Complicated Mechanical Complications of Myocardial Infarction

Critical Role of Echo to Guide Management

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Use of Echo in the Setting of Myocardial Infarction

- Diagnosis – RWMA in setting of unclear history and ECG
- Prognostication – Pre-discharge Echo for LVEF, 40 days
- Complications
    - Thrombus
    - Mechanical Complications
    - RV infarction
    - Concomitant Heart Conditions

CASE PRESENTATION -

- Thanks to Yining XU MDCM, FRCPC

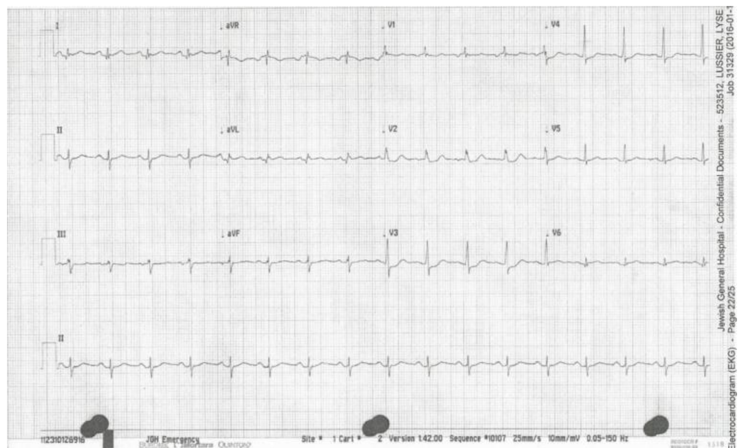
- ID: 56 F, very active, from home
- PMHX: Lt Breast CA s/p mastectomy several months prior with no chemotherapy or radiation
- Not known to have DM/HTN/DLP/CAD
- Medications: Letrizole

HPI

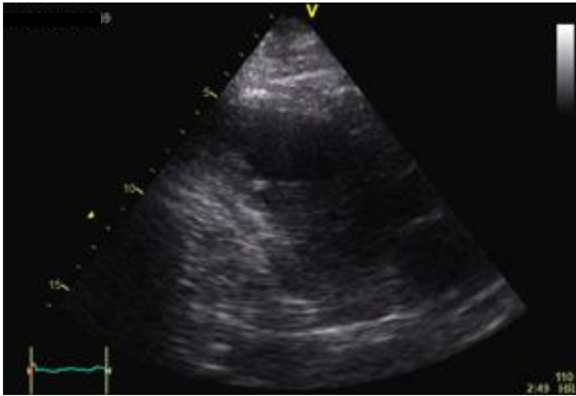
- RSCP with radiation to her throat ~ 3 minutes, 7 days ago
- Spontaneously resolved
- Next AM, progressive SOBOE, PND, orthopnea with myalgias and fatigue
- Presented to ER due to worsening dyspnea

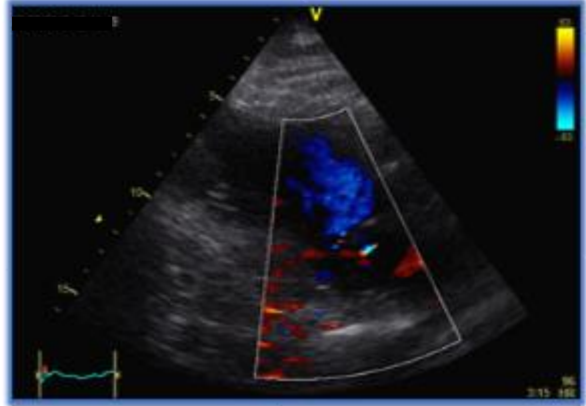
Exam and EKG

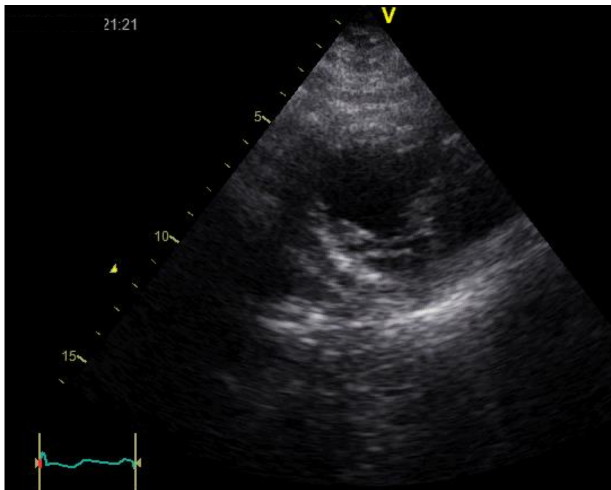
- BP: 95/60, HR 90 regular, RR 30, Sat 90% on 2L NP
- RESP: using accessory muscles, crackles up to the bilateral upper lung zones
- CVS:
  - JVP elevated at 13 cm H_2O
  - Normal S1 S2, Holosystolic murmur grade II/VI radiating to axilla

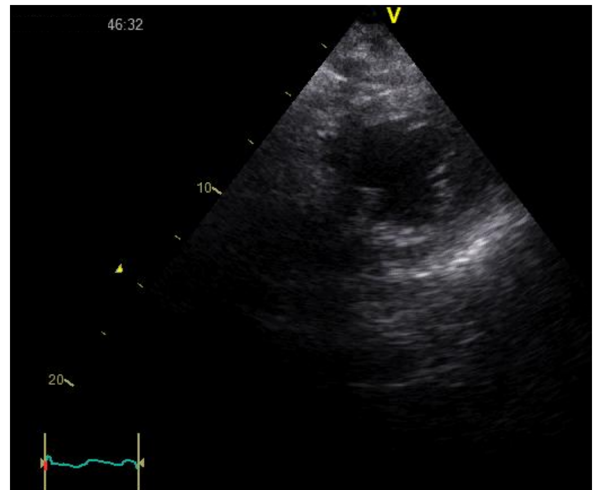


STAT BEDSIDE TTE to stratify need for emergent cath – limited windows due to persistent left chest pain and bandages post-mastectomy









- Echo confirms diagnosis of LCx STEMI with preserved overall LV EF and significant (> mild-moderate) MR

LABS

- Initial High Sensitivity Trops 1180 nmol/l
- Normal CBC, Lytes, Kidney functions, TSH

- DX: Late presentation ACS (Kilip class 2) with Ischemic MR

Plan:

- ASA/Plavix/IV Heparin, Oxygen
- Diuresis with IV Lasix
- Markedly improved within an hour (BP 110, HR 80, O_2 sat 95%), so…
- Angiogram in AM

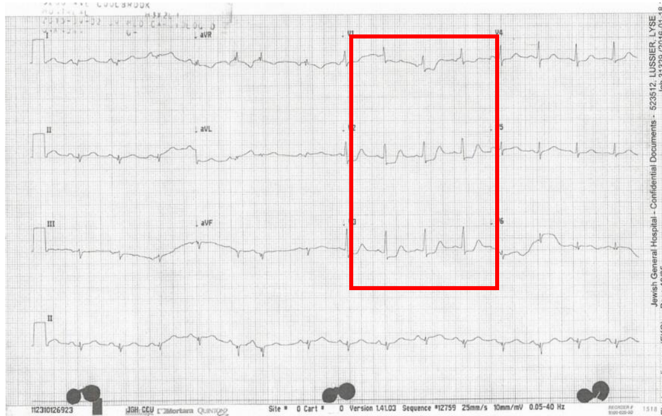
NEXT MORNING …

- Diuresed 2 L overnight
- Pre AM rounds: lying flat, conversing pleasantly with staff

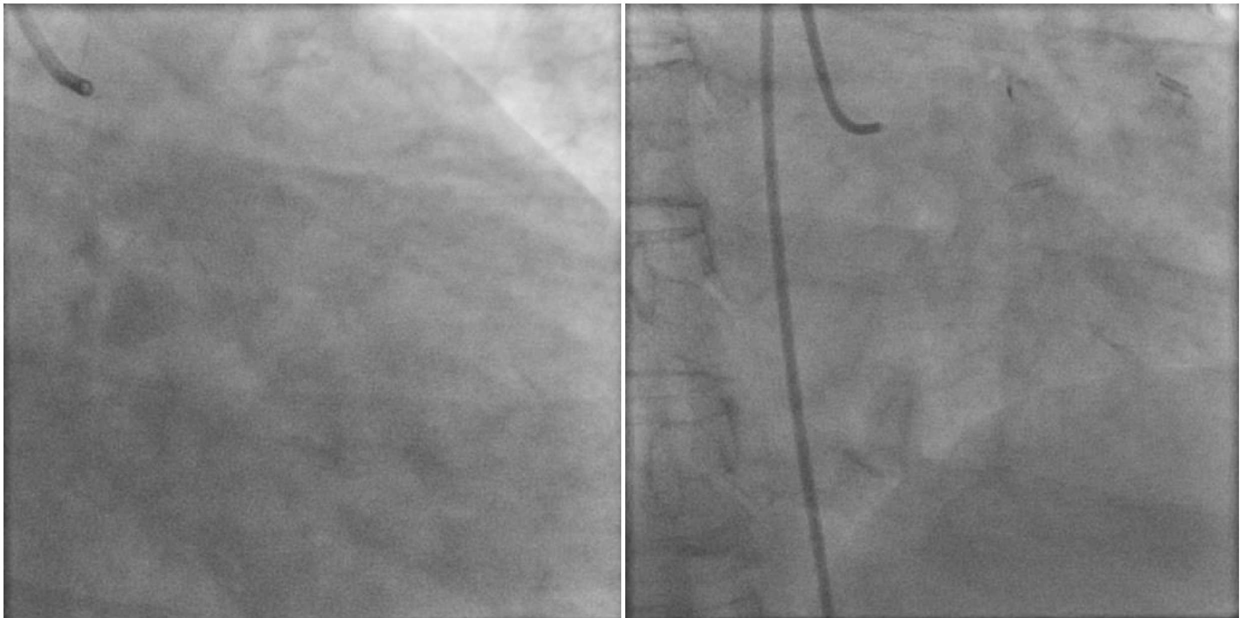
- But then…

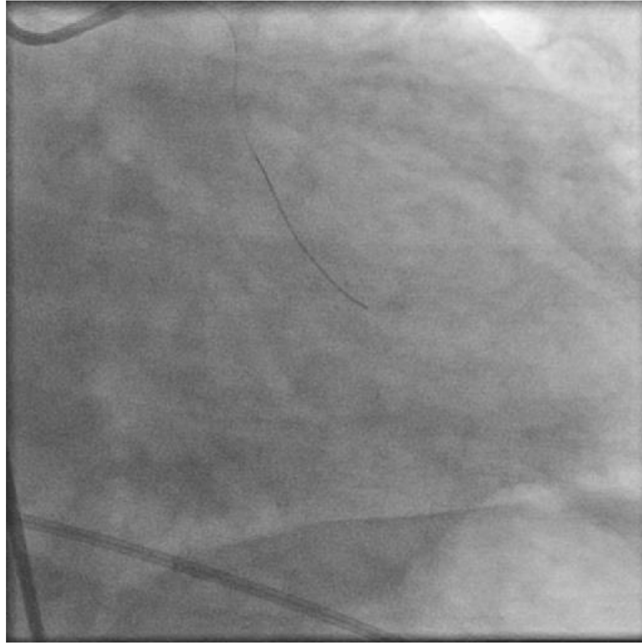
- Oxygen desaturation to 75% on room air.
- SBP 75 mmHg with worsening SOB, HR 120

DDx – Pump (R, L, Valve, Pericardium)

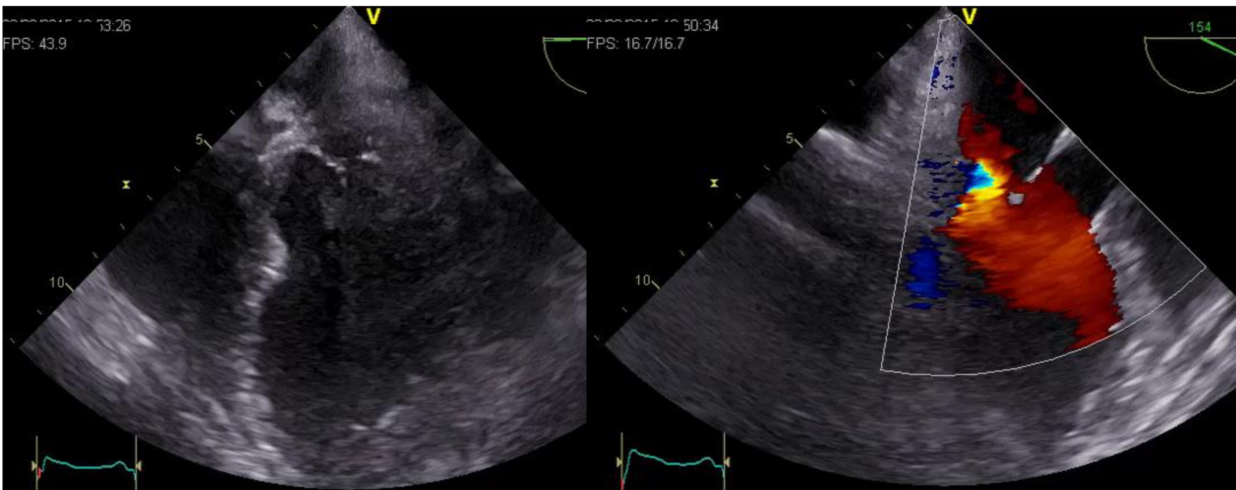


- Intubated and Supported with Norepinephrine
- STAT Bedside Echo: No gross pericardial effusions
- Brought STAT to Cath Lab
- Planned TEE during Cath to rule out MR from papillary muscle rupture



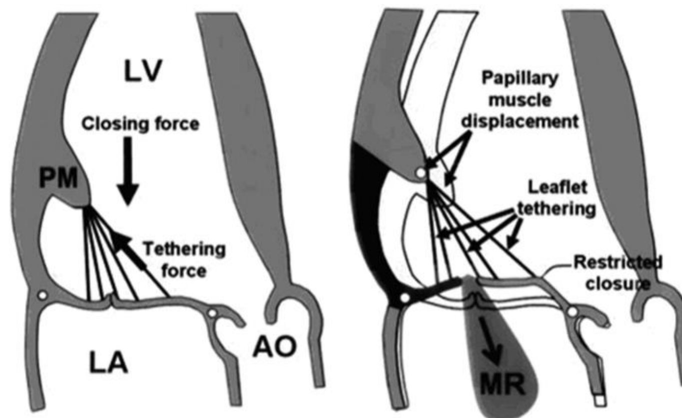


TEE DURING ANGIOGRAM



- TEE Confirms localized LCx territory WMA with > moderate Carpentier 3b MR.

The Importance of the Left Ventricle Form and Function



- Plan:
- Urgent OR: CABG + Mitral valve replacement
  - Why Not PCI, Why replacement?

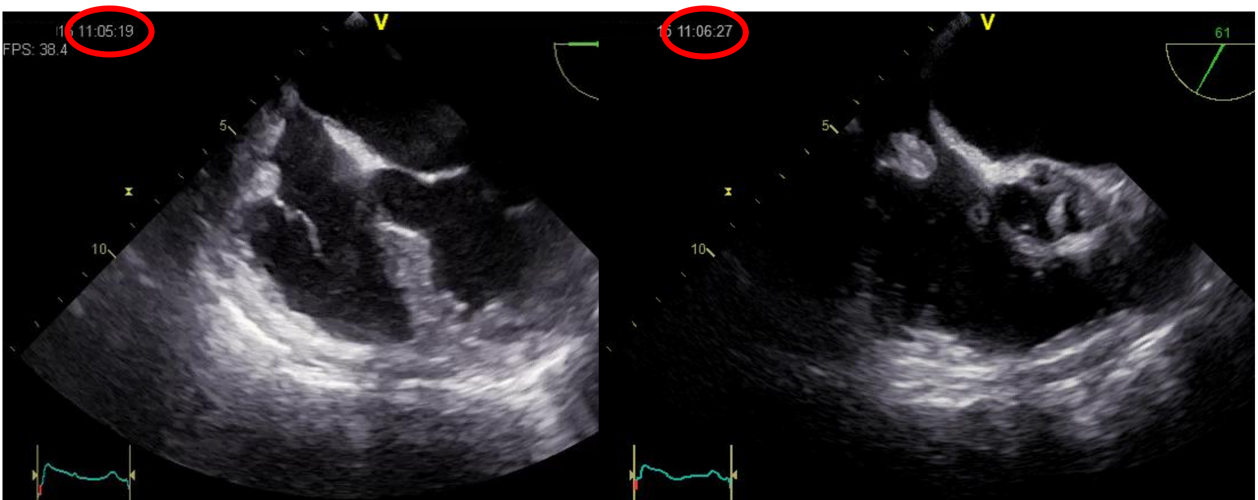
- While the Angiographer was deploying the access site closure device…

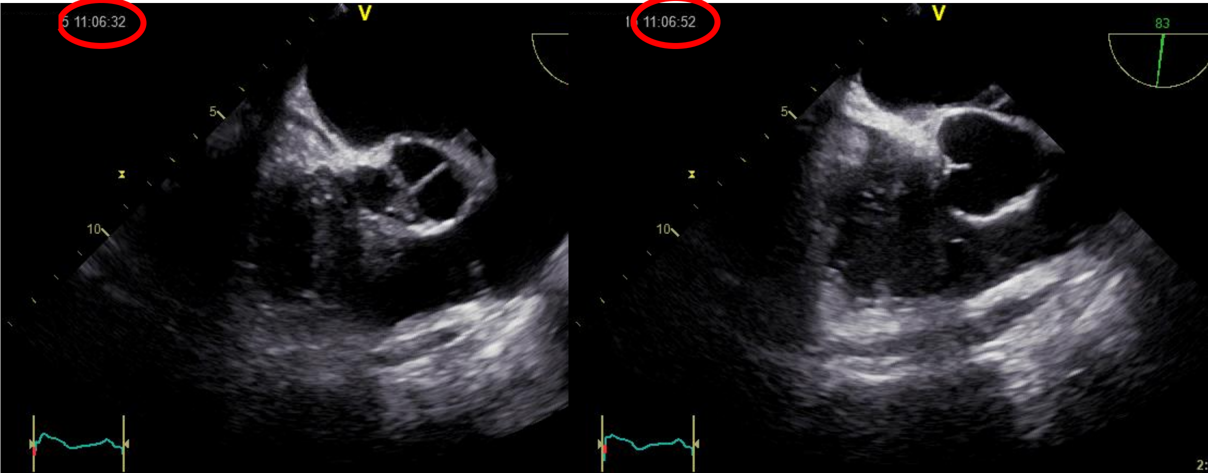
- SBP dropped to 75 mmHg

DDx?

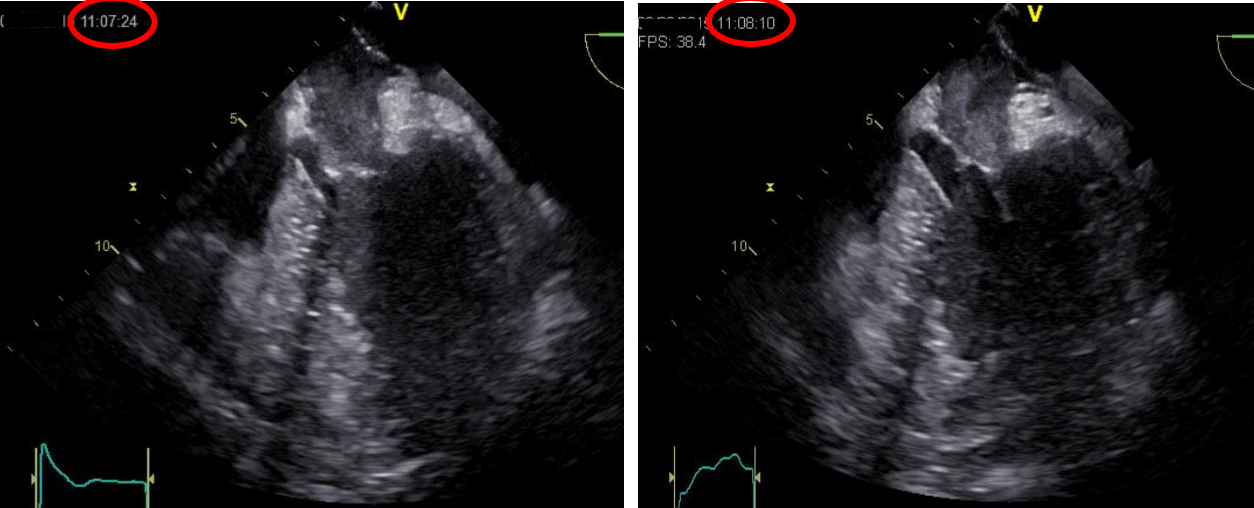
- **Coronary Perforation – wire passed**
- **Other…**

I have no idea why the probe was still down…

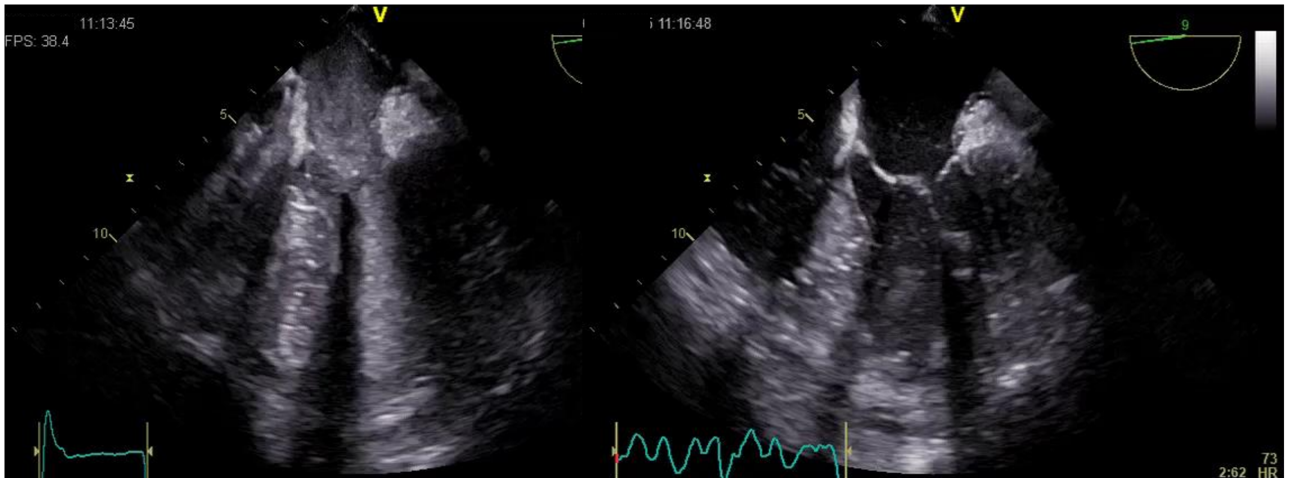




"Dom, She's about to arrest…"

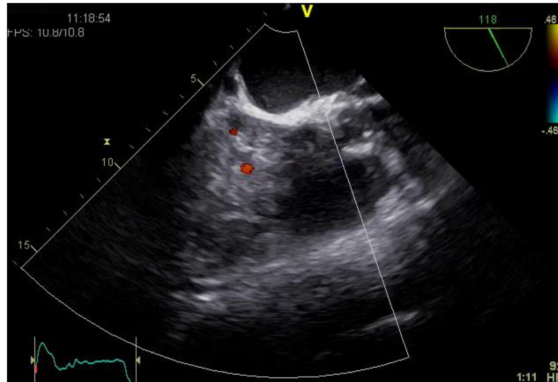


WHY DO WE DO CPR?



- No aortic dissection seen on TEE
- ?Coronary perforation: No dye leak on reinjection
- LV free wall rupture suspected

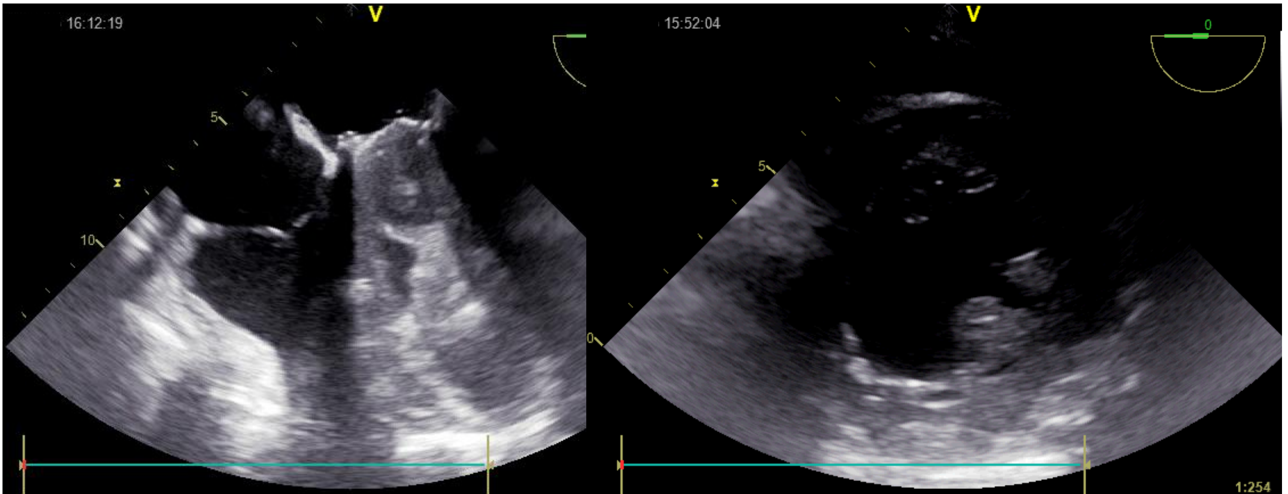
Can we actually see the rupture?



EMERGENT OR

- PEA arrest
- Emergent Pericardiocentesis: Fresh Blood
- To OR ~ 20 minutes with ACTIVE CPR until on pump
  - Left ventricle lateral wall perforation was patched with autologous pericardial patch occluding OM 1
  - CABG X 3 (OM2, OM3, RCA)
  - Mitral Valve Replacement
    - Posterior leaflet severely tethered

INTRA-OP TEE



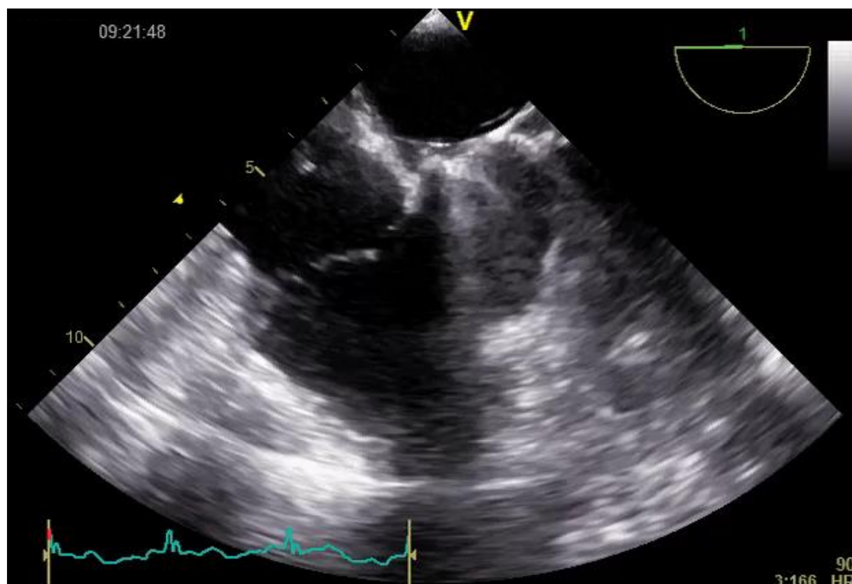
ICU COURSE:

- Admitted to ICU with Levo 40, Epi 28, Vaso 0.04, iNO with IABP 1:1
- POD #1, off propofol, responsive to commands
- Hypotensive on **large doses of** vasopressors

Echo – Post-op

- Tamponade, Tamponade, Tamponade
- LV pump failure
- RV pump failure
- Valvular dysfunction
- Dissection

POST OP DAY 1 – Low C.I.



POST OP COURSE

- RV Failure
- Ventilator Associated Pneumoni
- AKI requiring temporary CVVH

- POD #30: discharge to rehab center (No neurological deficit)

Complications of MI – Be Systematic Including Critical Role of Echo

- MR – ruptured papillary muscle, but don't forget remodeling and tethering
- Free wall rupture
- Acute VSR
- RV dysfunction – in this case, related to difficulty in protecting the RV intra-op, especially with long OR
- Systematic approach, close collaboration (cath, echo, surgery, CVICU, ICU…), and a little luck is necessary