Impending hemodynamic collapse in CTEPH

POCUS Conference

Gabriel Shaya
PGY-3

3/26/19

Case Presentation

- 50yo M PMHx
  - ESRD 2/2 HTN on HD
  - Essential thrombocytosis
  - Recurrent pulmonary emboli c/b severe WHO Group IV PH on coumadin, 2L home O2

- Presenting with 4-5d acute on chronic dyspnea
- Recent 2 week admission ~1mo prior to presentation with acute dyspnea and palpitations
- Found with submassive occlusive PE in R PA with acute and chronic components and superimposed LLL PNA.
- Improved with abx, HD, starting tadalafil → discharged home with 2LNC and close outpt f/u

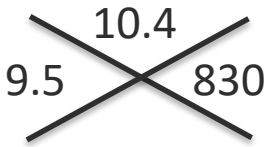
Case Presentation

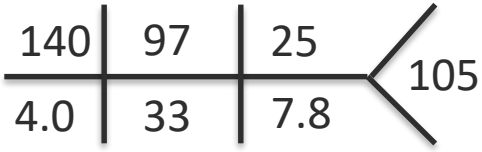
- Switched from tadalafil → Riociguat ~1week prior to current presentation
- Discharge exercise tolerance 3 blocks
- Increasing DOE and rising O2 requirement to 4L after HD 4 days prior
- Day of admission with severe fatigue, dyspnea during HD up to 6LNC prompting presentation to ED.

VITALS/EXAM

- VS: AF, HR 90s-100s, SBP 130-140s, RR low 20s, SpO2 94 → 86% on 6LNC
- In respiratory distress with breathless speech
- No JVD seen, tachy regular, loud S2
- Clear lungs
- Abd soft, ntnd, without organomegaly
- Ext warm without edema

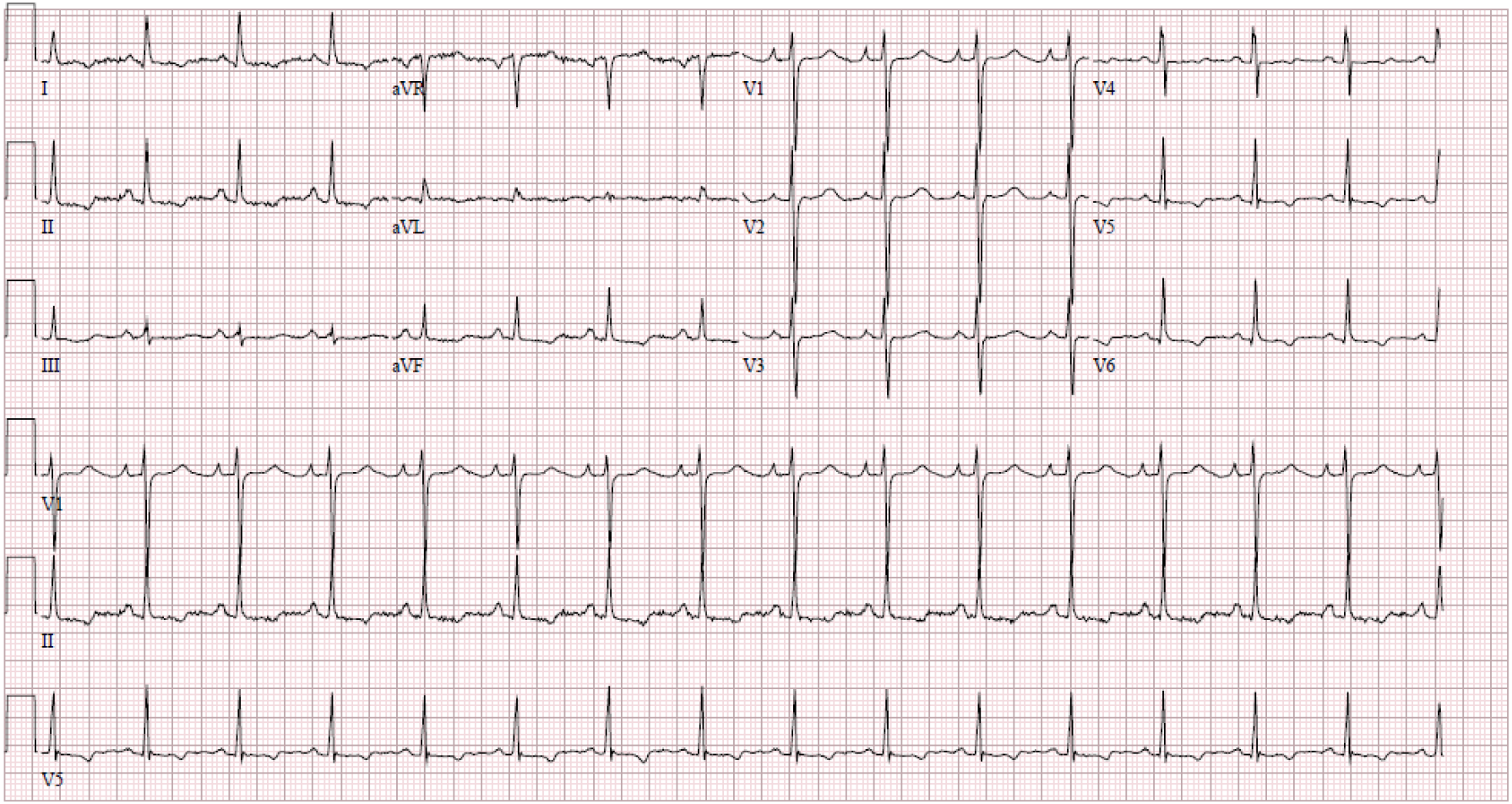
Case Presentation



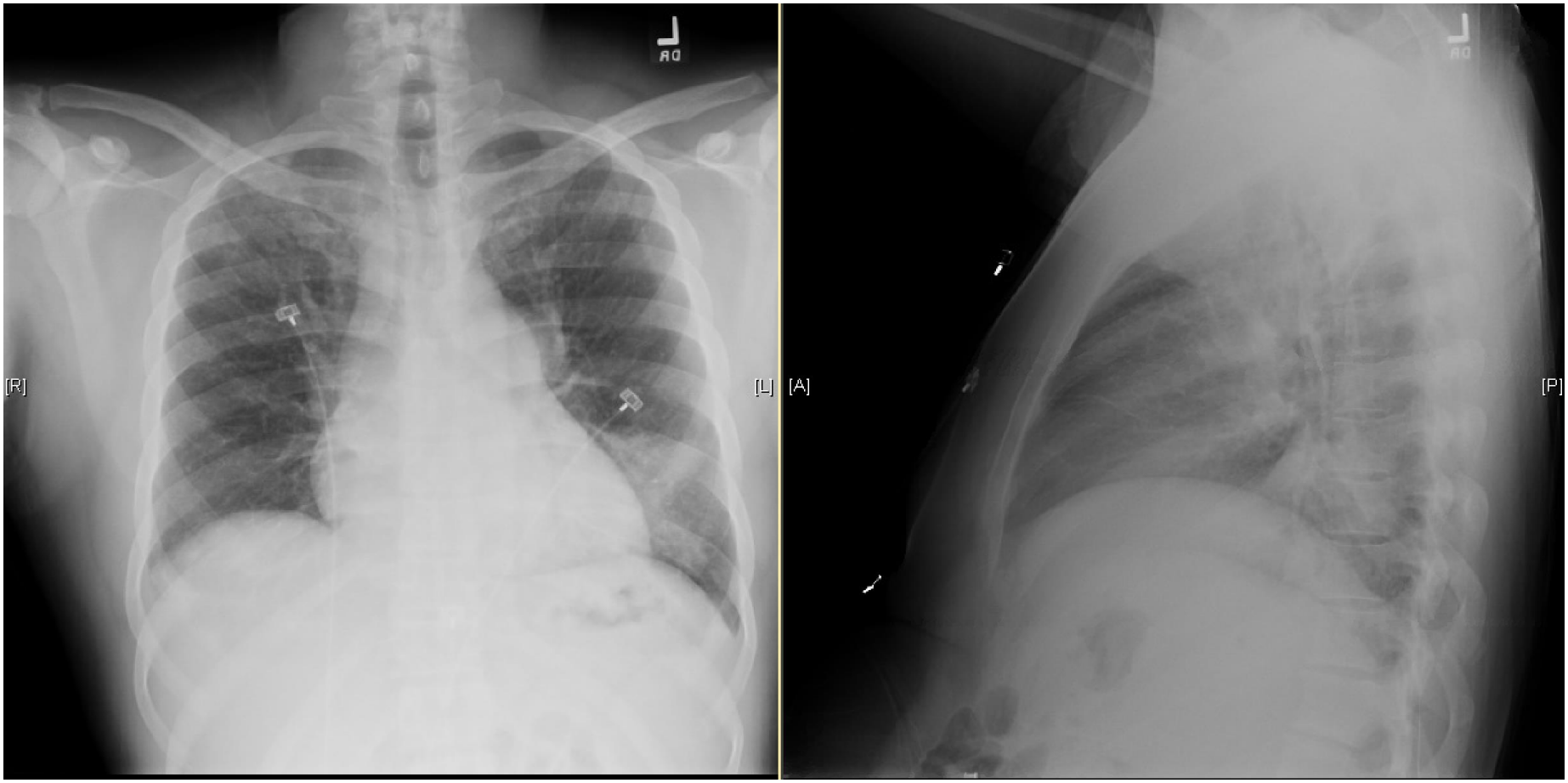


LFTs WNL
INR 3.2
VBG 7.52/40/17/33
Lactate 1.10
BNP 276 ← 362 prior admission
Trop negative

Case Presentation



CXR

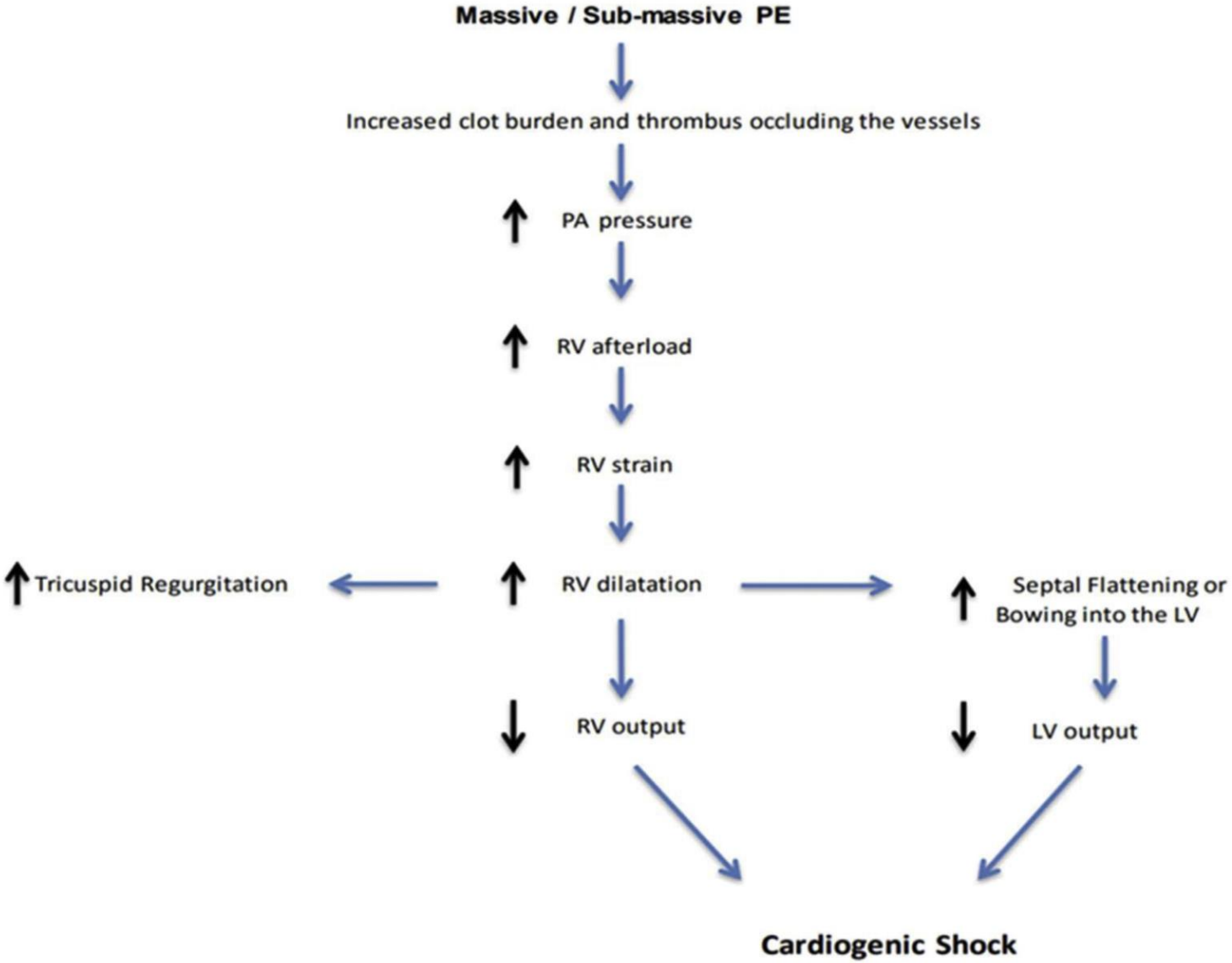


Case Presentation

- **TTE from prior admission**
  - NL LV size and function
  - NL RV size and function
  - RA mildly dilated
  - PASP 51 mmHg
  - 1+TR (Vmax 3.3 m/s)
  - Concentric LVH
  - Diastolic dysfunction
    - E:e' 11.5
- **RHC from prior admission**
  - RA 4
  - RV 81/7
  - PAP 82/31/52
  - PCWP 12, v-wave 28

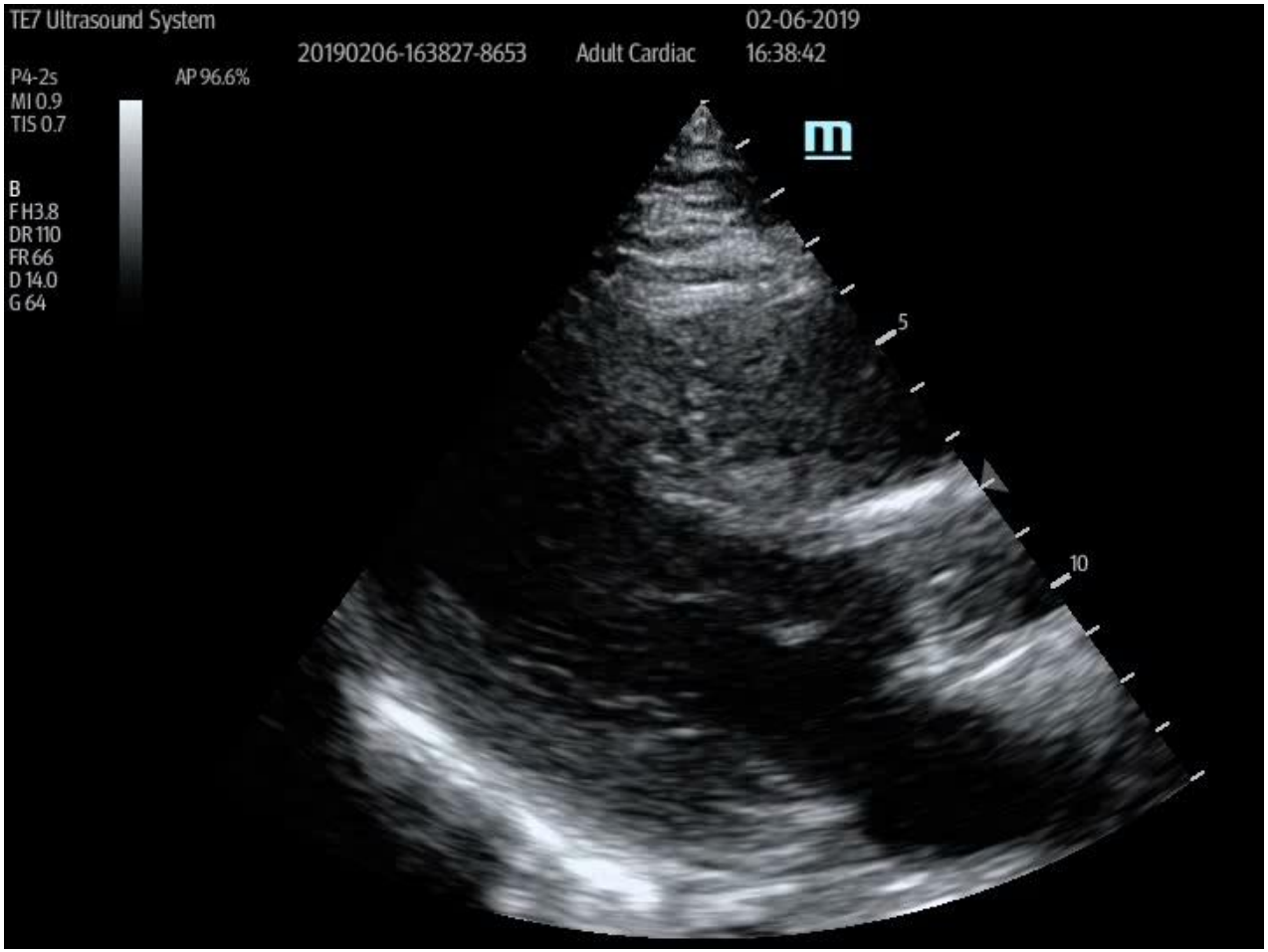
Case Presentation

- On reassessment patient c/o profound fatigue, lightheadedness
- Worsening hypoxia placed on NRB → HFNC though remained normotensive
- CCU consulted

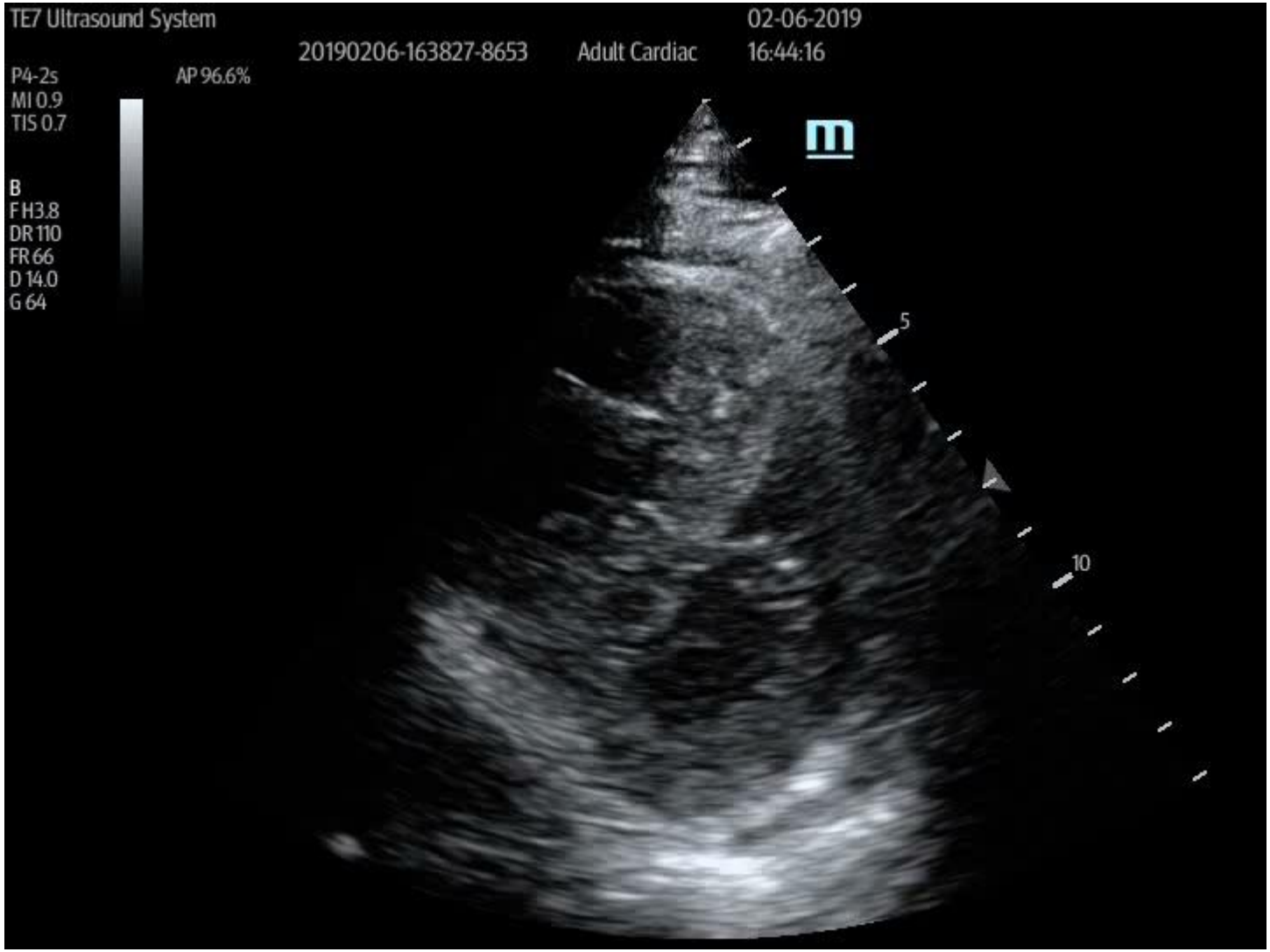


Lee et al. *Clin Chest Med*, 2018. 39(3):549-560

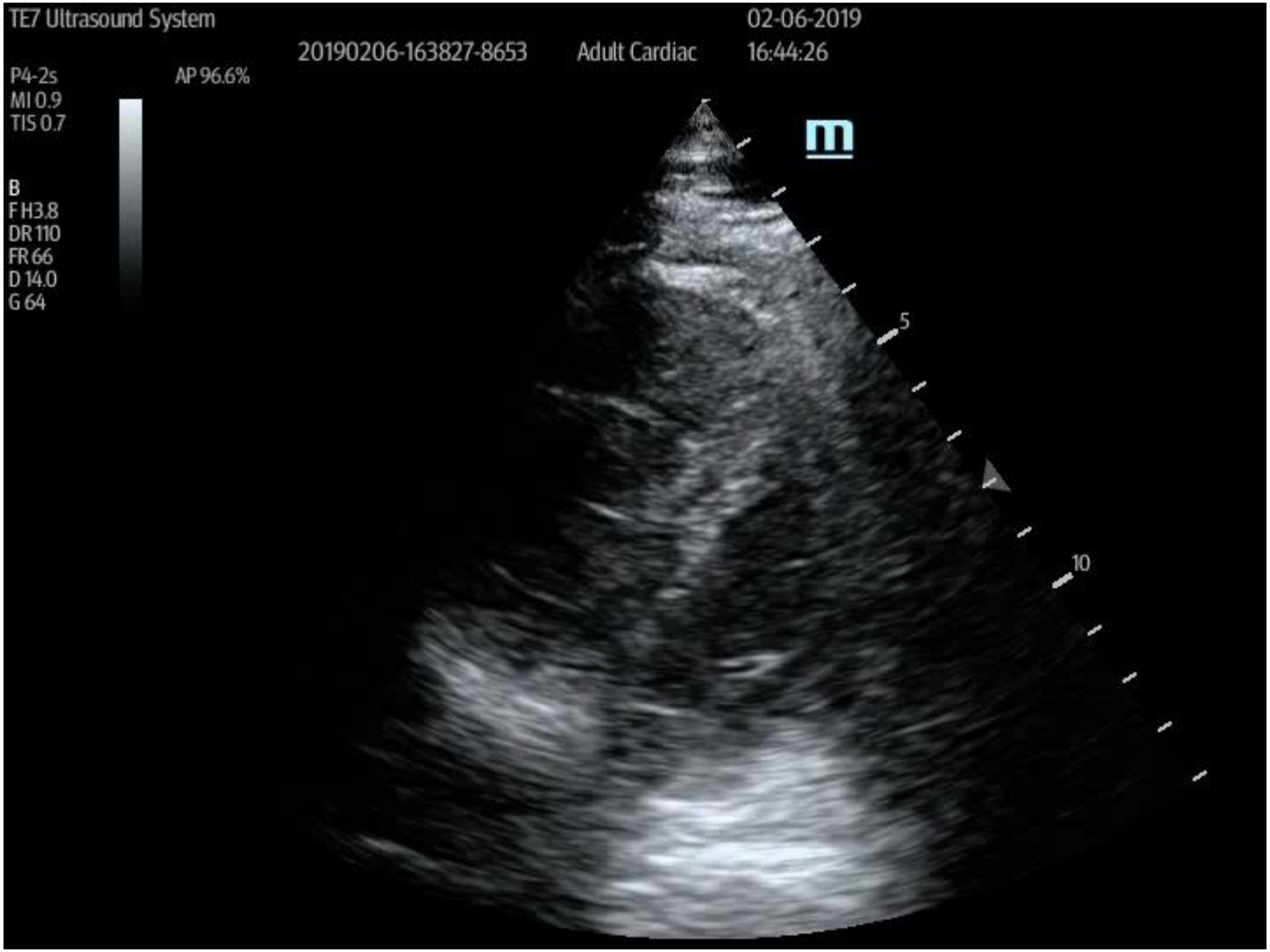
Parasternal Long



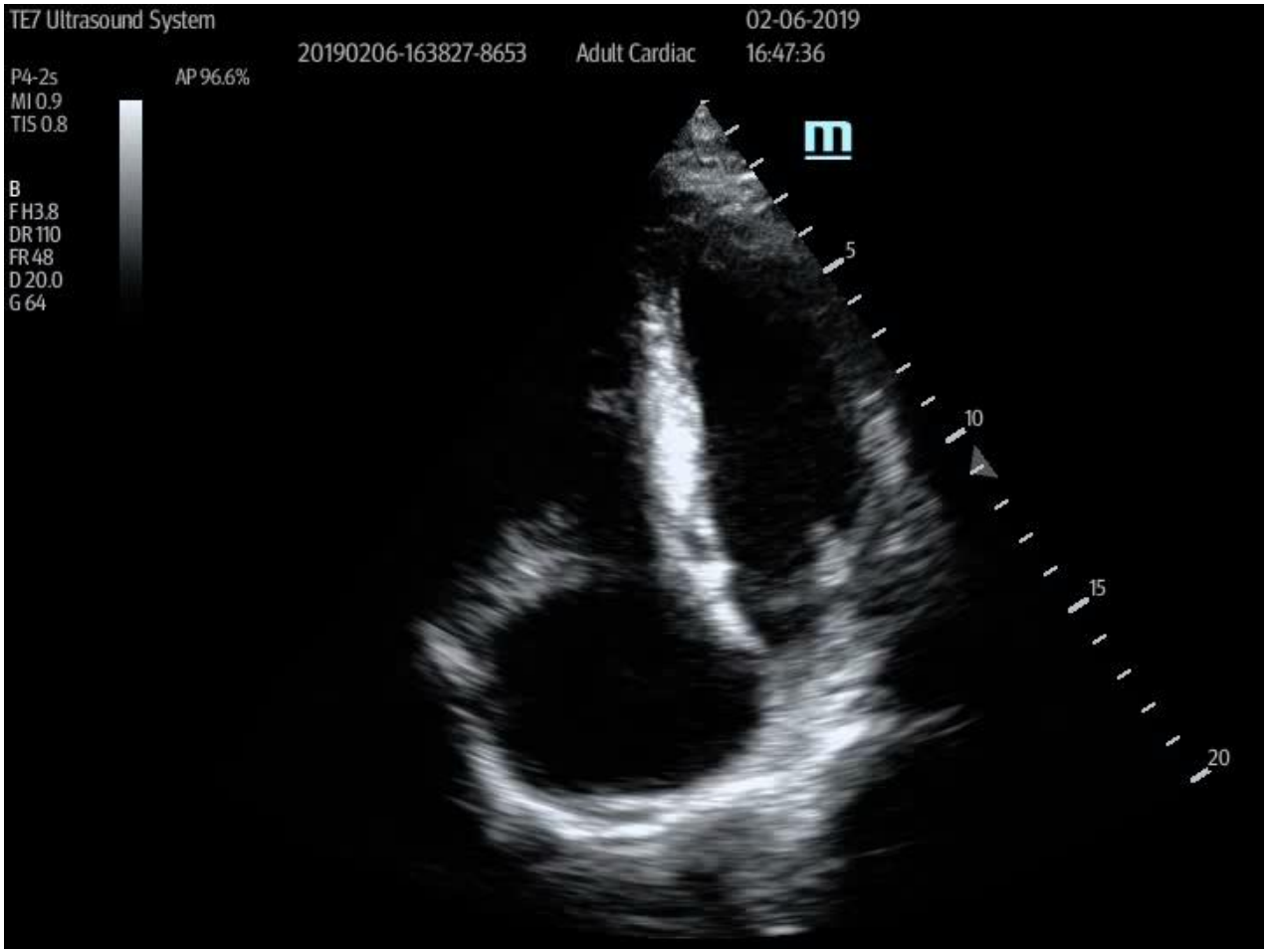
Parasternal Short



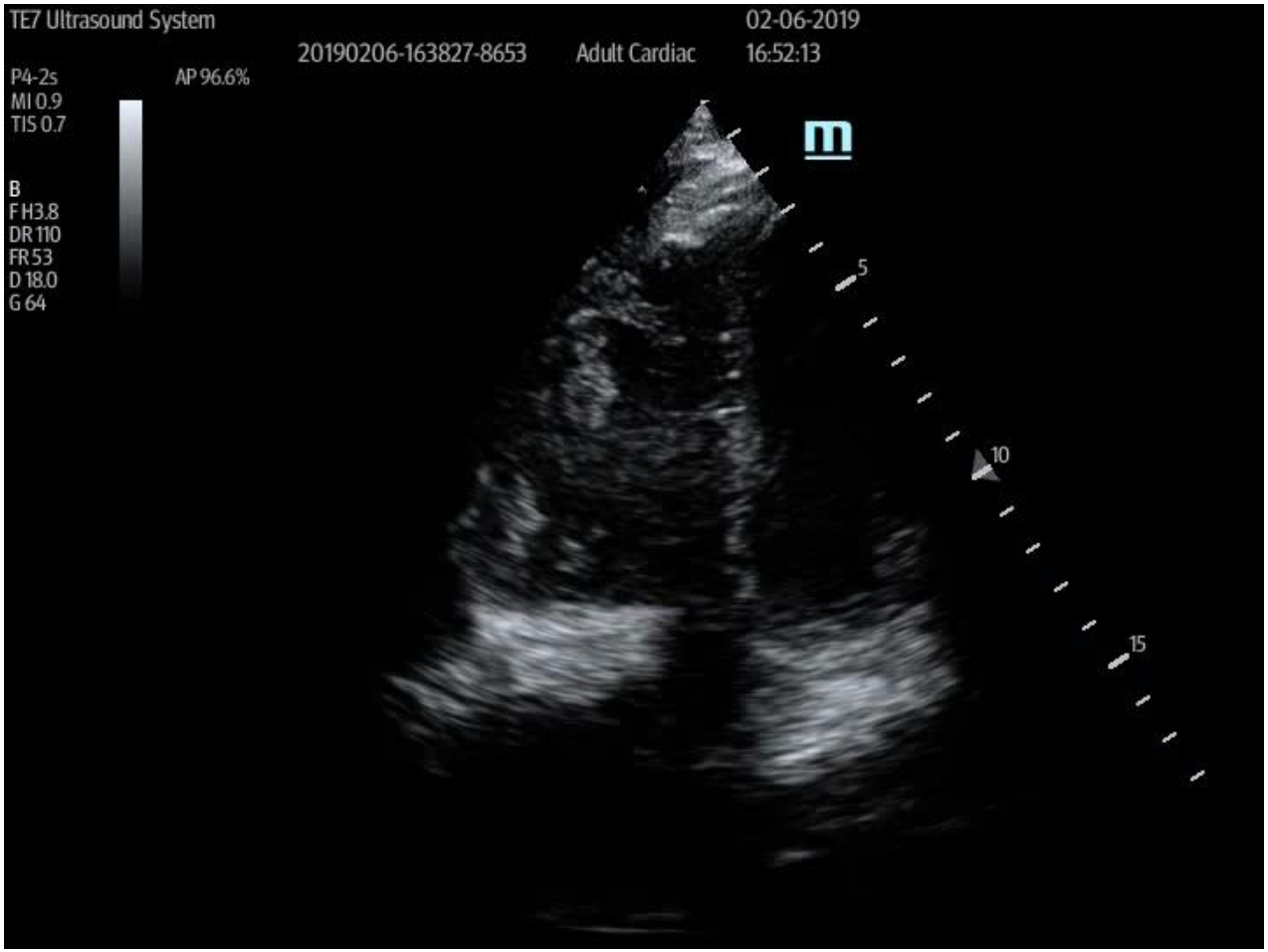
Parasternal Short



Apical 4 Chamber



Apical 4 Chamber

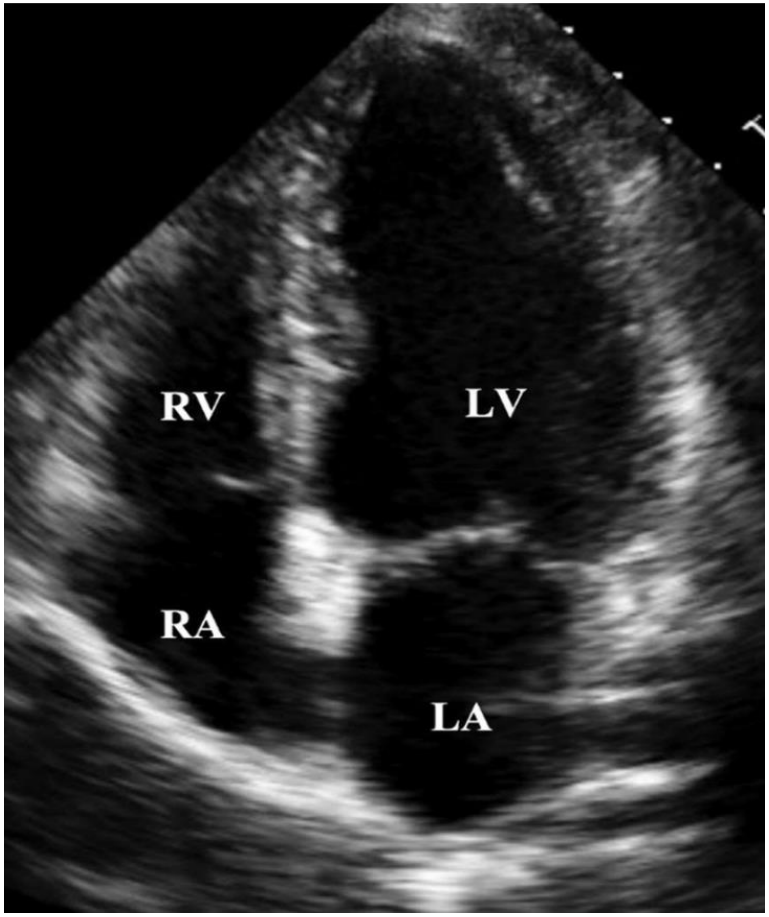


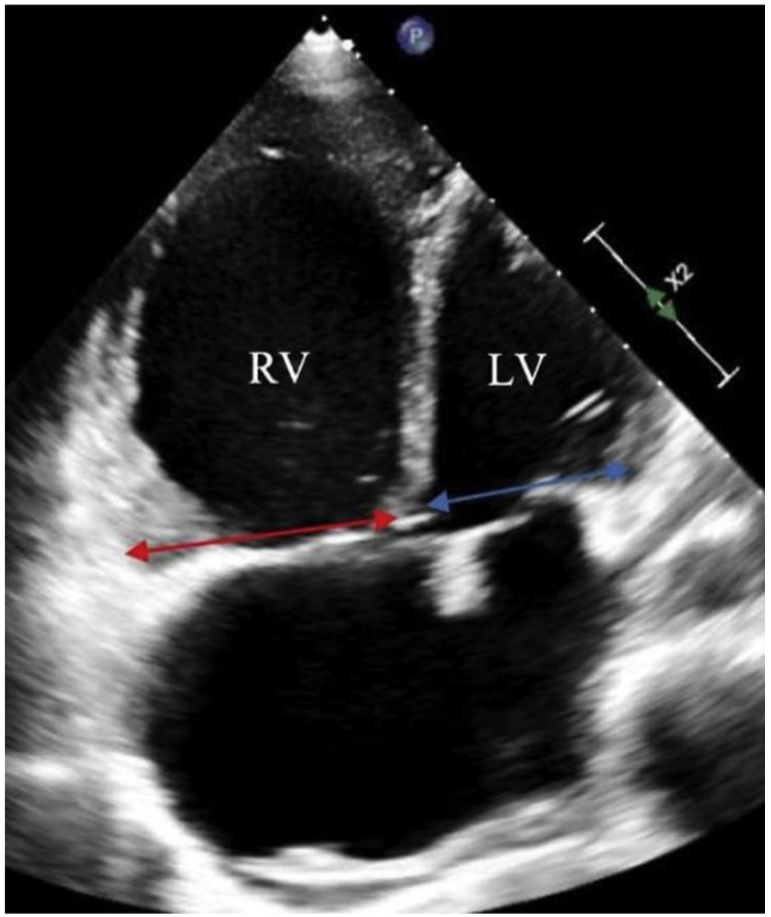
The Value of Bedside Echocardiogram in the Setting of Acute and Chronic Pulmonary Embolism

David W. Lee, MD[a], Kavitha Gopalratnam, MBBS[b], Hubert James Ford III, MD[c], Lisa J. Rose-Jones, MD[a,*]

RV Chamber Size

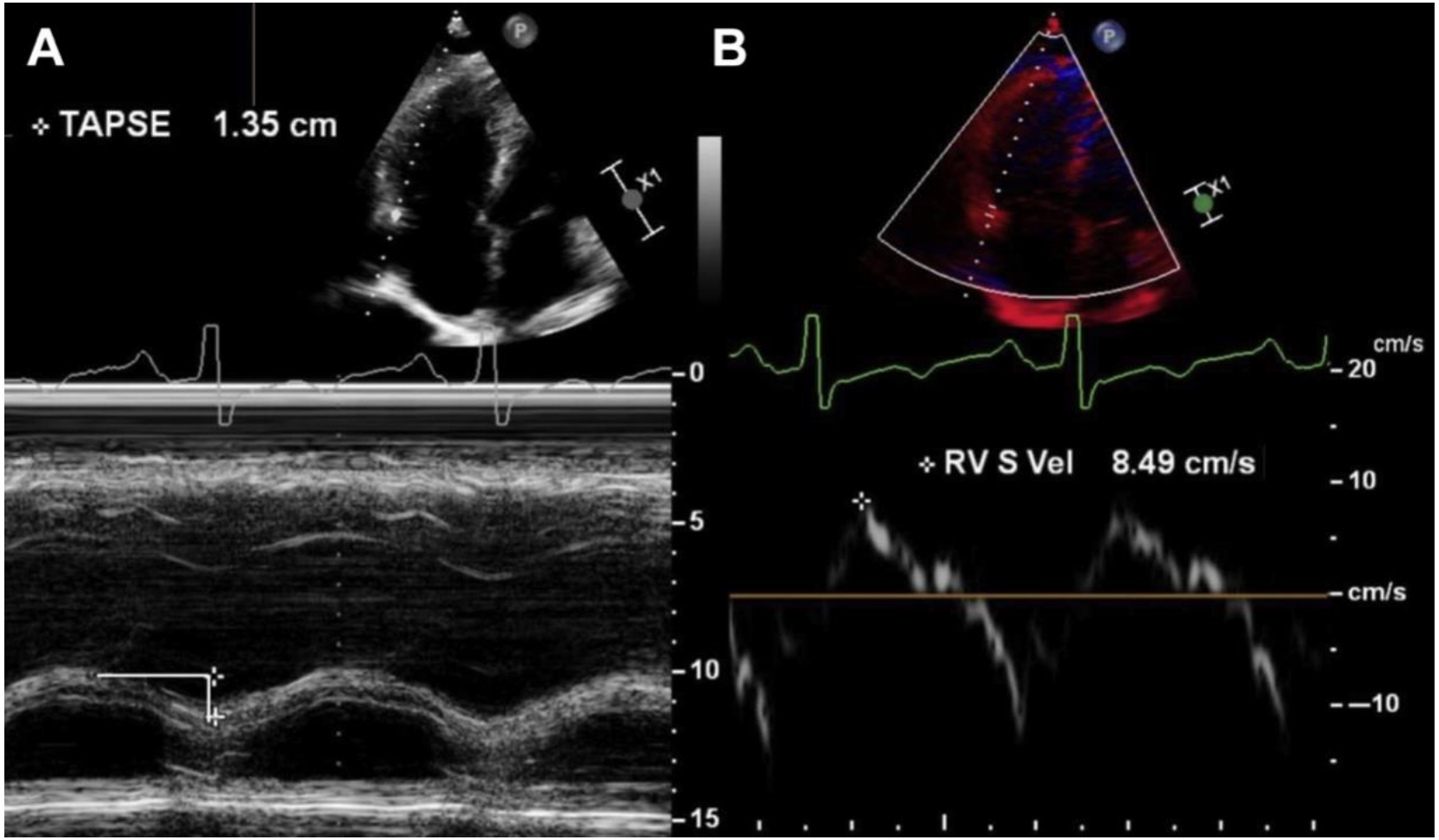
- RV/LV Basal Diameter > 0.9





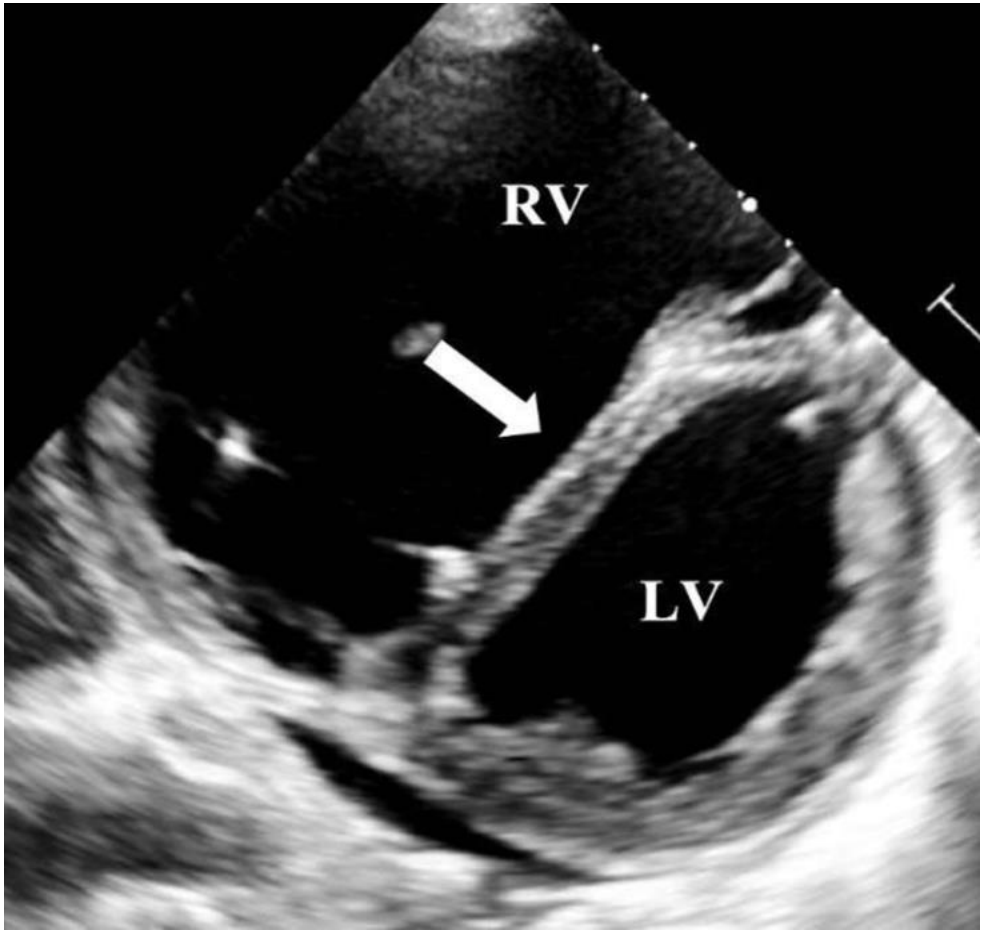
RV Systolic Function

- **TAPSE <17mm**
- **TASV <10cm/s**



RV Pressure Overload

- **“D-sign” = septal flattening in systole**



Case Presentation

- Formal TTE
  - Mildly dilated RV
  - TR Vmax 3.5 m/s
  - PASP 61 mmHg
  - TAPSE 13
  - Septal flattening c/w RV overload
  - Diastolic dysfunction with elevated filling pressure
    - E:e’ 16.1

Case Presentation

- No clear acute trigger
- Repeat CTA deferred thought of limited utility with known severe chronic thromboembolic disease
- Presenting symptoms thought 2/2 inadequate volume removal with HD vs excess pulm vasodilation and increased flow into non-compliant LV

- Improved with more aggressive HD and holding Riociguat then ultimately transitioned back to tadalafil
- Ongoing planning for pulmonary thromboendarterectomy

Weill Cornell Medicine

NewYork-Presbyterian

Sources

Lee DW, Gopalratnam K, Ford HJ, Rose-Jones LJ. The Value of Bedside Echocardiogram in the Setting of Acute and Chronic Pulmonary Embolism. *Clin Chest Med*. 2018;39(3):549-560. doi:10.1016/j.ccm.2018.04.008.