longitudinal

- Visualize gallbladder in long axis
- Identify the portal vein
- Rotate probe to visualize the portal vein in long axis
- CBD is located anterior to the portal vein

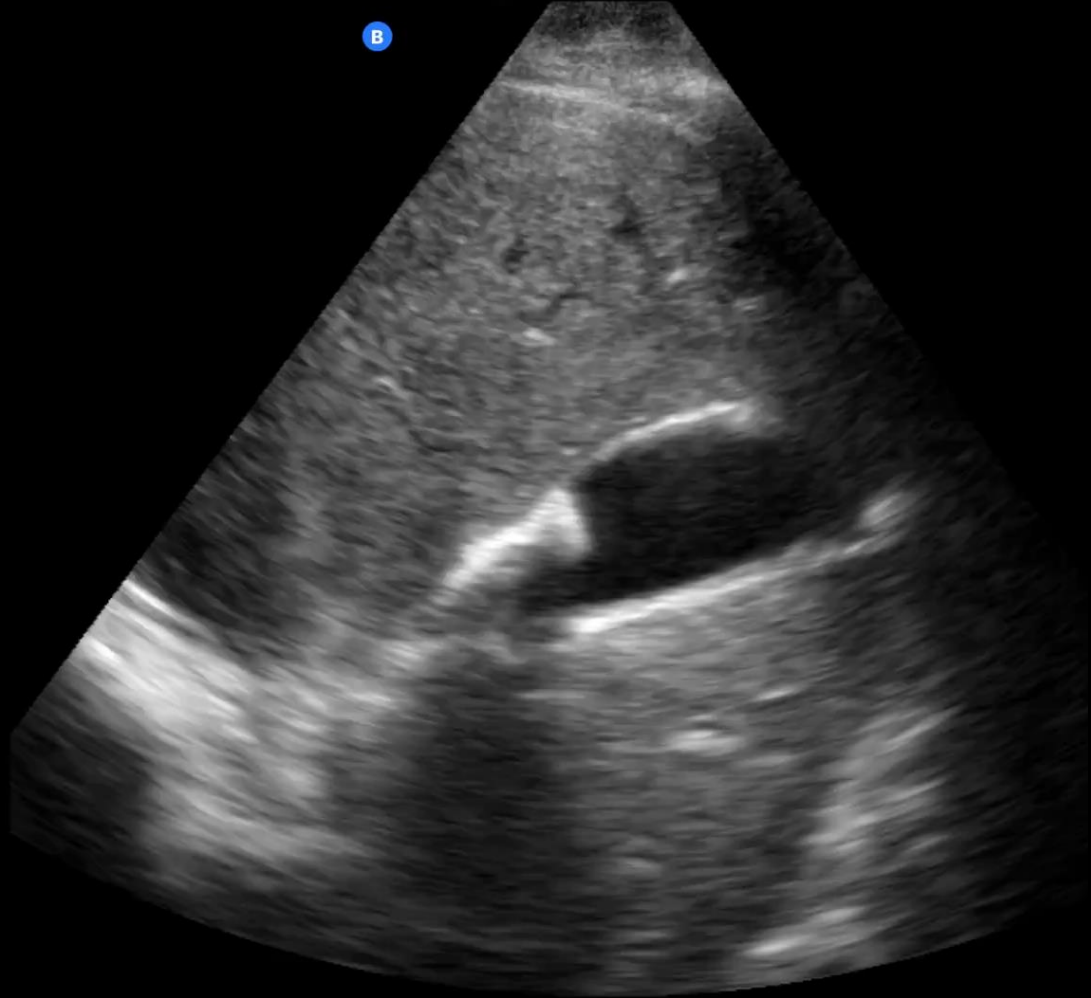


Take Home Points

- Evaluate gallbladder with POCUS in longitudinal and transverse views
- Assess for cholelithiasis, gallbladder wall thickening and CBD dilation
- Measure gallbladder wall thickness from the anterior wall
- Measure common bile duct diameter from inner wall to inner wall
- Normal gallbladder wall thickness: <3 mm
- Normal common bile duct diameter: <6 mm

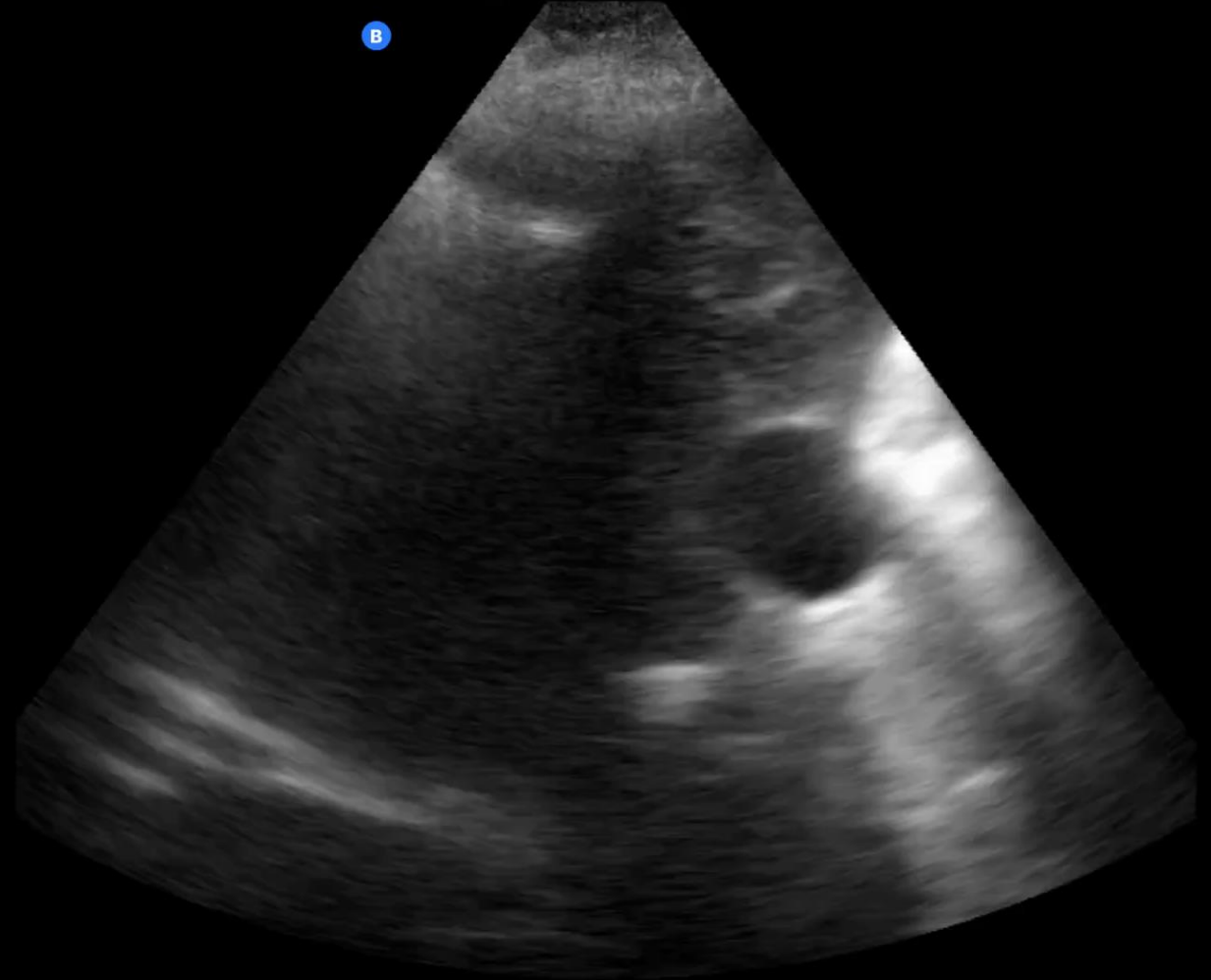
TIS: 0.01, MI: 0.16, Abdomen

B

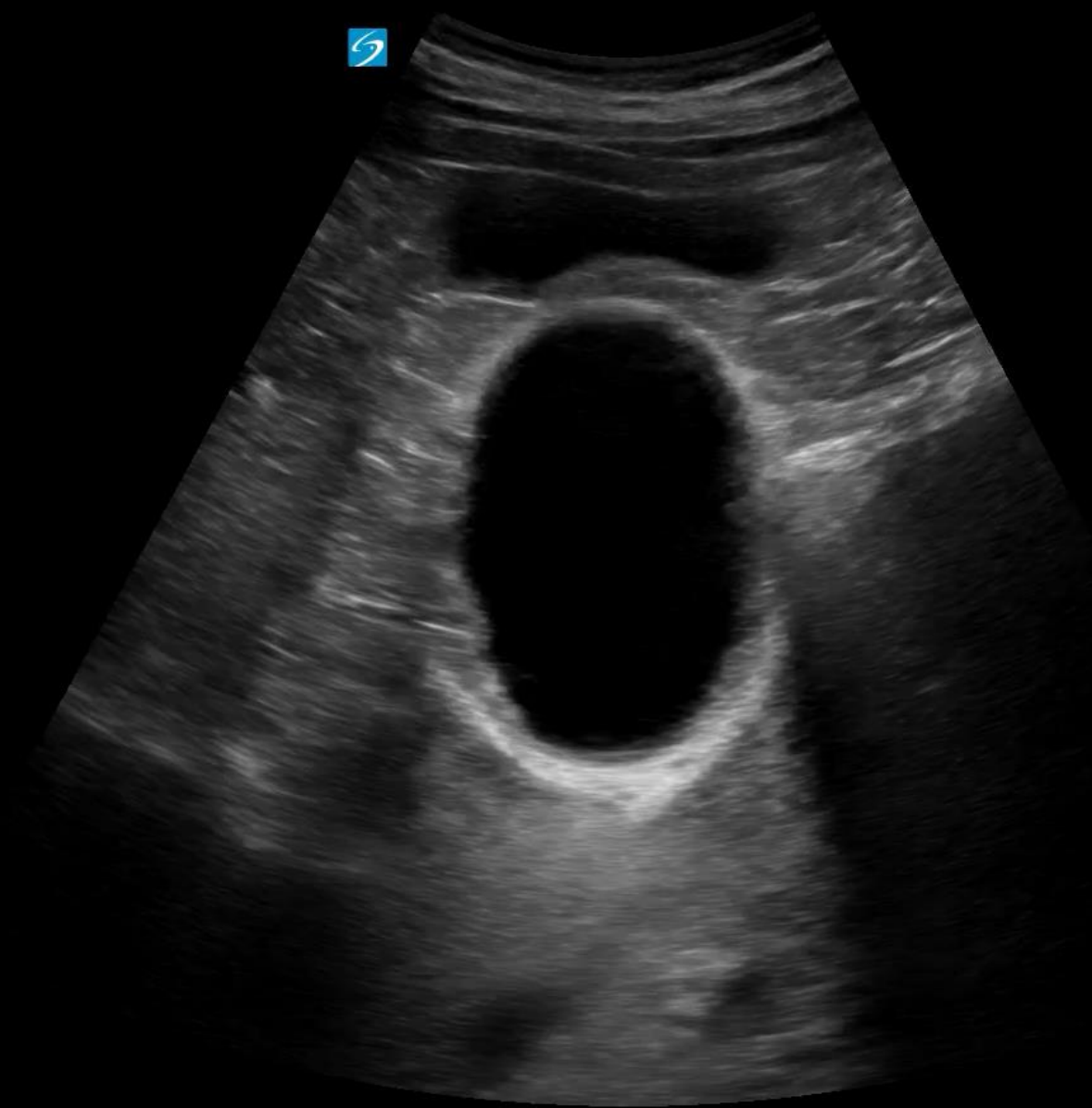


TIS: 0.01, MI: 0.16, Abdomen

B



✕ GB Wall 5.9 mr



0 — 0 —
— —
4 — 4 —
— —
8 — 8 —
— —
12 — 12 —
— —
16 — 16 —

16.2 cm

16.2 cm

CINE

2033

C5-1
Abdomen

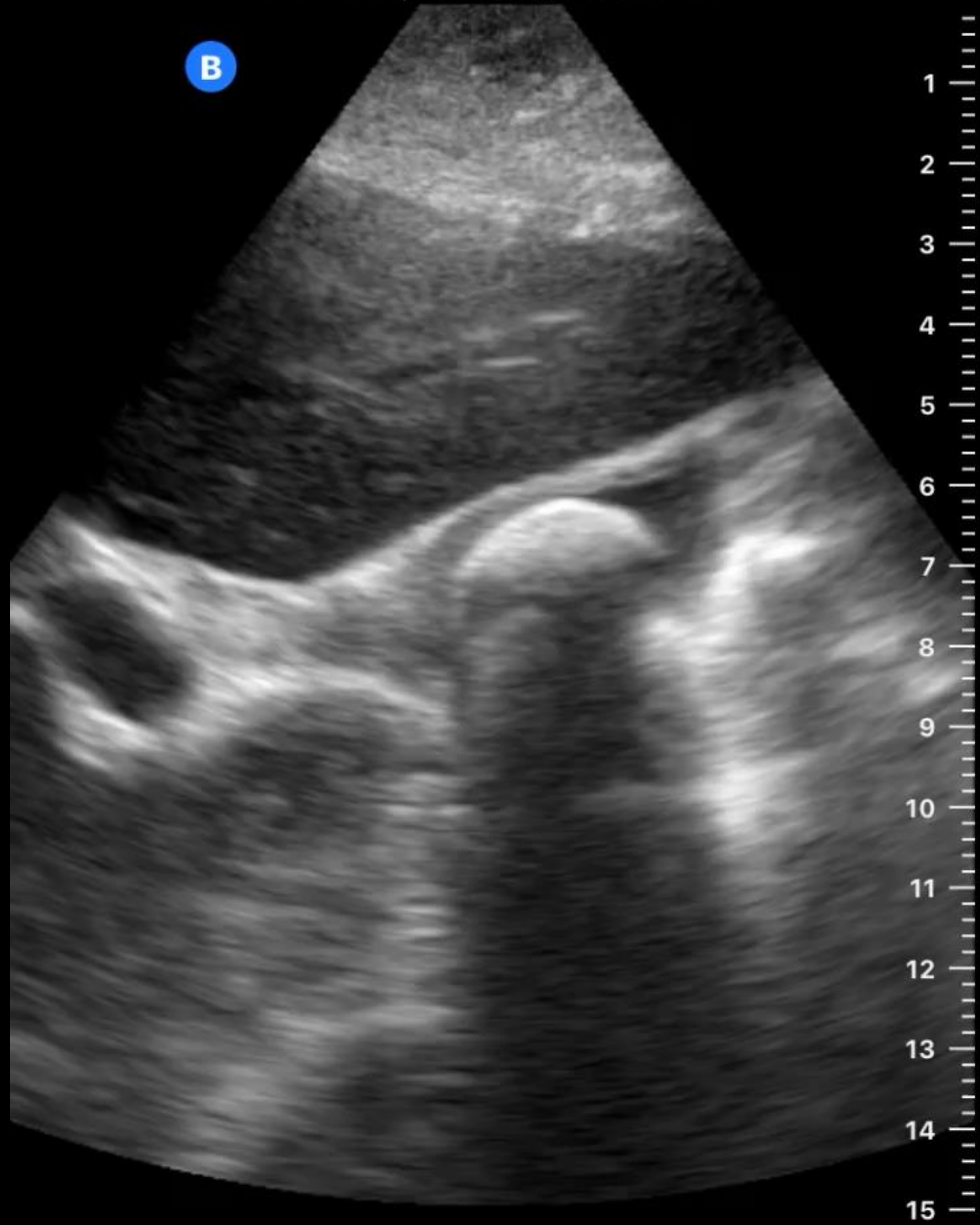
MI: 1.2 TIS: 0.4

2D: G: 35
Gen DR: 0
MB
THI

2D: G: 35

TIS: 0.01, MI: 0.16, Abdomen

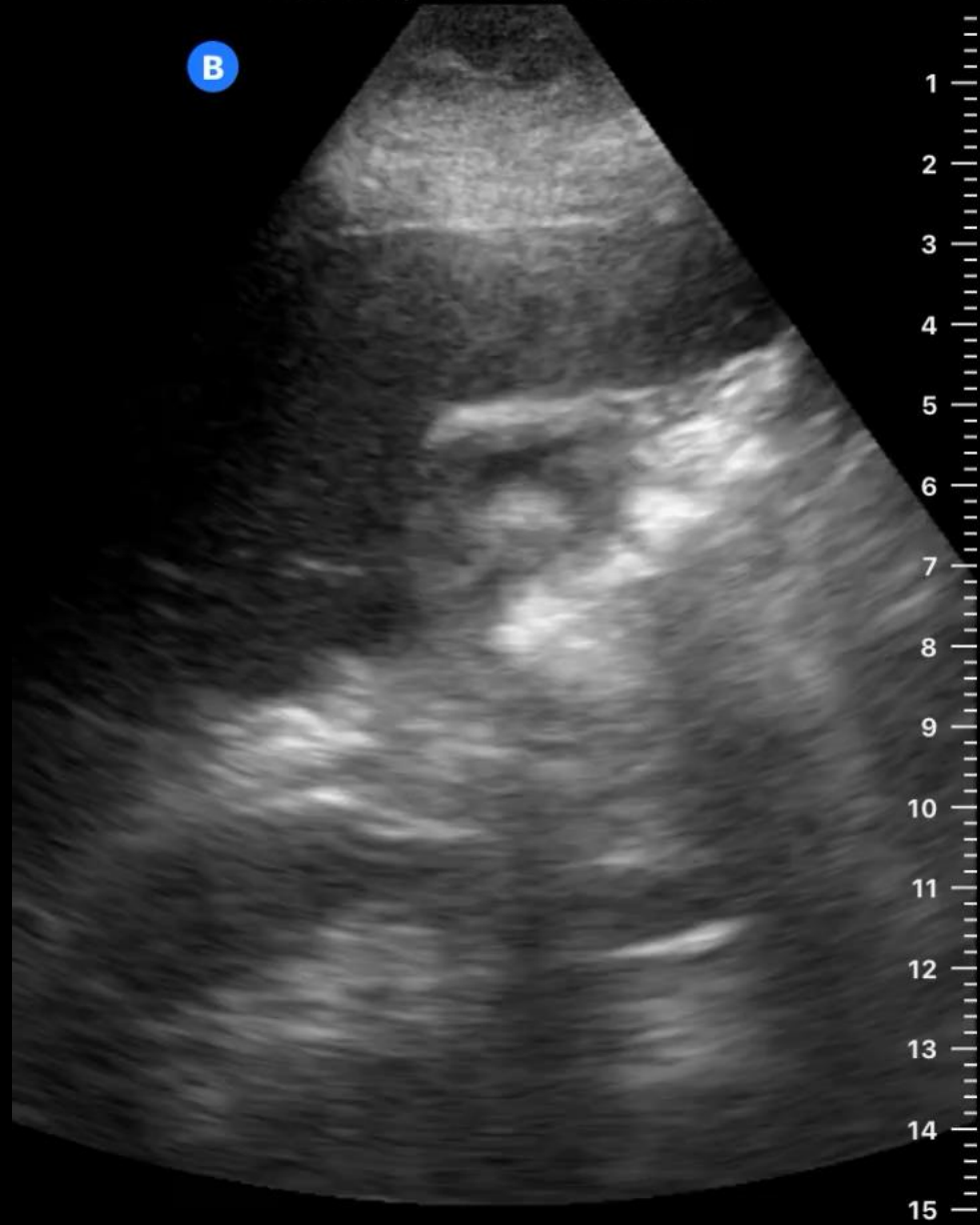
B



Longitudinal

TIS: 0.01, MI: 0.16, Abdomen

B



Transverse

TIS: 0.11, MI: 0.37, Abdomen

B

+23.4

cm/s

-23.4

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

