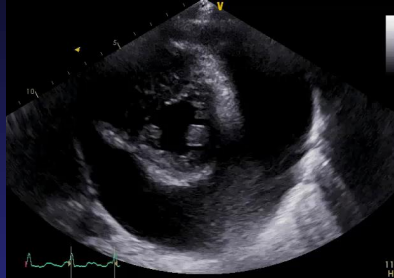


Echo Emergencies



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No disclosures



Introduction

- *Echo is the optimal modality to evaluate critically ill patients*
 - Real-time
 - Portable
 - Noninvasive
- *Where are these echos performed?*
 - Emergency room
 - ICU
 - Wards
 - Interventional lab/OR



Echo in the ER

- *Full echo performed by cardiology-run echo lab for complex studies*
- *Focused echo performed by ER personnel*
 - First guidelines published by ACEP in 2001
 - Guidelines revised by ACEP in 2008
- *ER US not confined to the heart*
- *US training now incorporated into ER residency and fellowship training programs.*



Scope of Practice

- *Goal-directed, focused US exam that answers brief and important clinical questions*
- *Evaluation of emergency medical conditions, resuscitation of acutely ill or injured pts*
- *Applied to any emergency medical condition in any setting with limitations of time, personnel or patient condition*
- *US performed, interpreted, and integrated in an immediate and rapid manner*



Goals of Focused Cardiac US in the ER

- *Assessment for presence of pericardial effusion*
- *Assessment of global cardiac function*
- *Identification of RV and LV enlargement*
- *Intravascular volume assessment*
- *Guidance or pericardiocentesis*
- *Confirmation of pacing wire placement*



J Am Soc Echocardiogr 2010

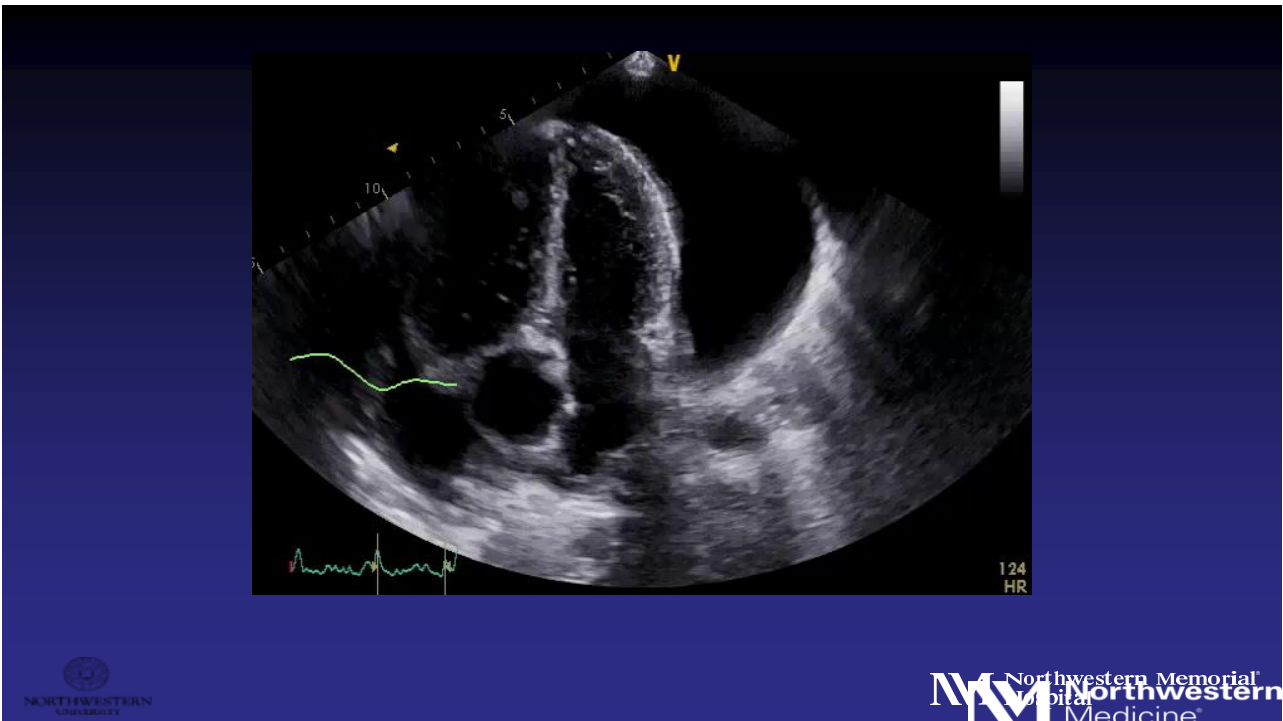
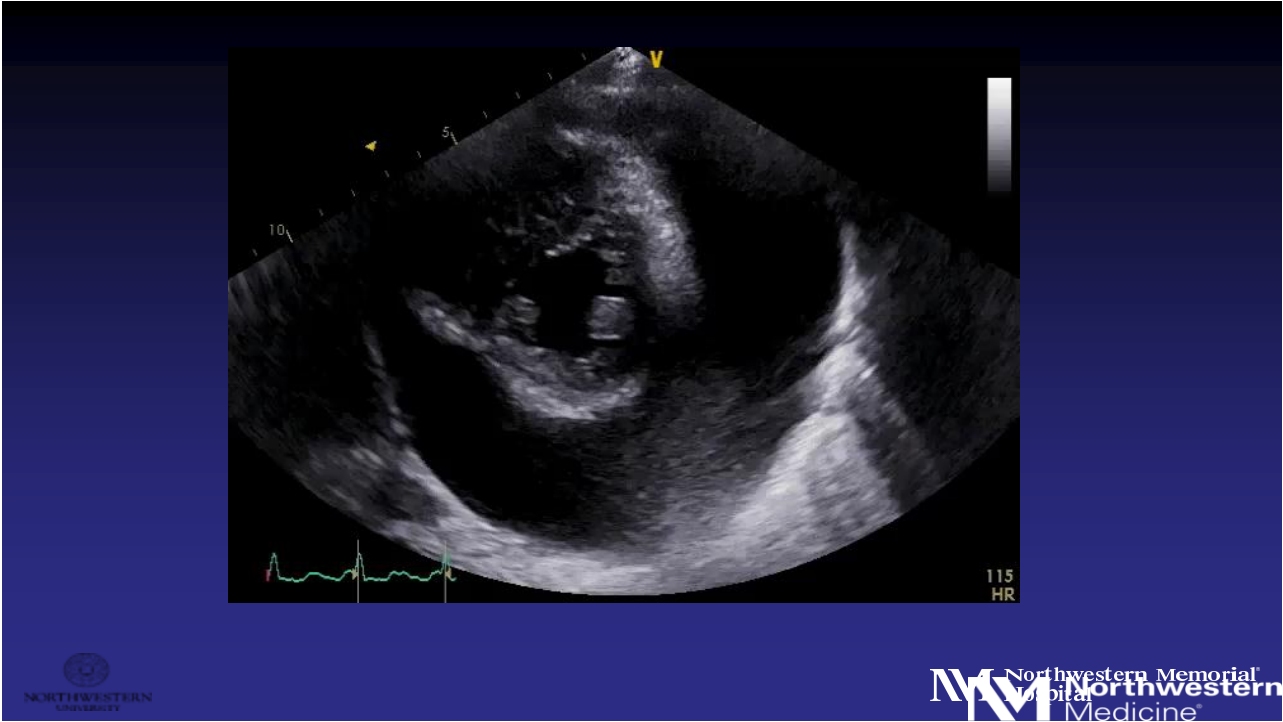


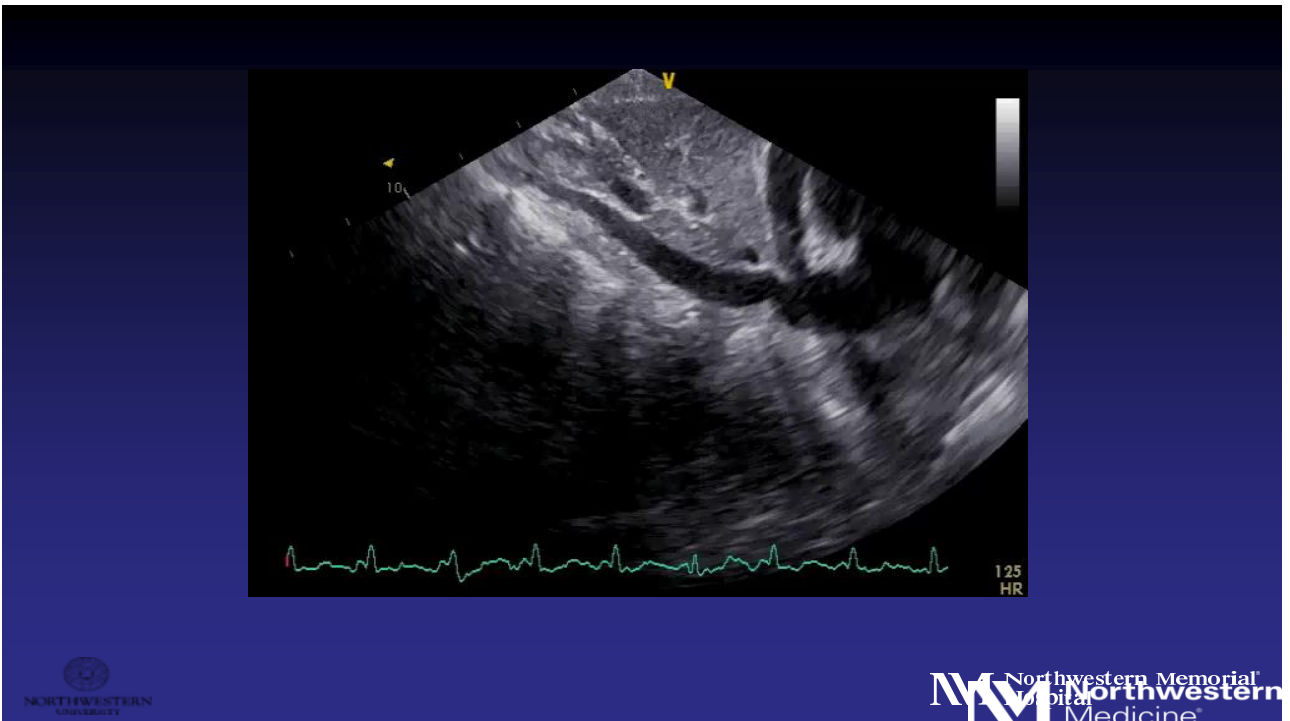
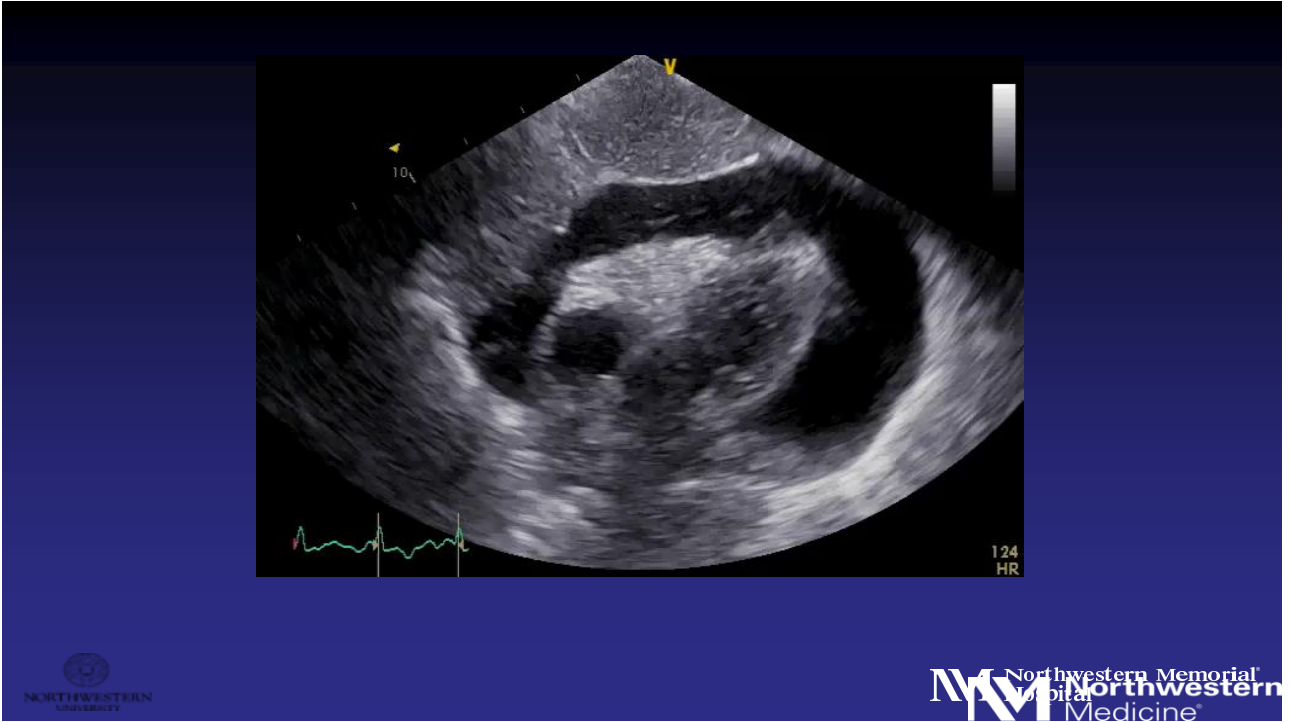
- *44 year old female NSCLC, pulmonary blastomycosis presents with weakness and poor po intake.*
- *Vomiting, dyspneic and somnolent in ED.*
- *Intubated and resuscitated, abx for sepsis. Poor BP response despite IVF.*



- *40 yr old female with scleroderma complicated by interstitial lung disease.*
- *C/o worsening dyspnea and tachycardia*
- *Echo lab sonographer called to do echo*







Echo in the ICU

- *Complications of MI*
- *Shock*

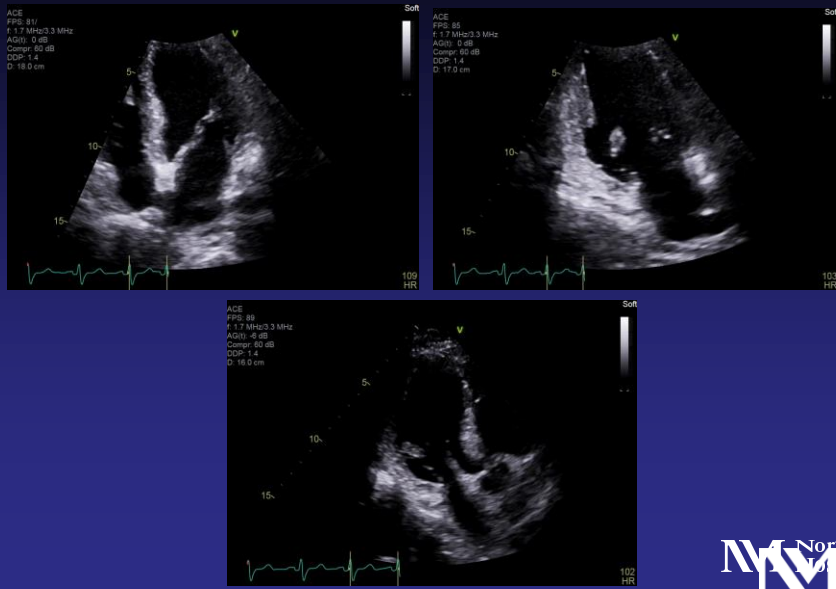


History

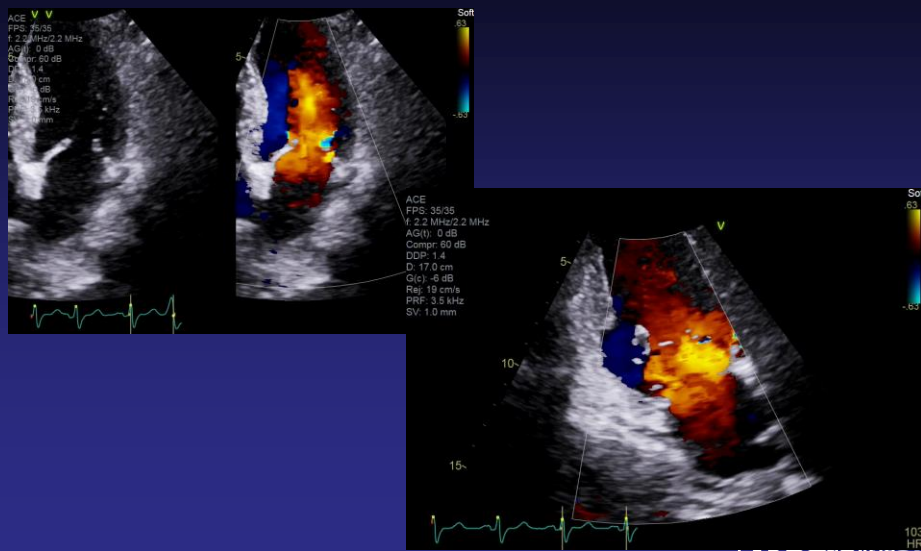
- *66 yr old female, 1ppd smoker*
- *Noted URI symptoms 5 days prior to admission*
- *One day prior to admission, she developed chest discomfort that became severe the following day*
- *She presented to the ER for evaluation*



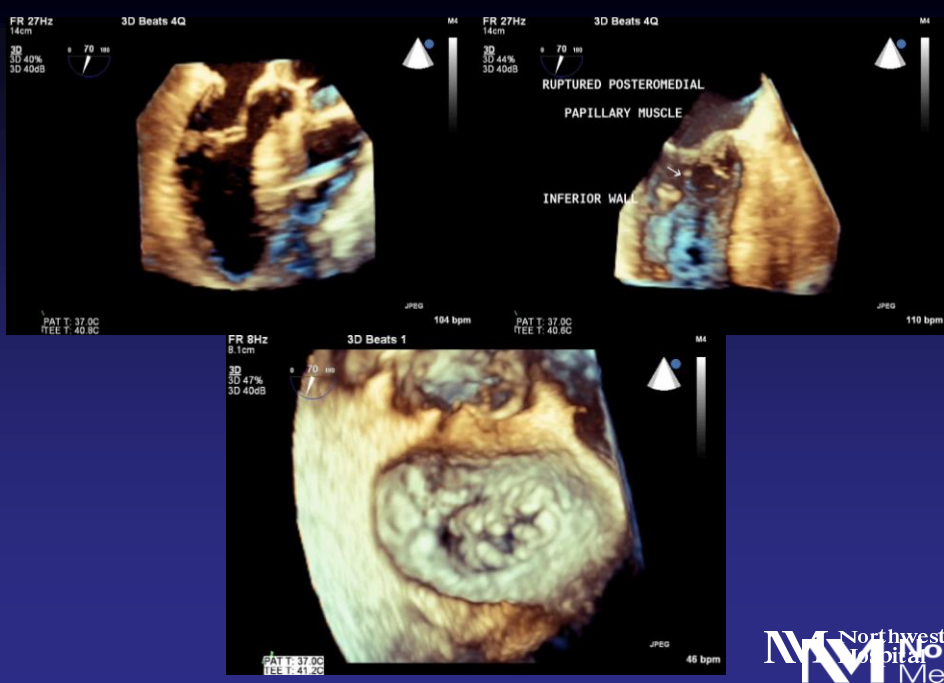
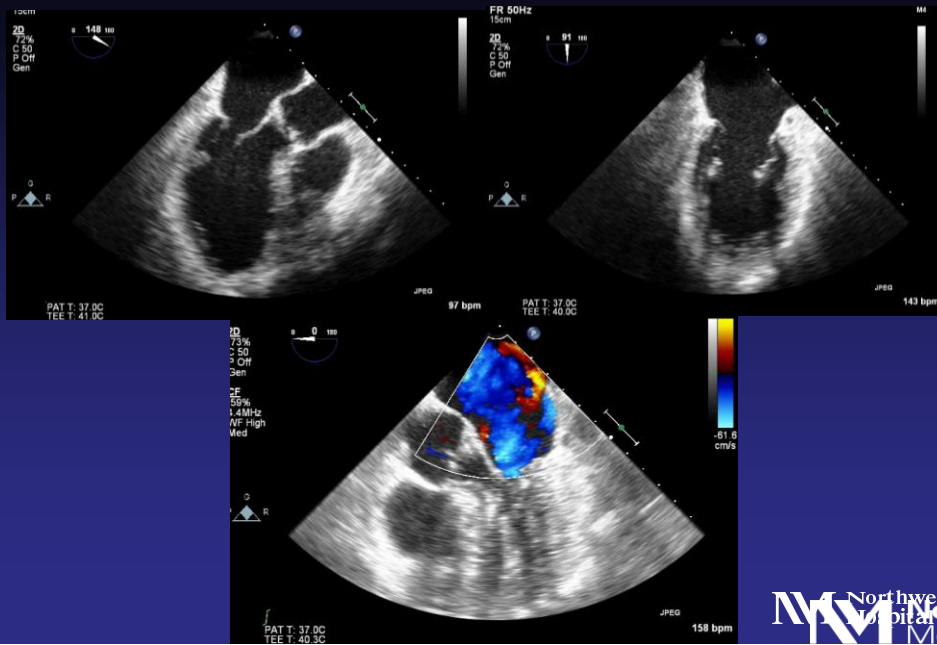
Initial Echo



Initial Echo



OR TEE



Papillary Muscle Rupture

- *About 1% of all MI's*
- *Sudden development of apical systolic murmur and CHF/shock*
- *Bimodal peak: Within 24 hrs and 3-5 days (Range 1-14 days)*
- *Posteromedial papillary muscle most often involved*
- *Infarct usually involves the RCA or LCX*

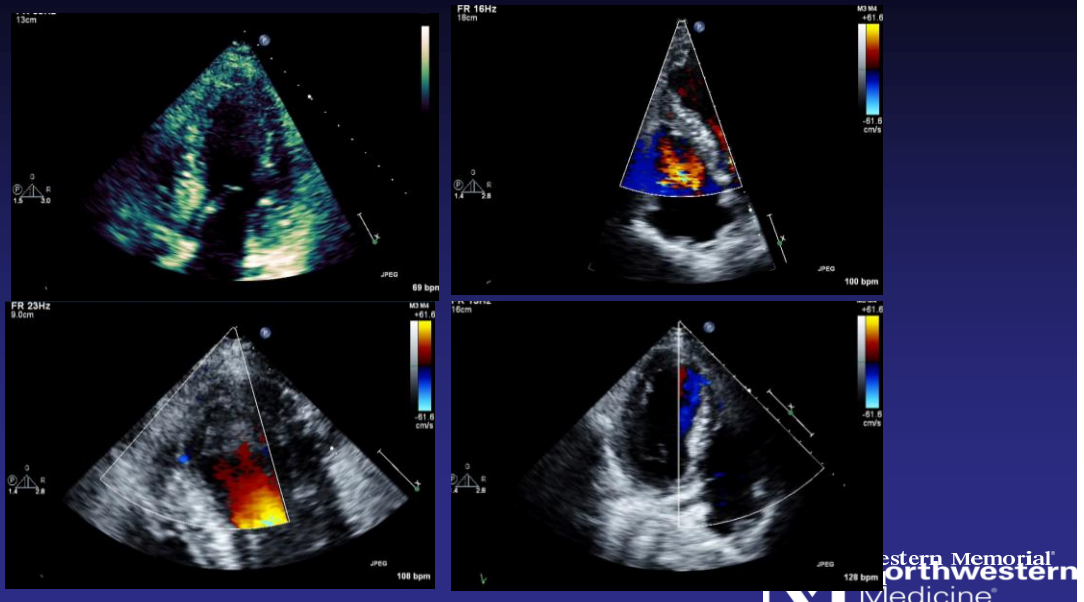


History

- *58 yr old male presented with chest pain to an outside hospital*
- *Diagnosed with a large AW STEMI*
- *LAD stent was placed*
- *IABP pump placed for hemodynamic instability*
- *Transferred to NMH*

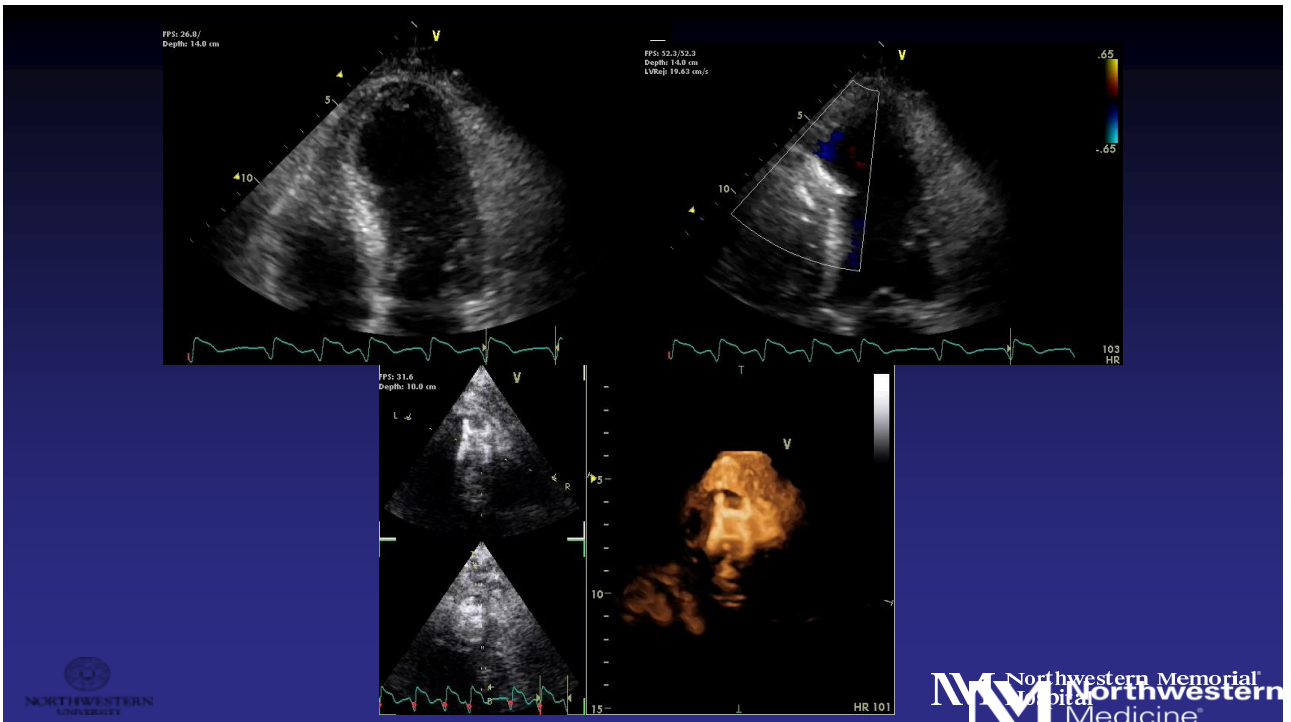


Initial TTE



Hospital Course

- *CT surgery consulted. No valvular disease or coronary disease needing intervention. Transcatheter device closure recommended*
- *He was taken to the cath lab where the VSD was successfully closed with an Amplatzer device*
- *Hemodynamics improved. IABP weaned*
- *3 days later, he developed worsening heart failure*



Ventricular Septal Defect

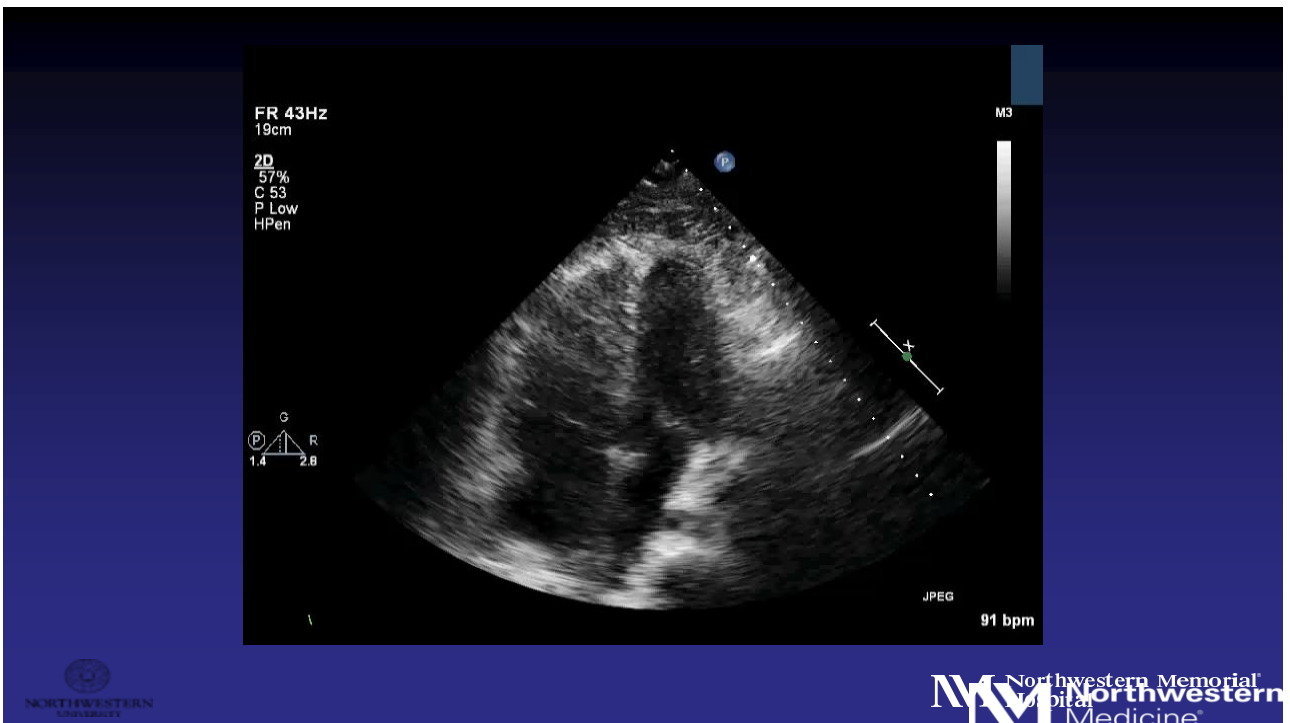
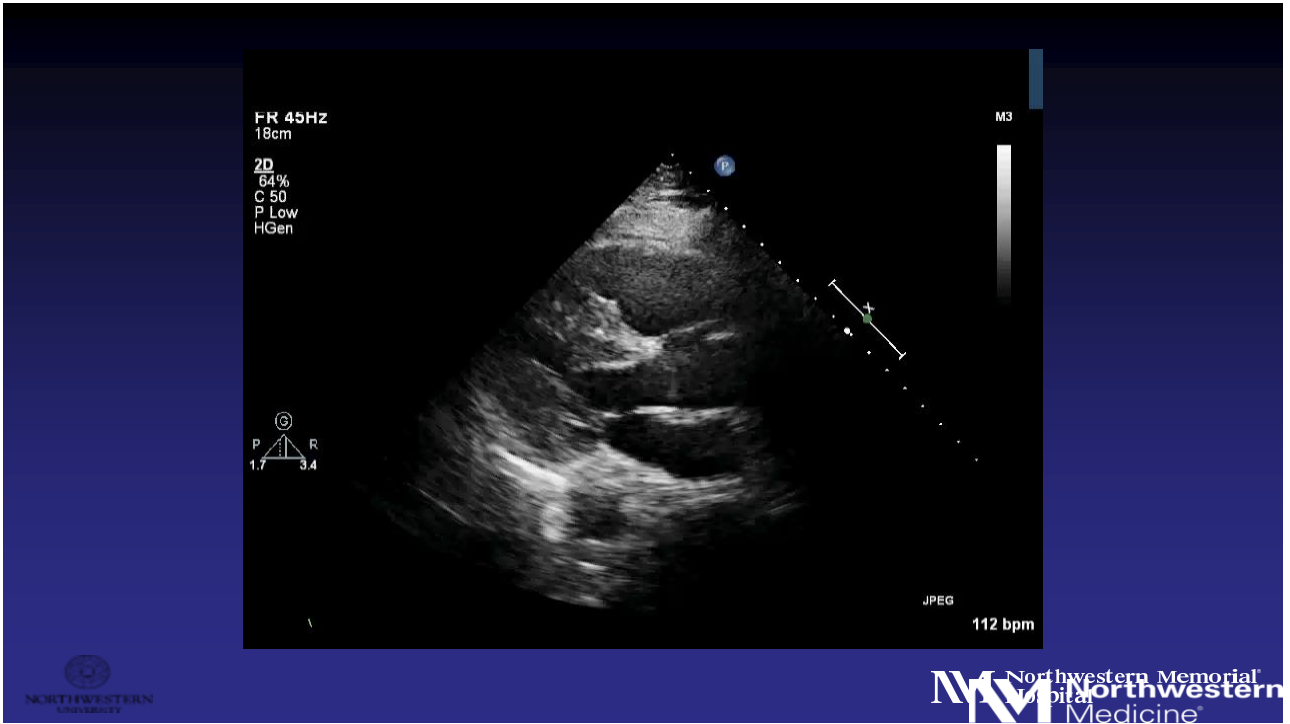
- *1-3% in patients with reperfusion therapy*
- *Bimodal peak: Within 24 hrs and 3-5 days (Range 1-14 days)*
- *Equal frequency between IWMI, AWTMI*
- *Seen commonly in elderly women without previous MI (single vessel CAD).*
- *New systolic murmur with abrupt and progressive hemodynamic deterioration.*

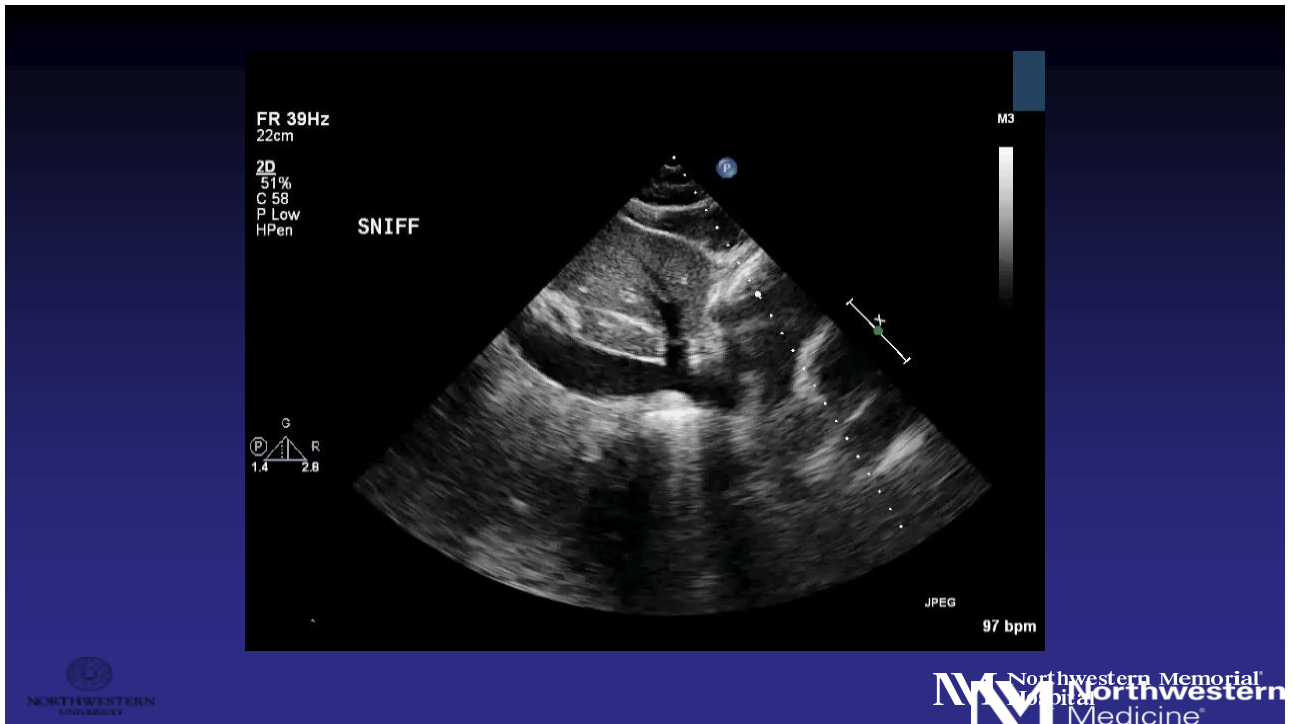
Echo Emergencies on the Wards



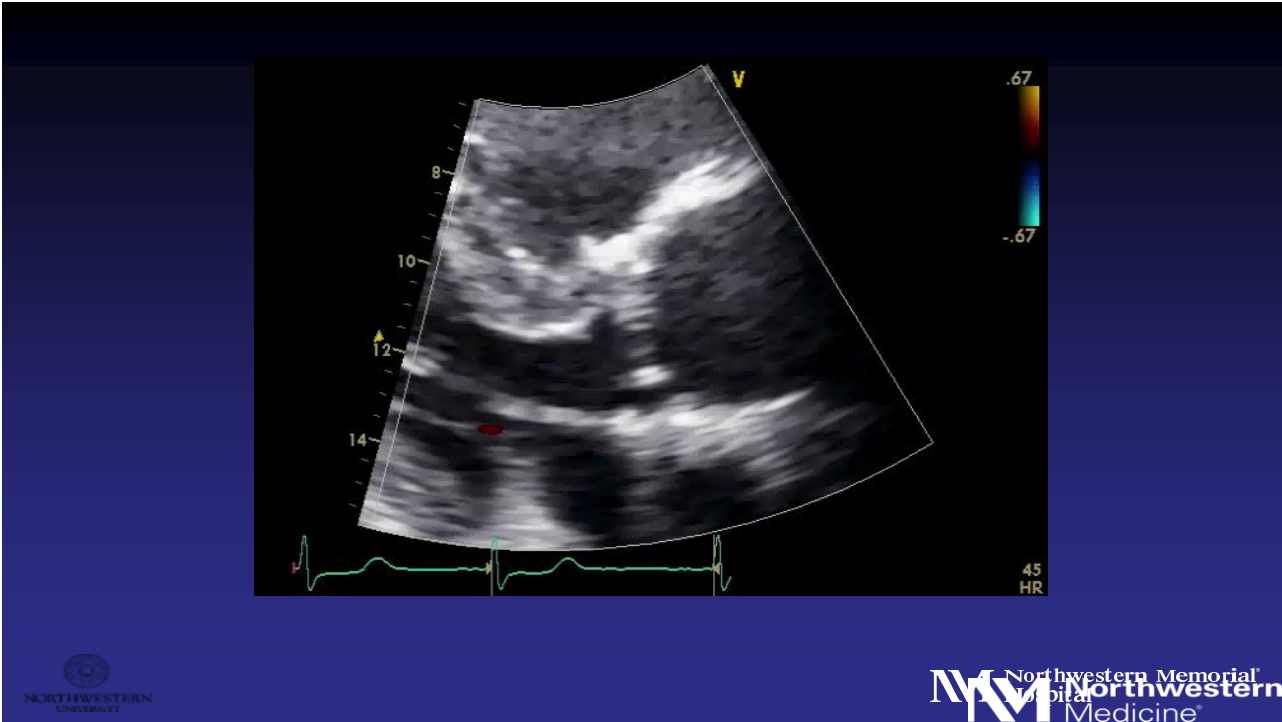
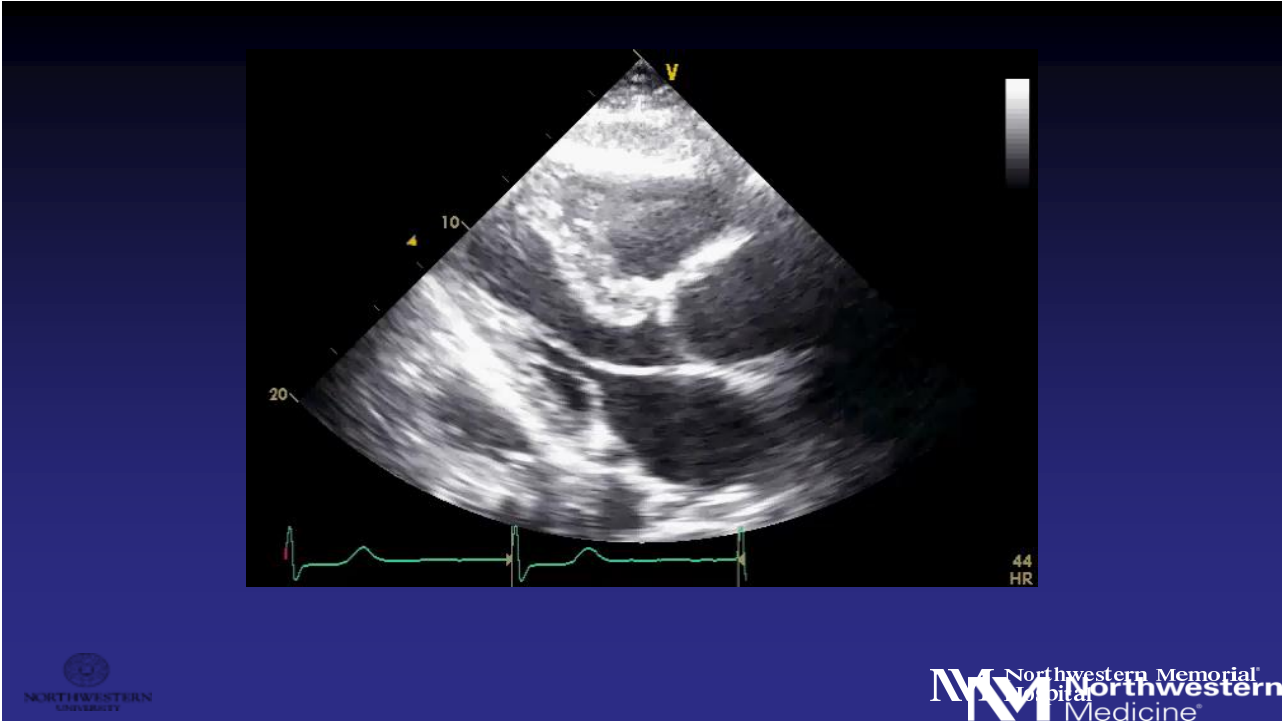
- *65 yr old female who presented with RUQ and right lower chest pain associated with belching*
- *Normal ECG, labs, troponins*
- *Admitted to the medicine service*
- *Patient became acutely SOB shortly after admission*

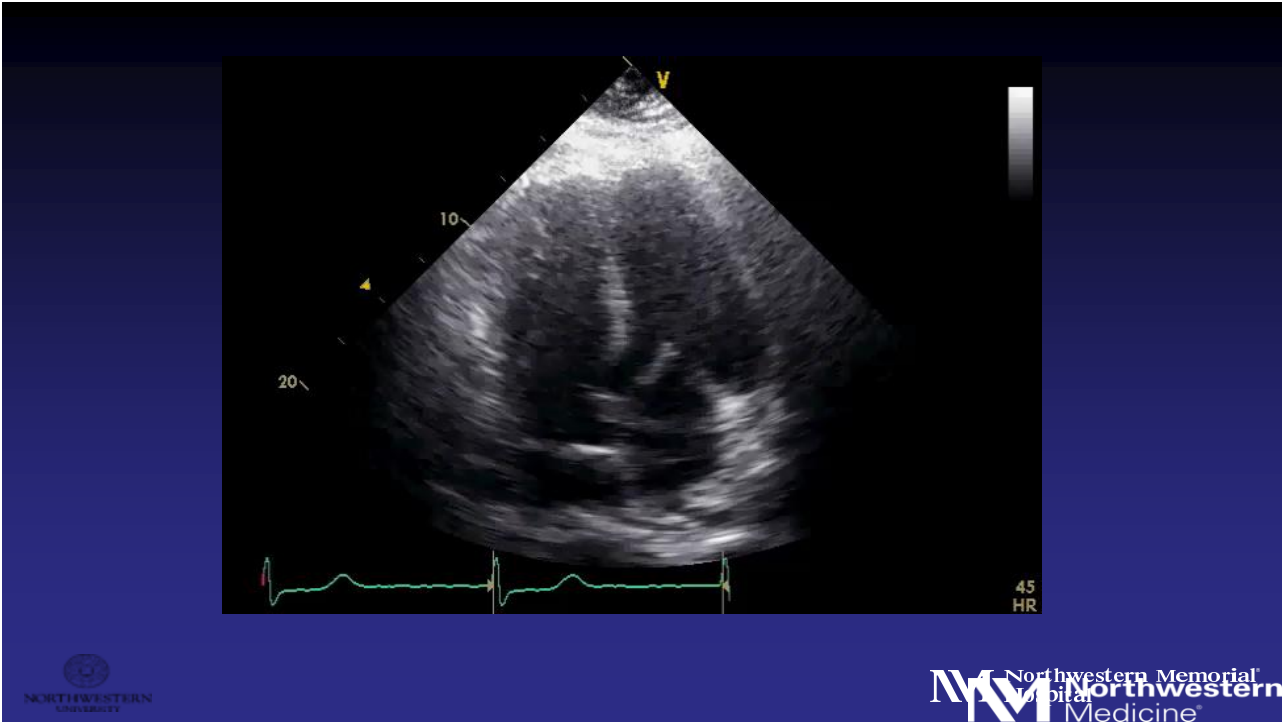
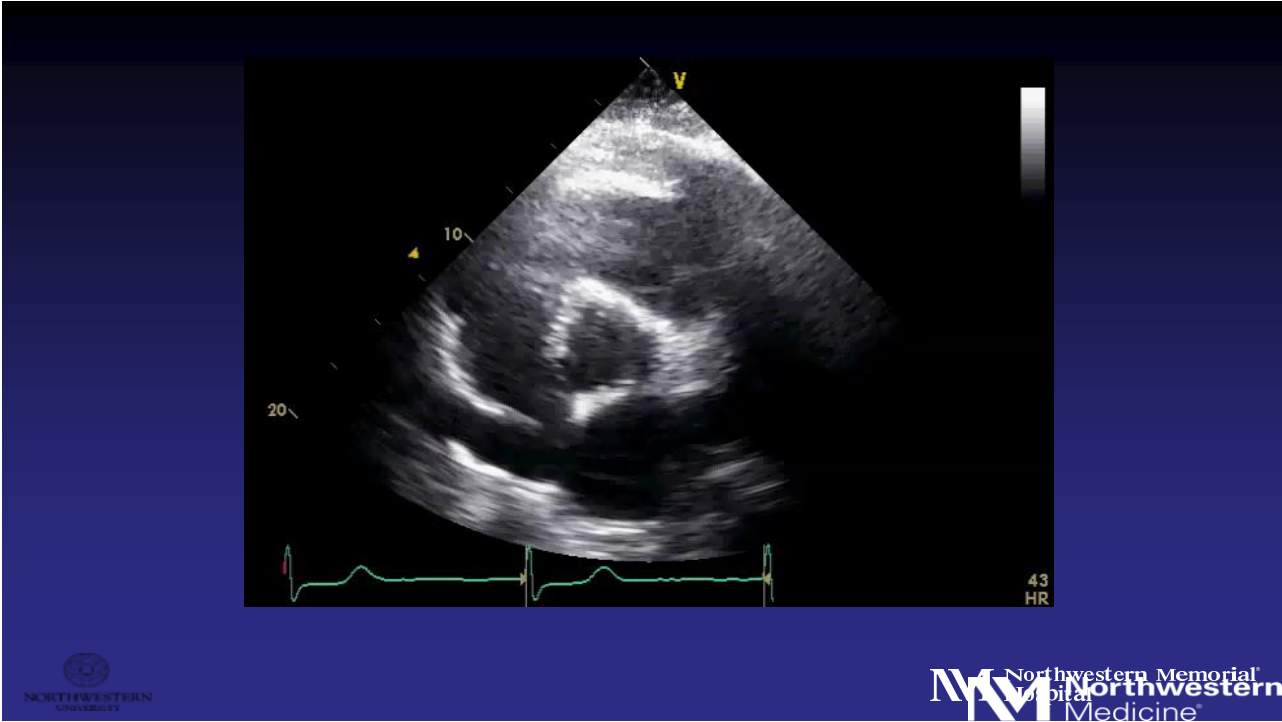


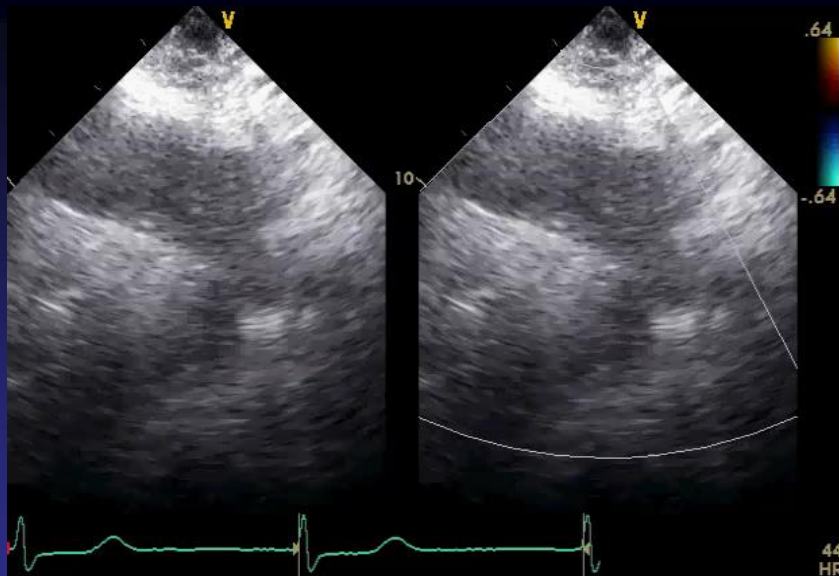




- *65 yr old male with history of HTN, CKD, prior Afib ablation and recent DVT*
- *C/o acute onset facial pain, nausea, vomiting and blurred vision*
- *Admitted to medicine unit*
- *Pt noted to be hypotensive*







What would you do next?

- A. No further testing. Hold BP meds and monitor
- B. Another TTE in the AM
- C. TEE
- D. CT
- E. MRI

Echo Emergencies in the Interventional Lab/OR

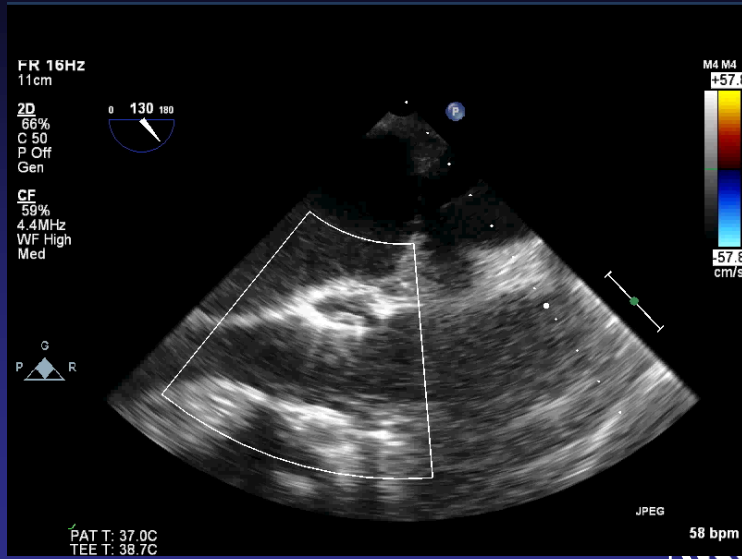


Case Example

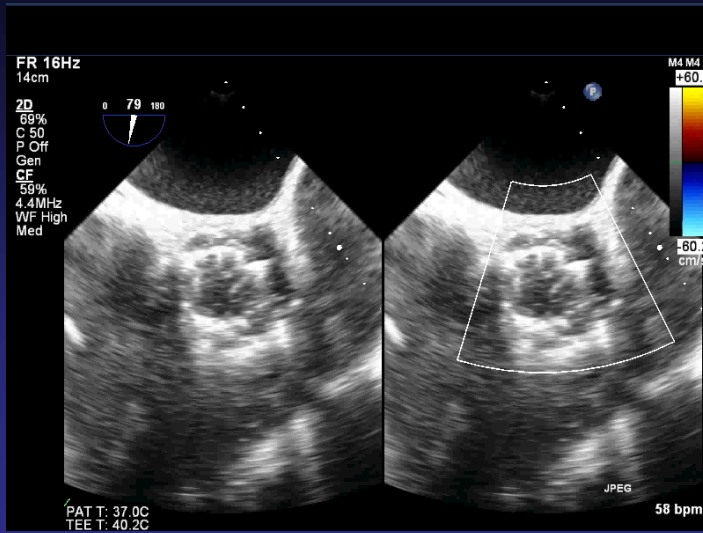
- *90 yr old male with severe AS*
- *Complains of dyspnea when walking around his house*
- *s/p CABG 2000, DM, kidney disease, COPD*
- *STS score=26*
- *TAVR recommended*



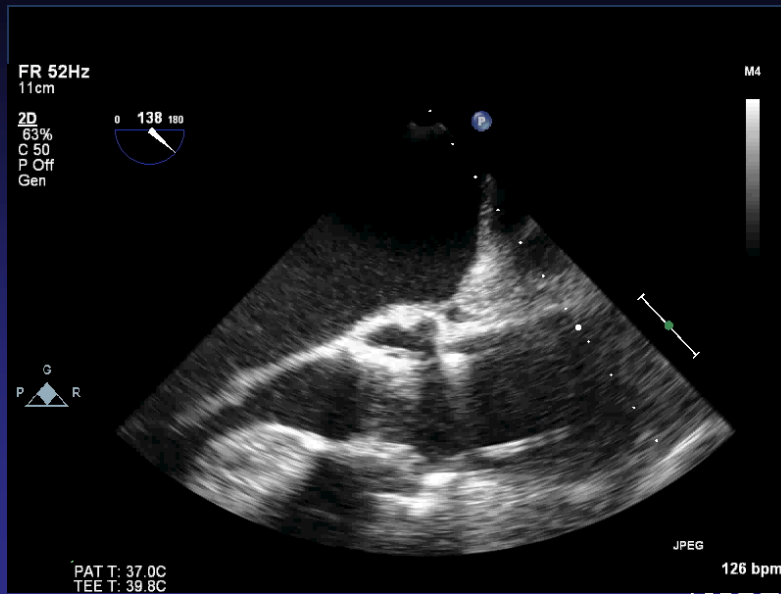
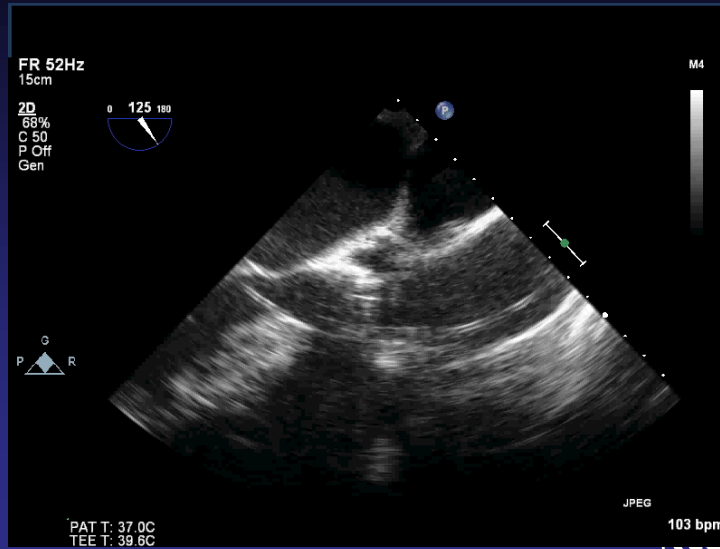
Post TAVR

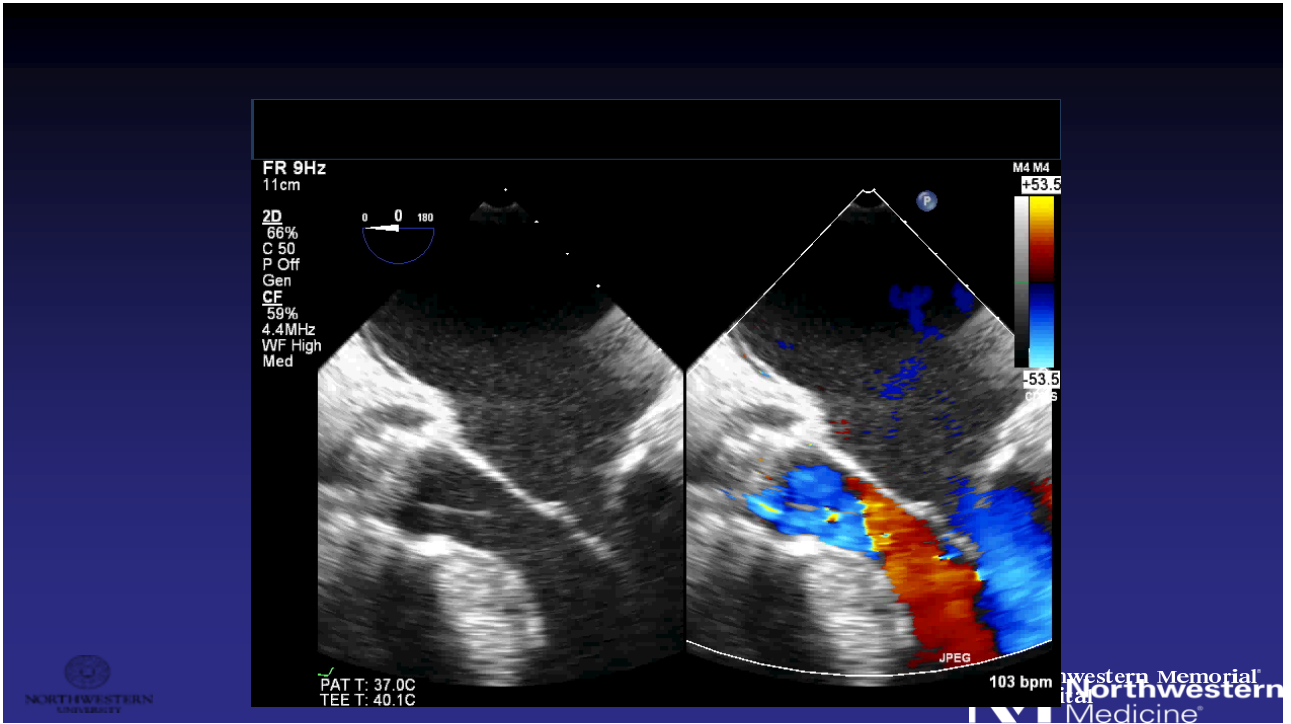


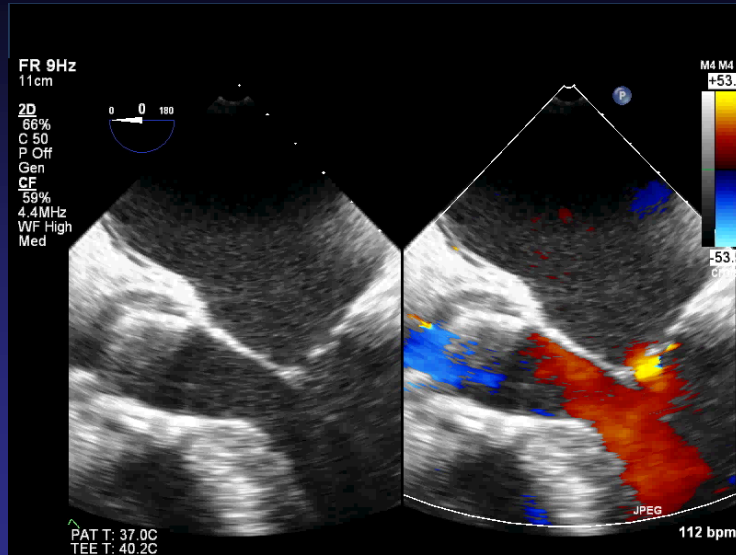
Post TAVR: AR Due to Frozen Leaflet



Second Valve



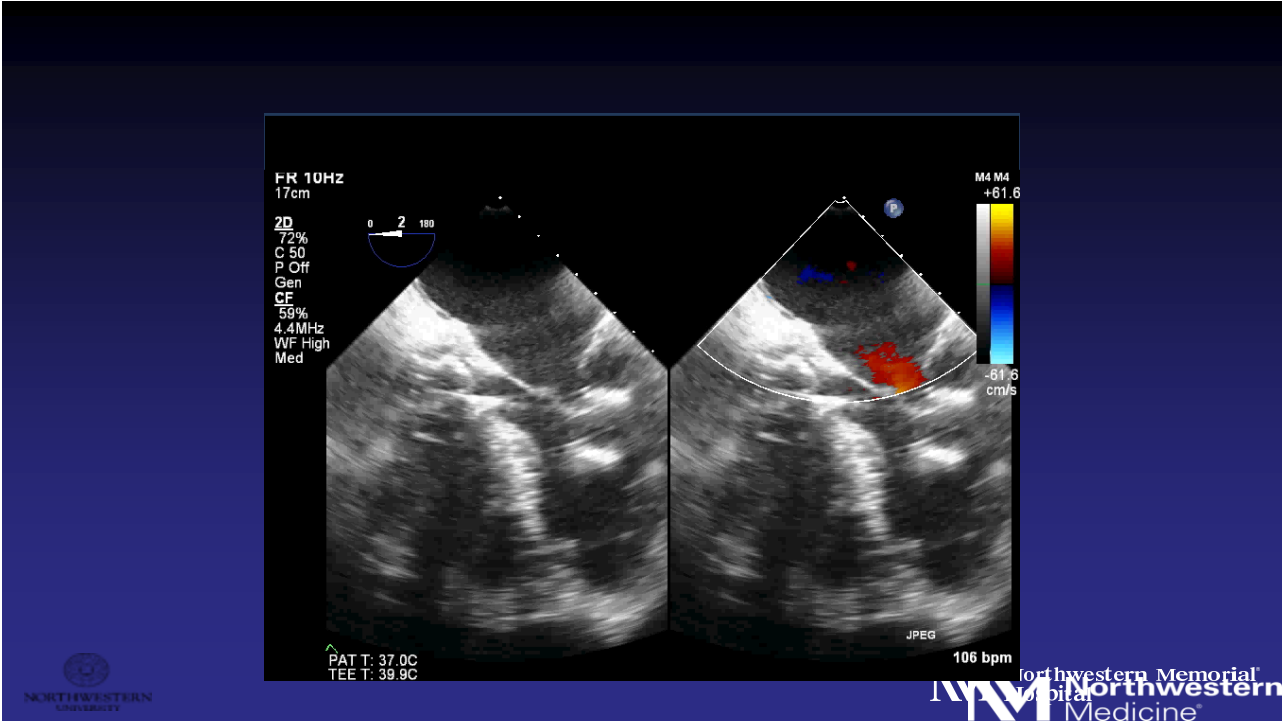




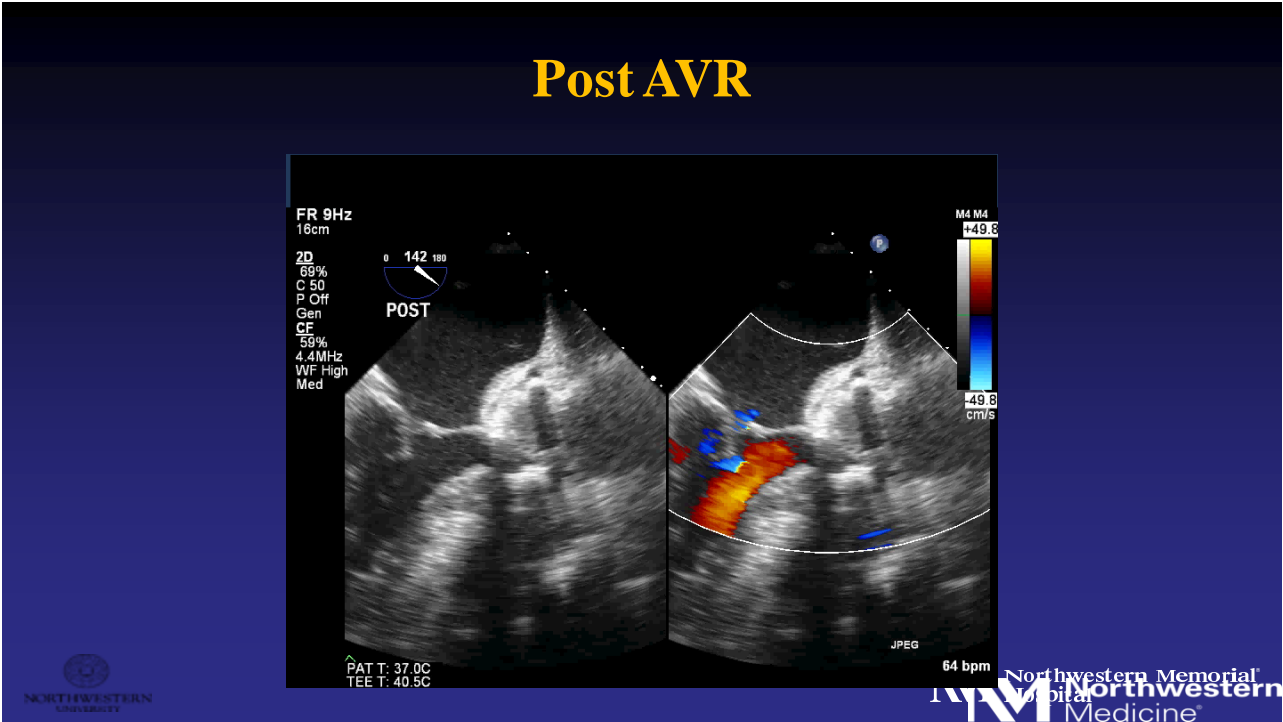
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Northwestern
Medicine



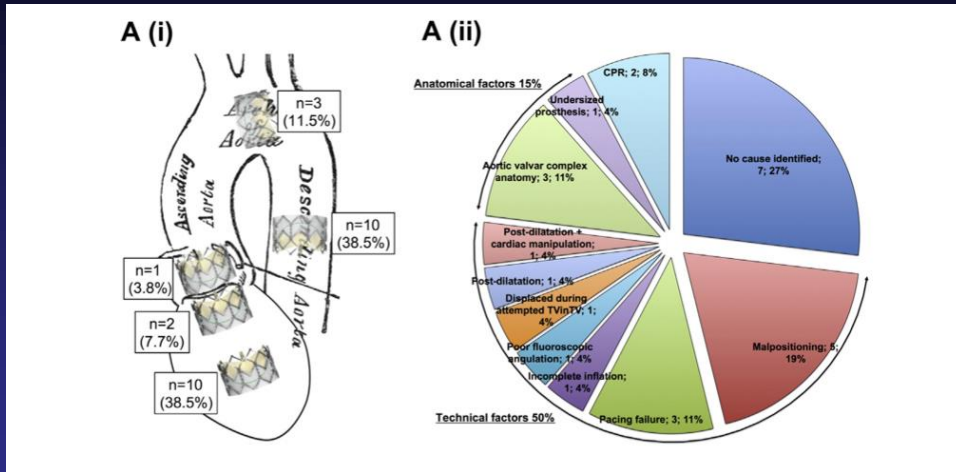
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Hospital
Northwestern
Medicine



Post AVR



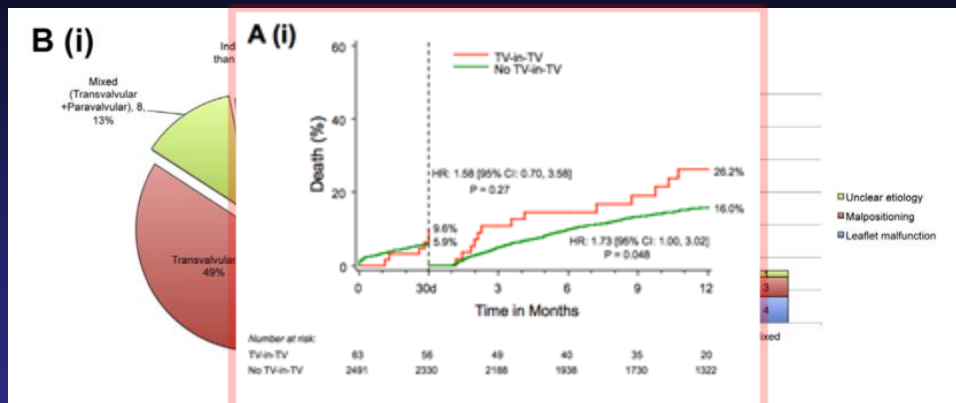
Valve Migration



Makkar et al. J Am Coll Cardiol 2013;62:418-30



Valve in Valve



J Am Coll Cardiol 2013;62:418-30



Summary

- *Echo is usually the first imaging modality ordered to evaluate critically ill patients*
- *Echos are now performed by cardiologists and non-cardiologists in a variety of hospital settings*
- *Thorough knowledge about cardiac causes of acute clinical decompensation necessary for rapid diagnosis and treatment*



Thank You

