COMPLICATIONS OF LATE PRESENTATION MI

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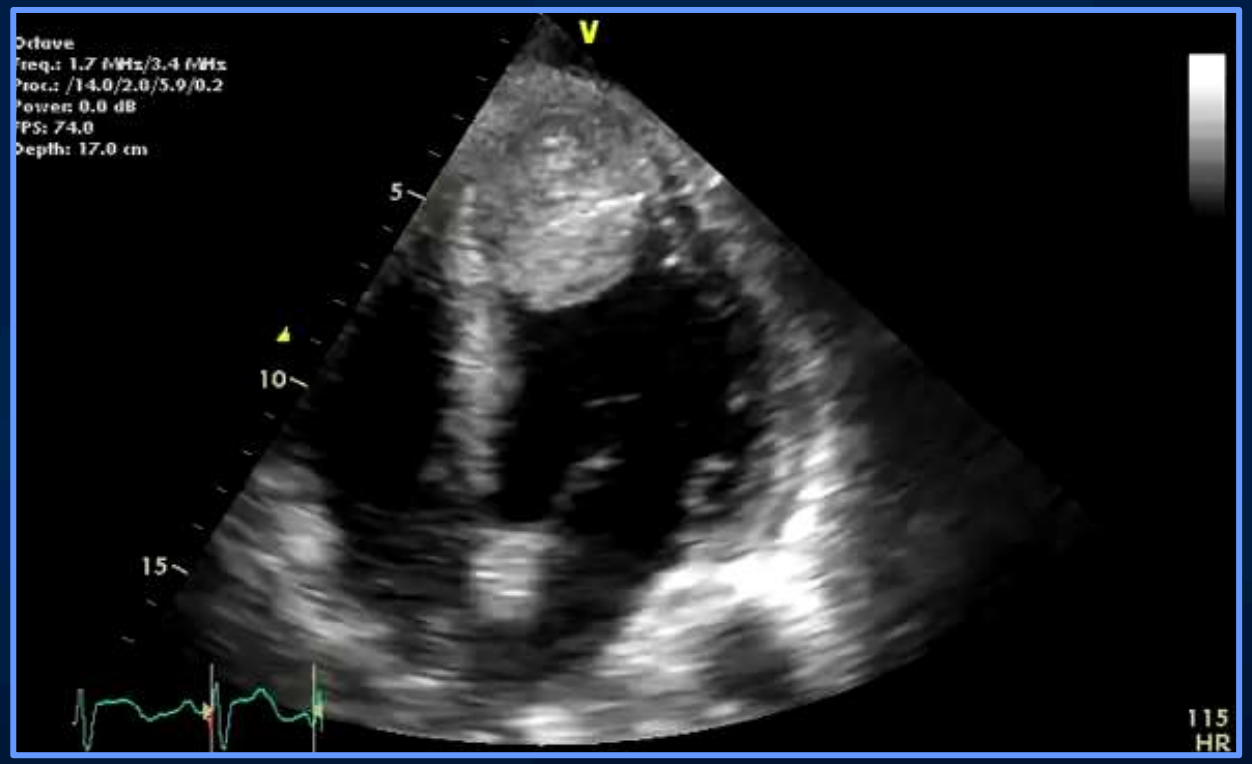
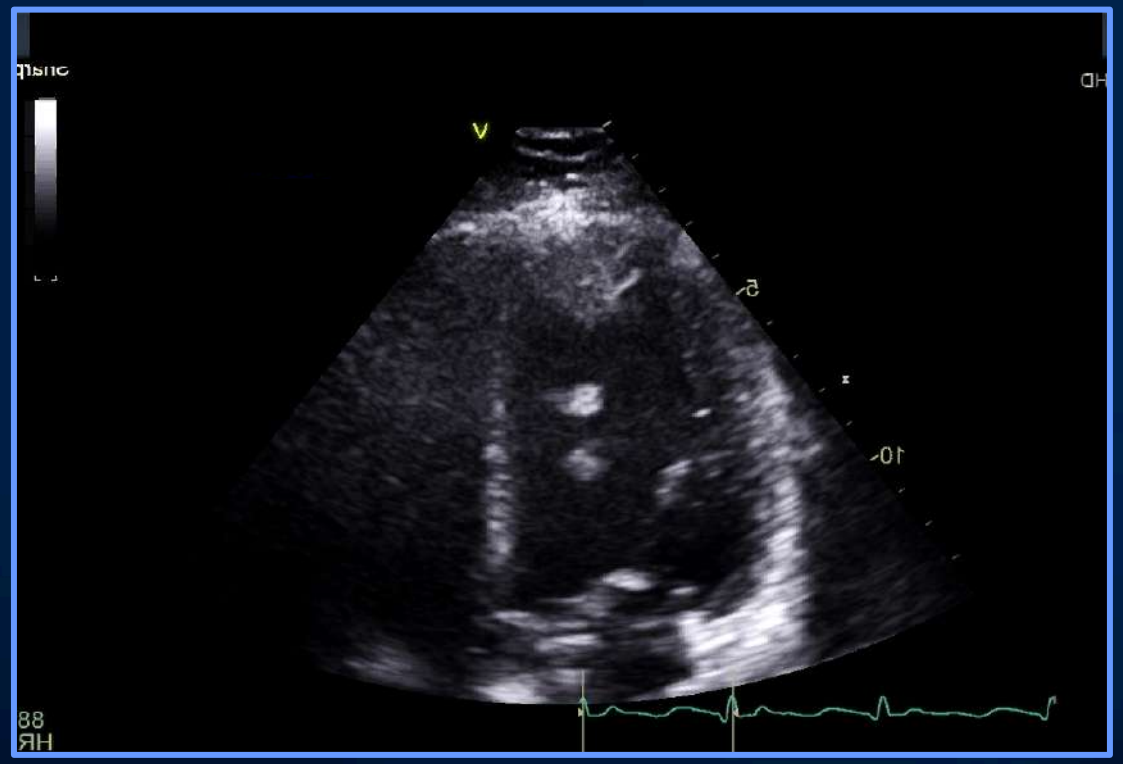
NO DISCLOSURES

Complications of MI

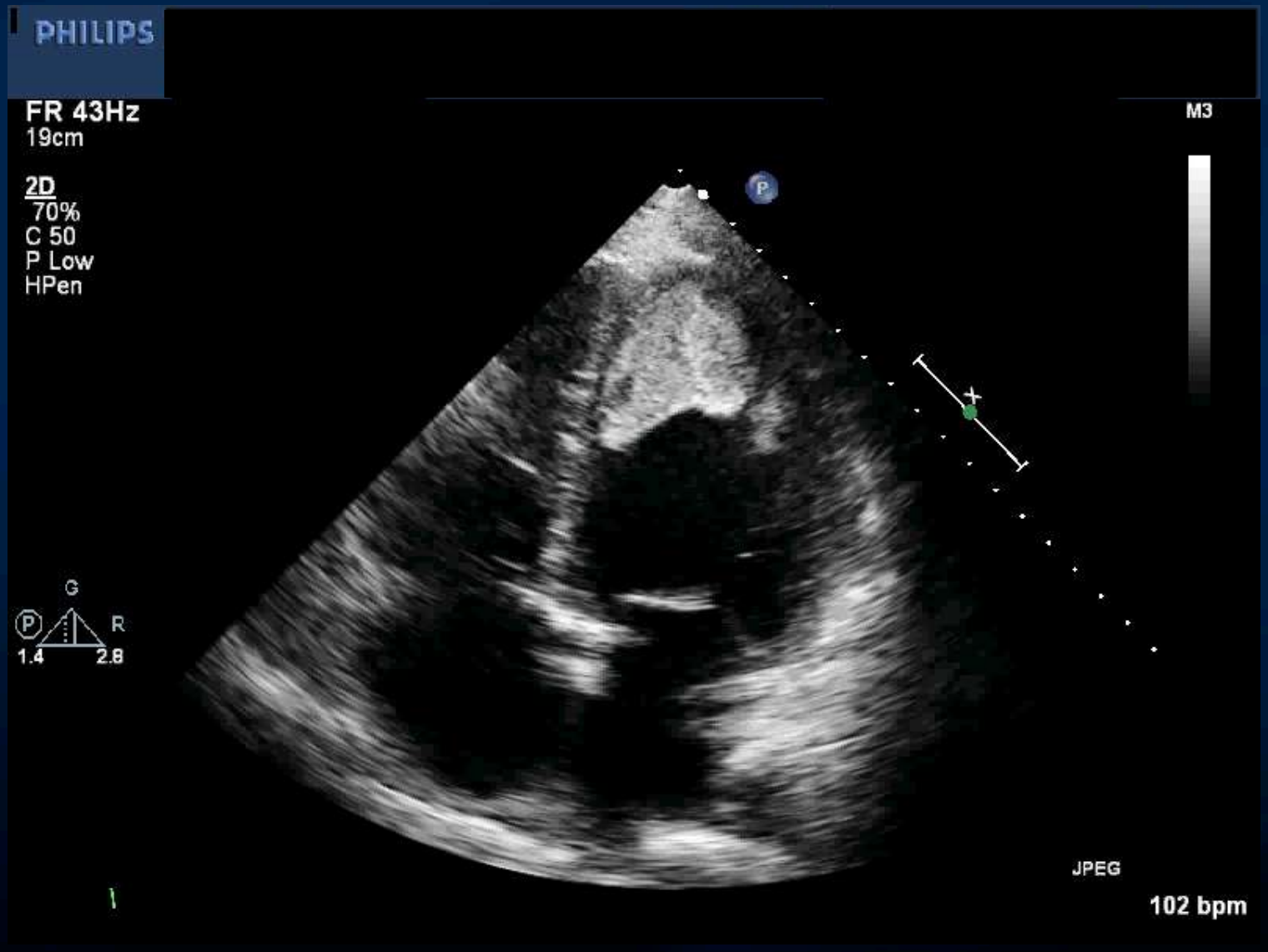
- Contractile dysfunction
  - Cardiogenic shock
  - Ischemic cardiomyopathy
- Arrhythmias
- **Myocardial rupture**
- **Papillary muscle dysfunction/rupture**
- Pericarditis/effusions
- **Mural thrombus**
- RV infarct
- **Aneurysm**
- **VSD**
- Infarct expansion
- Sudden death

LV Thrombus Post-MI



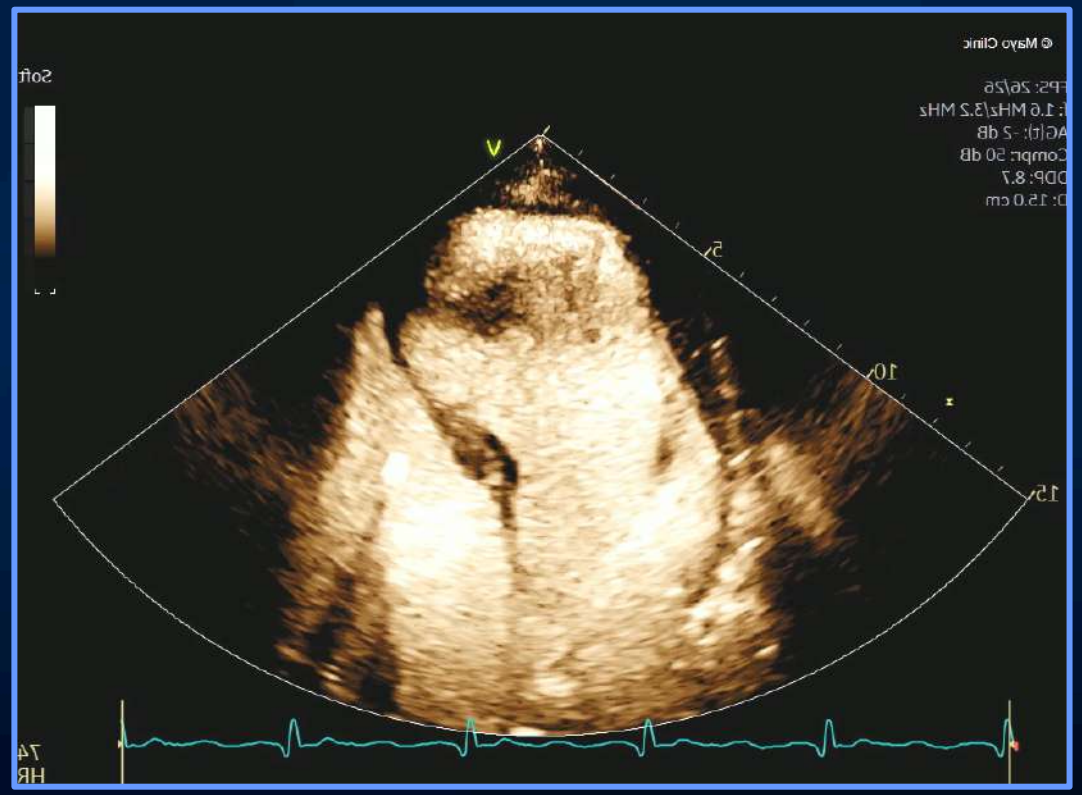


- Static flow in region of akinesis or dyskinesis (apical location most commonly)
- Reduced EF (<30%)
- Risk of Emboli
- Differentiate from trabeculation (multiple planes)


PHILIPS
FR 43Hz
19cm
2D
70%
C 50
P Low
HPen
M3
G
P
R
1.4
2.8
JPEG
102 bpm

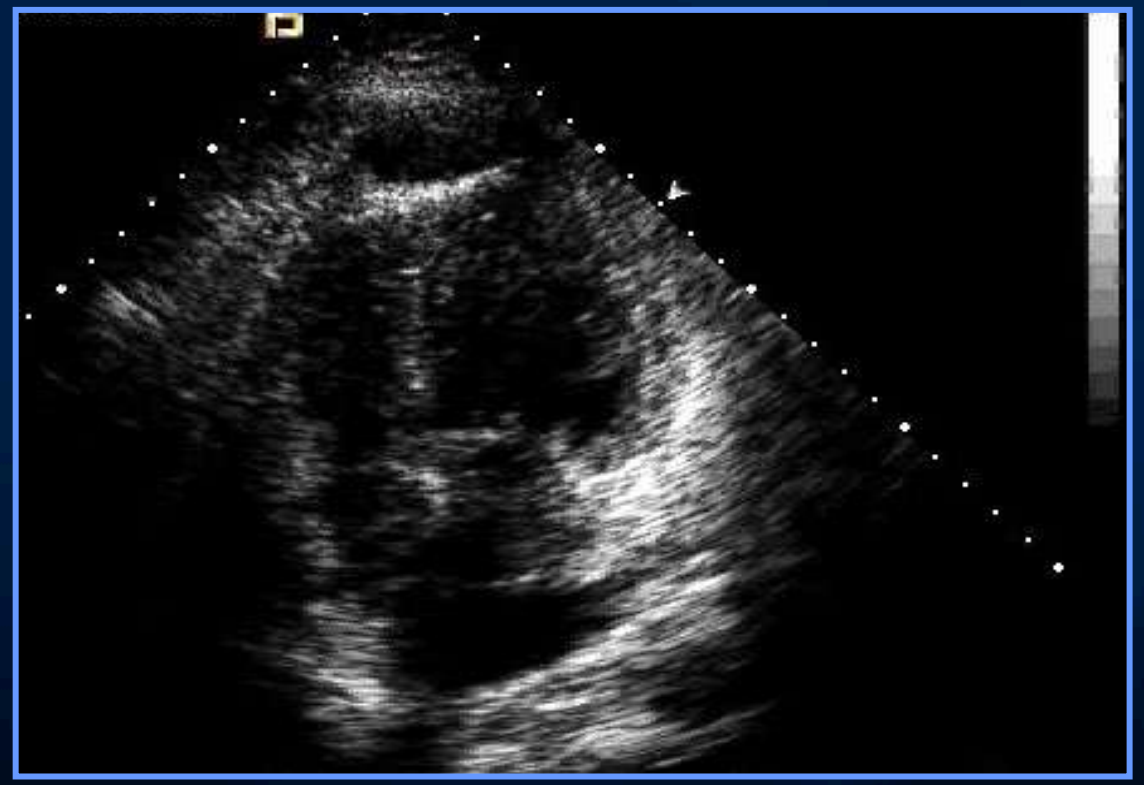
LV Aneurysm vs Pseudoaneurysm

LV Apical Aneurysm



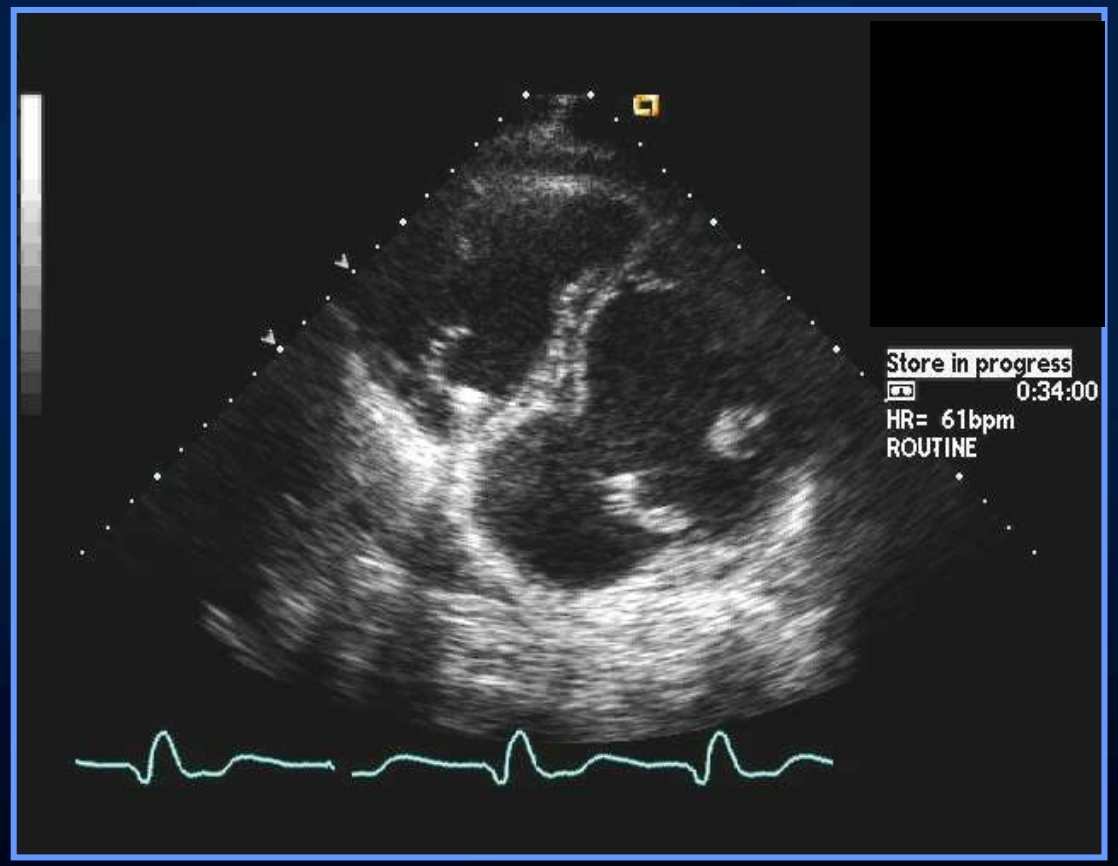
- Wide neck with larger ratio of diameter of entry to maximum cavity

LV Apical Pseudoaneurysm

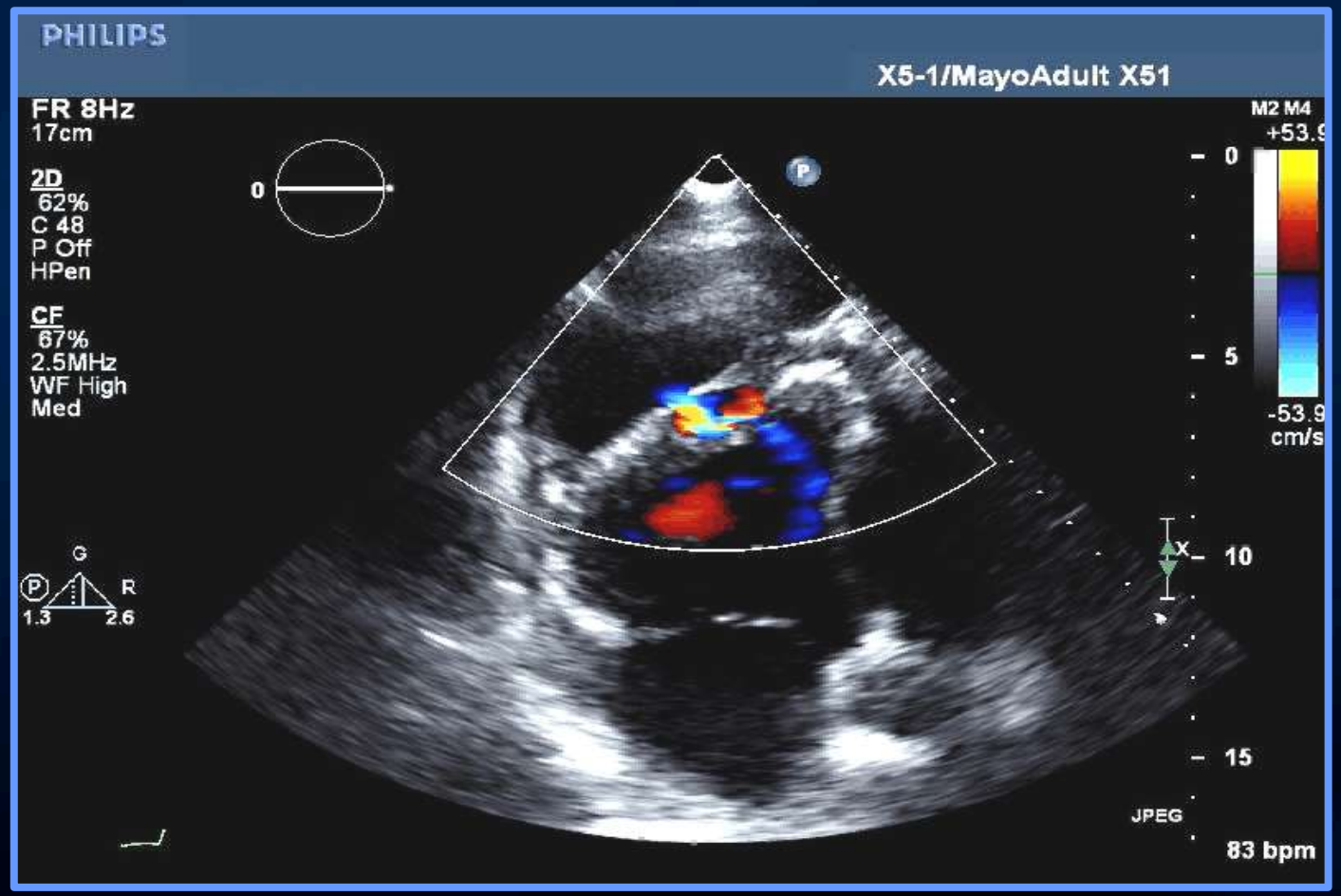


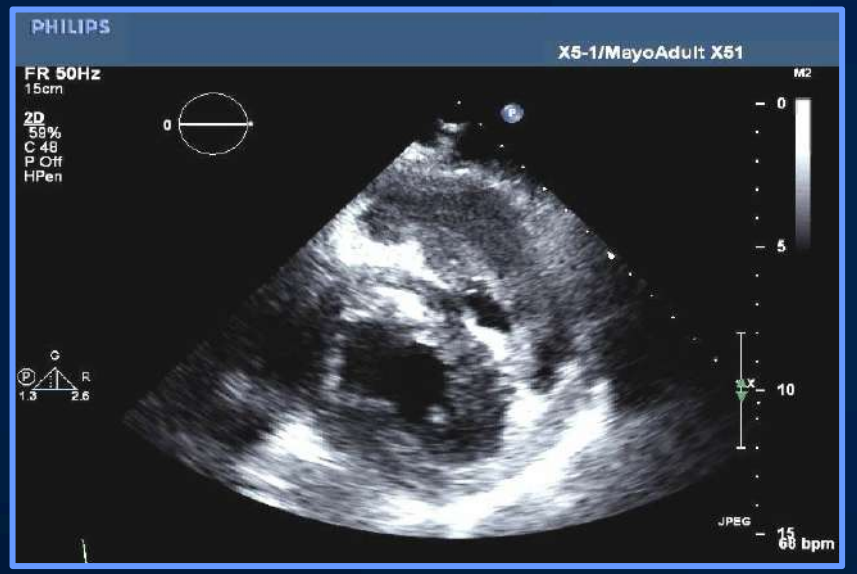
- Small neck communication
- Ratio of diameter of entry to maximum cavity < 0.5

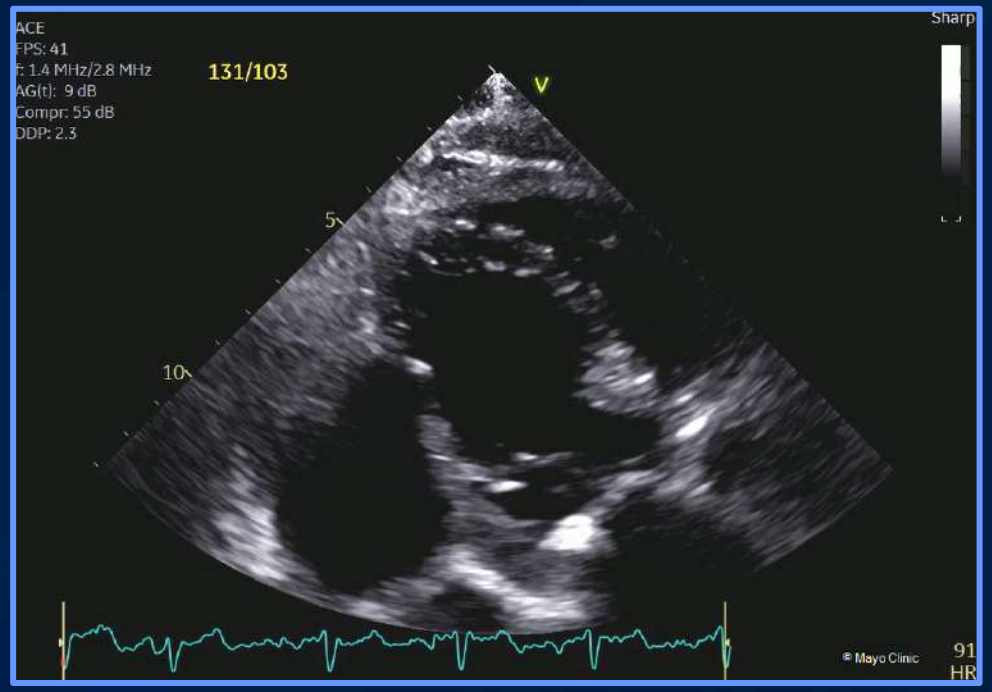
“Pseudo-Pseudoaneurysm” → LV Aneurysm

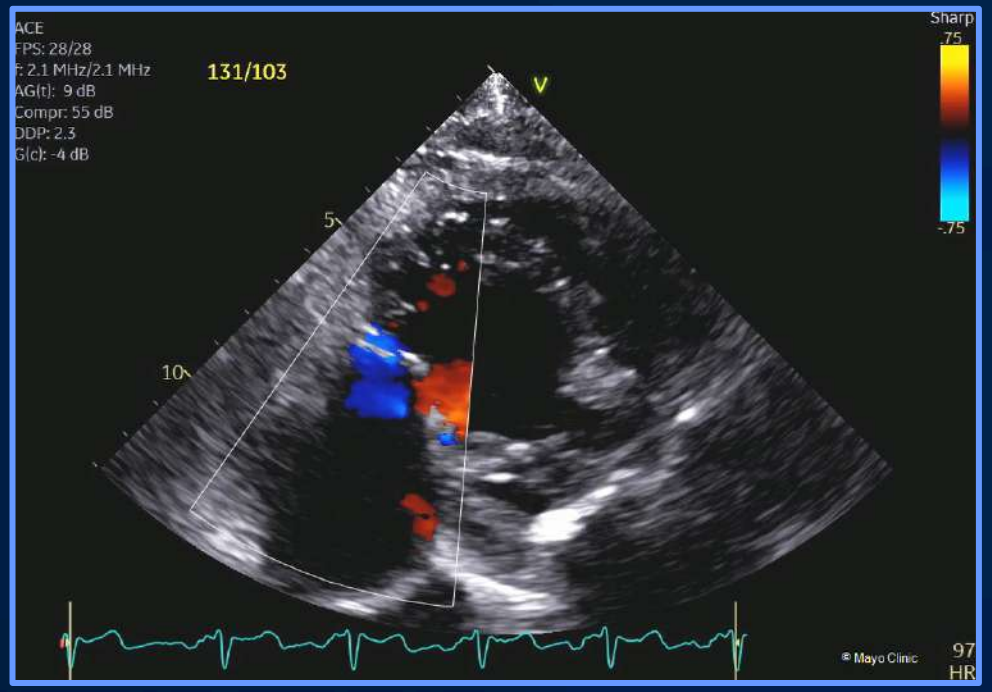


LV Pseudoaneurysm: “Too and Fro Flow”






ACE
FPS: 41
F: 1.4 MHz/2.8 MHz
AG(t): 9 dB
Compr: 55 dB
DDP: 2.3
131/103
Sharp
5
10
© Mayo Clinic
91
HR


ACE
FPS: 28/28
F: 2.1 MHz/2.1 MHz
AG(t): 9 dB
Compr: 55 dB
DDP: 2.3
G(c): -4 dB
131/103
Sharp
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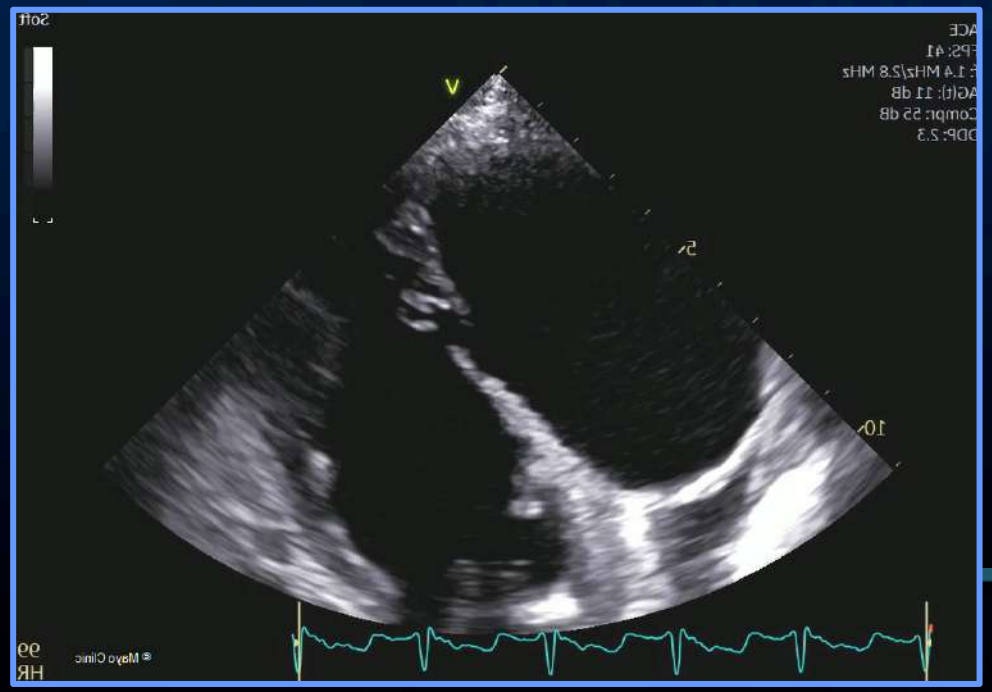
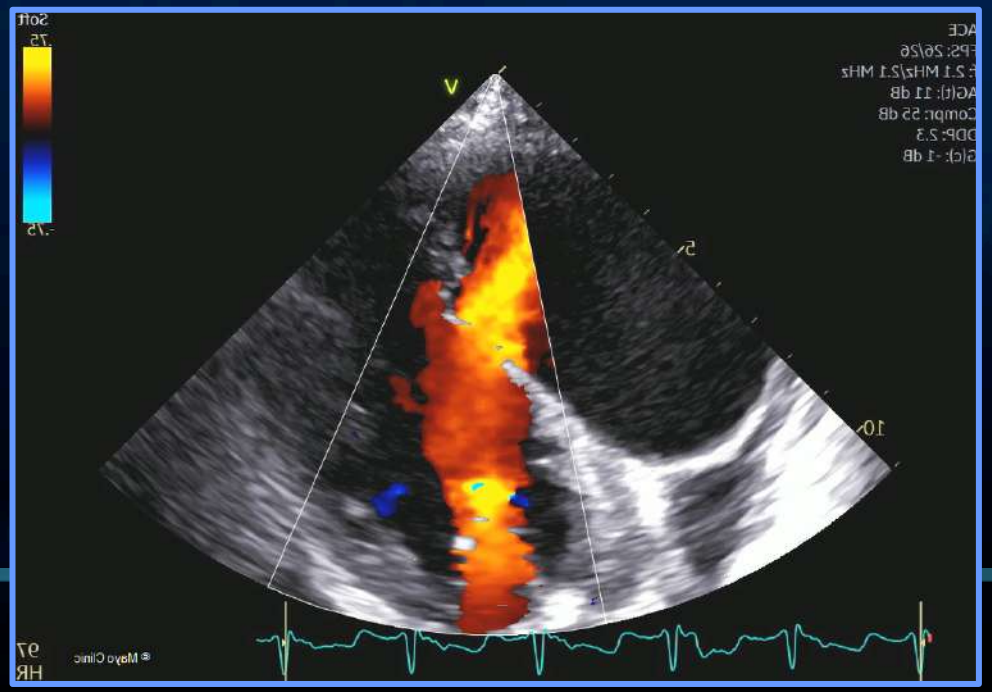
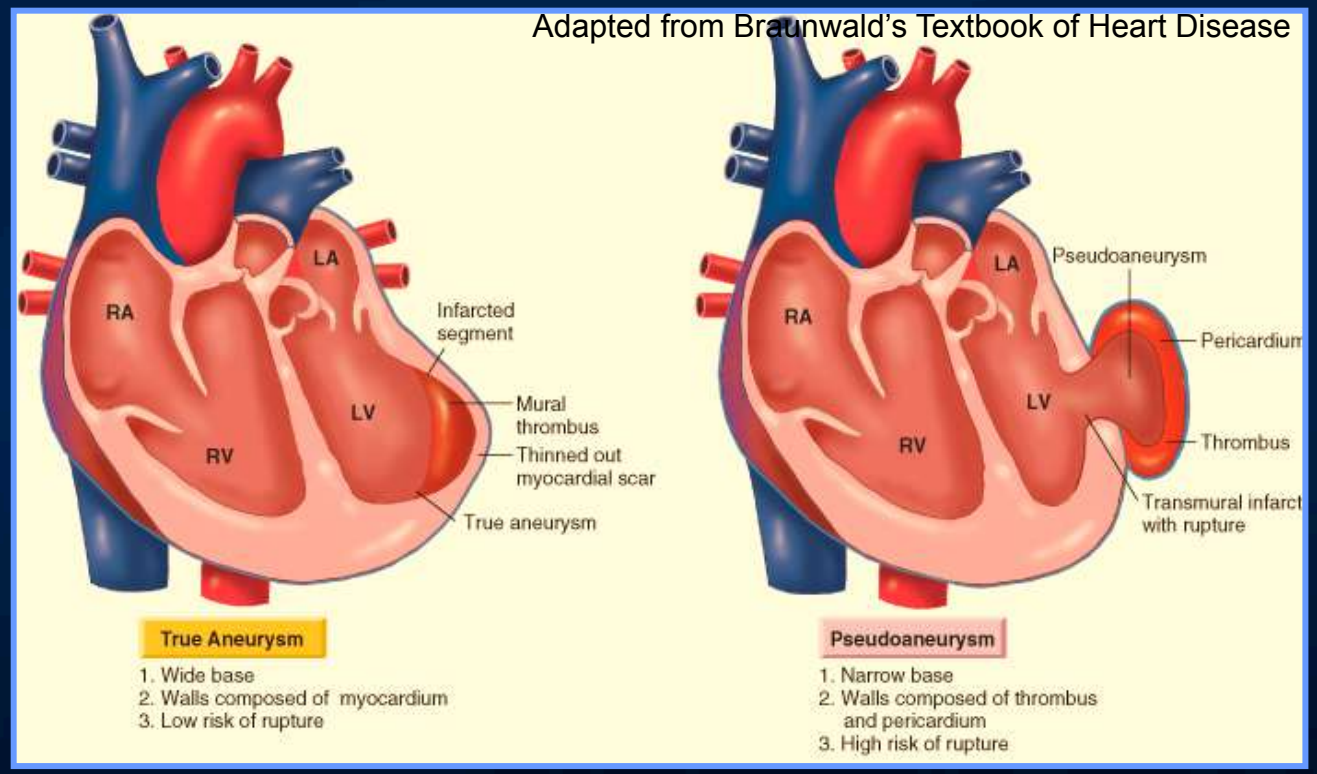
© Mayo Clinic
97
HR





LV Aneurysm vs Pseudoaneurysm



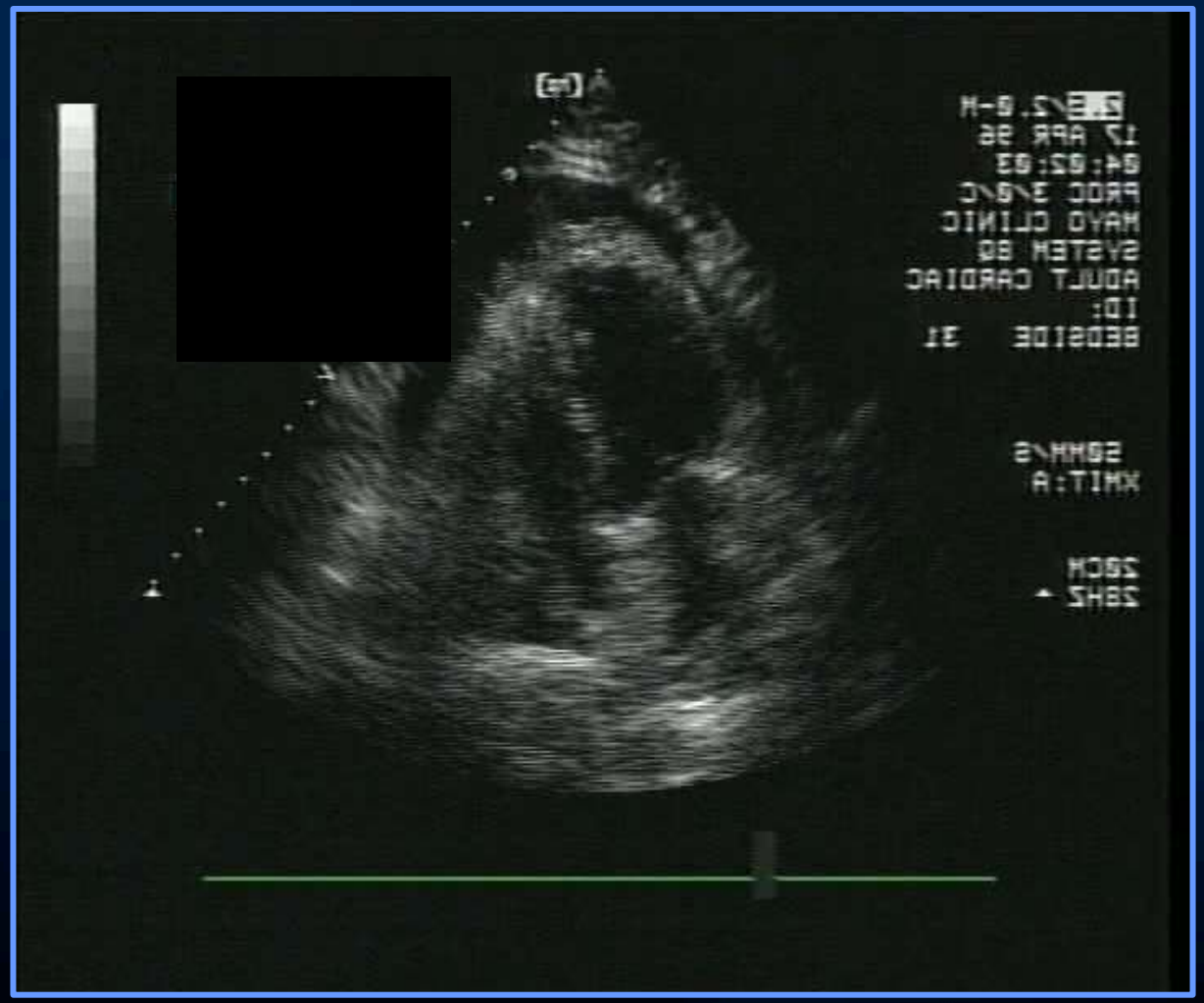
- All 3 layers of myocardium (epicardium, mid-myocardium, and endocardium are present; fibrotic scar)
- Only the pericardium is keeping blood in the ventricle

- Post-MI LV aneurysm is caused by scar formation resulting in thinning and expansion of the myocardium → usual treatment is conservative unless refractory angina, heart failure or ventricular arrhythmia
- Post-MI LV pseudoaneurysm occurs when a rupture of the LV free wall is contained by overlying, adherent pericardium → usual treatment is urgent surgical repair

Case

- 78-year-old female
- Presented with chest pain and evidence of “NSTEMI” by biomarkers
- EKG - nonspecific
- Echocardiogram: Preserved EF, lateral HK
- Cath: occluded diagonal, 70% RCA and LCx → planned medical tx
- Worsening dyspnea and atypical chest pain 48 hours after admission

Stat Echo

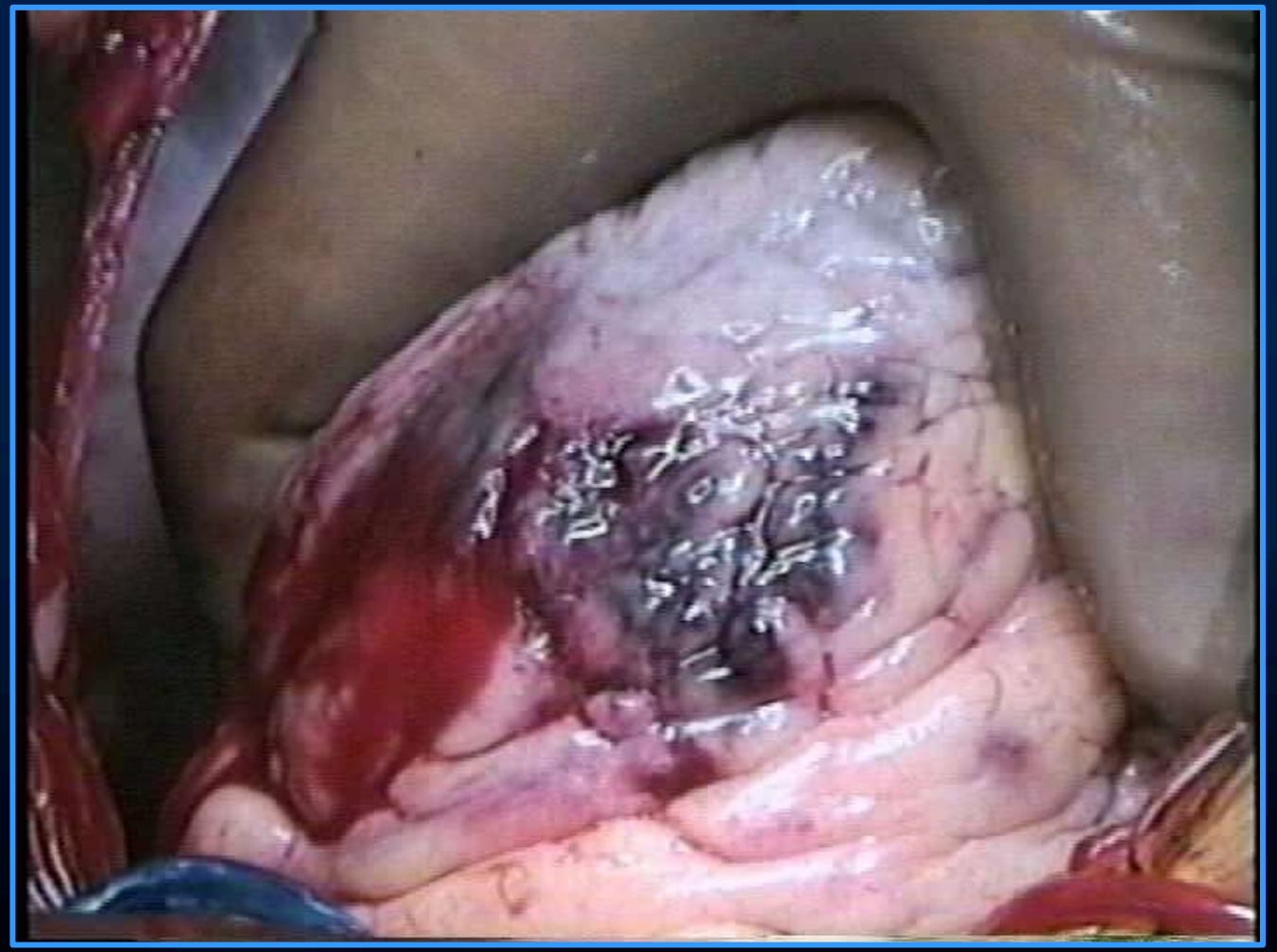


Taken Emergently to OR

Myocardial Free Wall Rupture

30-40% of patients may have “subacute” free wall rupture

- -Hypotension
- -Nausea/emesis
- -Pericardial chest pain



Myocardial Free Wall Rupture

- Rare, but potentially fatal, complication of acute myocardial infarction, requiring prompt surgical intervention
  - Occurs in approximately 1% of MI's
    - Accounts for up to 8-17% of deaths
    - More common in women, hypertensive and older patients
    - Single CAD
    - Coagulum in pericardial space
    - Usually, no clinical warning signs
    - Sudden death

Lorusso R et al. *J Am Coll Cardiol* 2024;83:1902-1916

Myocardial Rupture → Tamponade → Death

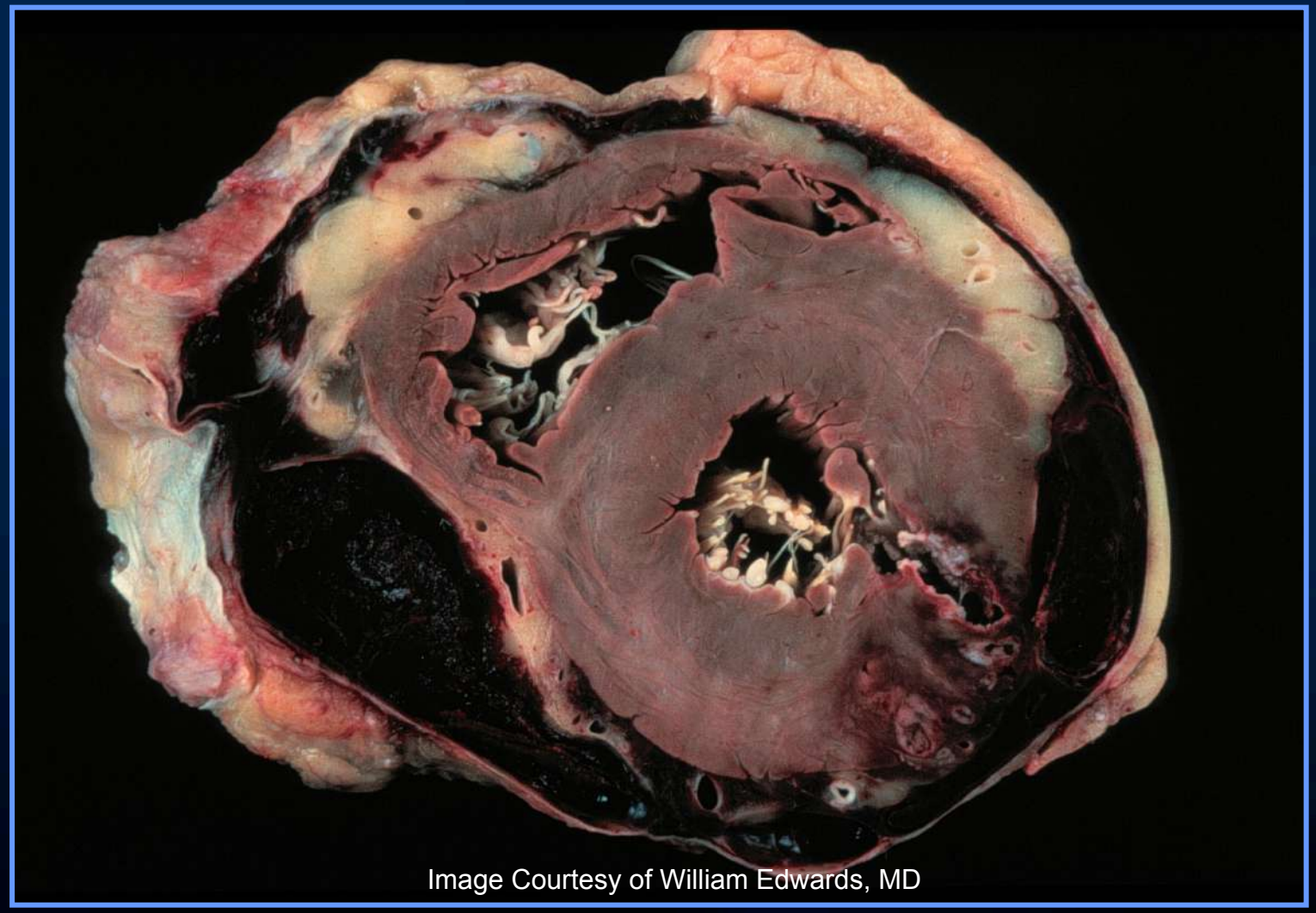
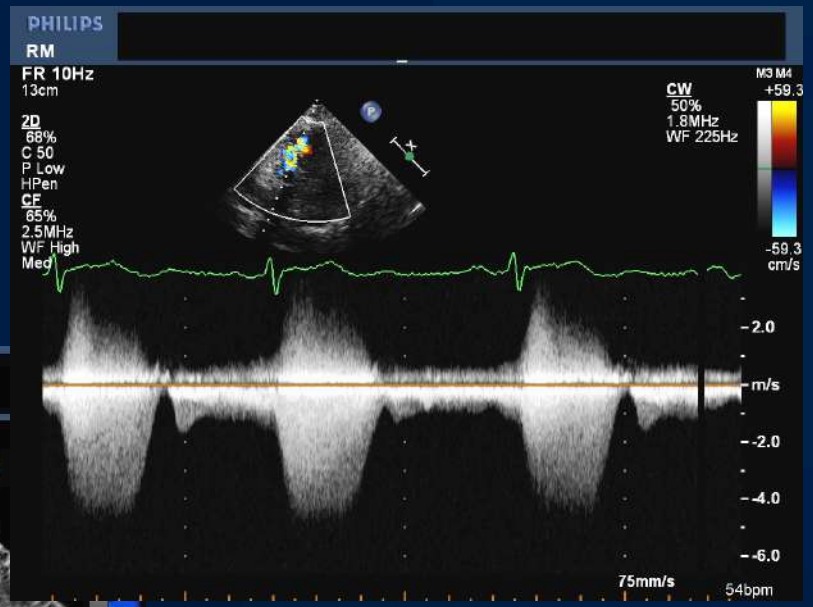
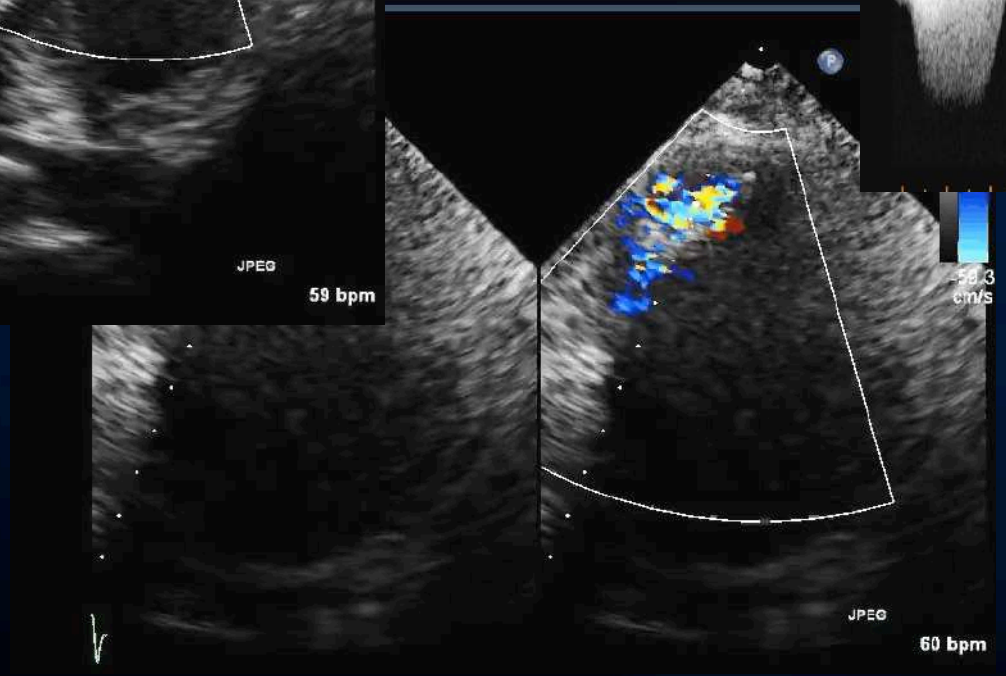


Image Courtesy of William Edwards, MD

Post-MI Ventricular Septal Defect (Rupture)

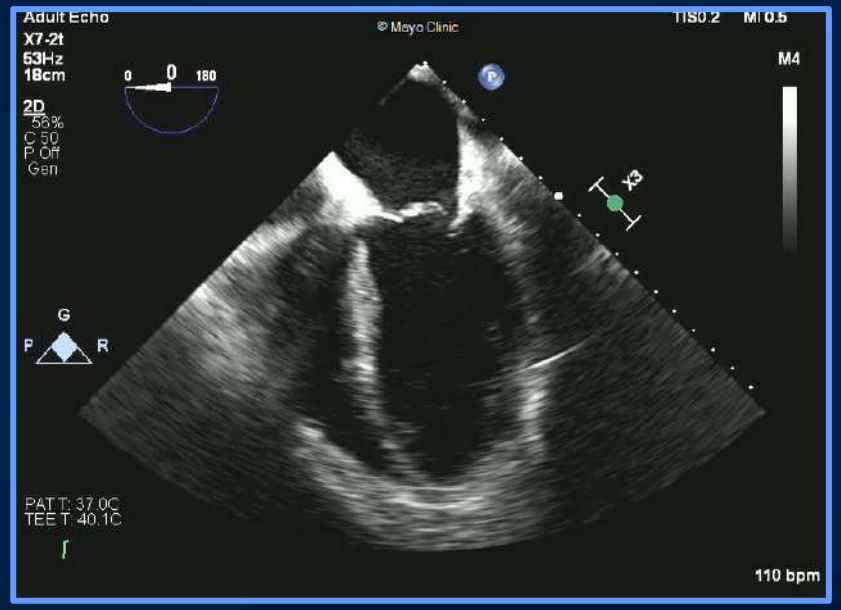


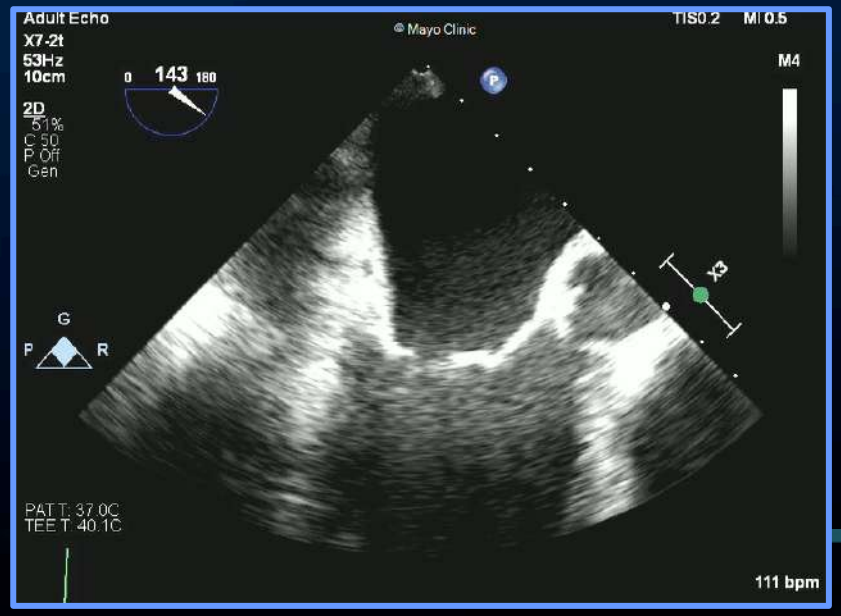


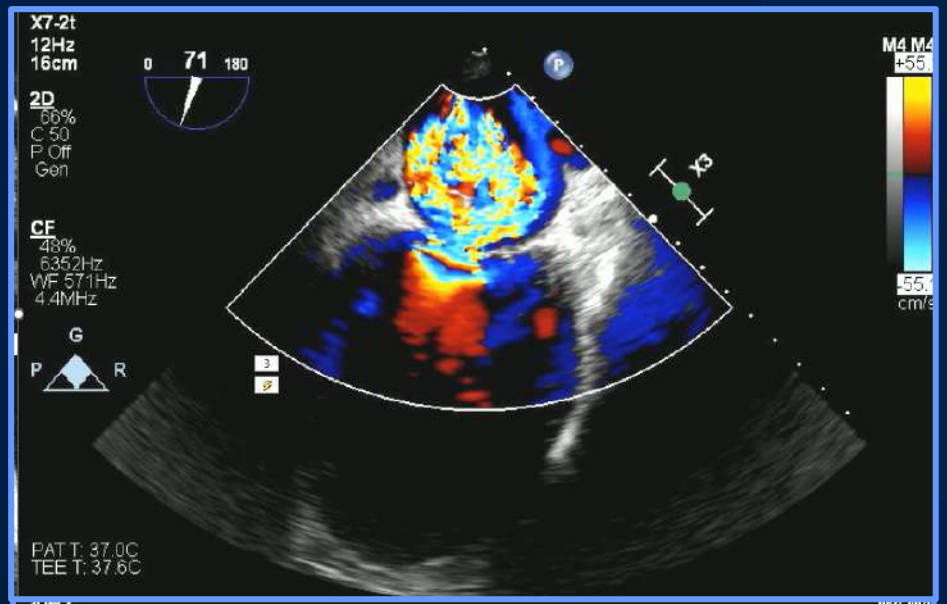
Papillary Muscle Rupture

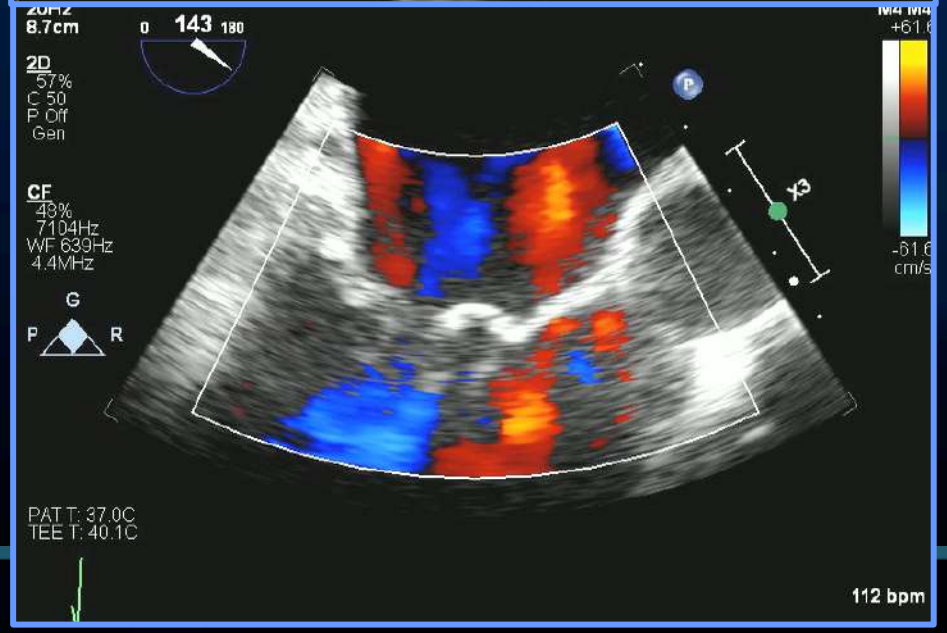
- Loss of papillary muscle integrity
  - Typically occurs 3-7 days after infarct
- Hemodynamically, the most serious MV complication
- Most commonly involves small infarct of RCA or Circumflex (inferior, inferolateral MI) → posteromedial papillary muscle
- Rupture of RV papillary muscle rare

Papillary Muscle Rupture: Flail Anterior MV Leaflet







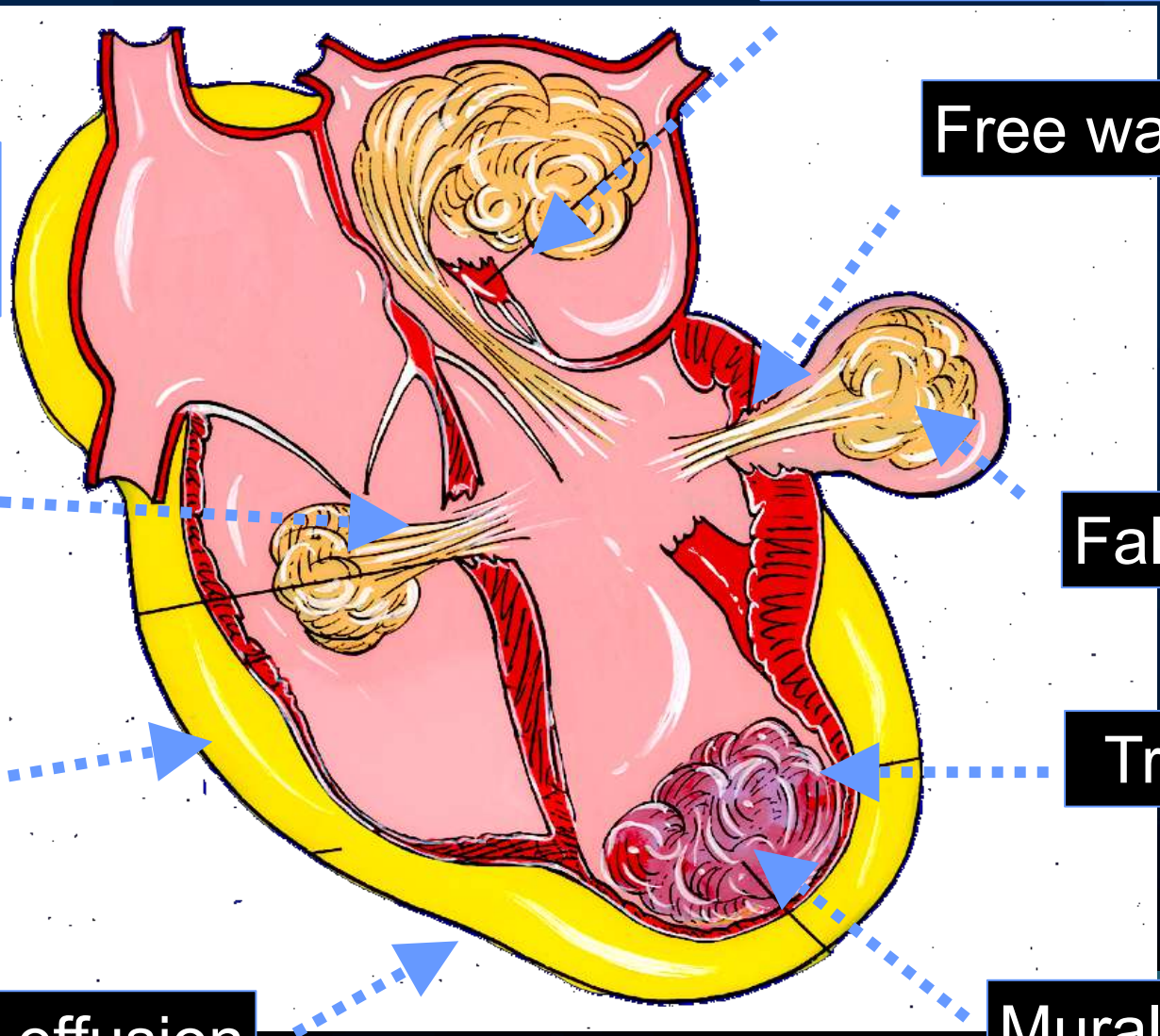


Differential Diagnosis of a New Systolic Murmur Following MI

	VSD	Pap Muscle Rupt.	LVOT Obst.
Location	Anterior or Inferior	Inferior > Anterior	Usually Anterior (Apical)
Signs	Low Cardiac Output	Pulmonary Edema	Hypotension
Hemodynamics	O_2 step-up (RA→PA) > 10%	V wave on PCWP tracing	Dynamic LVOT Obstruction
Treatment	Operation	Operation	Fluids, β -blocker, α-agonist

Adapted from Oh JK et al. Echo Manual 3rd Edition

Conclusions: Echo and Complications of MI



Ruptured papillary muscle

Free wall rupture

Dynamic LV Outflow Tract Obstruction

Ventricular septal rupture

False aneurysm

RV infarction

True aneurysm

Pericardial effusion

Mural thrombus