

Echoes of Displacement: When the Spleen Wanders and the Heart Follows

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BACKGROUND

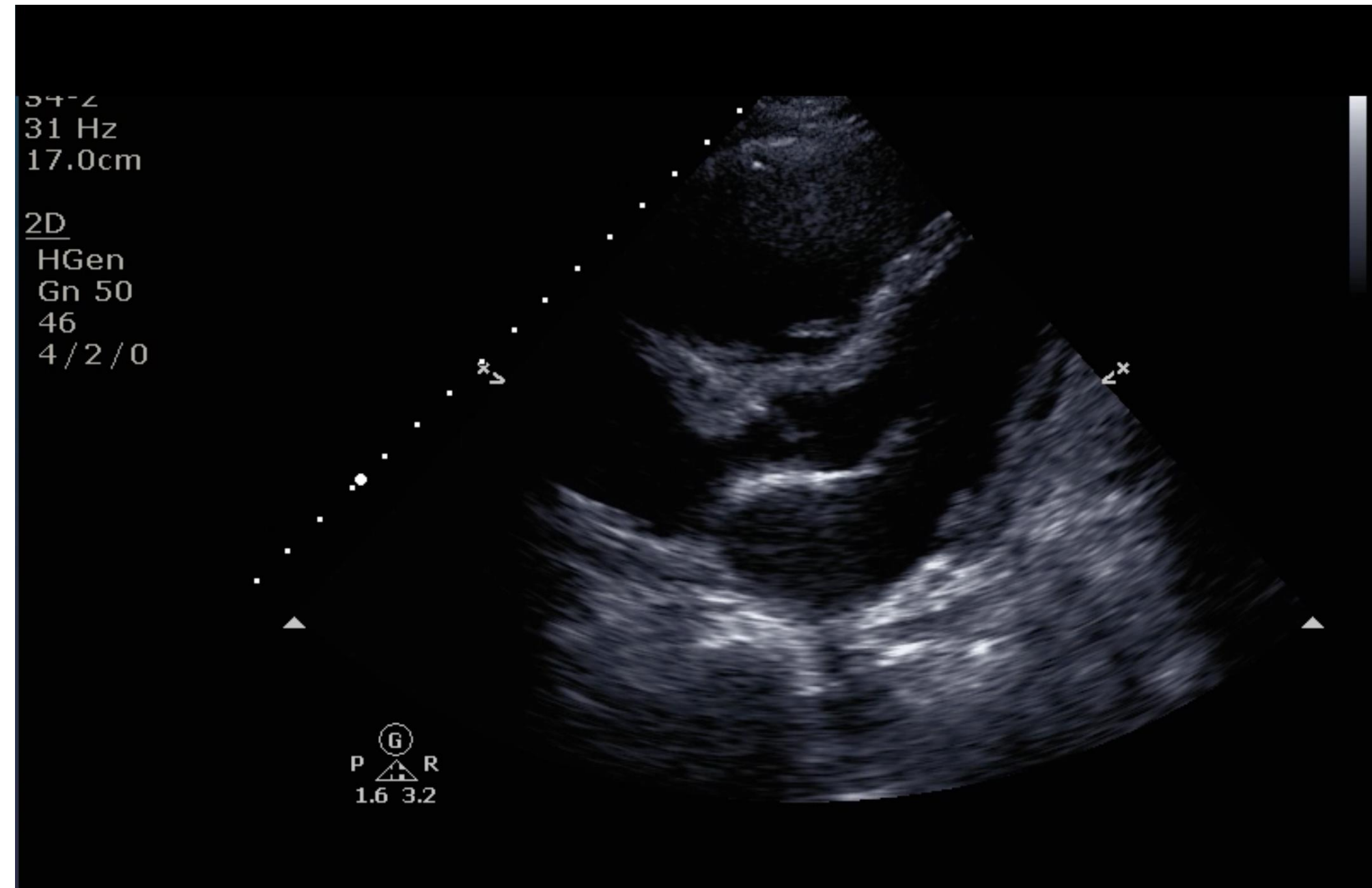
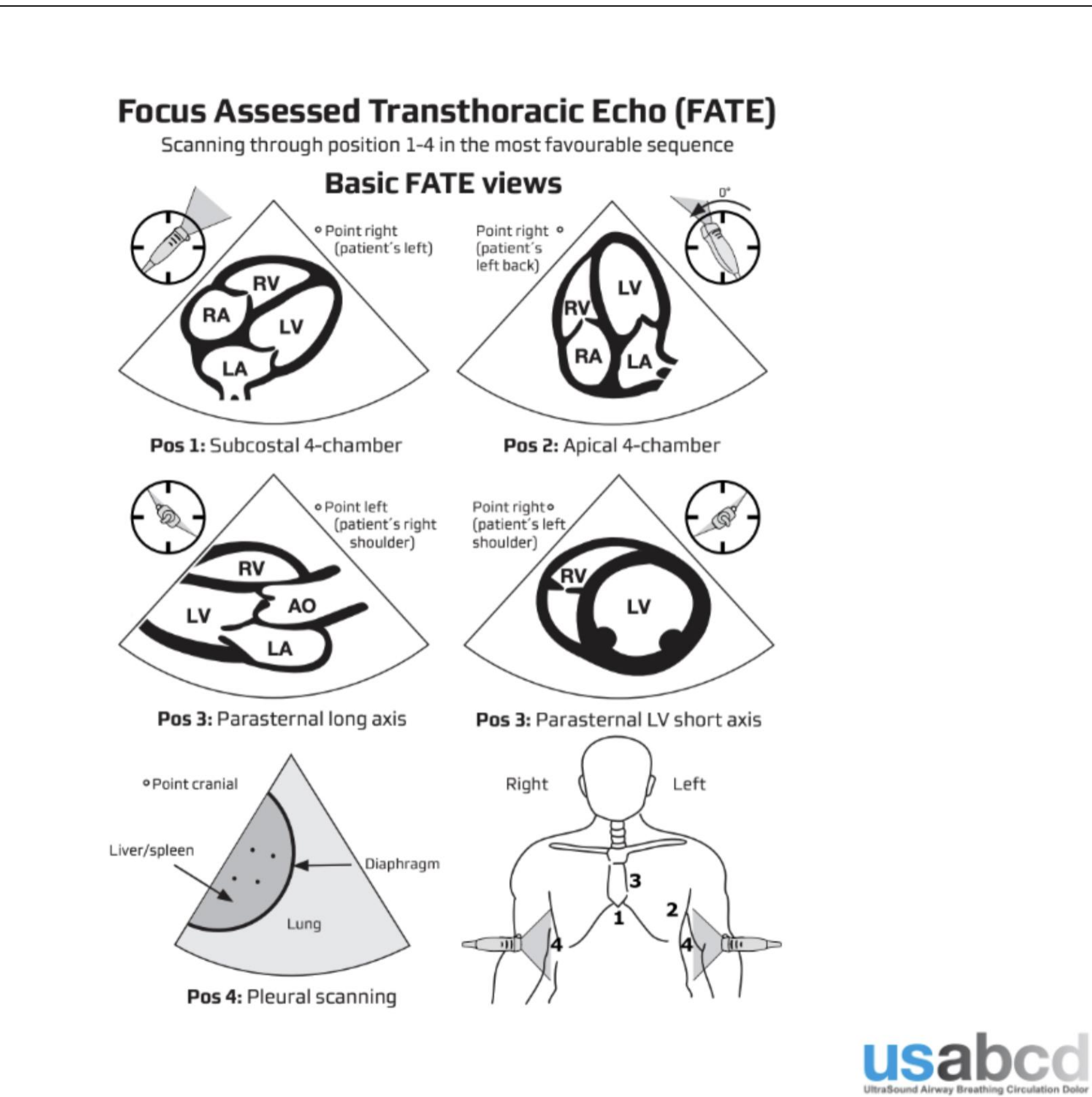
- Point of Care Ultrasound (POCUS) is a bedside imaging technique that allows clinicians to perform rapid, real-time assessments, making it invaluable in critical care, emergency medicine, and other clinical settings.
- POCUS provides immediate results without the need for contrast agents or radiation, is portable for bedside use, and offers a cost-effective alternative to traditional imaging methods like CT or MRI.
- Focused Assessment with Sonography in Trauma (FATE) protocol, which systematically evaluates patients, particularly in trauma and critical care. The FATE protocol includes assessments of cardiac function, fluid status, and lung and pleural spaces, enabling clinicians to quickly identify issues.
- By offering real-time, non-invasive insights, POCUS enhances clinical decision-making and improves patient outcomes. Its ability to detect life-threatening conditions early allows for timely interventions, increasing diagnostic accuracy and clinical confidence.

OBJECTIVE

Reviewing FATE protocol for POCUS
Identify abnormal anatomy through various imaging modalities
Discussing ultrasound maneuvers to obtain optimized images from POCUS
Utilizing data from point of care ultrasound to better guide patient management

PATIENT PRESENTATION

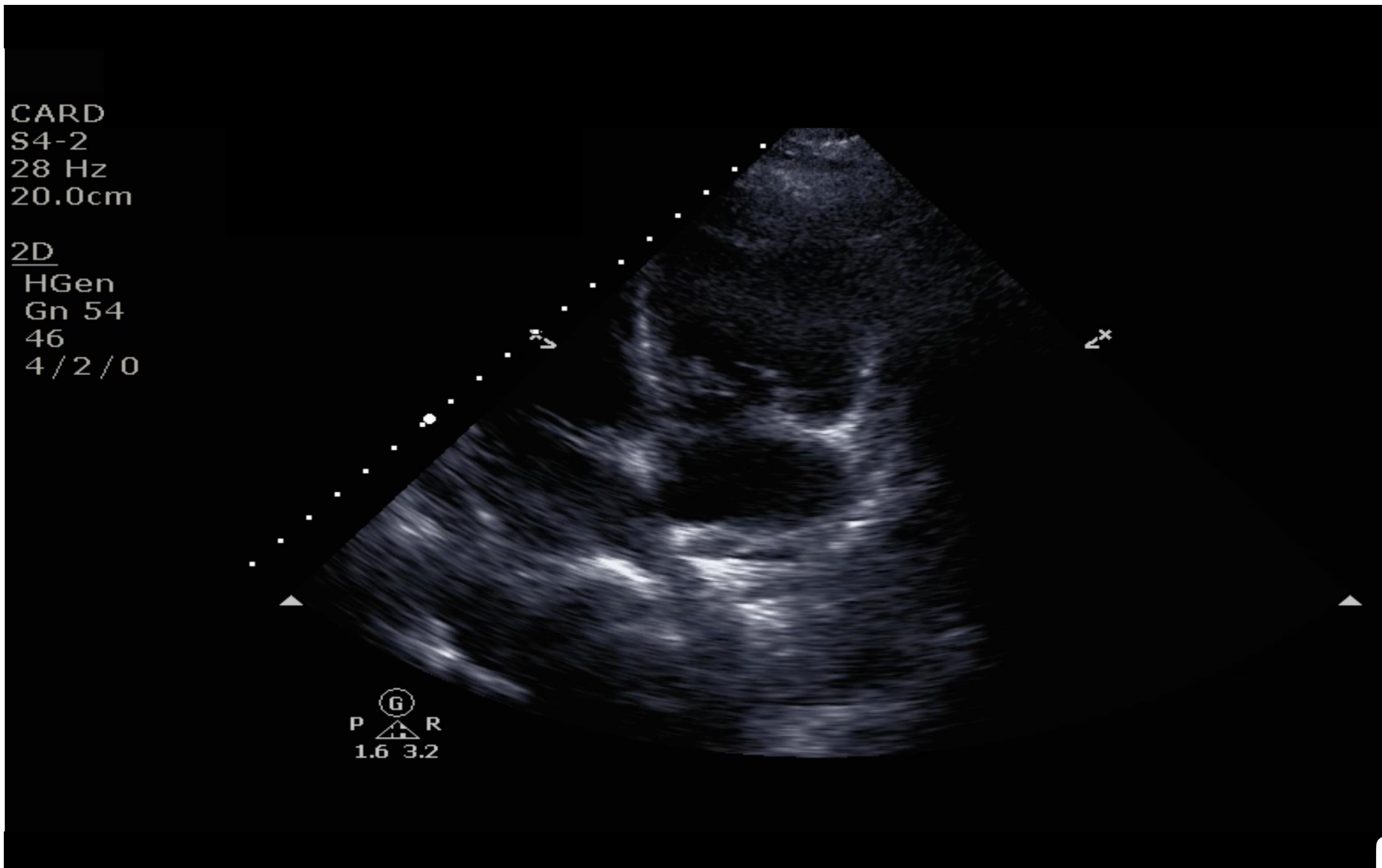
30-year-old female with past medical history significant for autism, intellectual disability found be have a traveling spleen presenting for emergent splenectomy secondary to septic shock.
Patient had successful intervention and was in PACU after partial spleen resection
Patient had known history of organ malpositioning



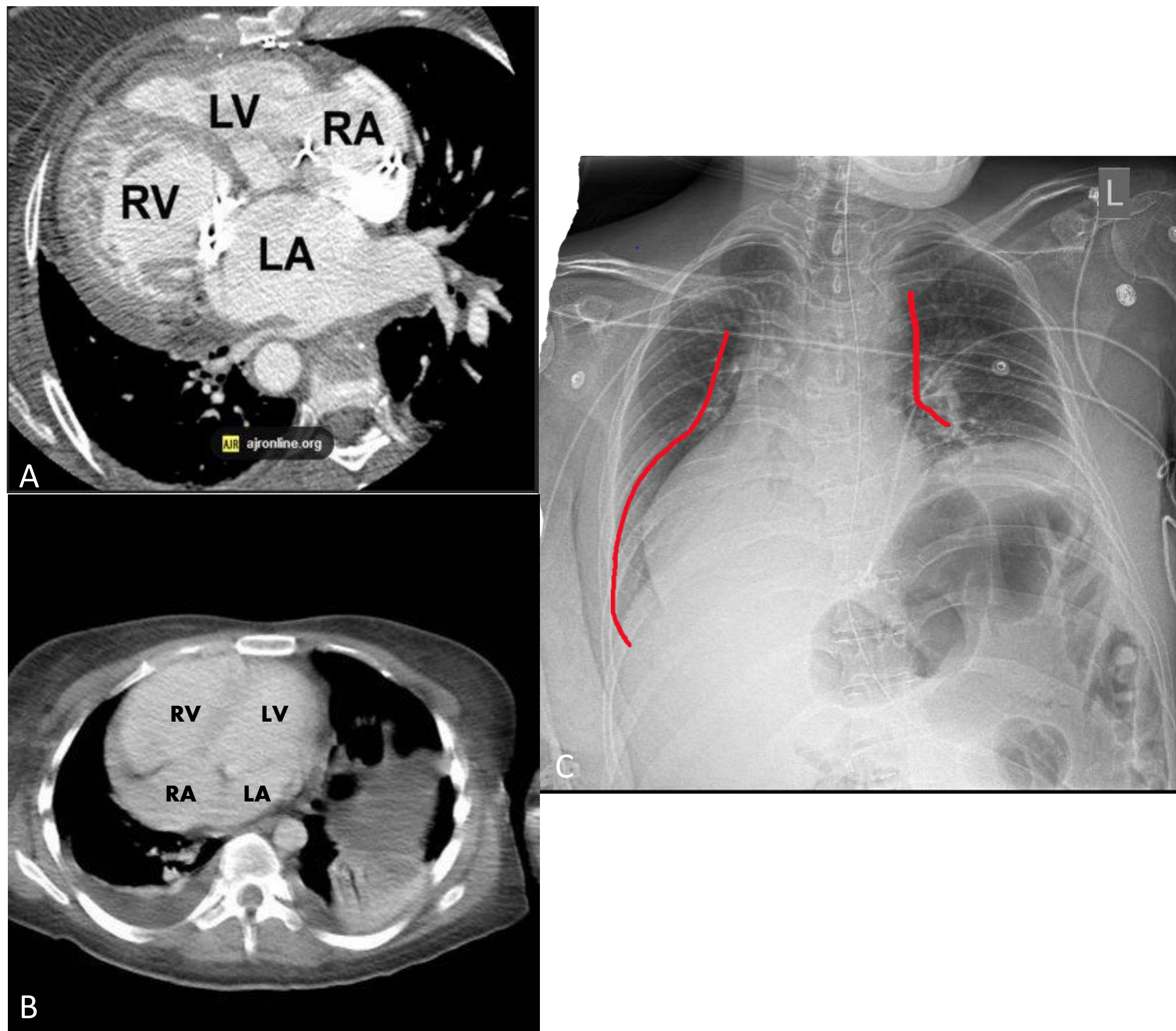
Parasternal Long Axis View

Table 1. Redefined Set of Fundamental Transducer Motions		
Slide		Motion in the long axis of the probe across the body with a consistent angle of insonation at 90° to the target
Rock		Motion in the long axis of the probe along a fixed point on the body while changing the angle of insonation away from 90°
Sweep		Motion in the short axis of the probe across the body with a consistent angle of insonation at 90° to the target
Fan		Motion in the short axis of the probe along a fixed point on the body while changing the angle of insonation away from 90°
Pressure/compression		Pressure on the probe into the body, compression of the body by applying force on the probe toward the patient's body
Rotation		Movement around the compression axis in a clockwise or counter-clockwise direction

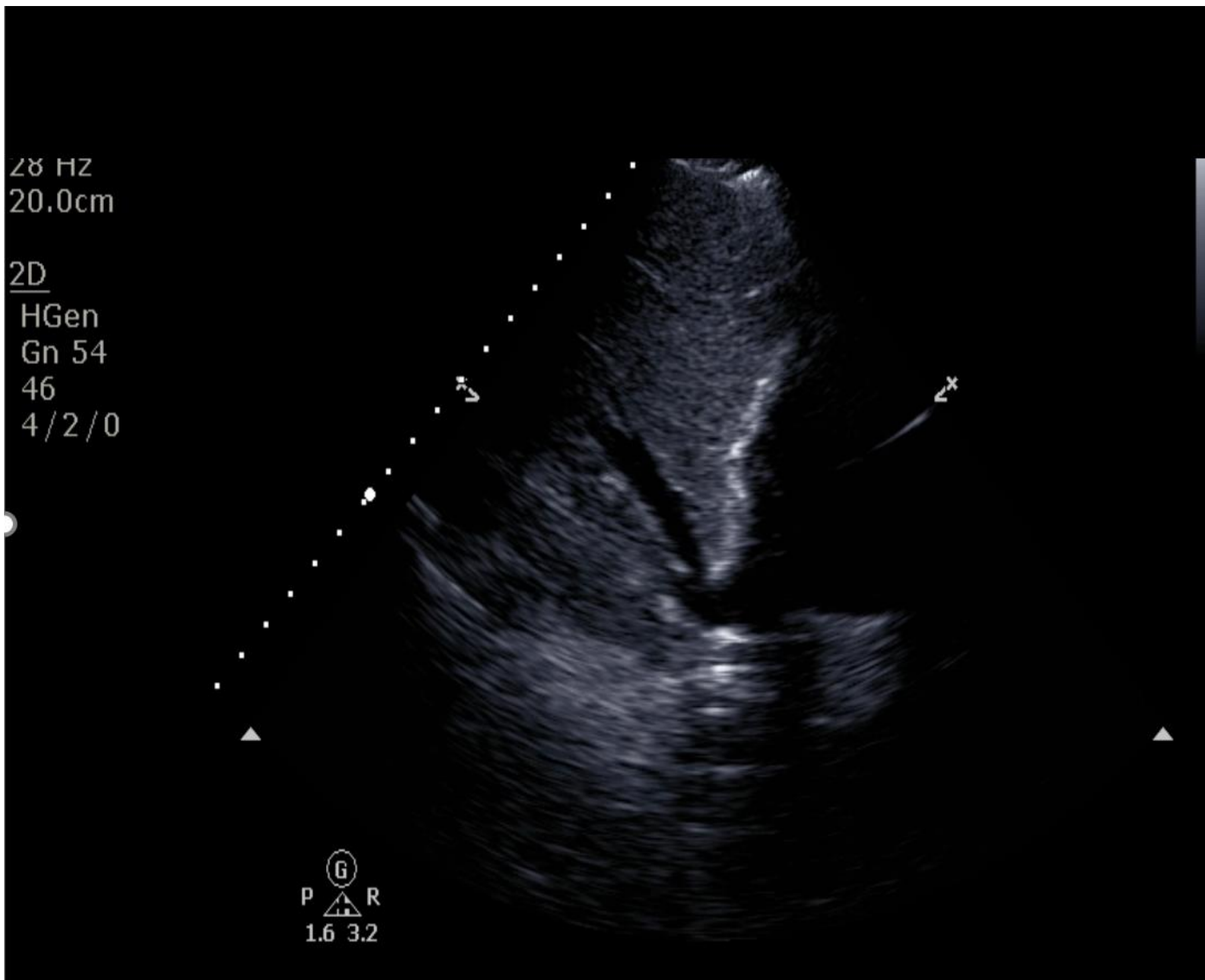
Bahner et al. 2016



Apical 4 Chamber View with Liver Obstructing optimization



A. Normal CT scan of heart with ventricles labeled;
B. Patient CT scan of heart with ventricles labeled
C. Patient chest x-ray with cardiac silhouette outlined
RV = right ventricle; LV = left ventricle; RA = right atrium; LA = left atrium



Sub-Xiphoid View of Hepatic Vein to IVC

DISCUSSION/CONCLUSIONS

- Several pathologies can result in abnormal cardiac location including, but not limited to: Pentalogy of Cantrell, Kartagener syndrome, and abnormal cardiac looping during fetal development. Additionally, iatrogenic causes such as surgical manipulation, trauma, or thoracic procedures can occasionally lead to apparent or real cardiac displacement.
- Recognition of organ malposition and atypical anatomy through thoughtful probe manipulation and image interpretation was critical to appropriate management.
- Abnormal anatomy can skew the POCUS exam but by understanding US mechanics and normal POCUS views, it is still possible to obtain information and complete a full bedside POCUS with valuable clinical information
- Identifying anatomical heart pathology can help providers understand further complications in other organ systems and better optimize patient for clinical care
- This case emphasizes the importance of dynamic ultrasound evaluation techniques and a strong understanding of anatomical variants to avoid misdiagnosis and guide timely interventions in complex clinical scenarios

REFERENCES

- Maldjian, P. D., & Saric, M. (2007). *Approach to dextrocardia in adults: Review. American Journal of Roentgenology*, 188(6 Supplement), S39–S49. <https://doi.org/10.2214/AJR.06.1179>
- Mishra M, Kumar N, Jaiswal A, Verma AK, Kant S. Kartagener's syndrome: A case series. *Lung India*. 2012 Oct;29(4):366-9. doi: 10.4103/0970-2113.102831. PMID: 23243352; PMCID: PMC3519024.
- Nair R, Muthukuru SR. Dextrocardia. [Updated 2022 Sep 19]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK556074/>
- Sana MK, Rentea RM. Pentalogy of Cantrell. [Updated 2023 May 29]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-.