



COMPLETED 100%



4.6.1: Lung consolidation

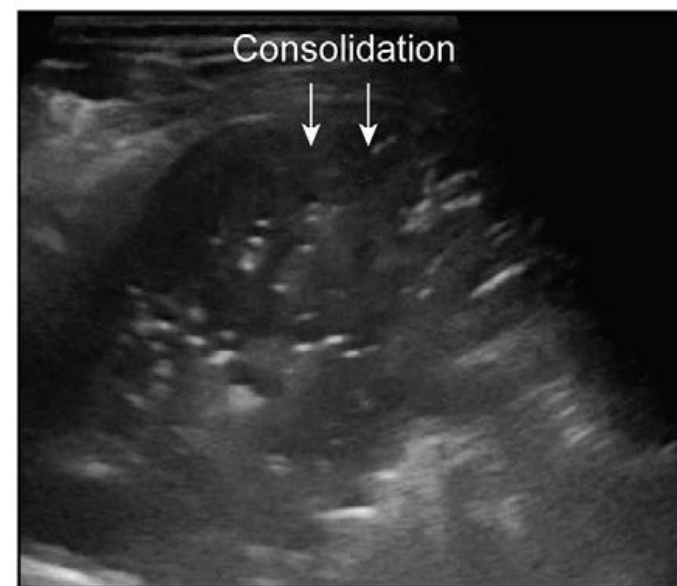
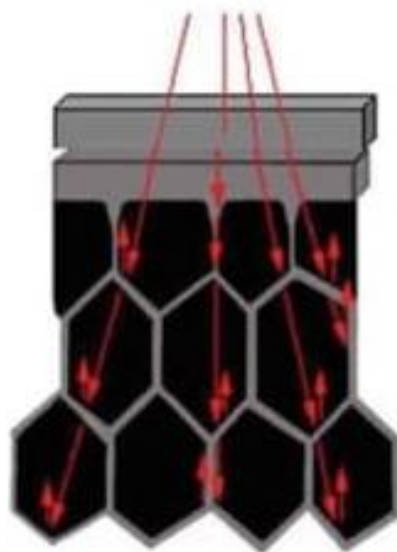
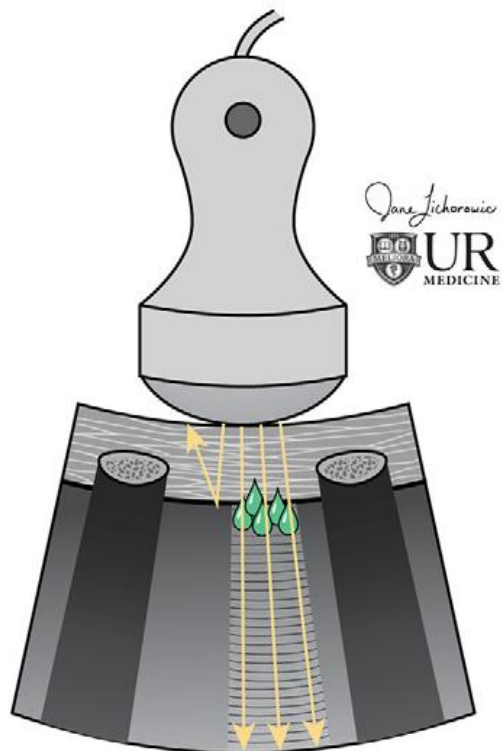
Thoracic ultrasound - Part 1 > Module 4: Chest sonography > 4.6.1: Lung consolidation



4.6.1: Lung consolidation

LUS has a high diagnostic accuracy for **community-acquired pneumonia** in children and adults.

- In a multicentre study by Reissig et al (2012), the **sensitivity and specificity of LUS** for diagnosing community-acquired pneumonia were **93.4% and 97.7%**, respectively.
- Additionally, LUS has been demonstrated as being a potential follow-up tool for pneumonia.
- The characteristic ultrasonographic appearance of pneumonia is a **diffusely demarcated, hypoechoic lung consolidation**.
- Visible **air bronchograms** within the consolidation are a very characteristic finding of pneumonic lung consolidation, typically not seen in the other causes of lung consolidation. The air bronchograms are seen as **punctuate or linear hyperechoic structures** within the lung consolidation.



ΠΥΚΝΩΣΗ

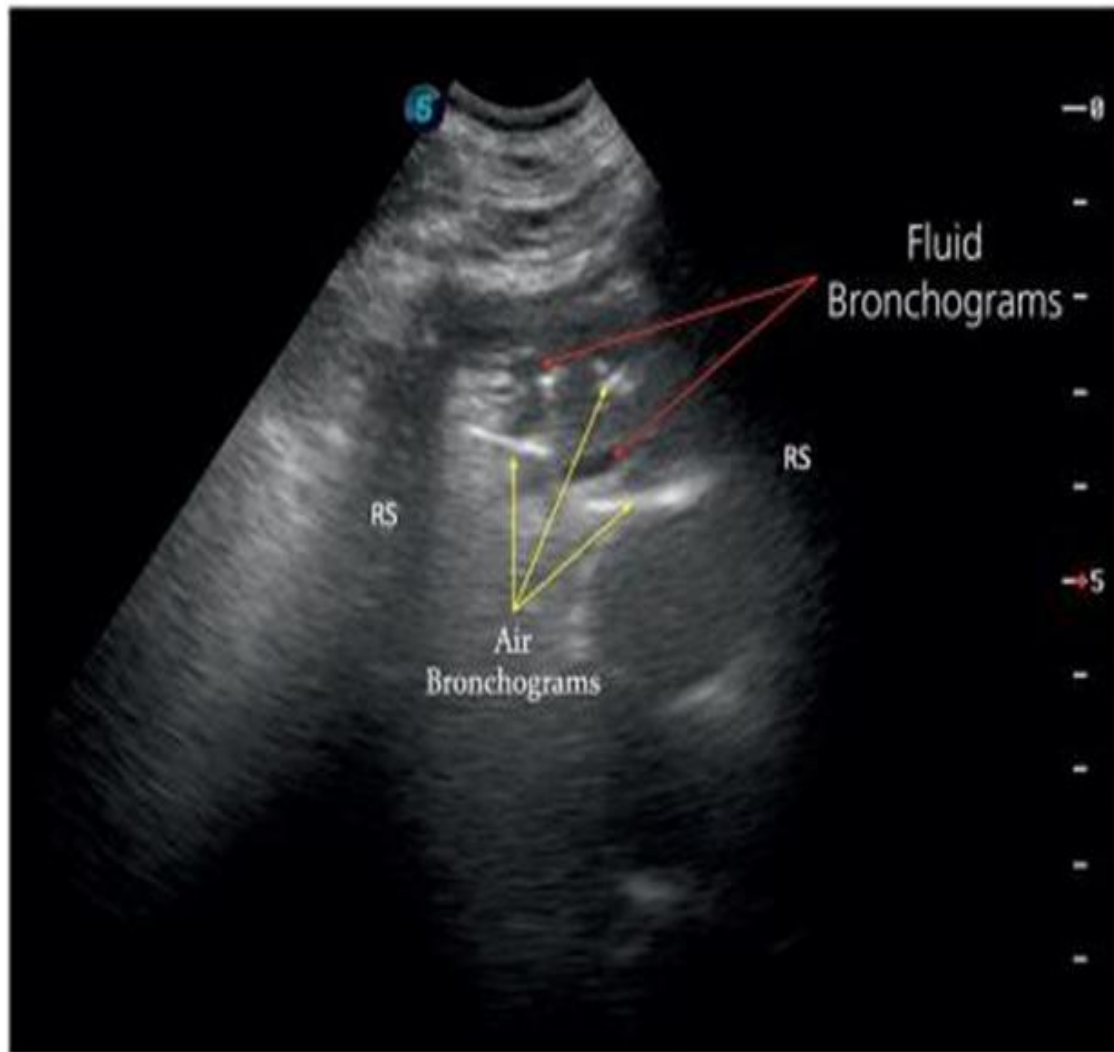
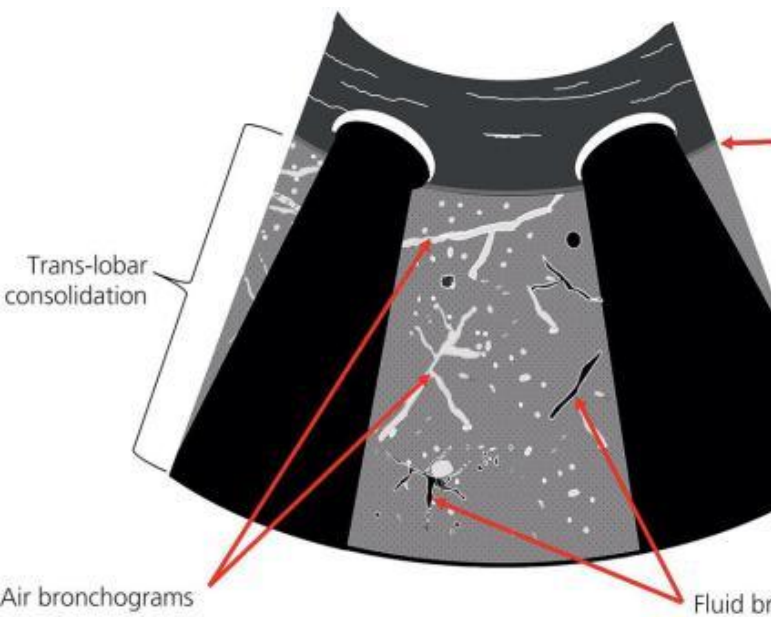
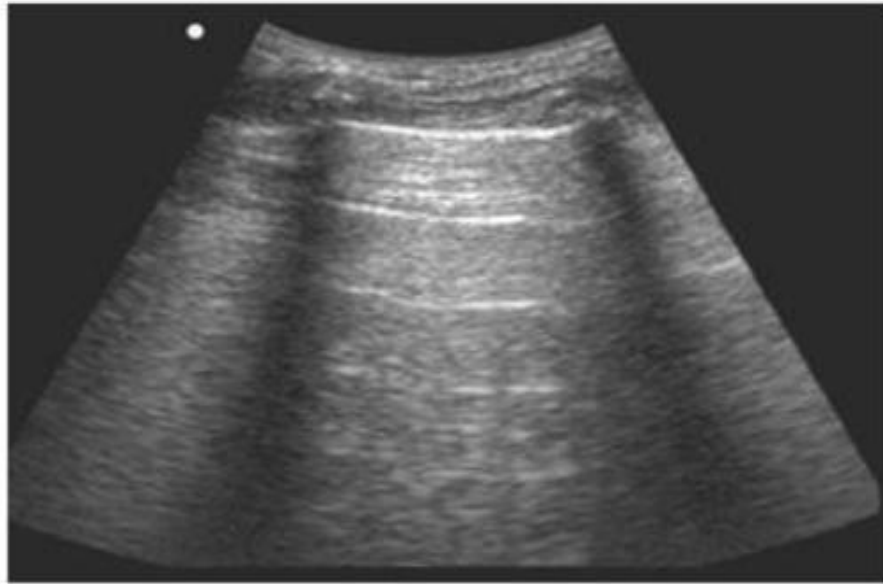
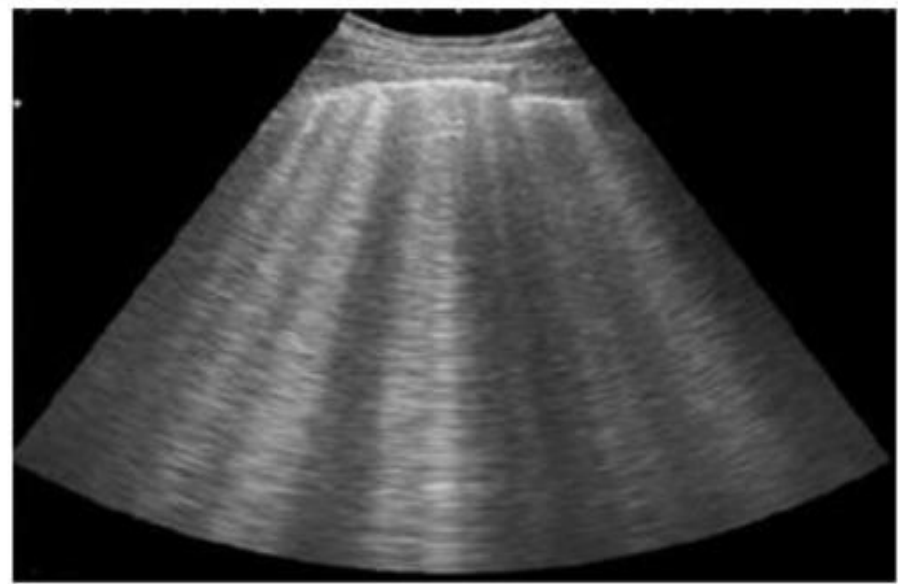


Table 1: Patterns of lung aeration loss

Degree of lung aeration	Points for each lung zone	Pattern
Normal (A profile)	(0) point	Lung sliding, horizontal A lines, and ≤ 3 vertical B lines
Moderate loss (B1 profile)	(1) point	Multiple regularly and irregularly spaced B lines originating from the pleural line
Severe loss (B2 profile)	(2) Point	Multiple and coalescent B lines
Complete loss (C profile)	(3) Point	Lung consolidation with tissue echogenicity with static or dynamic air bronchograms



A Profile



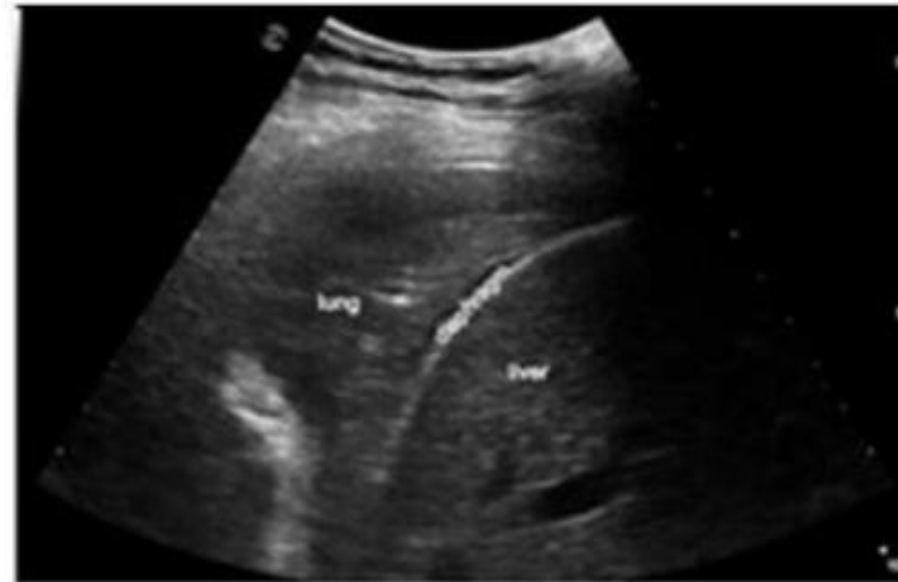
B1 Profile

Table 1: Patterns of lung aeration loss

Degree of lung aeration	Points for each lung zone	Pattern
Normal (A profile)	(0) point	Lung sliding, horizontal A lines, and ≤ 3 vertical B lines
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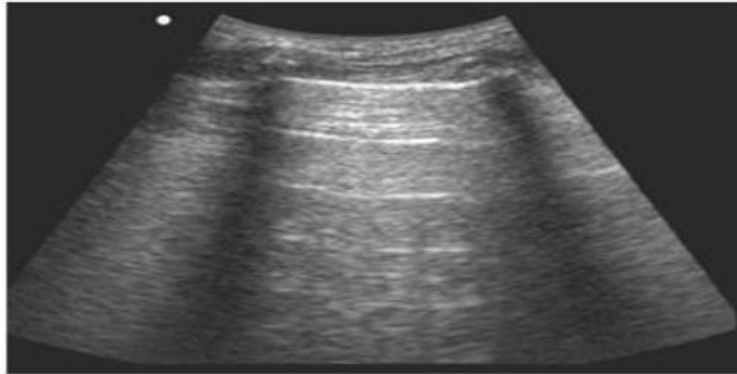
B2 Profile



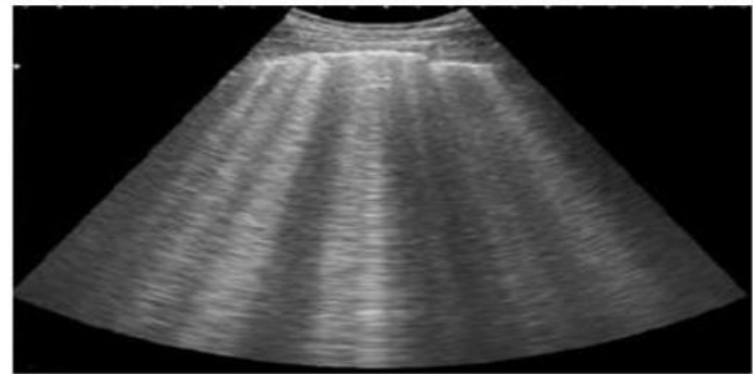
C Profile

Table 1: Patterns of lung aeration loss

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Normal (A profile)	(0) point	Lung sliding, horizontal A lines, and ≤ 3 vertical B lines
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A Profile



B1 Profile



B2 Profile

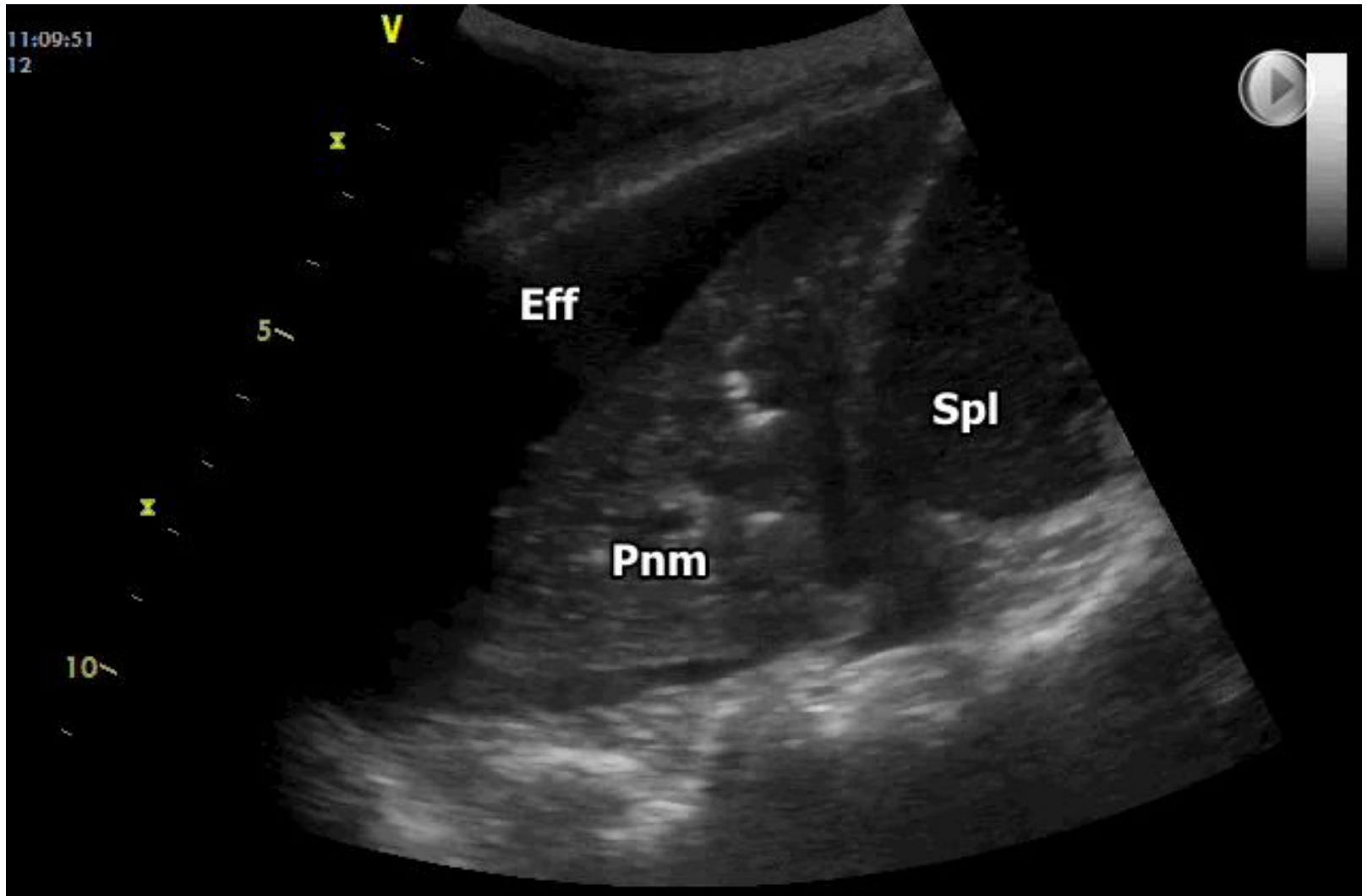


C Profile

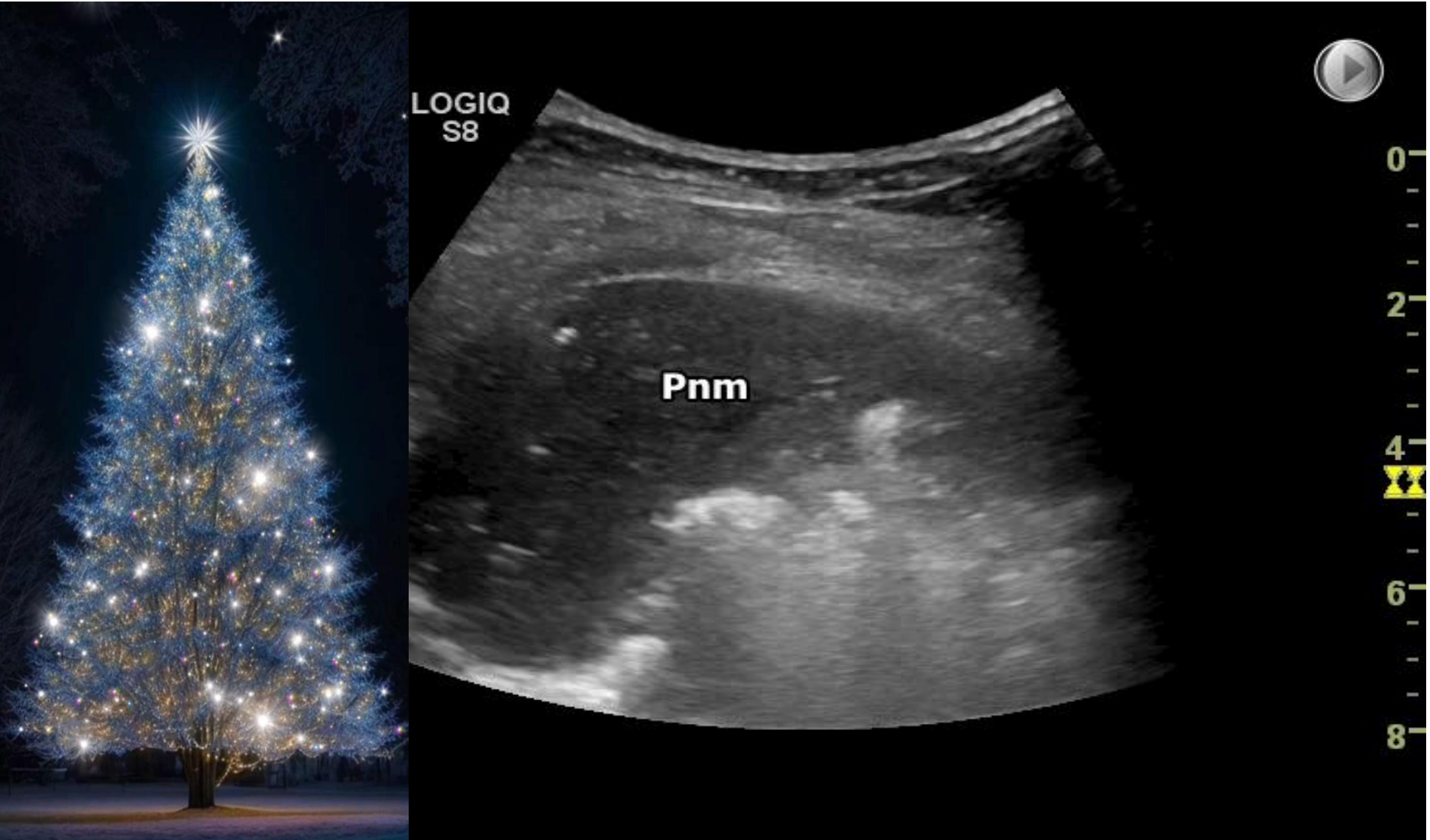
US (zone L3) from a patient with left lower lobe pneumonia. The spleen (Spl) and the typical findings seen in pneumonic lung consolidation (Pnm) can be seen. Numerous air bronchograms are present, one of which is marked (>).



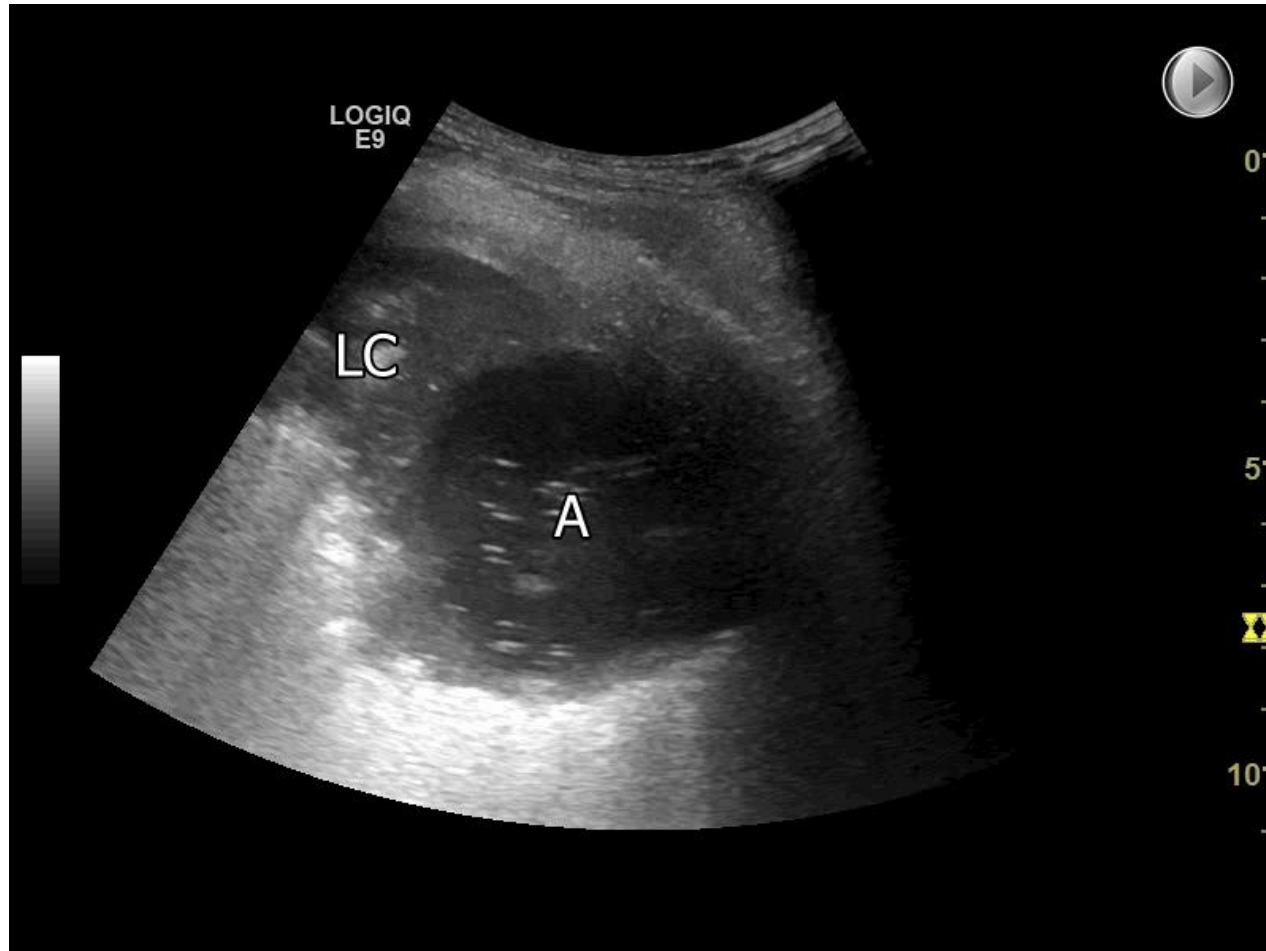
LUS of a large pneumonia and parapneumonic pleural effusion. Notice the air bronchograms within the consolidated lung tissue.



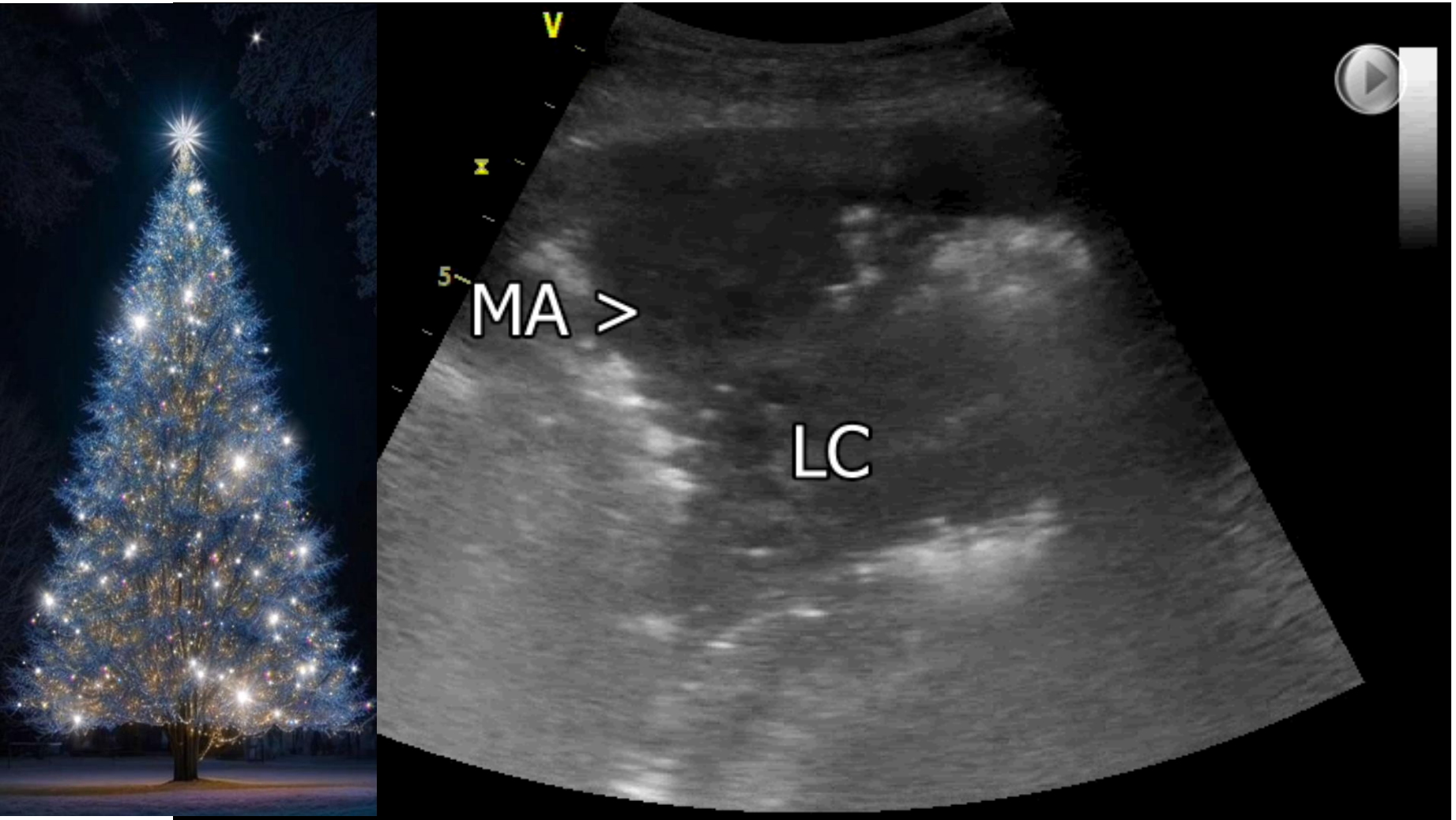
LUS demonstrating a pneumonic consolidation (Pnm), notice the reventilation of the consolidation during the breathing cycles.

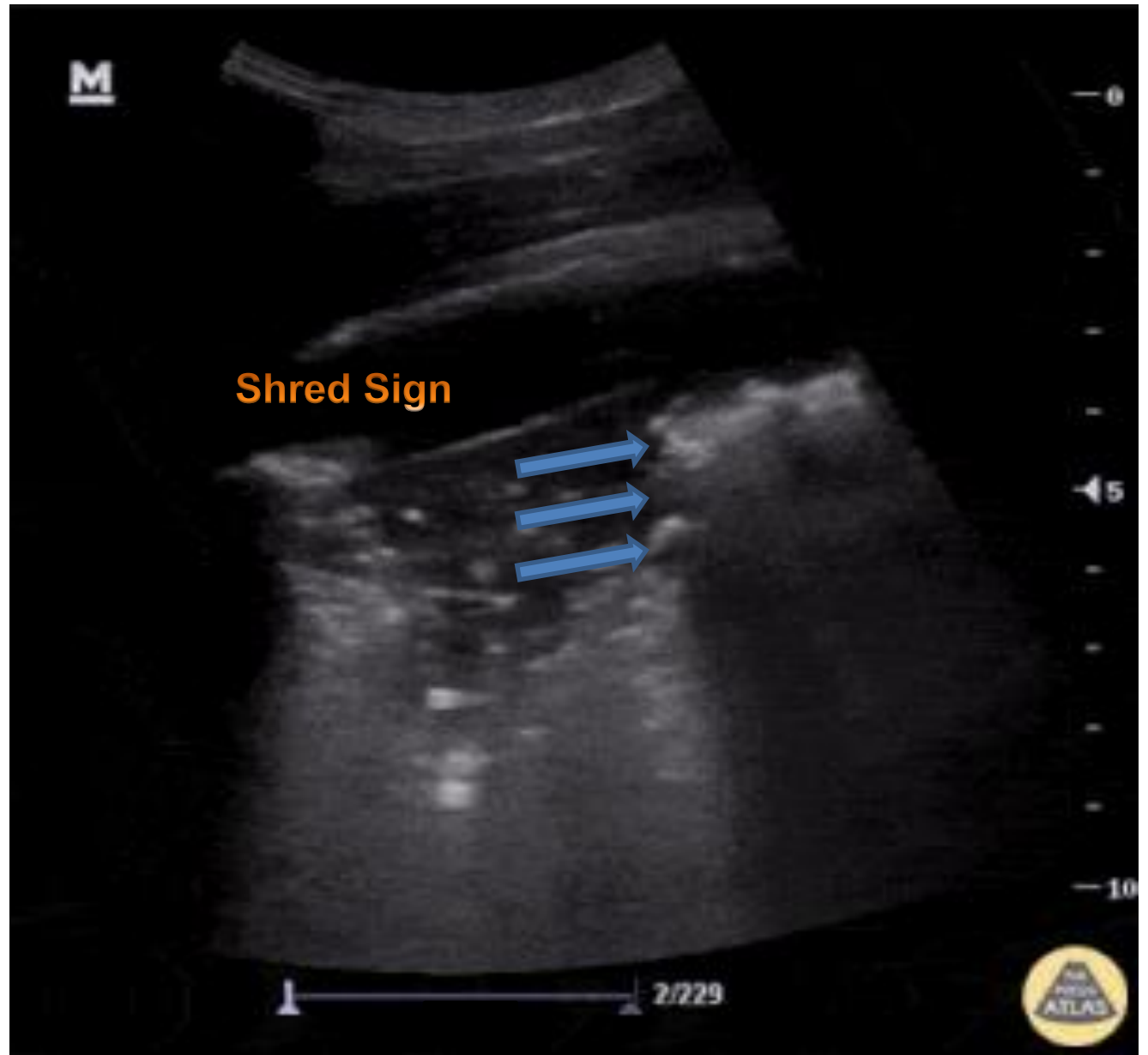


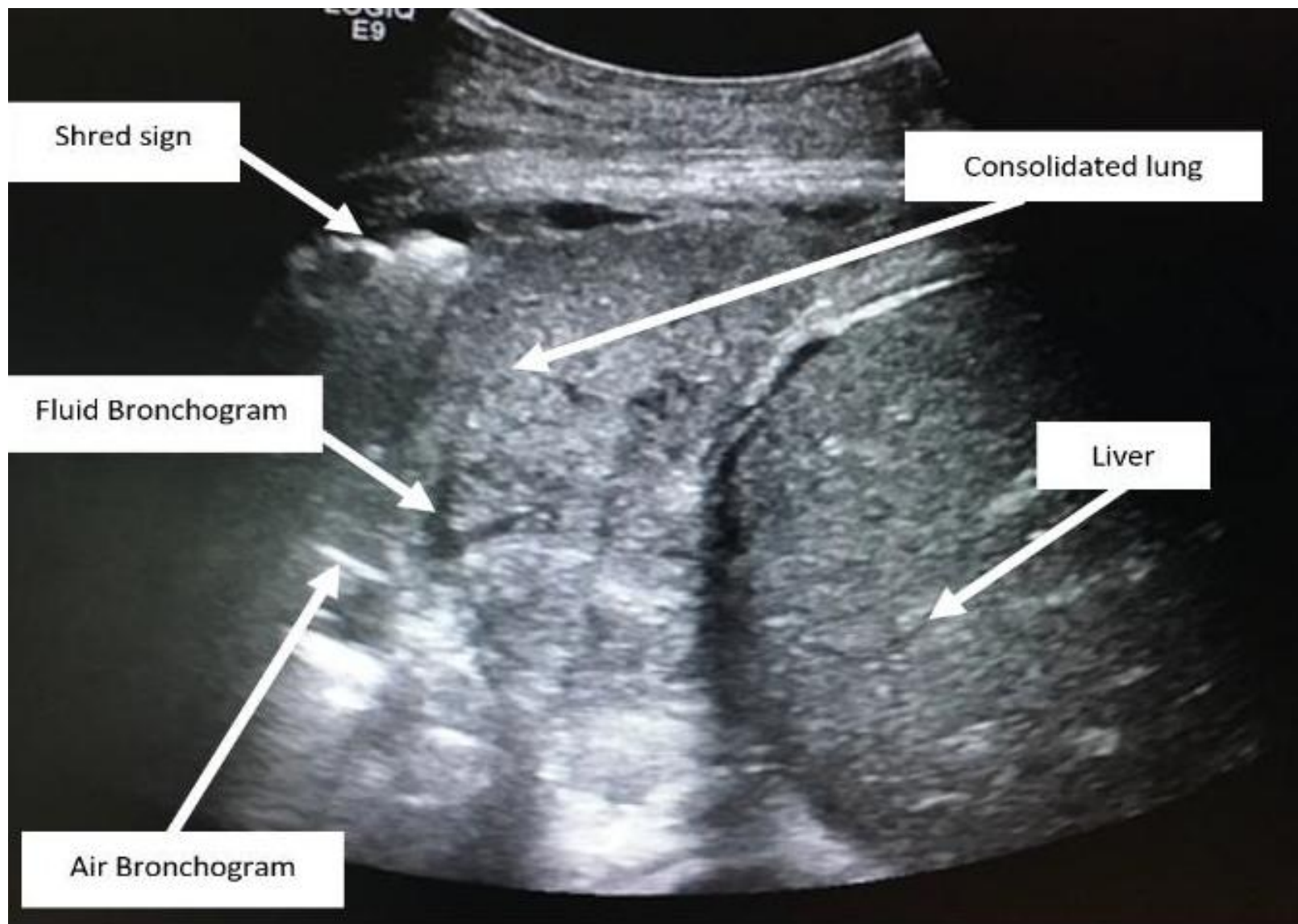
LUS of a patient admitted with a lung abscess (A). An area of lung consolidation (LC) is located next to the abscess.

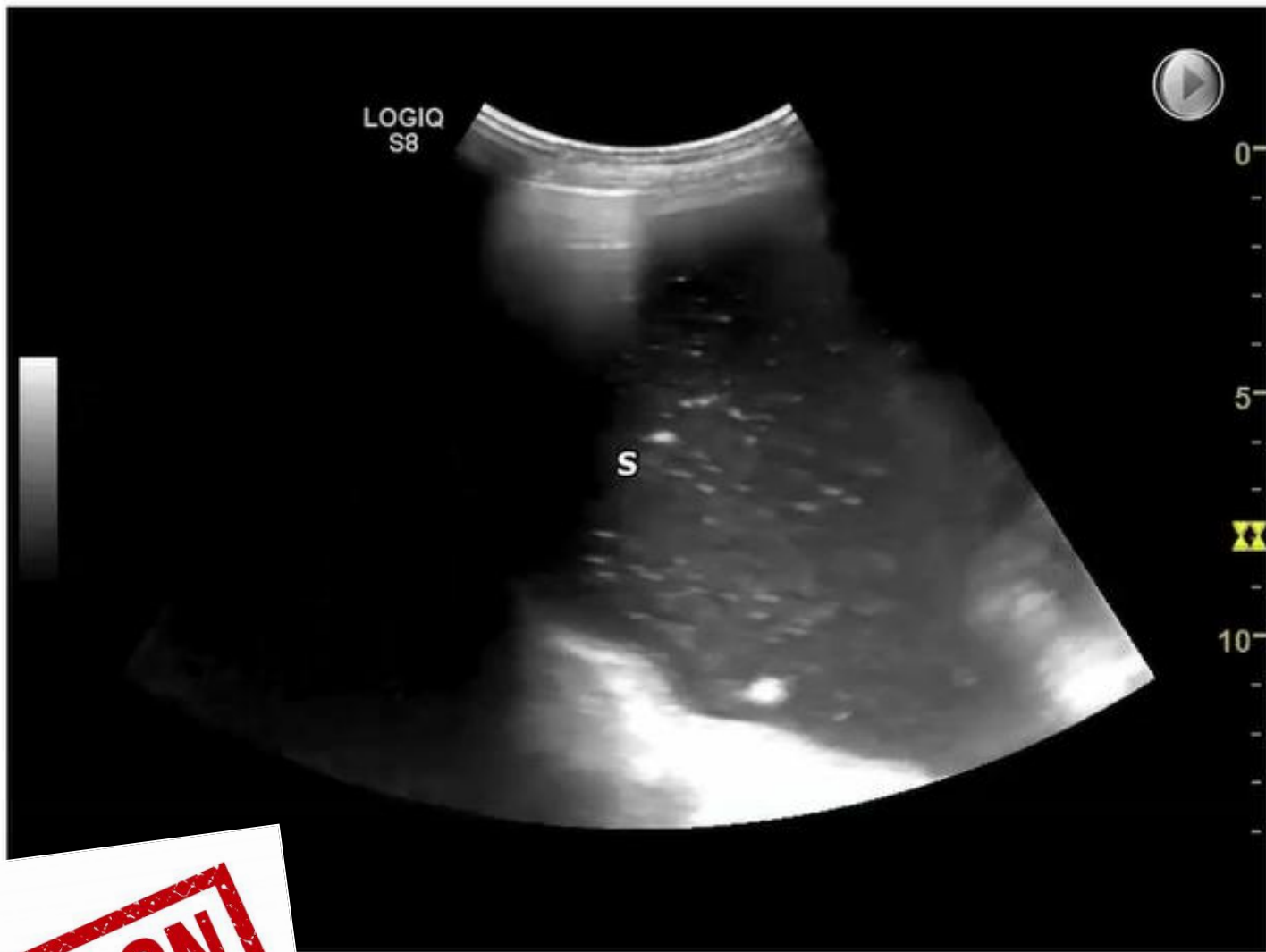


LUS of a patient suffering from bilateral pneumonia due to Staphylococcus aureus endocarditis. Within an area of lung consolidation (LC), several rounded hypoechoic areas (MA) are present consistent of microabscess formation within the consolidated lung.



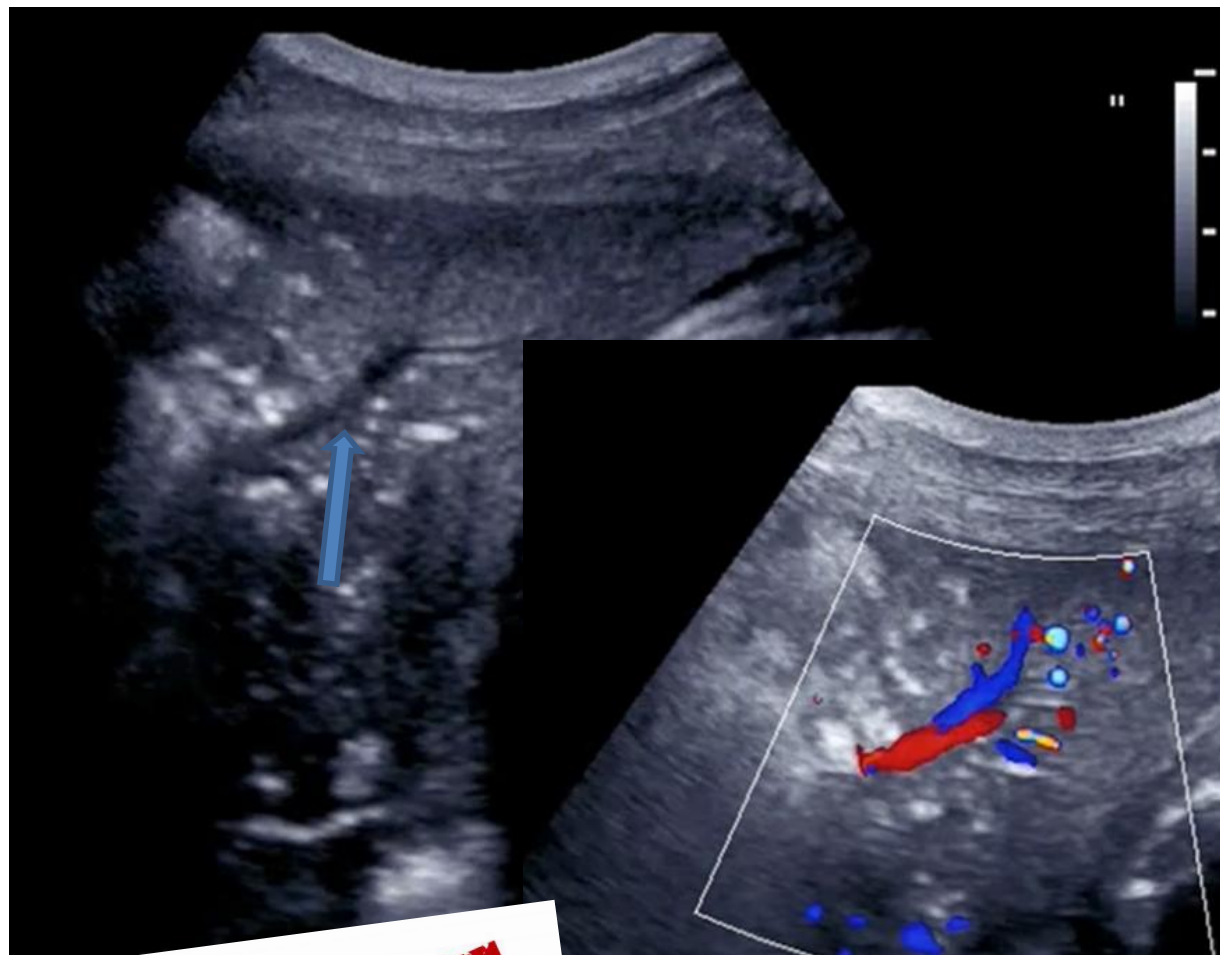






ATTENTION

Διάταση στομάχου – κατακράτηση περιεχομένου



ATTENTION





COMPLETED 100%



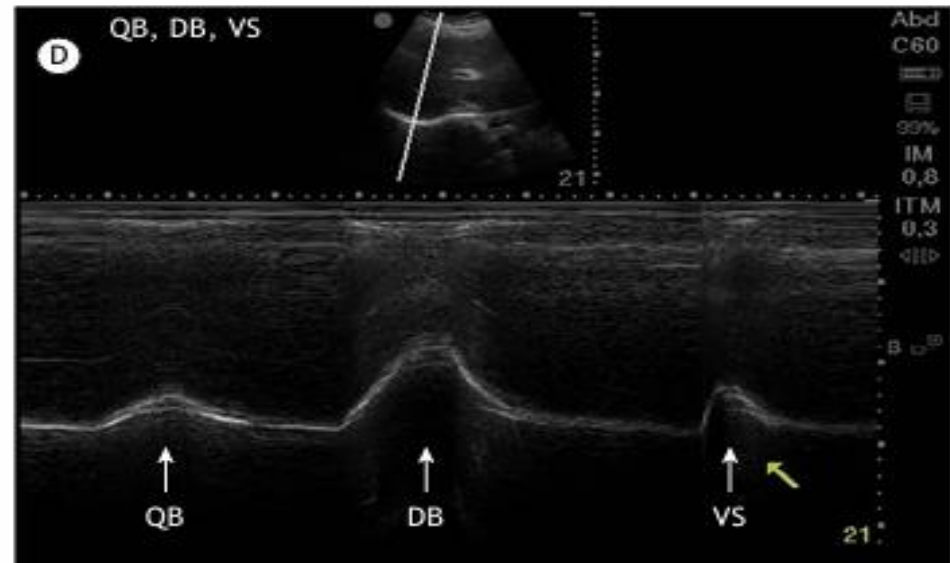
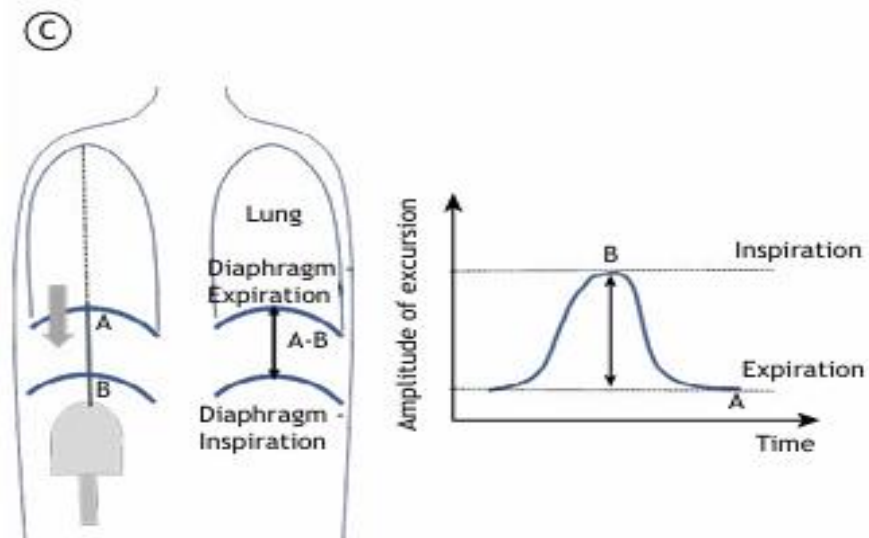
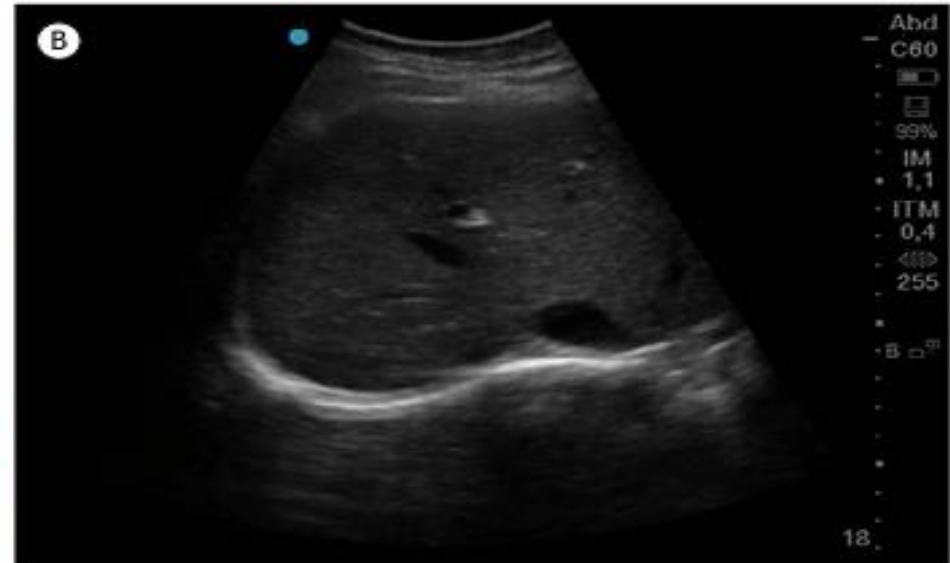
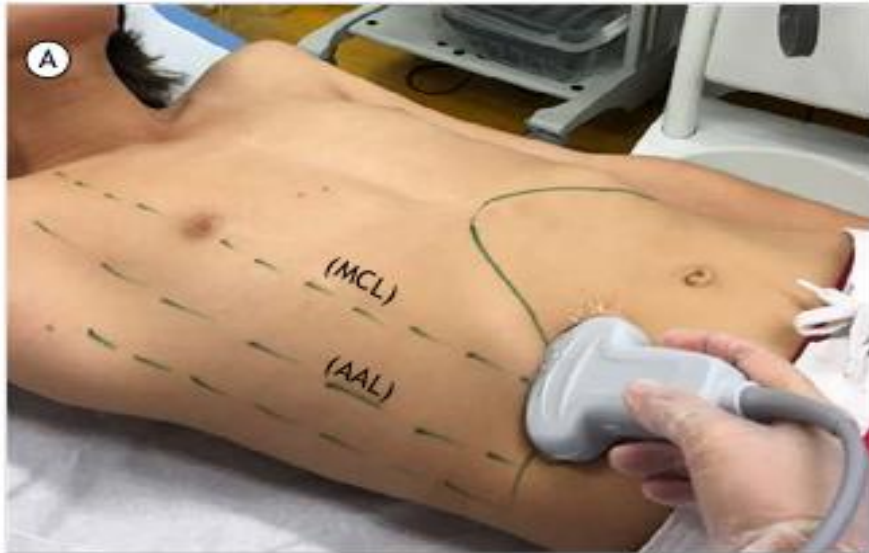
Thoracic Ultrasound Certified Training Programme - Part 1

Thoracic ultrasound - Part 1 > Module 4: Chest sonography > 4.7: Diaphragm

 **4.7: Diaphragm**

Diaphragmatic ultrasound: a review of its methodological aspects and clinical uses

Pauliane Vieira Santana^{1,2} , Leticia Zumpano Cardenas^{1,2} , André Luis Pereira de Albuquerque^{1,3} , Carlos Roberto Ribeiro de Carvalho¹ , Pedro Caruso^{1,2} 





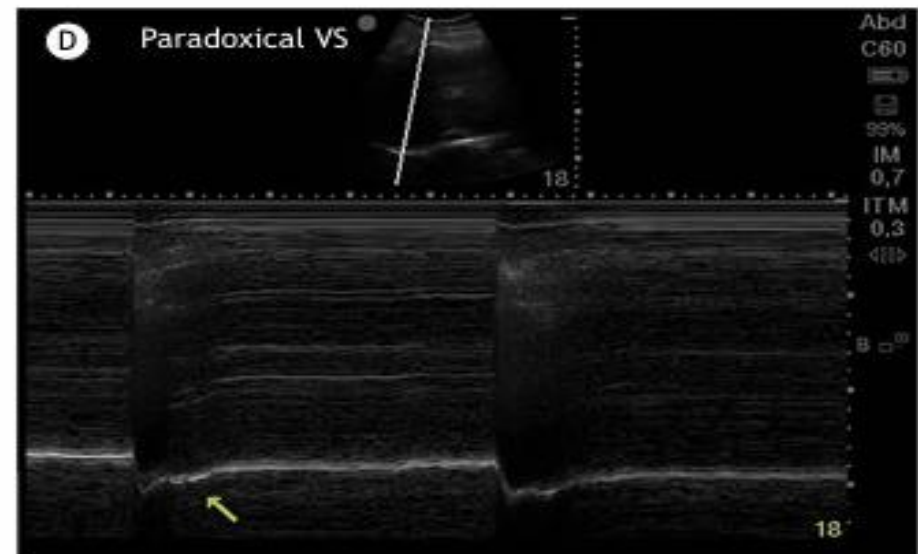
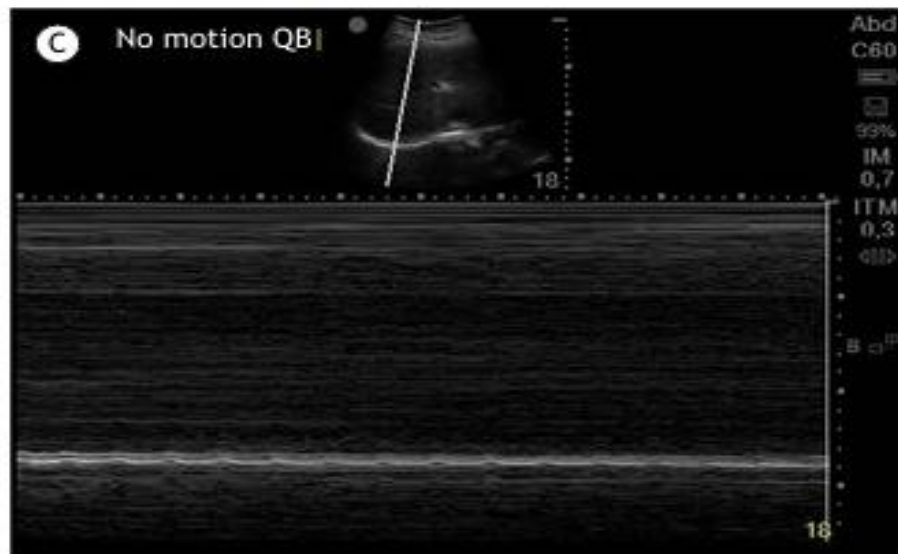
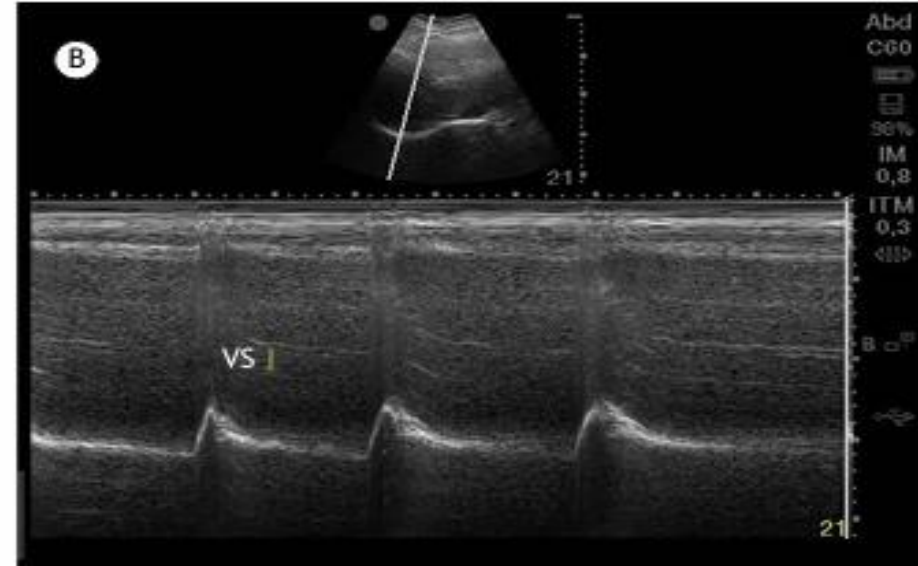
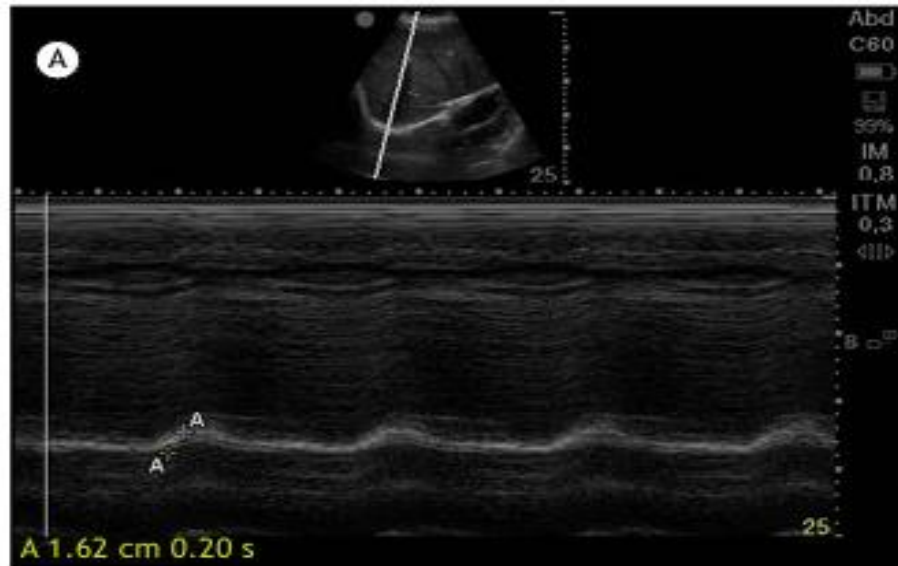
Demonstrating transducer placement for the anterior subcostal view on the right side.



Demonstrating transducer placement for the posterior view.

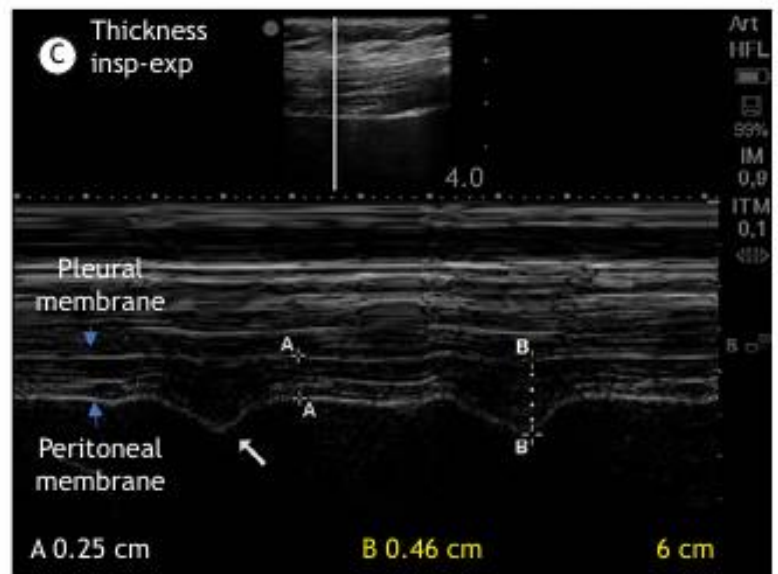
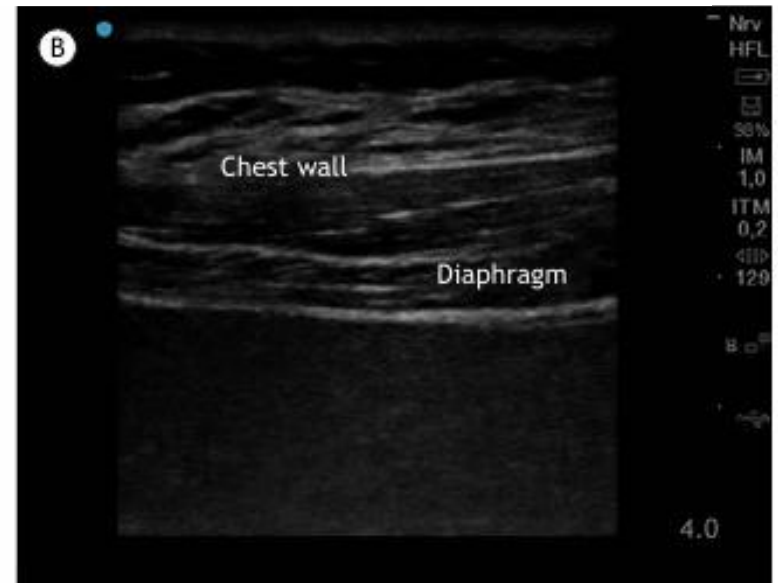
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Lung ultrasound: diagnostic and therapeutic issues

L. Cattarossi

Department of Neonatology, Azienda Ospedaliero Universitaria S. Maria della Misericordia, Udine-Italy

Technique and uses of Lung Ultrasonography in Critical Care Setting

M. Omar¹, H. Attia¹ and A. Yassin²

REVIEW

Open Access

Lung ultrasound: a new tool for the cardiologist

Luna Gargani

ULTRASOUND: BASICS

ABTAHI SEYED MAHDI, SANDEEP HEDGIRE, RACHEL BORCZUK, AZADEH ELMI, & MUKESH HARISINGHANI

Feldman, M., Katyal, S., Blackwood, M. (2009). US artifacts. Radiographics : a review publication of the Radiological Society of North America, Inc 29(4), 1179 – 1189.

Point-of-Care Ultrasound in Anesthesia

18Point-of-Care Ultrasound in Anesthesia

Søren R. Boysen¹ and Daniel S.J. Pang²

REVIEW ARTICLE

CURRENT CONCEPTS

Point-of-Care Ultrasonography

Christopher L. Moore, M.D., and Joshua A. Copel, M.D.

Received: 12 February 2024 | Revised: 1 April 2024 | Accepted: 8 April 2024

DOI: 10.1111/cyt.13382

ORIGINAL ARTICLE

WILEY

Ultrasound fundamentals and their clinical implications for interventional cytopathologists

David Lieu

Review

Ultrasound-Assisted and Ultrasound-Guided Thoracentesis: An Educational Review

Andrea Boccatonda^{1,2,*}, Chiara Baldini³, Davide Rampoldi³, Giacomo Romani³, Antonio Corvino⁴, Giulio Cocco⁵, Damiano D'Ardes⁶, Orlando Catalano⁷, Luigi Vetrugno⁸, Cosima Schiavone⁵, Fabio Piscaglia^{2,9} and Carla Serra¹



Diaphragmatic ultrasound: a review of its methodological aspects and clinical uses

Pauliane Vieira Santana^{1,2}, Leticia Zumpano Cardenas^{1,2}, André Luis Pereira de Albuquerque^{1,3}, Carlos Roberto Ribeiro de Carvalho^{1,3}, Pedro Caruso^{1,2}

Chest Ultrasound

Ali Abdullah Alnakhli^{1*}, Fatimah Taher Alnakhli², Maryam Abdullah Alnakhli²

¹EMS, Paramedic and MD, Szeged University, Szeged, Hungary

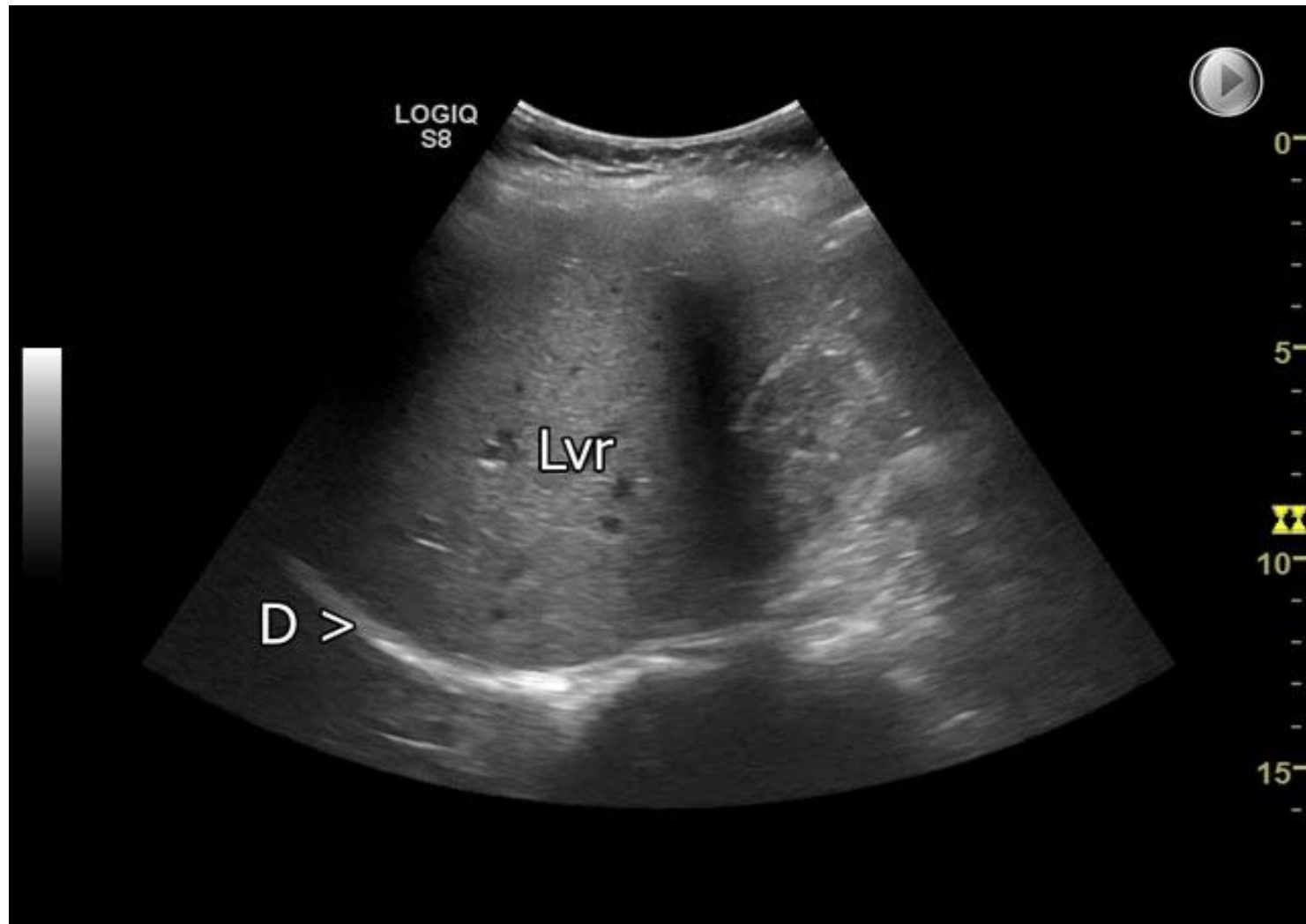
²Medical Intern. MRBS. Tnhah Univrsity. Madinah. KSA

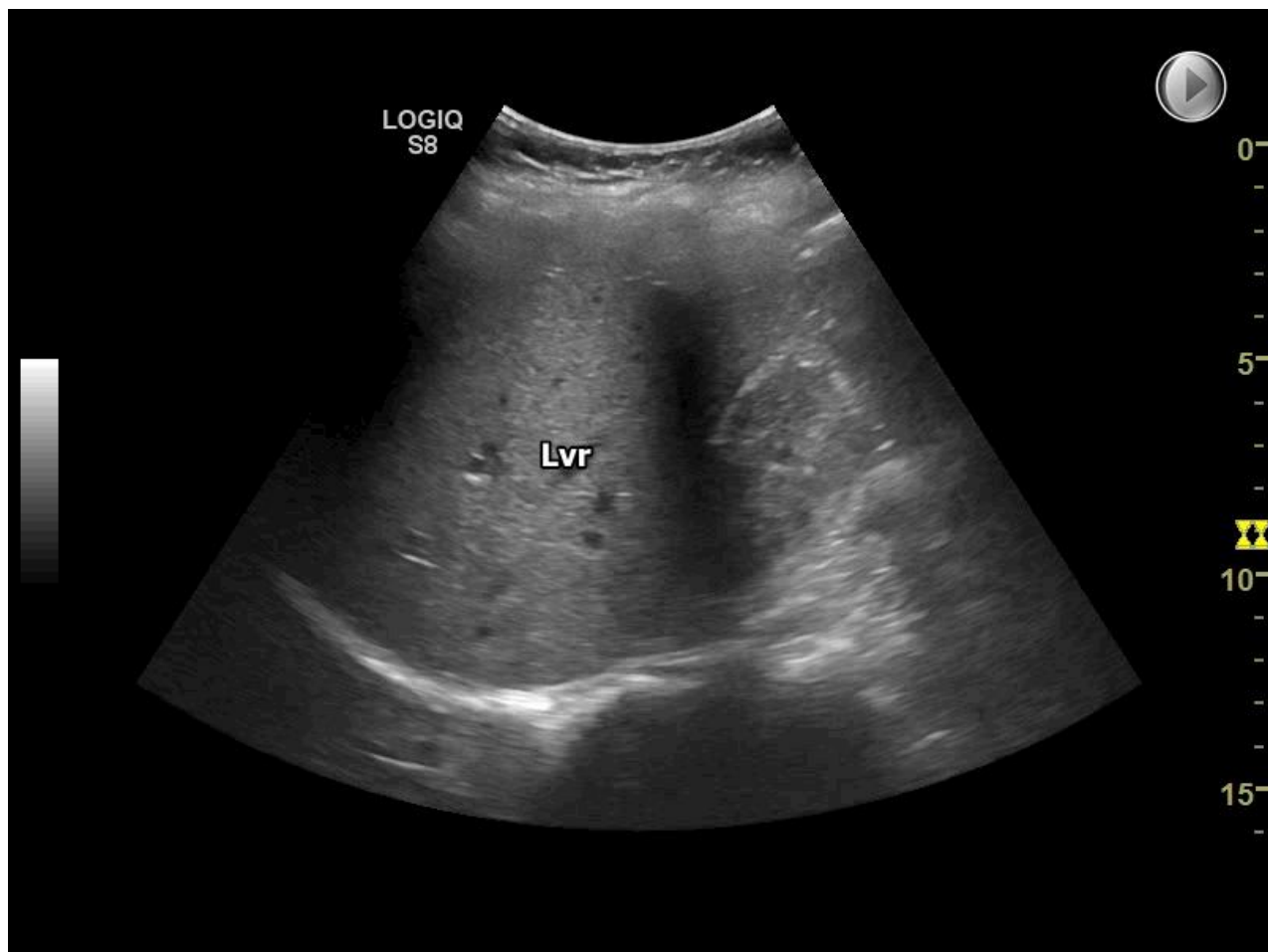
Review

Infectious Pneumonia and Lung Ultrasound: A Review

Andrea Boccatonda^{1,*}, Giulio Cocco², Damiano D'Ardes³, Andrea Delli Pizzi⁴, Gianpaolo Vidili⁵, Chiara De Molo⁶, Susanna Vicari¹, Carla Serra⁶, Francesco Cipollone³, Cosima Schiavone² and Maria Teresa Guagnano³

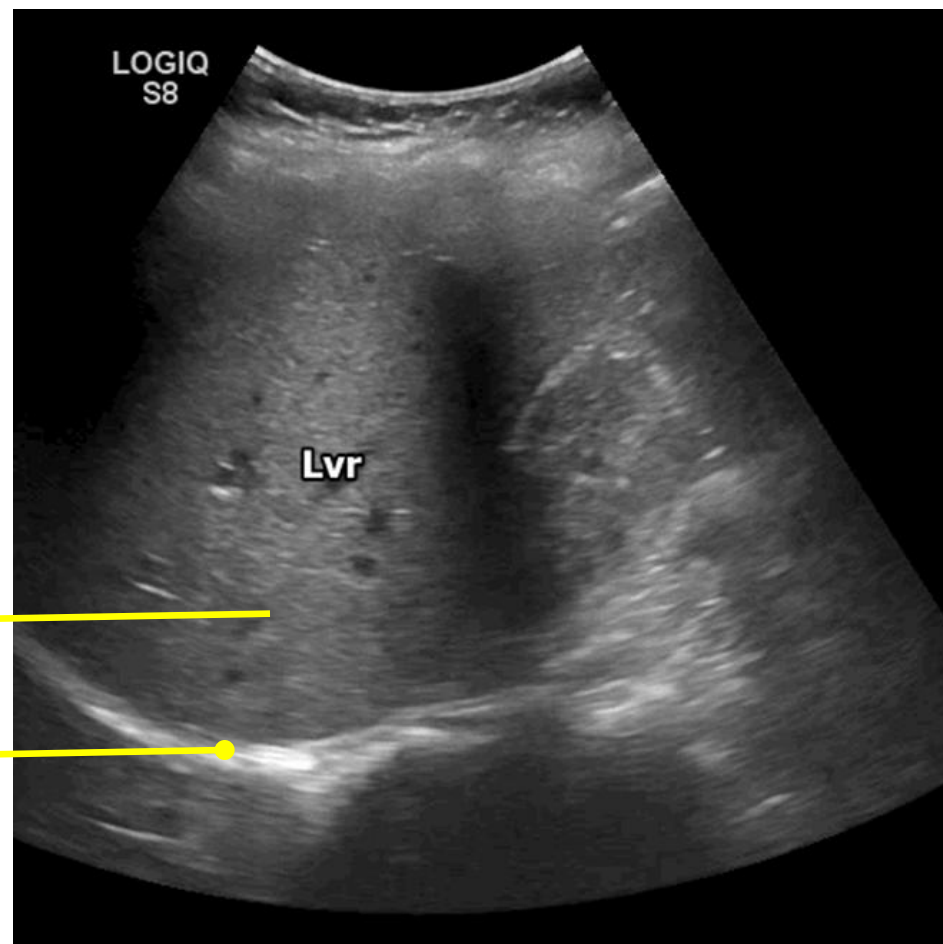
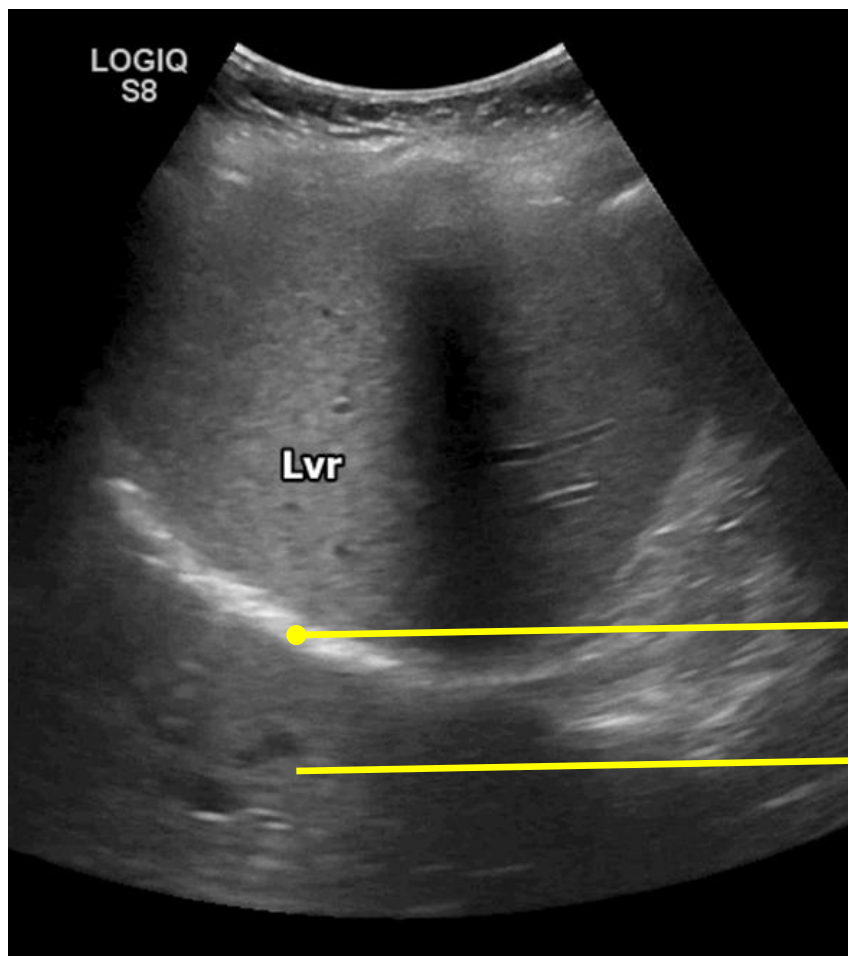
Liver and diaphragm. When using the liver (Lvr) as an acoustic window, the more profound parts of the diaphragm (D) can be visualised as a broad hyperechoic line.





ΕΙΣΠΝΟΗ

ΕΚΠΝΟΗ



Normal values for M-mode measurement of diaphragmatic movement,

Breathing pattern Men, cm Women, cm

Quiet breathing	1.1-2.5	1.0-2.2
Deep breathing	4.7-9.2	3.6-7.7
Sniff manoeuvre	1.8-4.4	1.6-3.6

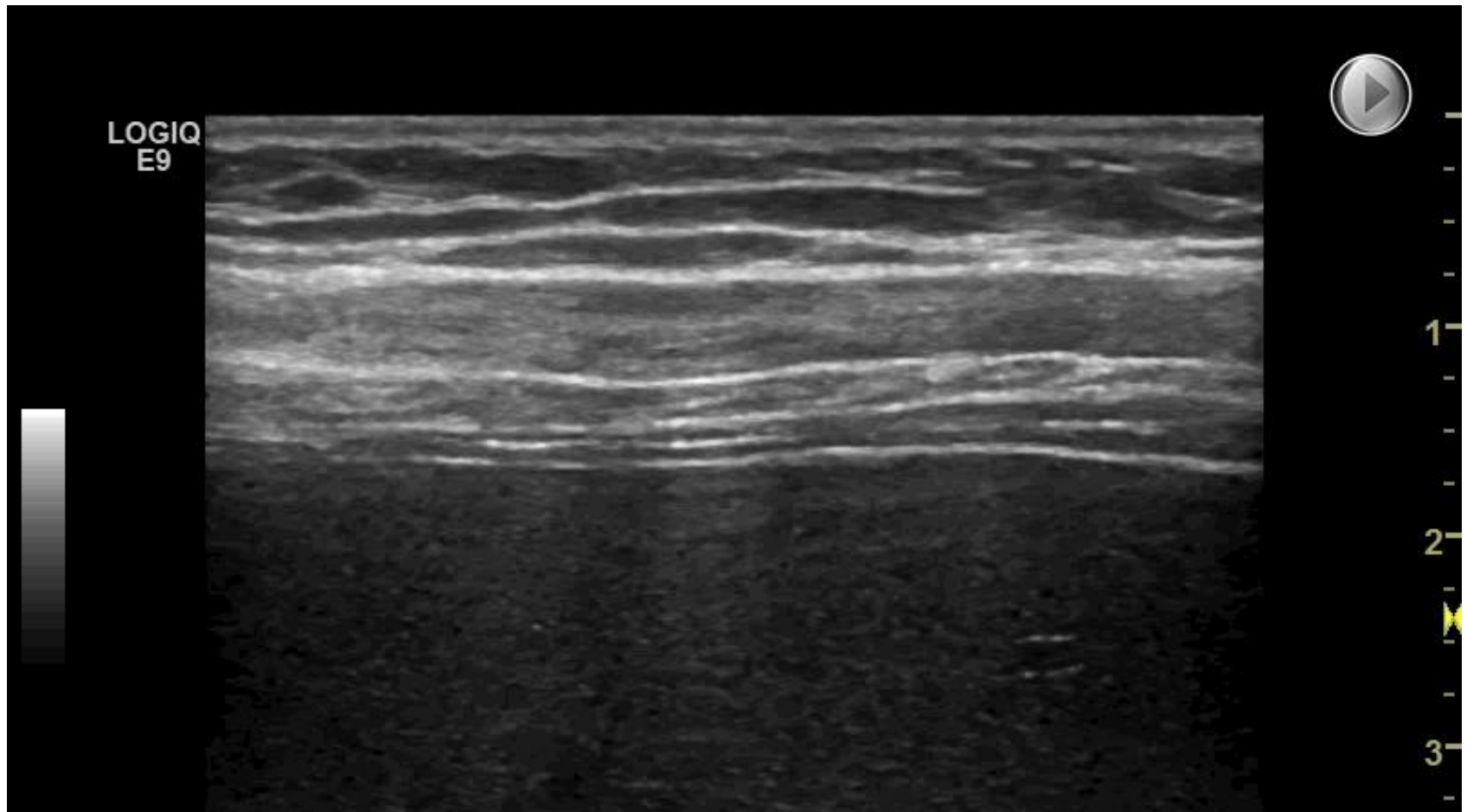
Normal values for M-mode measurement of diaphragmatic movement, left side.

Breathing pattern Men, cm Women, cm

Quiet breathing	1.0-2.6	0.9-2.4
Deep breathing	5.6-9.3	4.3-8.4
Sniff manoeuvre	1.9-4.3	1.7-3.7

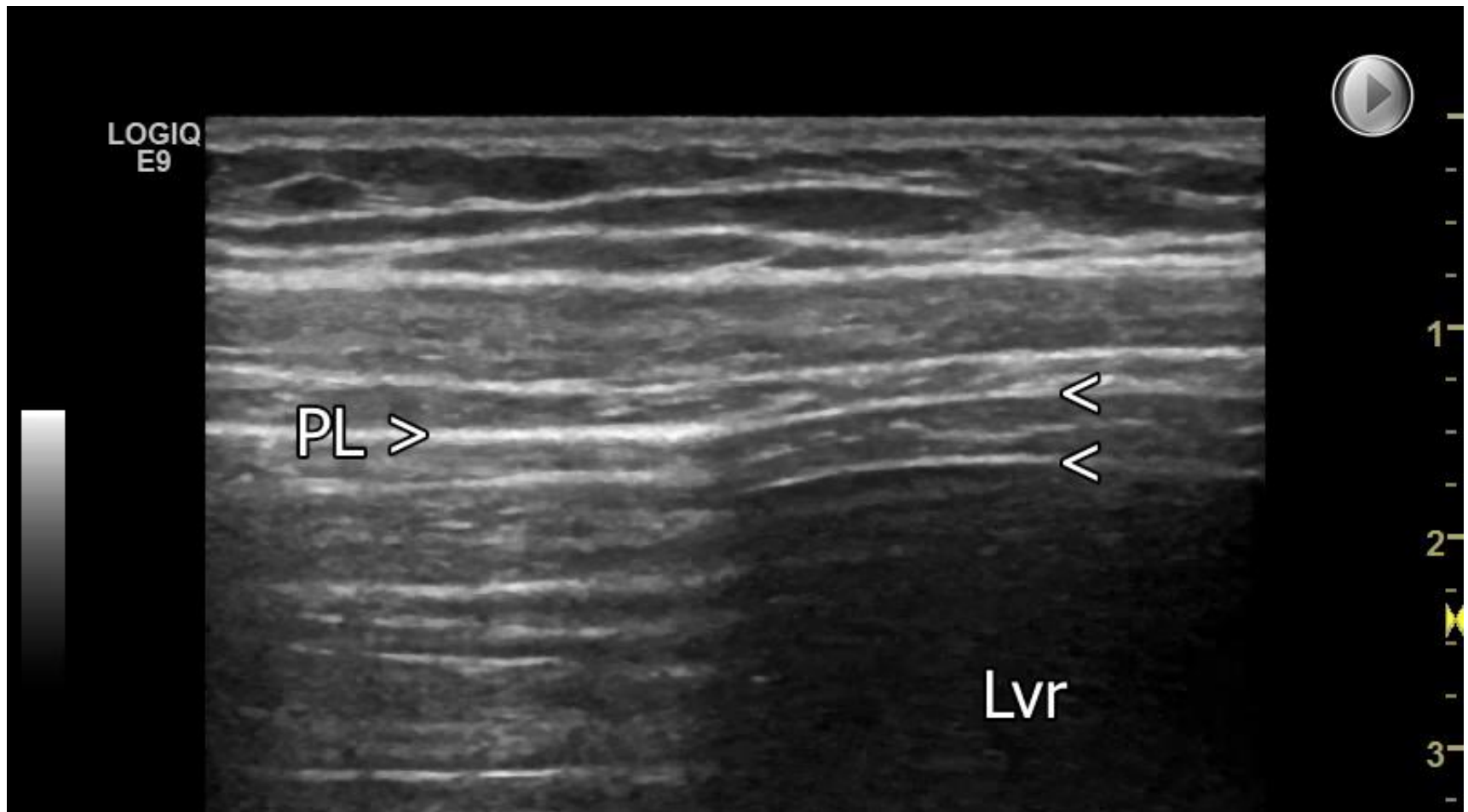


The motion of the diaphragm can be confused with the pleura line and corresponding lung sliding.



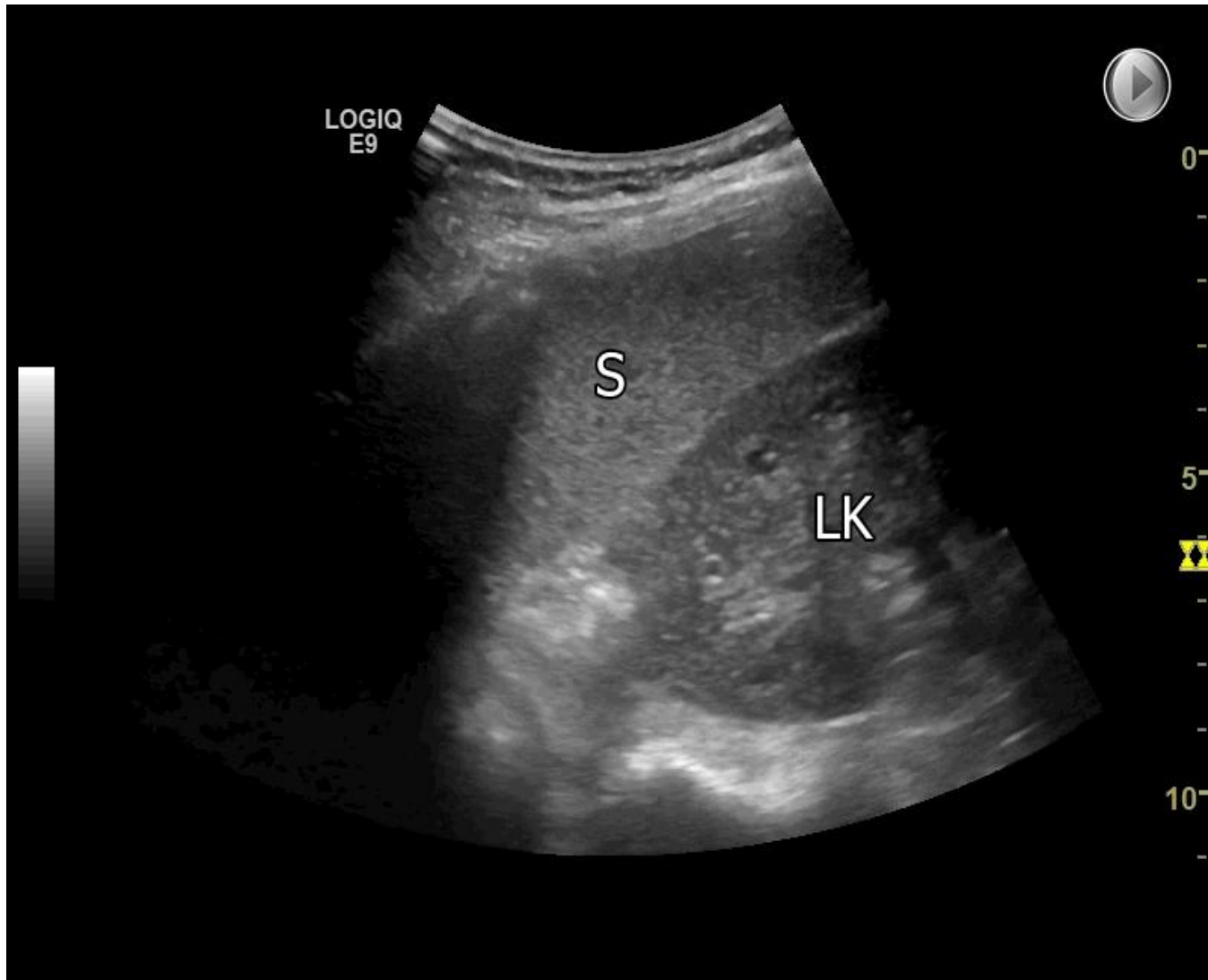
*The diaphragm can be seen as two hyperechoic, parallel, “**double-lines**” (arrows), the area between the lines representing the muscle fibres of the diaphragm.*

*The liver (Lvr) is located just below the diaphragm. **The pleura line (PL) can be seen as a “single-line”.***



Due to spleen smaller size, one often has to scan rather posteriorly (**posterior axillary line**) to identify the spleen.

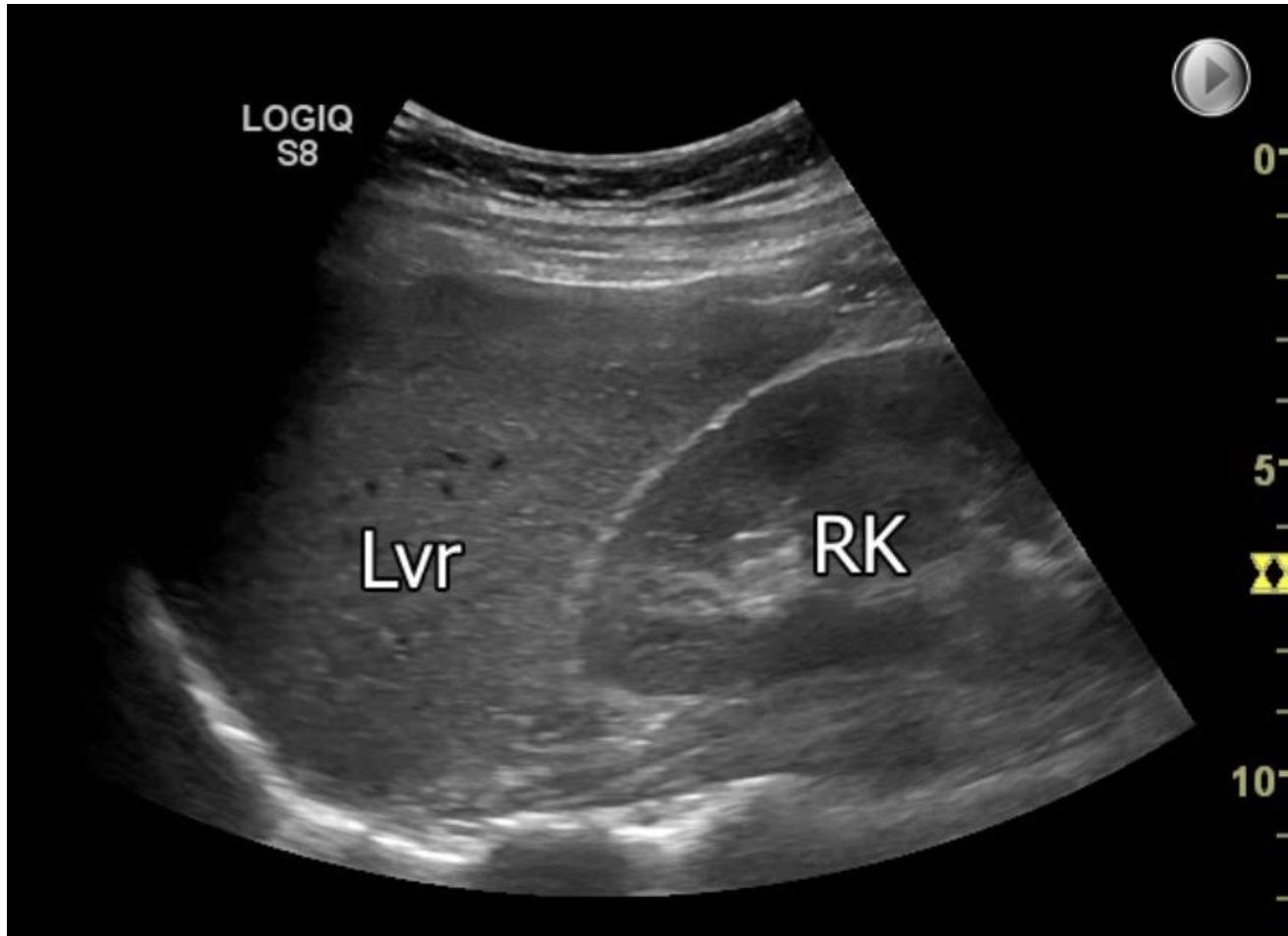
The **spleen** is seen as a hyperechoic (grey) solid structure.



the **left kidney** can be visualised.

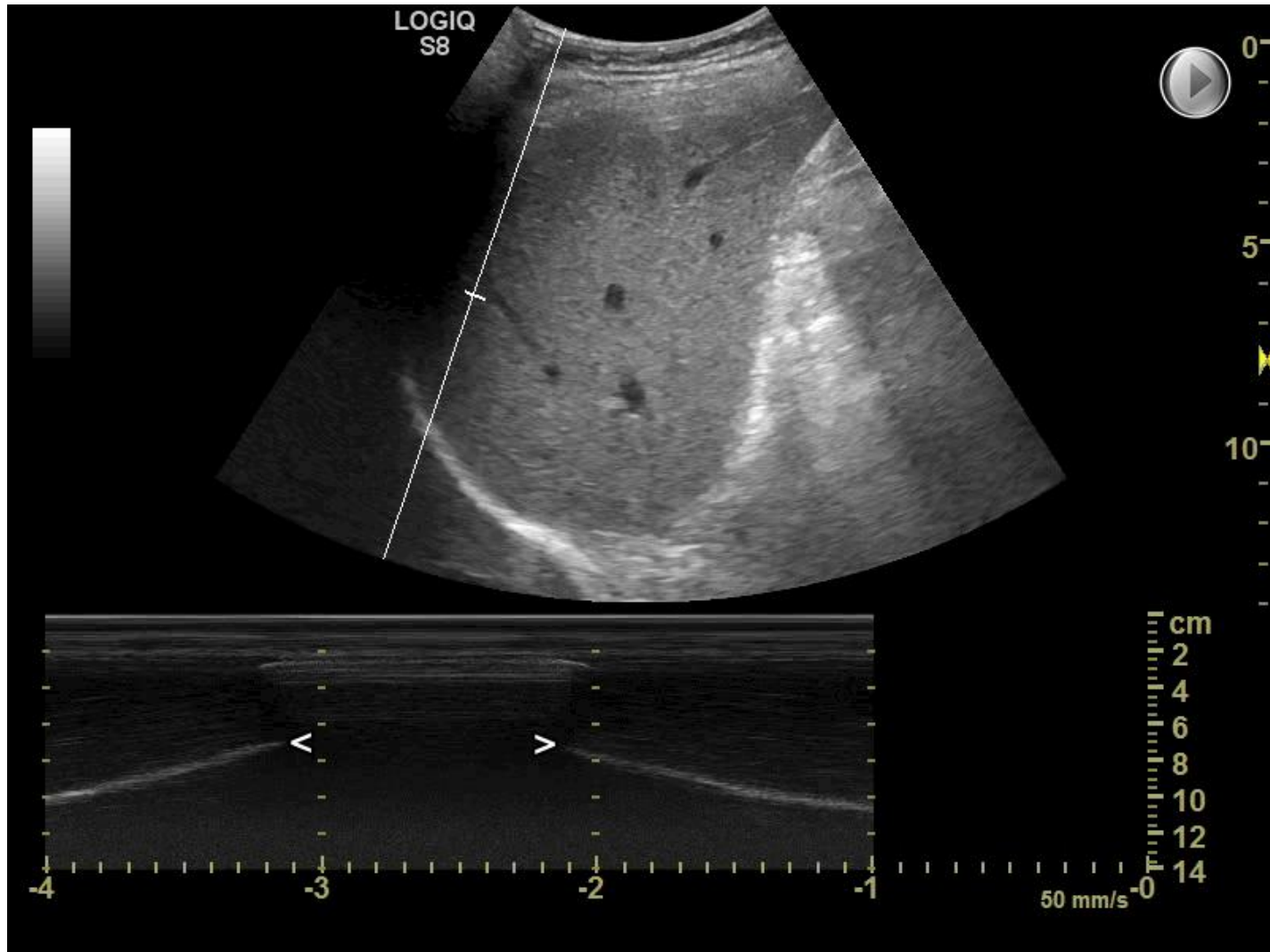
Excellent images of the liver can generally be obtained when scanning in the **mid axillary line**.

The **liver** is seen as a large, hyperechoic (grey) solid structure.

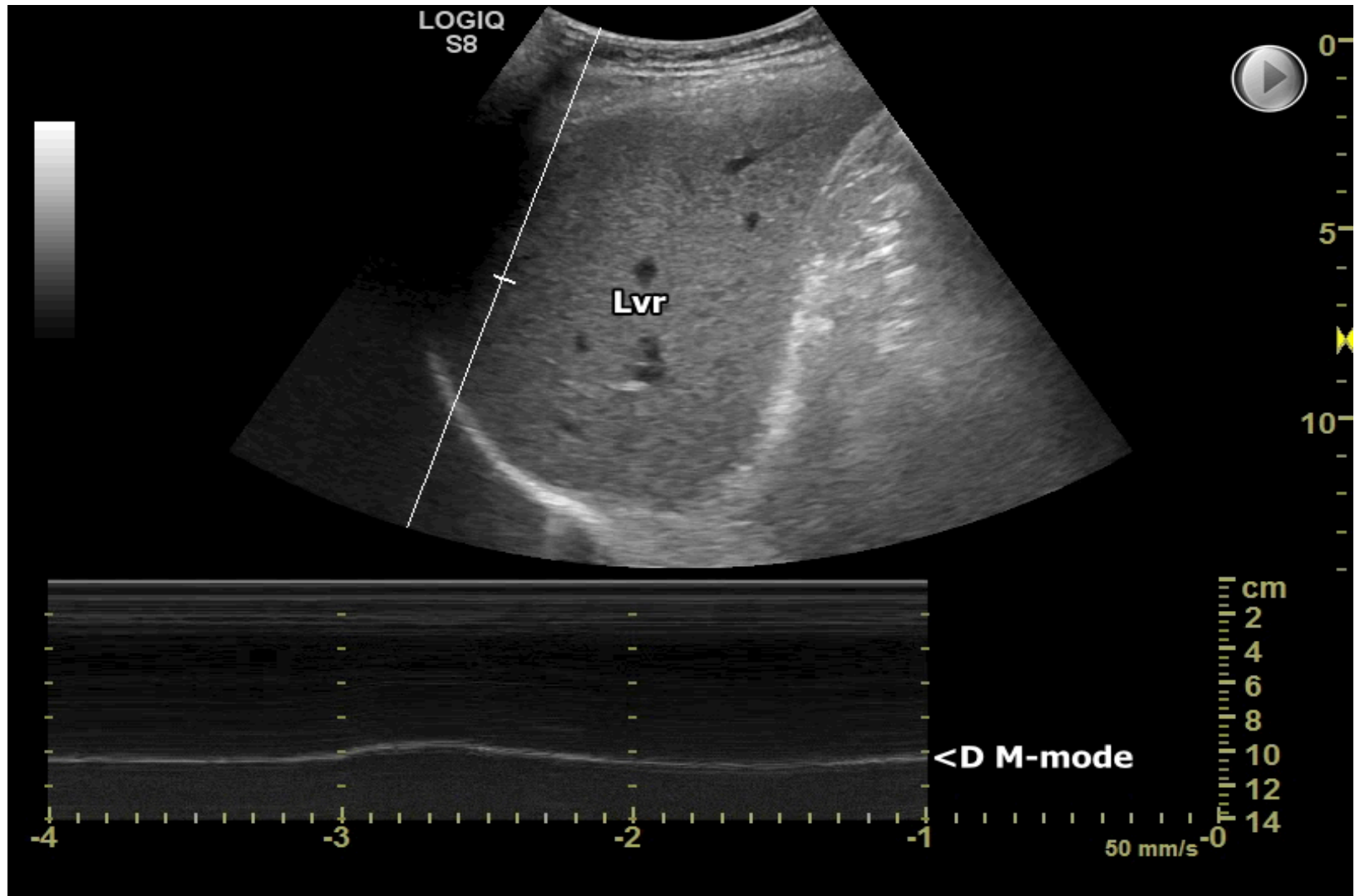


Just below the liver, the **right kidney** can be visualised.

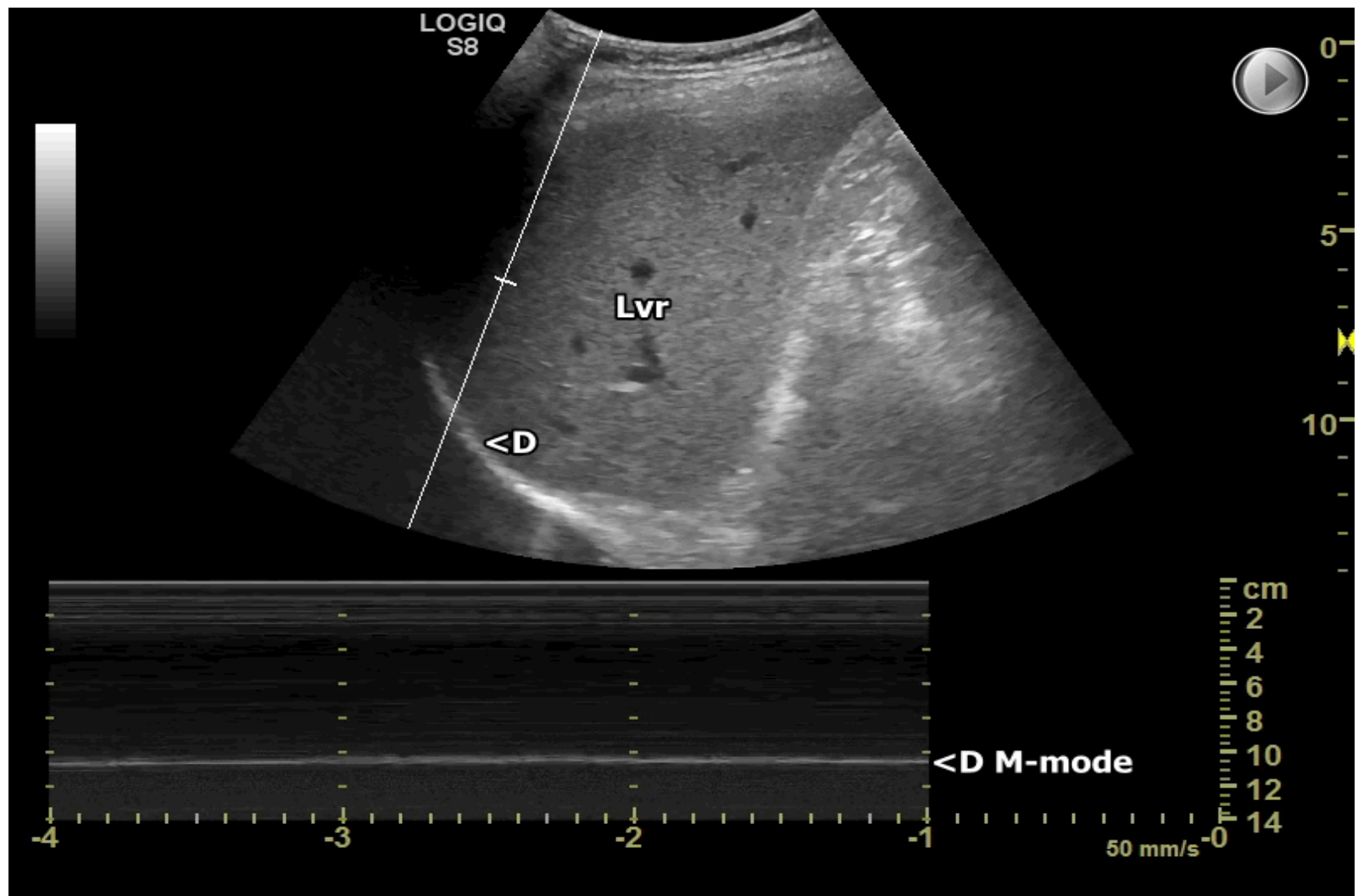
Diaphragm ... normal moving



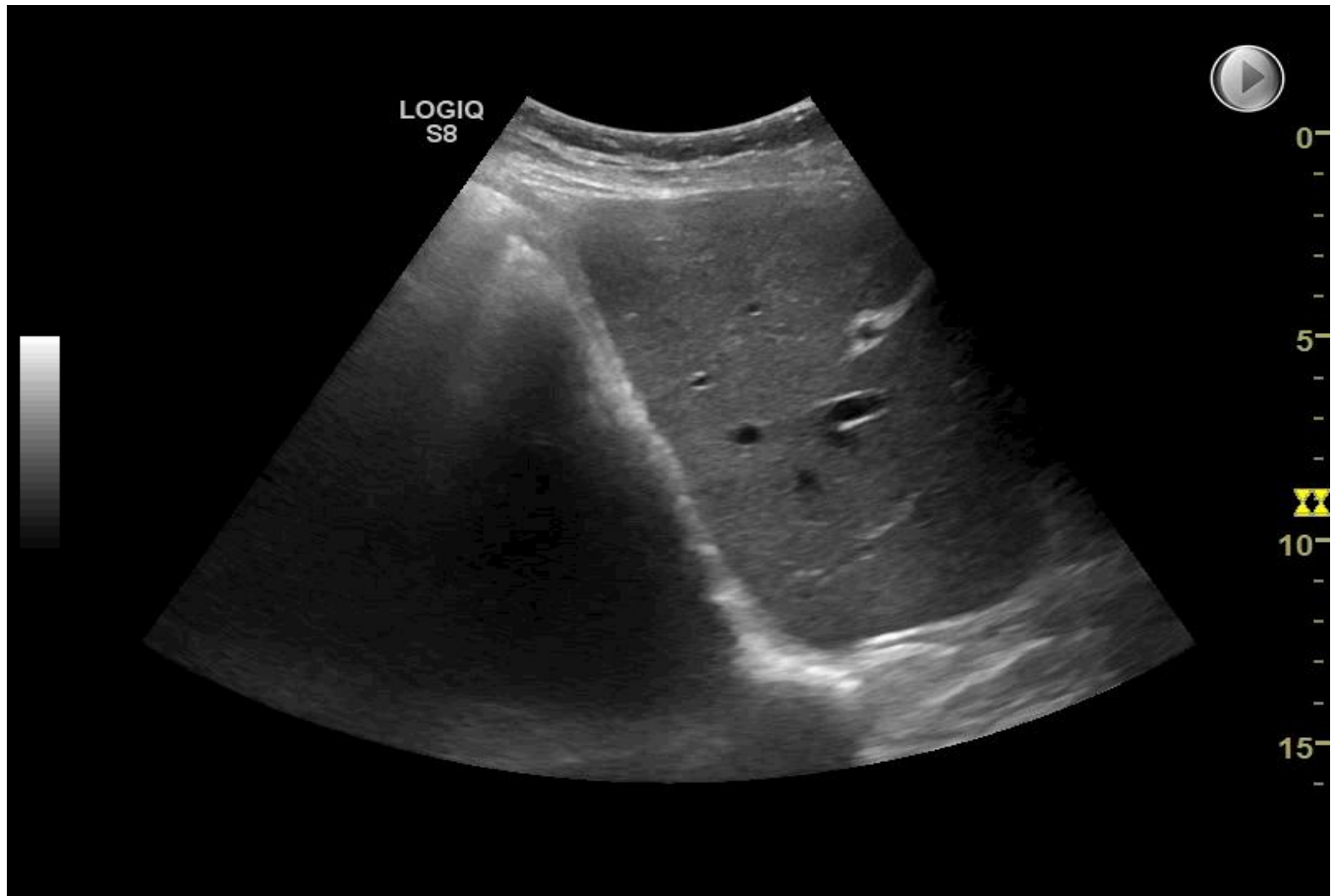
Diaphragm ... ubnormal moving



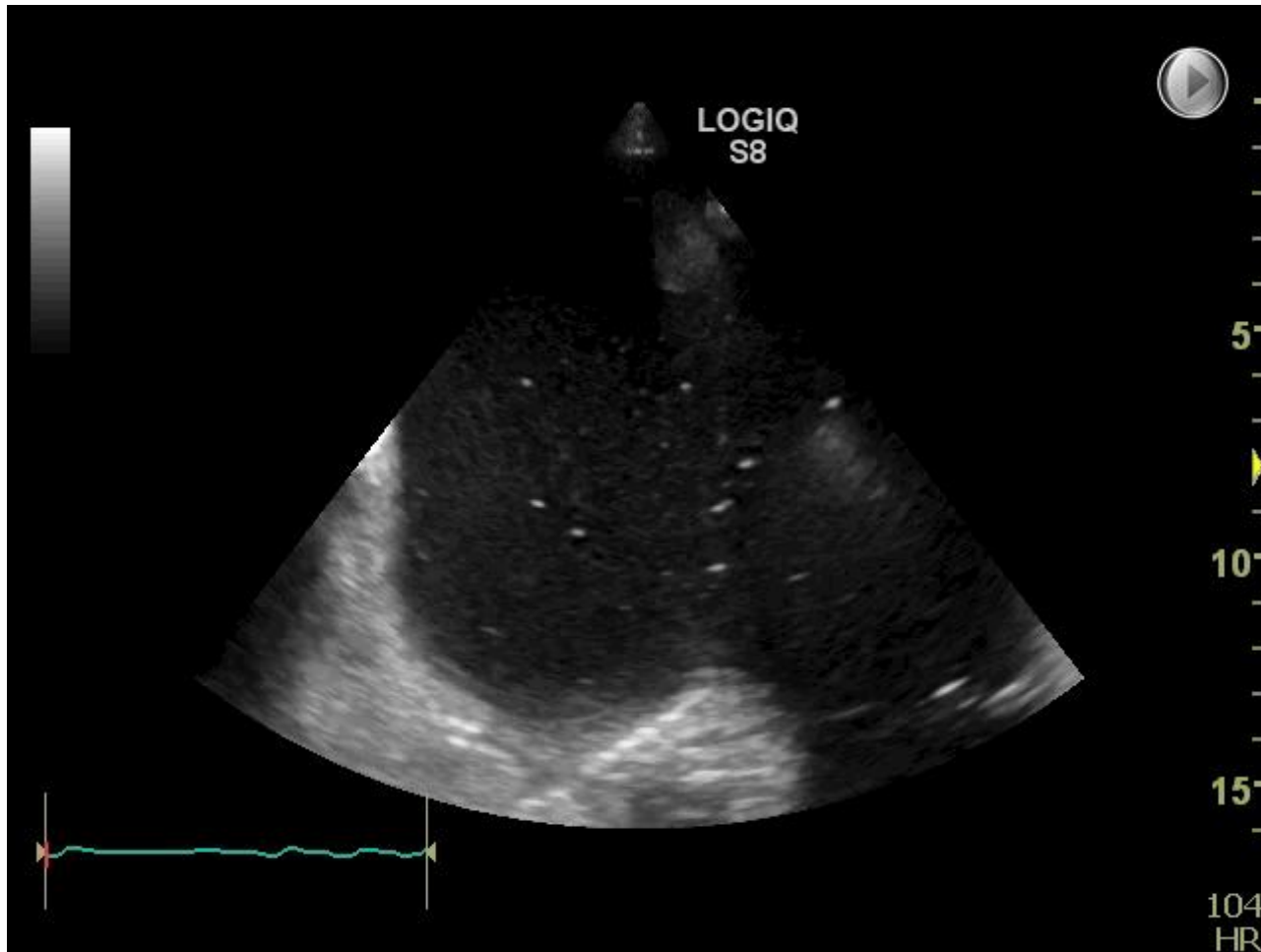
Diaphragm ... no moving



Hyperinflation

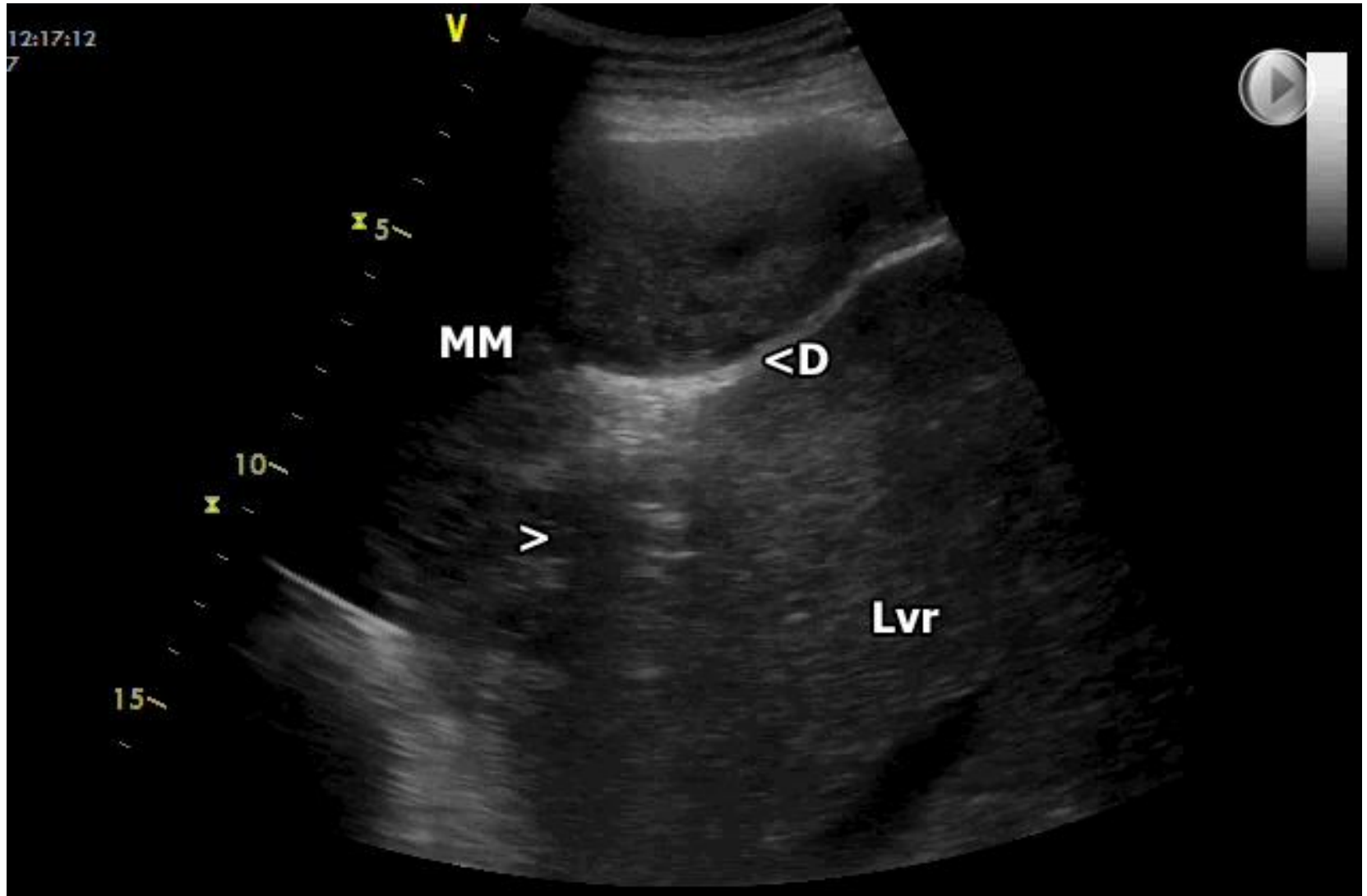


a subcostal view - stomach retention could be seen.

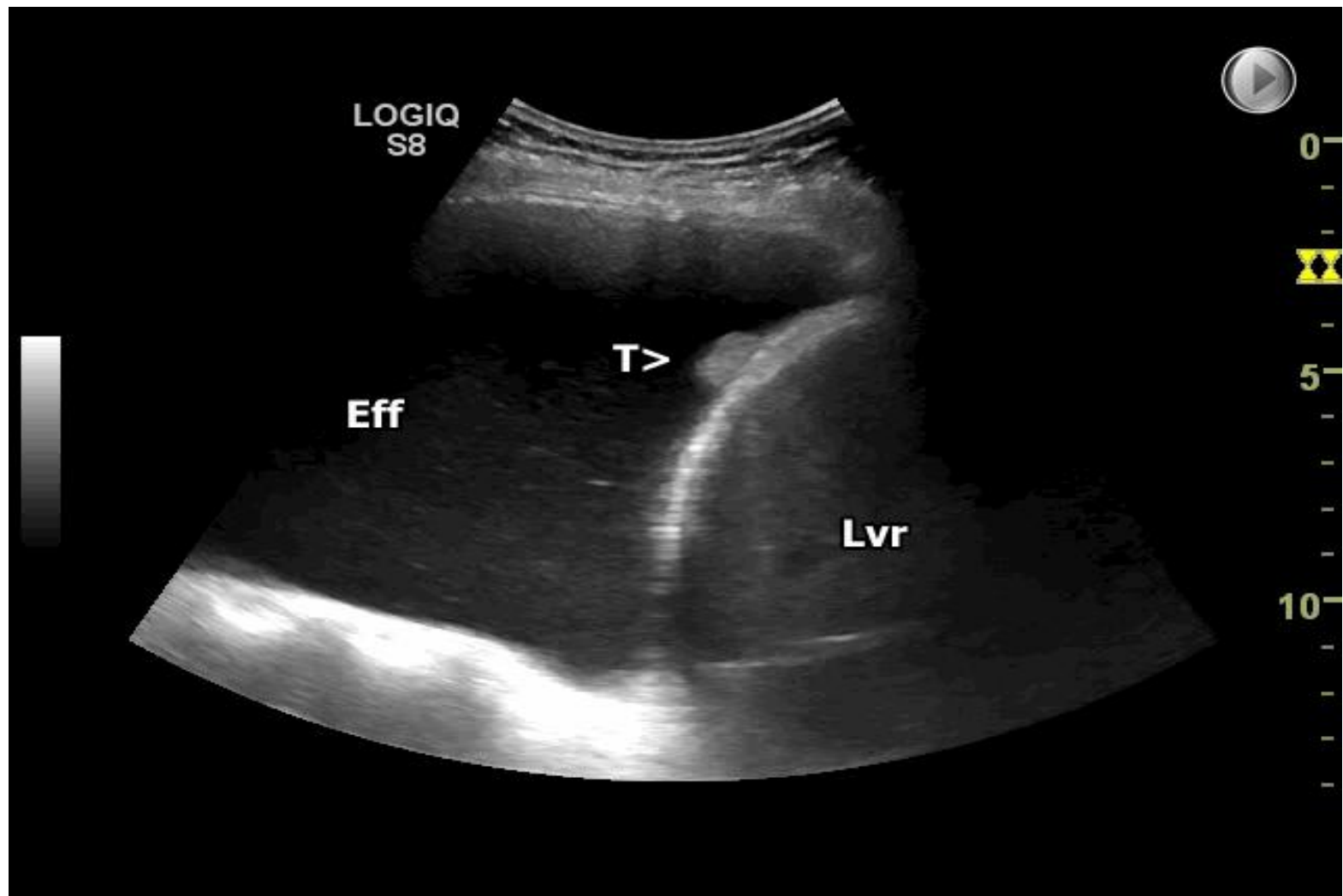


- Notice the presence of hyperechoic dots within the fluid,
- The presence of an air-fluid interface (I).
- The interface also causes the presence of mirror artefacts (M) on the other side of the interface.

*Patient with fluid retention in the stomach due to ileus.
The transducer was placed corresponding to zone L3, the
diaphragm has been displaced cranially.*



Tumor



Ascites

