

# Significant Mitral Regurgitation: Five Challenges, Two Etiologies, Three Approaches

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Disclosures: David H. Adams, MD

Icahn School of Medicine at Mount Sinai has royalty agreements with Edwards Lifesciences and Medtronic:

- Physio II Mitral Annuloplasty Ring
- IMR ETlogix Mitral Annuloplasty Ring
- TriAd Tricuspid Annuloplasty Ring

National Co-PI: Medtronic Apollo TMVR Pilot Trial

All patients have signed HIPAA release forms



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# Case 1

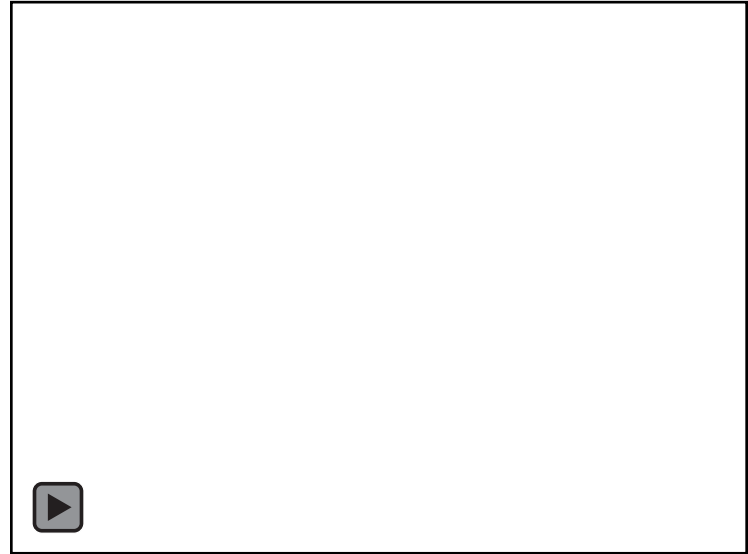
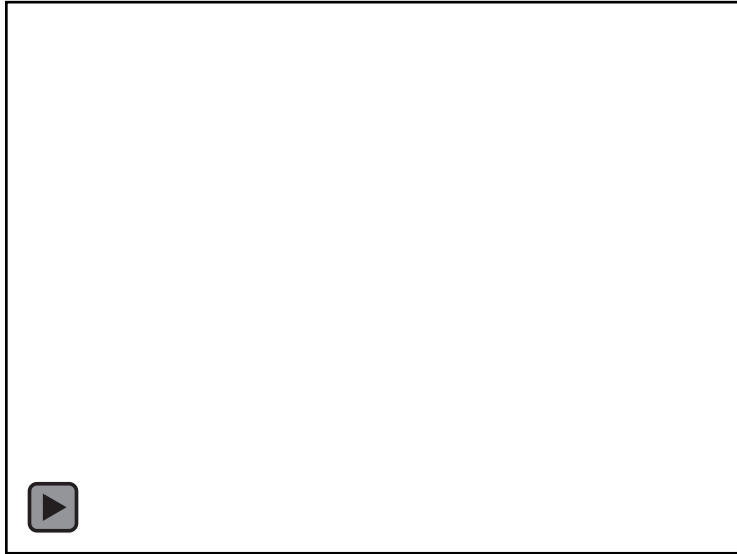


- 85 year old male; HTN, sleep apnea
- Diagnosed with MR, TR and Afib in 2012; medical Rx
- Recent onset of dyspnea
- Referred for one of many opinions



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# Transthoracic Echocardiogram June 2017

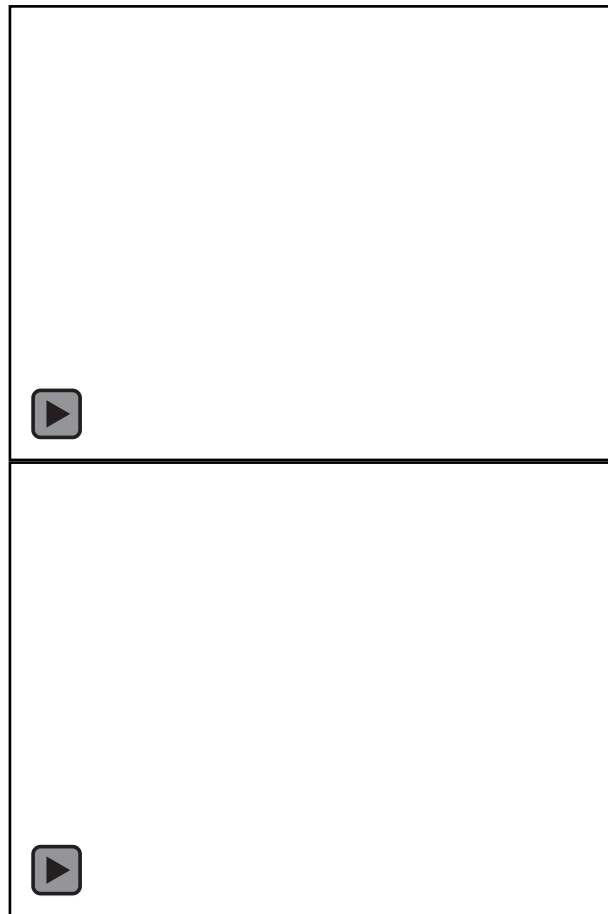
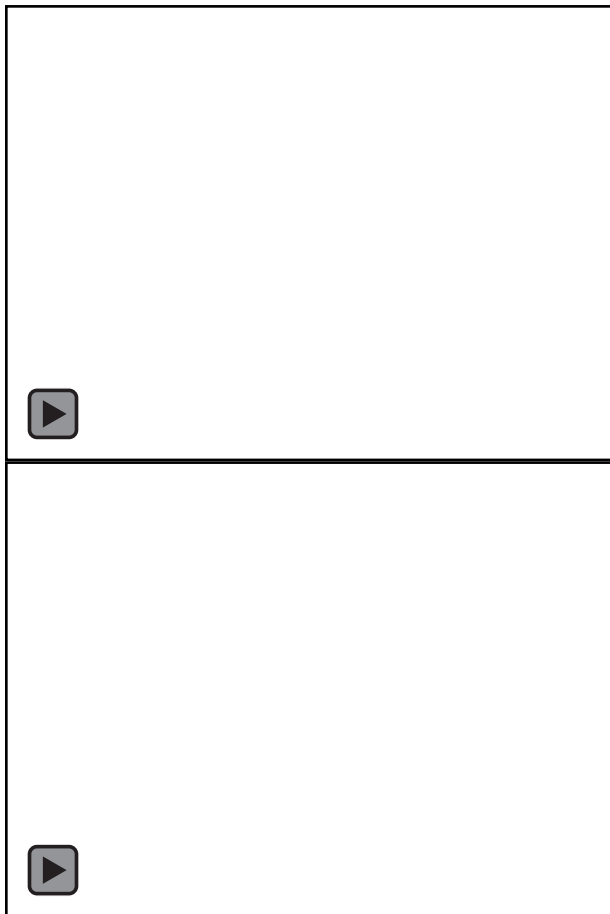


BP 120/65 mmHg Height 5'4" Weight 130Lb



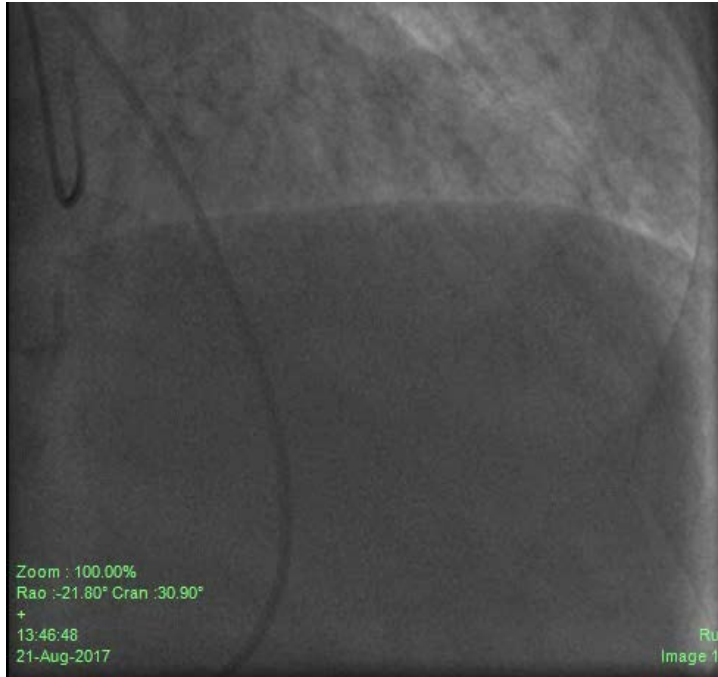
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# Coronary Angiography



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# Summary

Symptomatic 85 year old man with severe MR, develops Afib and exercise-induced PHTN (STS MV repair + CABG: 6.12%)

Imaging:

Severe MR, moderate TR (RVSP 51mmHg), moderate AI  
LVEDD 5cm, LVESD 3.3cm, LA 4.7cm, EF 57%

Cath: D1 80%, LCx-LPL 80%, Ramus 90%; Right Dominant

Baseline and exercise cath parameters:

PCW 18 (35), PASP 32 (65), RA 6 (12)



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# What would you recommend?

1. Optimize medical therapy, repeat TTE in 6 months
2. CABG, MV repair, MAZE, TV repair  $\pm$  AVR
3. PCI + MitraClip







## Case 2

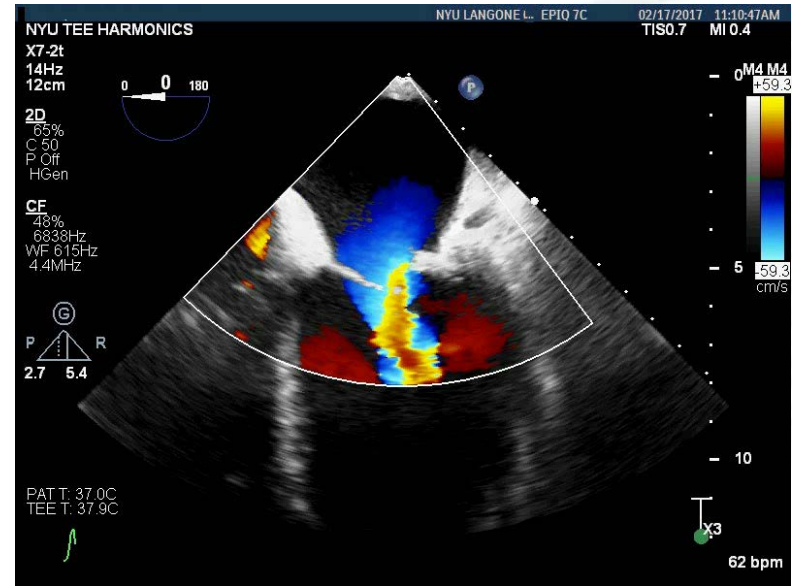
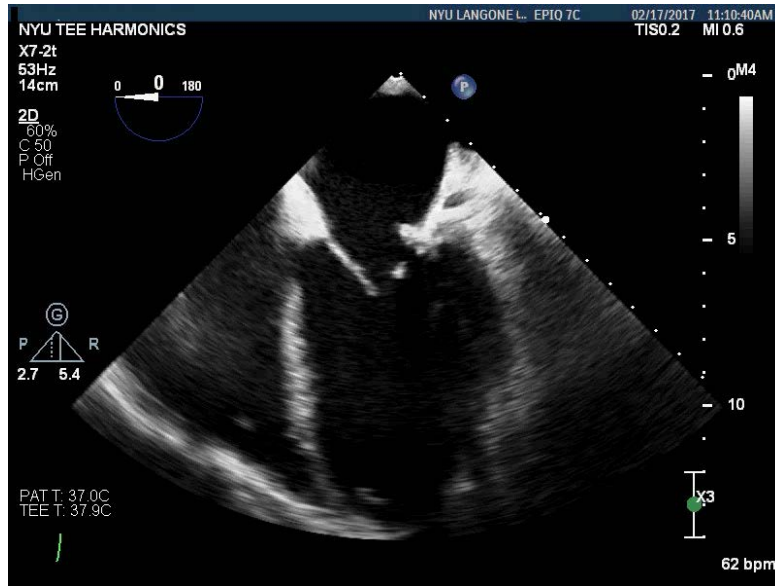


- 78-year-old male; with myxomatous MV disease
- OSH MVr ('04): P2 neochordae x6; 28mm MVA band
- Asymptomatic post MV repair, active echo surveillance
- Latest echo reports increasing MR



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# Transesophageal Echocardiogram

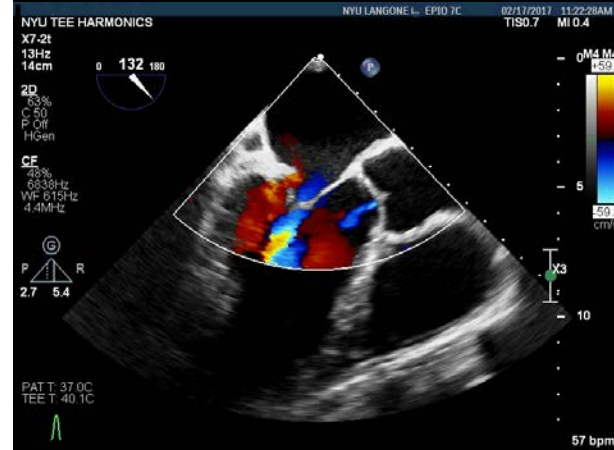
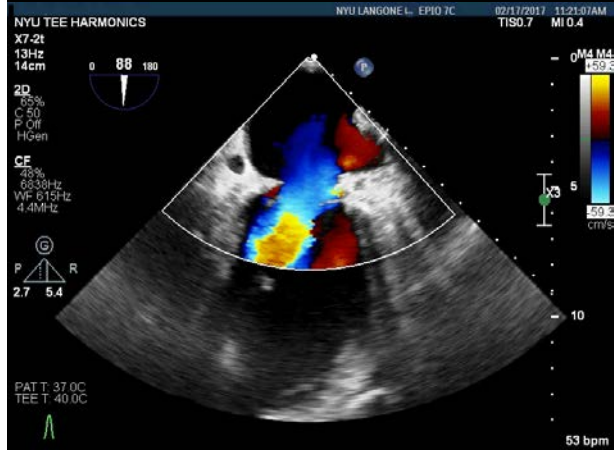
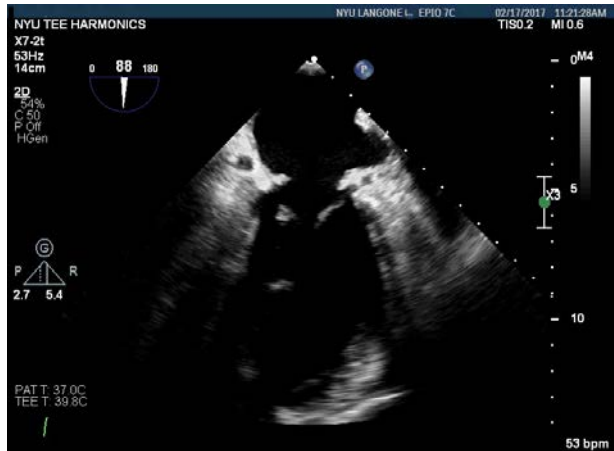


BP 153/81 mmHg Height 69in Weight 180 lb



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# Summary

Asymptomatic 78-year-old male, 13 years s/p MV repair and active echo surveillance, referred for suspicion of worsening MR

STS Score: MVRpr- Reop: 2.15%

Imaging:

Moderate-severe MR, mild TR (RVSP 34.6mmHg)

LVEDD 5.5cm, LVESD 3.9cm, moderate LA 4.8cm, EF 40-45%



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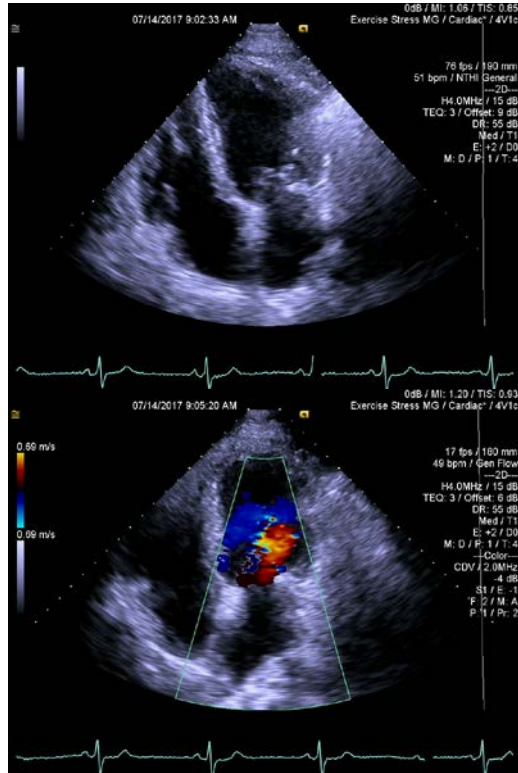
# What would you recommend?

1. Active surveillance, repeat TTE in 6 months
2. Exercise stress echocardiogram
3. Reoperative MV repair / replacement

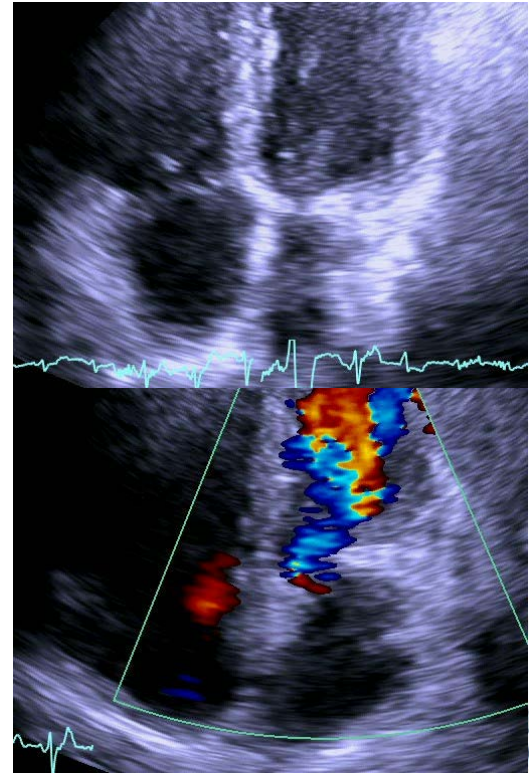


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# Exercise Stress Echocardiogram



6min 22sec  
(7.5METS)  
85% pred peak HR  
Normal LV + BP  
augmentation  
Mod PHTN at peak  
55 vs 41mmHg  
MR unchanged  
EF 52%



# What would you recommend?

1. Active surveillance, repeat TTE in 6 months
2. Reoperative mitral valve repair / replacement



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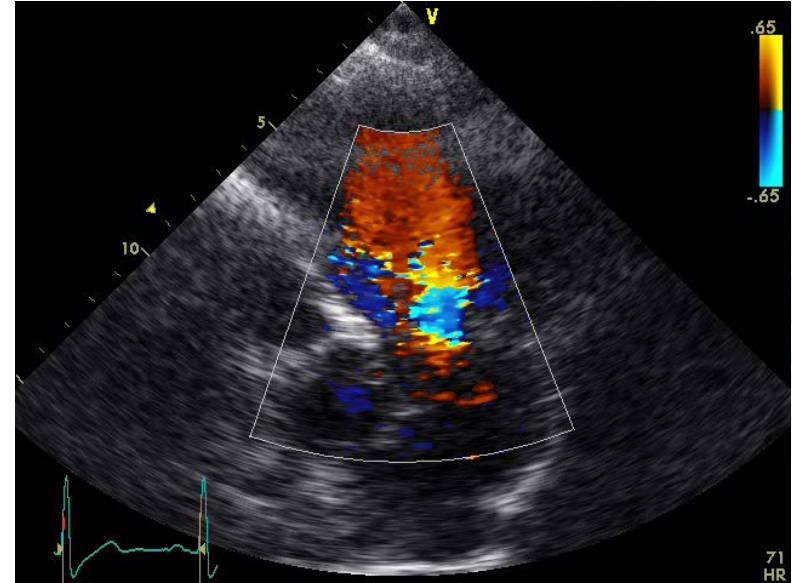
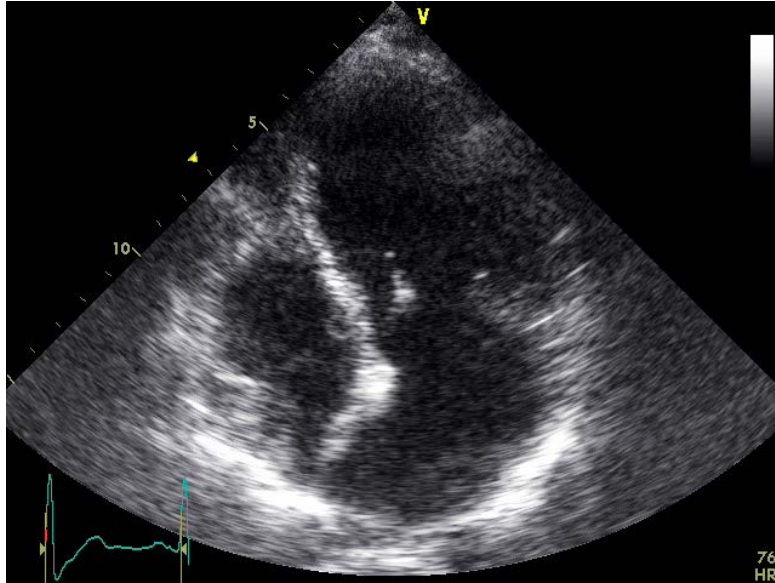


## Case 3

- 63-year-old female with remote history of bileaflet mitral valve prolapse
- Paroxysmal Afib, asymptomatic PVC's; active surveillance
- s/p instability during induction for Obstetric procedure (age 34)
- Progressive exertional dyspnea accompanied by palpitations (↑frequency / duration)
- Latest imaging revealed severe MR

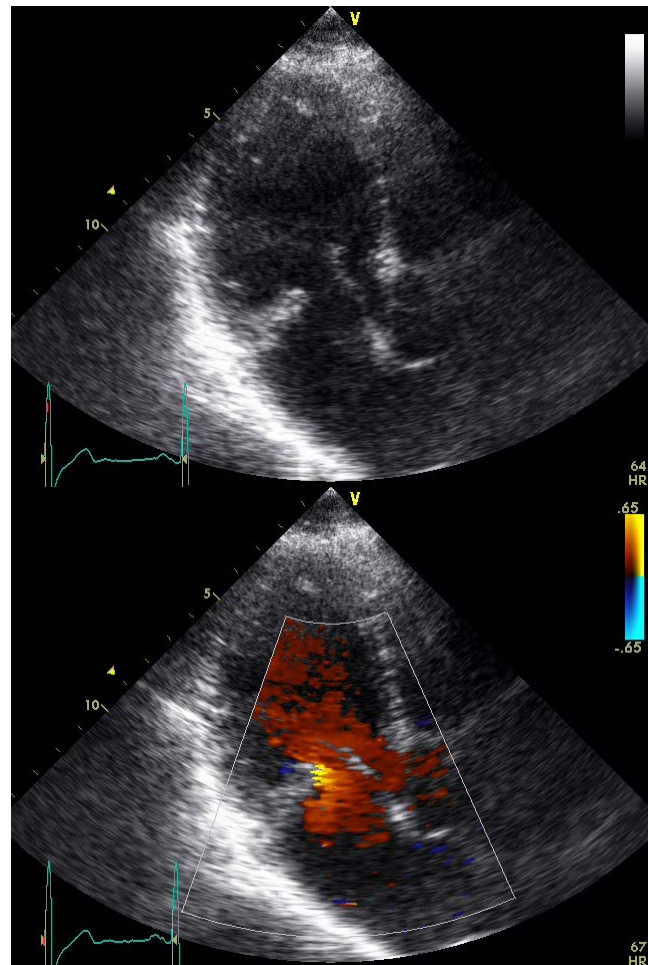
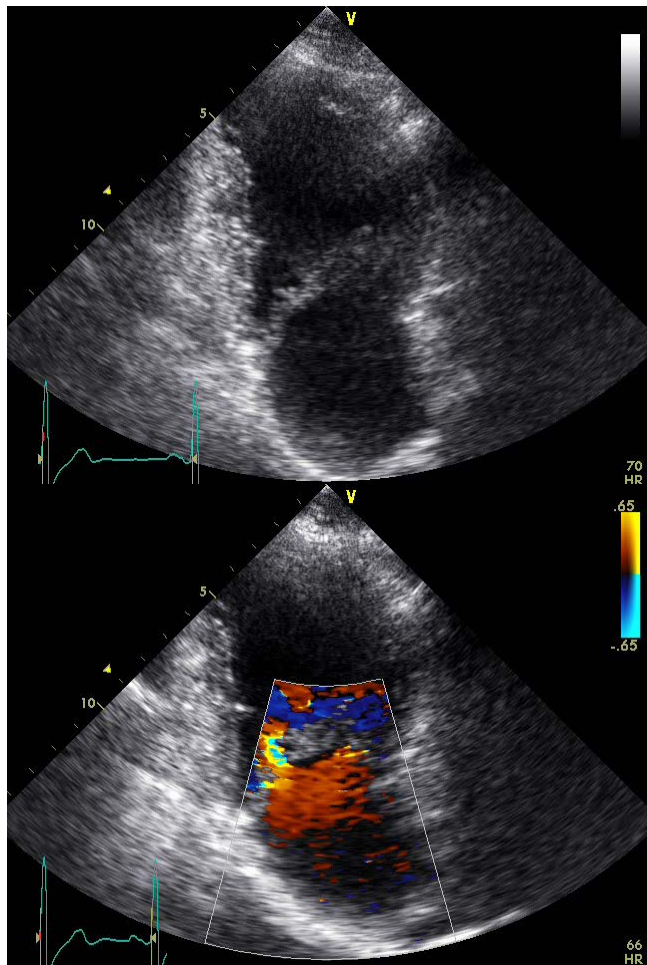


# Transthoracic Echocardiogram

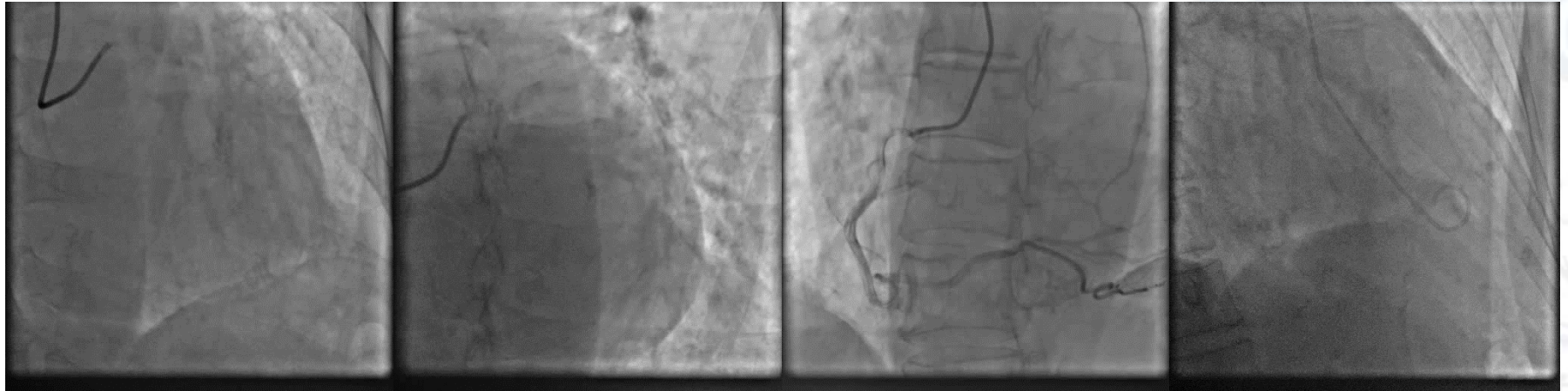


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# Coronary Angiogram



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# Summary

63-year-old woman with remote h/o bileaflet MV prolapse, PAF, worsening dyspnea and palpitations, seeks surgical opinion for severe MR  
STS Score MVr 0.86%

Imaging:

Severe MR, trace TR

LVEDD 5.3cm, LVESD 3.4cm, moderate LA 5.7cm, EF 66%

CATH: normal coronaries, right dominant, MR++++



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# What would you recommend?

1. Mitral repair  $\pm$  TV repair
2. Continue active surveillance



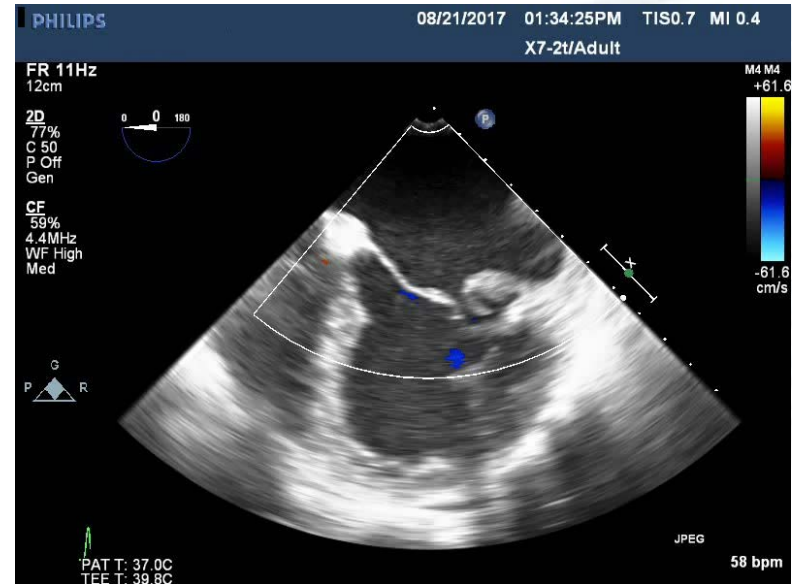
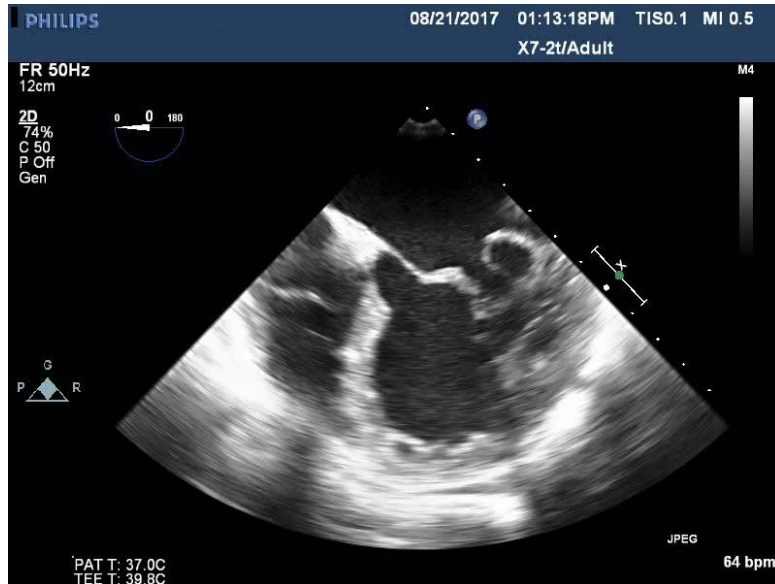
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# Intraoperative Events

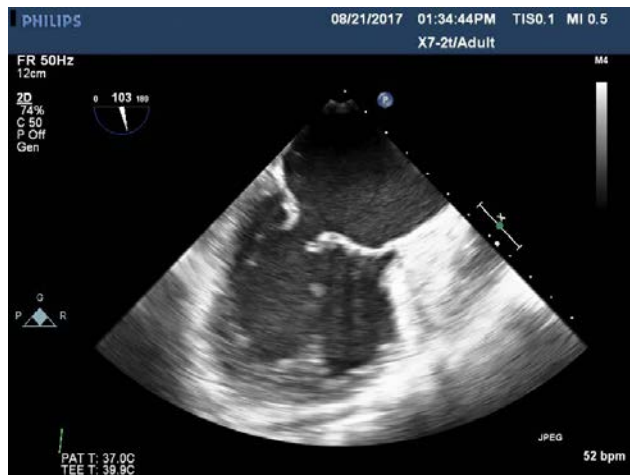
- 12:37pm Anesthesia Induction
- 12:39pm 16mcg IV-Bolus Epinephrine
- 12:42pm Intubation: short runs VF, Hypertension (200/140mmHg) → VF Arrest
- 12:42pm Chest Compressions; Defibrillation, Swan-Ganz catheter insertion
- 12:58pm Multiple cycles Epi, norEpi, Vassopressin to maintain MAP
- Emergent TEE: severe MR, Anterior & Ant/septal wall akinesis, EF 10%, PVC's +++



# Emergent Transesophageal Echocardiogram



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# Intraoperative Sequence

- EP Specialist called to OR to evaluate EKG findings: multiple polymorphic PVC's, QRS pattern consistent with pap. muscle origin
- IABP placed



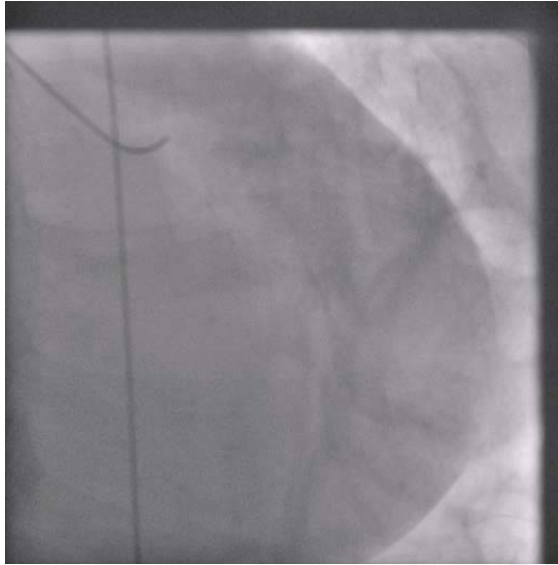
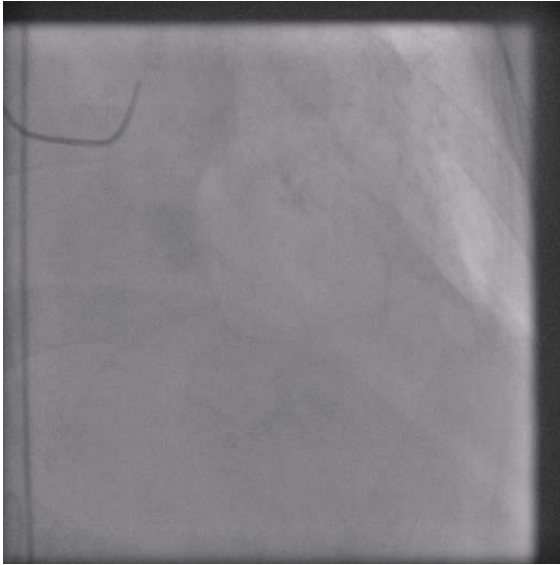
# What would you recommend?

1. Proceed to surgery as planned
2. Emergent coronary angiogram



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# Emergent Coronary Angiogram



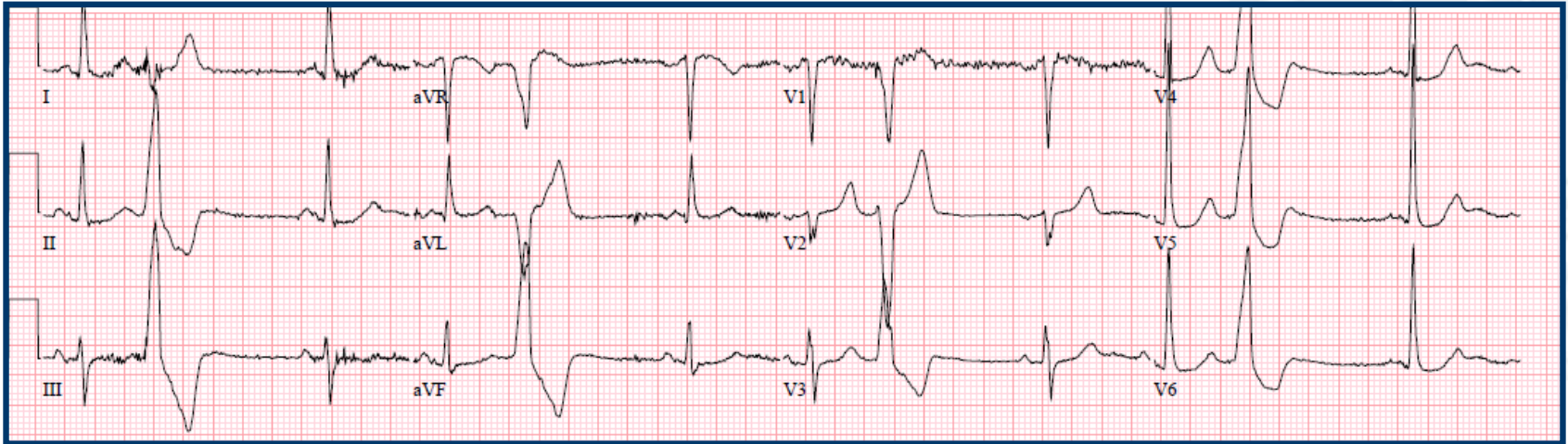
Normal Coronaries; No Coronary Vasospasm



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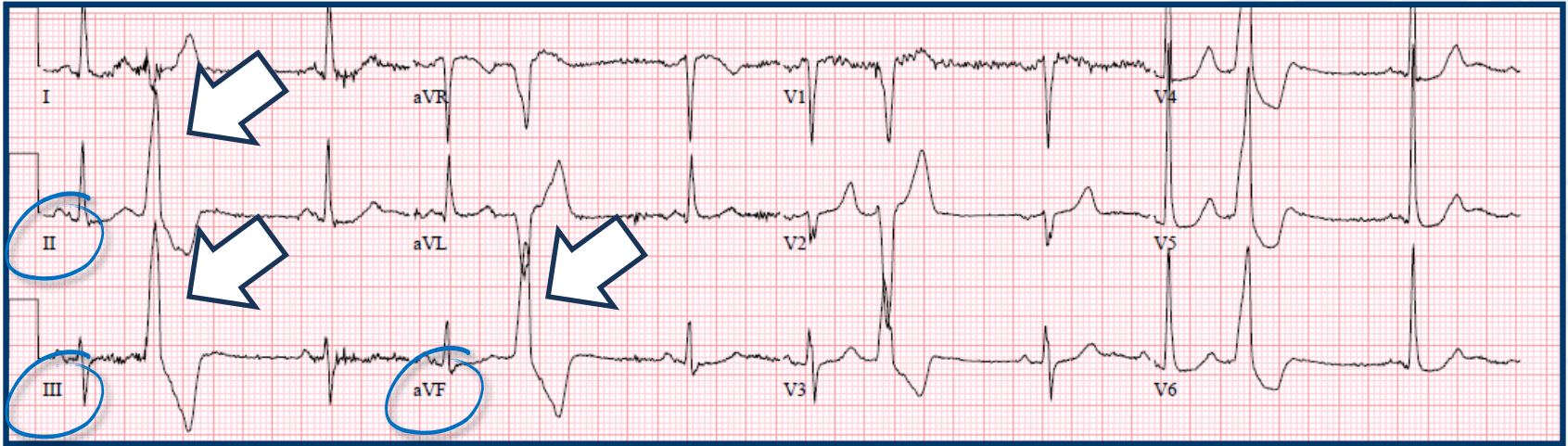


# Preoperative EKG



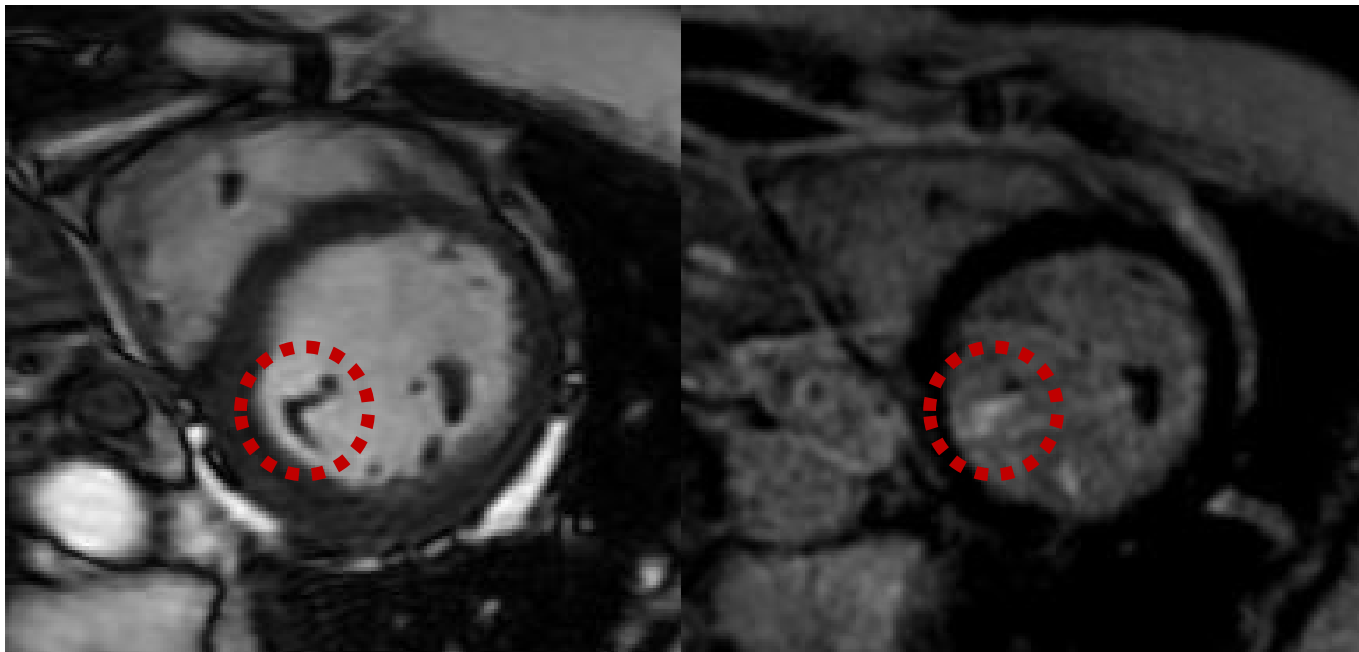
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# Strongly Positive PVC QRS in Inferior Leads





# Cardiac MRI: PM Pap. Muscle Tip Scar



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# What would you recommend?

1. AICD placement now
2. AICD placement if ventricular arrhythmias reoccur



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# What would you recommend?

1. Long-term medical therapy without surgery
2. Medical optimization and surgery in 3 months



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# Plan of Care

- IACD placement
- Tapering dose Amiodarone;  $\beta$ -blocker
- Mitral repair scheduled for early 2018





## Case 4

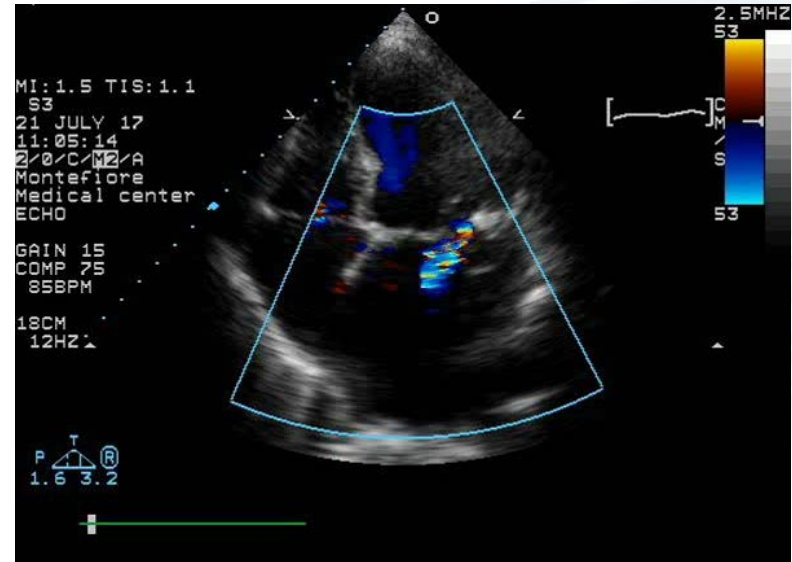
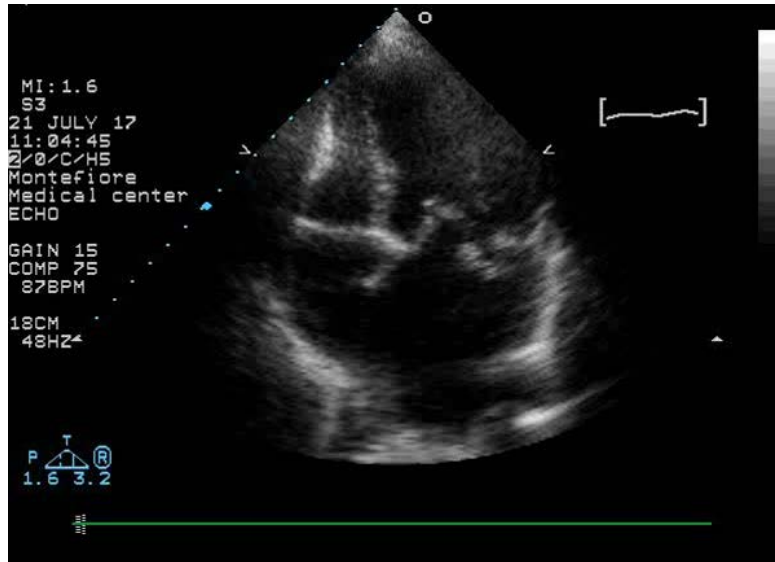


- 62-year-old retired speech & language pathologist
- History of MR and Parkinson's disease
- s/p Burr hole; deep brain stimulation
- Active echo surveillance
- Developed palpitations followed by organized AFib
- Now symptomatic on minimal activity





# Transthoracic Echocardiogram



BP 95/64 mmHg    Height 61"    Weight 108 lb



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# Transesophageal Echocardiogram



BP 139/73 mmHg Height 61" Weight 108lb



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# Summary

62-year-old female with long standing MR and Parkinson's disease, Afib and now dyspnea on inclines. STS MVr: 0.82%

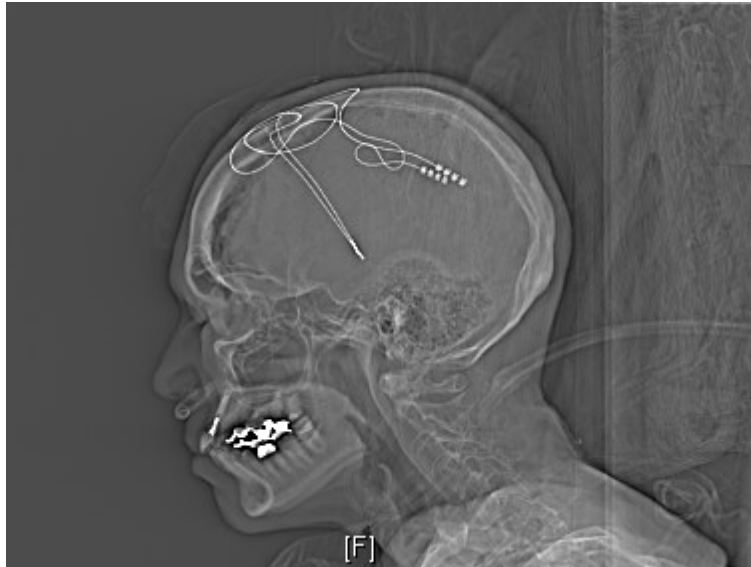
## Imaging:

2015: Moderate MR, mild TR (RVSP 30-35mmHg)  
LVEDD 4.9cm. LVESD 2.6cm, LA 5.1cm, EF 70%

2017: Severe MR, bileaflet MVP, MAC, mild TR (RVSP 41mmHg)  
LVEDD 5.3cm, LVESD 3.6cm, LA 6cm, EF 57%



# Deep Brain Stimulation Leads



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# What would you recommend?

1. Optimize medical therapy, repeat TTE in 6 months
2. MV repair + MAZE  $\pm$  TV repair
3. MitraClip



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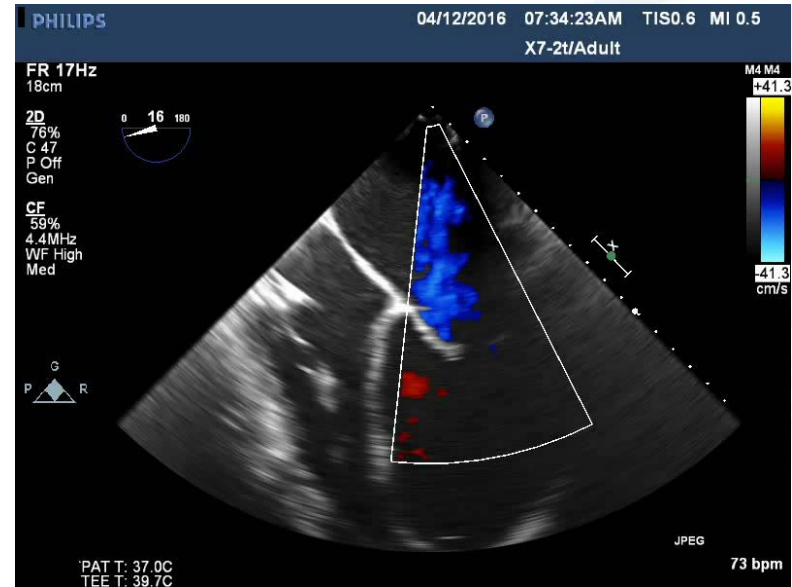
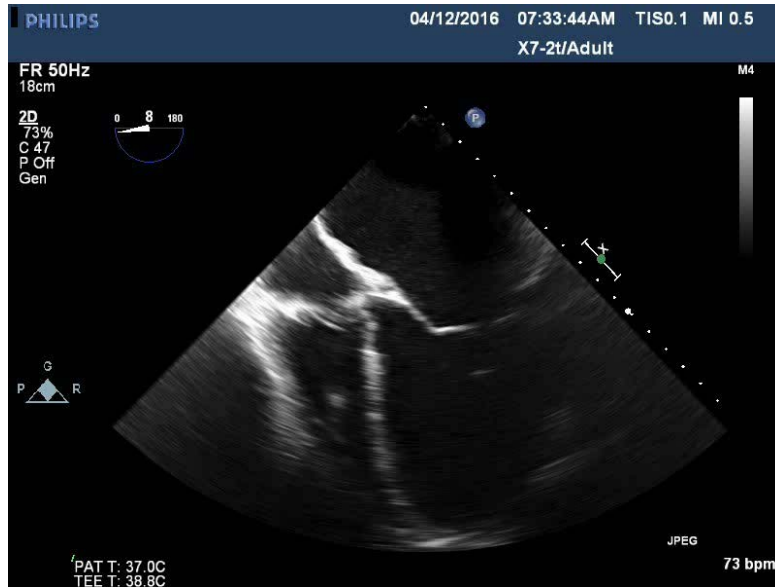
## Case 5

- 52-year-old male former Olympic gold medalist
- c/o dyspnea during intense physical training 4 years prior
- MRI/CATH 2012: non-ischemic dilated cardiomyopathy with severe MR
- s/p OOH AICD placement; CRT
- Now class III-IV symptoms on optimal medical therapy

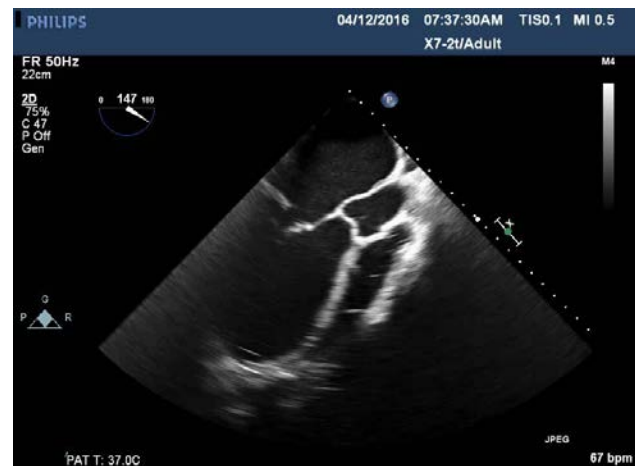
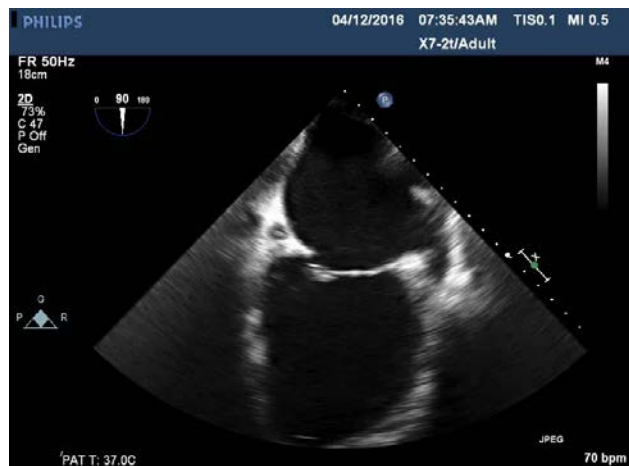




# Transesophageal Echocardiogram



BP 90/60 mmHg Height 68.1" Weight 134lb





# Summary

52-year-old athletic male with non-ischemic dilated cardiomyopathy and Bi-Ventricular AICD in situ, reports progressive decline in exercise tolerance and dyspnea at one flight of stairs, despite optimal medical Rx and CRT.

STS Score: MVr 0.496%

Imaging:

Severe MR, mild-moderate TR (RVSP 68mmHg)

LVEDD 6.9cm. LVEDD 6.7cm, LA 6.9cm, EF 21%

RHC-rest: PCW 20mmHg, PA 60/29/39mmHg, RV 60/7mmHg

Exercise: PCW 30mmHg, PA 75/38/50mmHg



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# What would you recommend?

1. Continued optimal medical therapy
2. MV repair  $\pm$  TV repair
3. MV replacement  $\pm$  TV repair
4. MitraClip

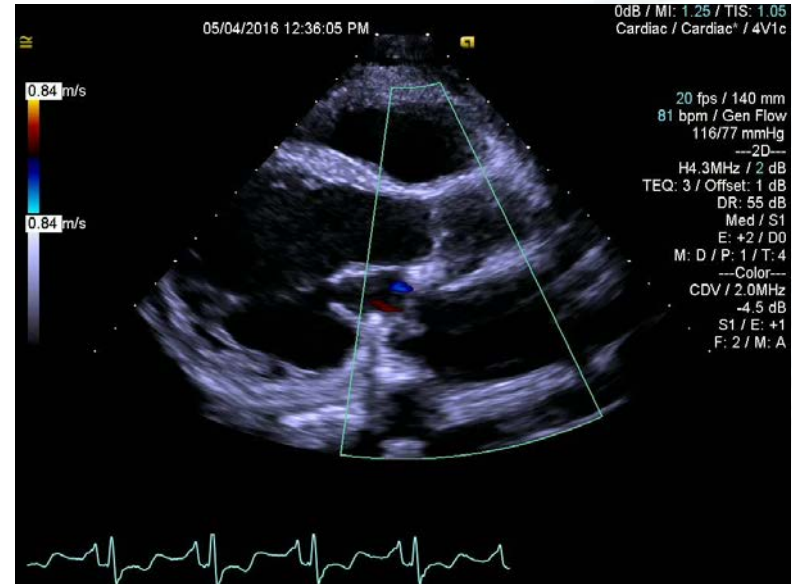


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## Follow-Up TTE 3 Weeks Postoperatively





# Follow-Up 6 Months Postoperatively

- Patient doing well
- Resumed moderate exercise training



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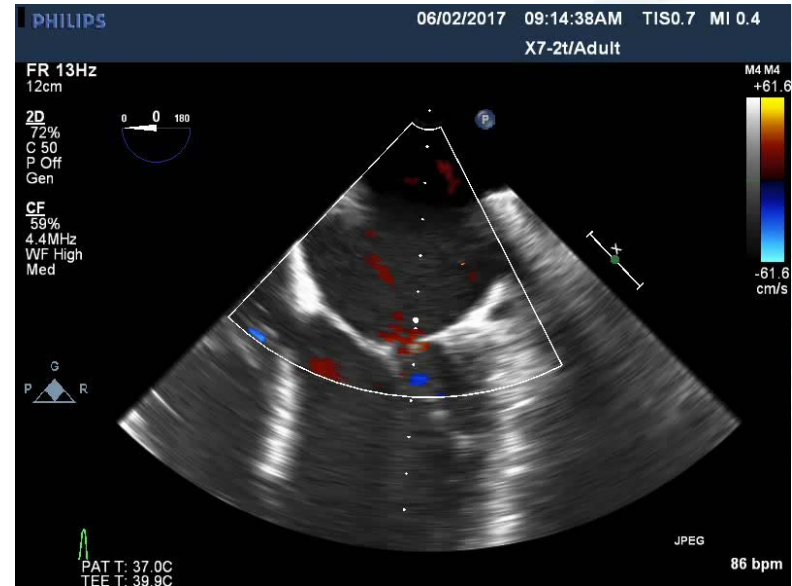
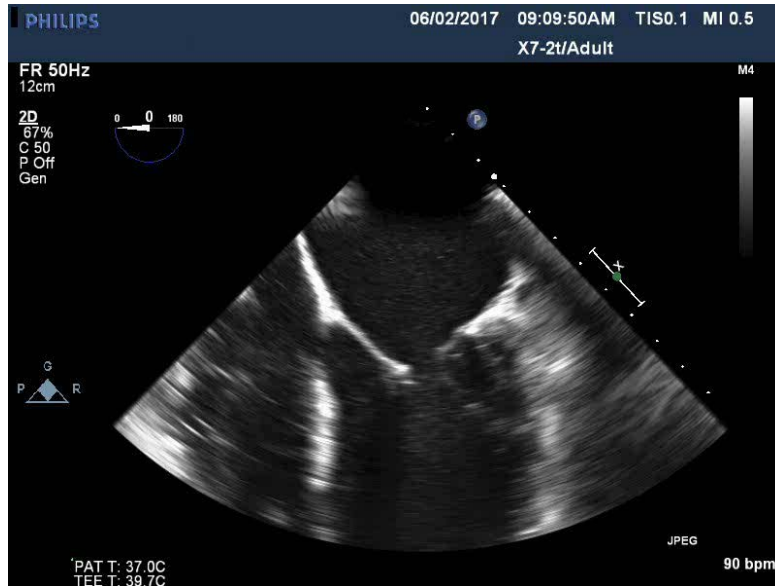


## Case 6

- 77-year-old female
- CHF admission, severe FMR, LVEF 27%, NYHA-IV
- CAD (STEMI 2003), HLD, HTN, T2DM, CKD, PVD, AFib
- s/p CABG (2005), AICD (2005), AVR(b) (2013), TIA (2016)
- Multiple OOH admissions: acute CHF episodes
- Referred for high-risk surgery consult

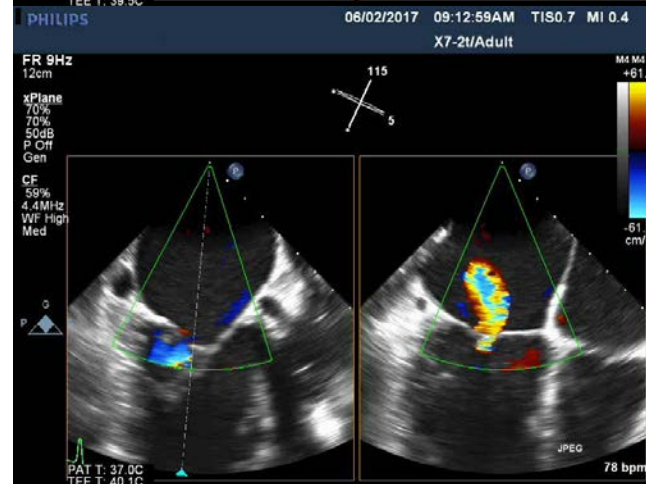
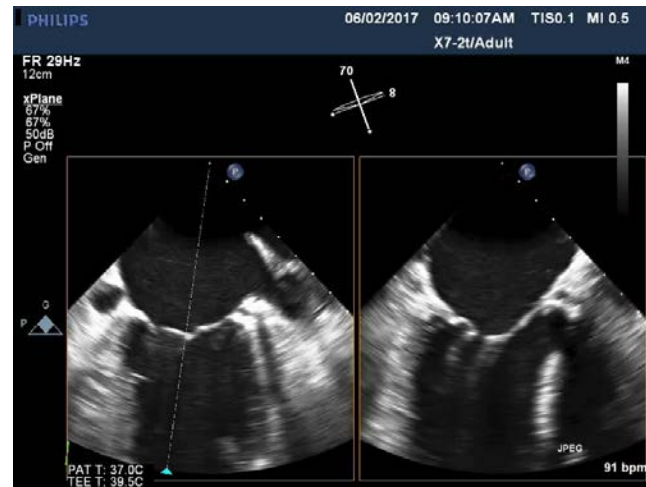


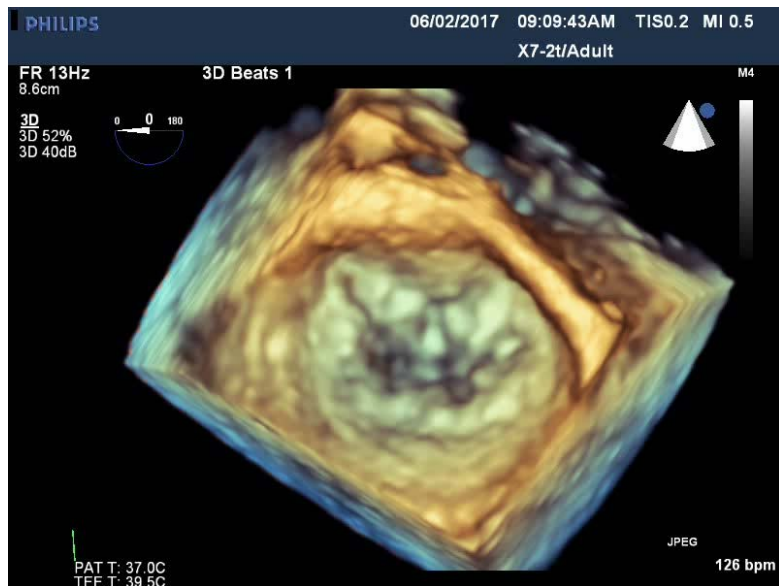
# Transesophageal Echocardiogram



BP 139/69 mmHg Height 163cm

Weight 73Kg





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# Summary

77-year-old female with ischemic cardiomyopathy, functional MR, multiple acute-on-chronic CHF, s/p CABG (2005), AICD (2005), AVR(b) (2013), TIA (2016), NYHA-IV, referred for high-risk surgery consult following ED admission for CHF exacerbation. STS Score: MV repair 11.21%

## Imaging:

Severe MR, multiple jets, MAC, chordal fibrocalcification  
mild TR, moderate PHTN (RVSP 51mmHg)  
LVEDD 5.2cm, LVESD 4.2cm, LA 4.6cm, EF 29%

Right Heart Cath: PCW 35, PA 64/25/38, RV 60/14  
Coronary CT Angio: patent SVG's to LAD, RCA



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# What would you recommend?

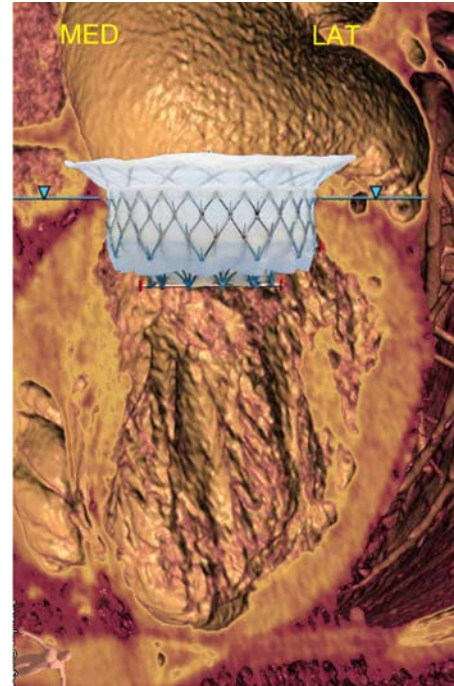
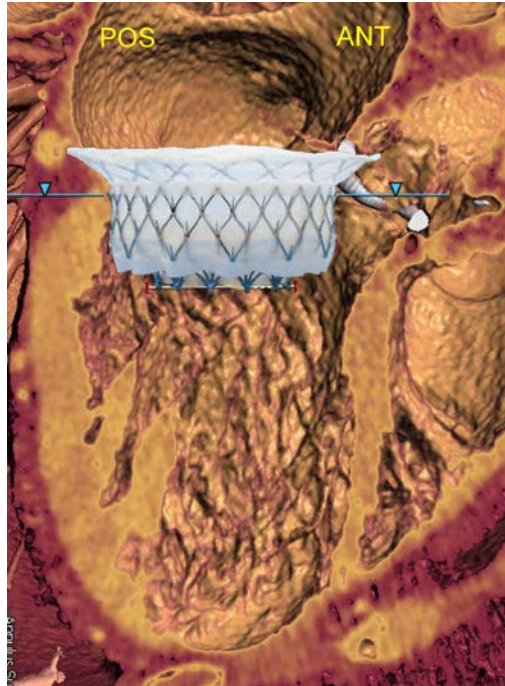
1. Continue optimal therapy; no intervention
2. MV surgery
3. MitraClip
4. TMVR



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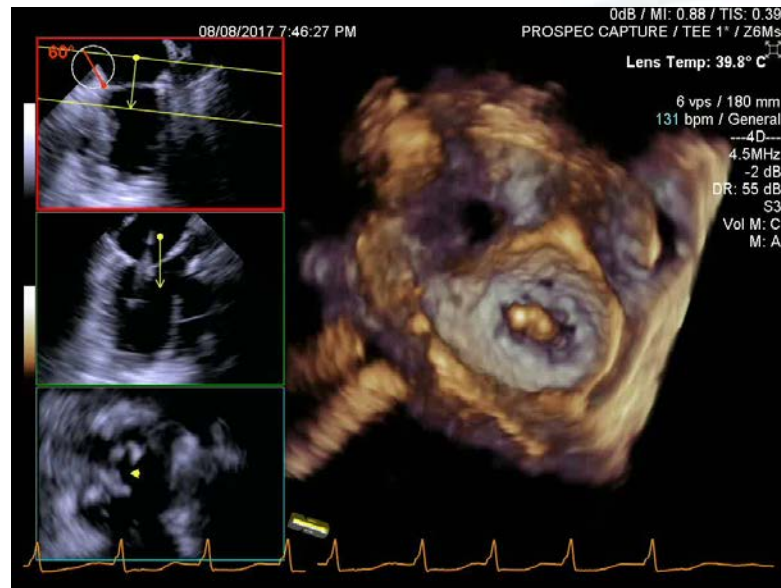
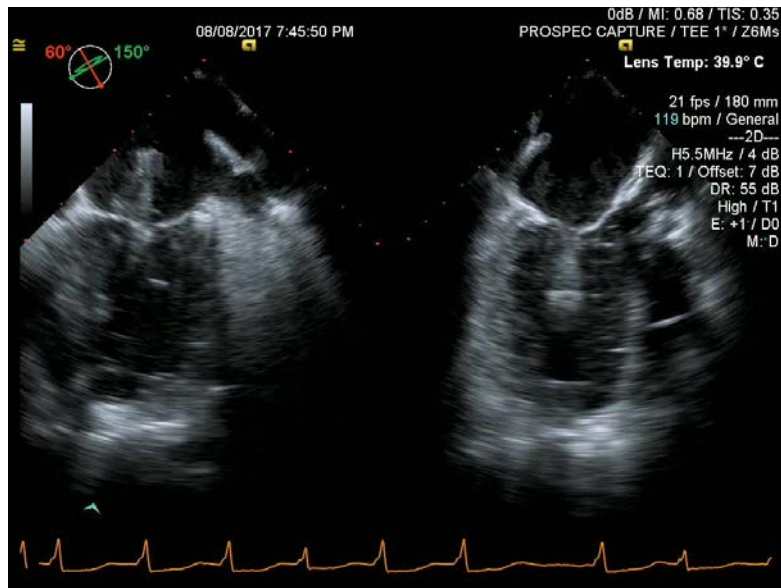
# Preoperative Screening



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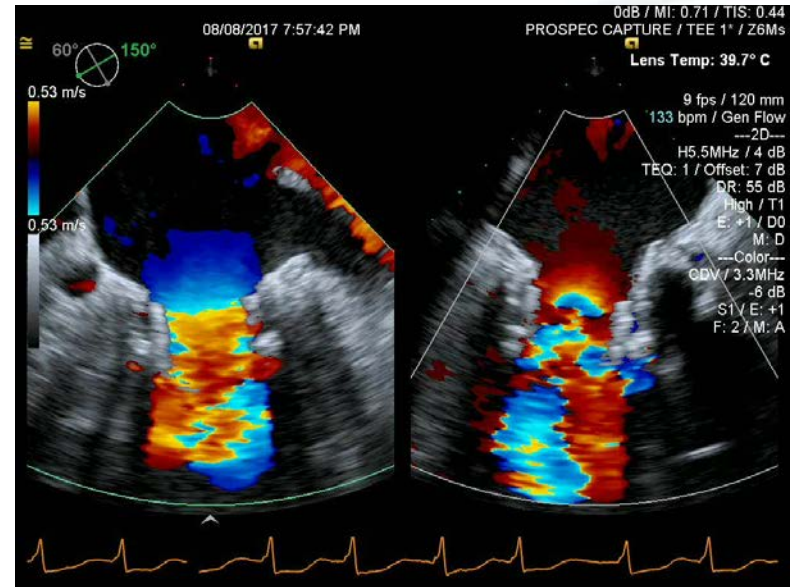
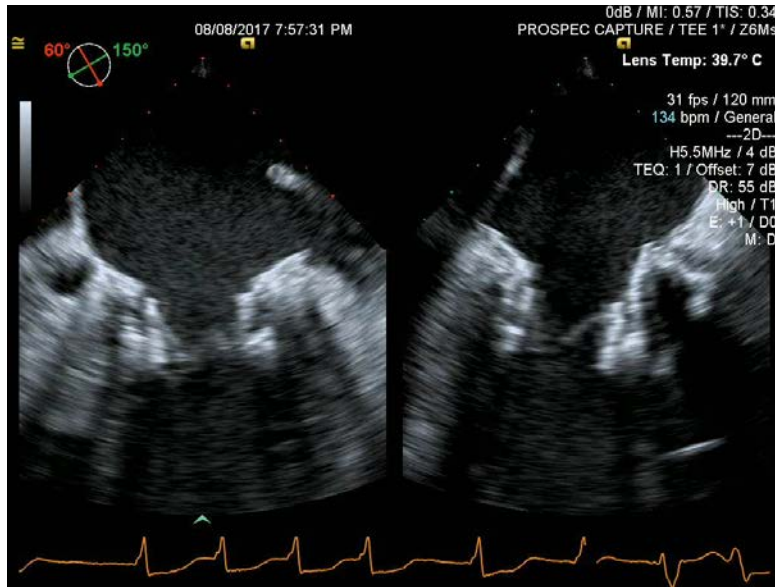


# Intraoperative Echocardiogram



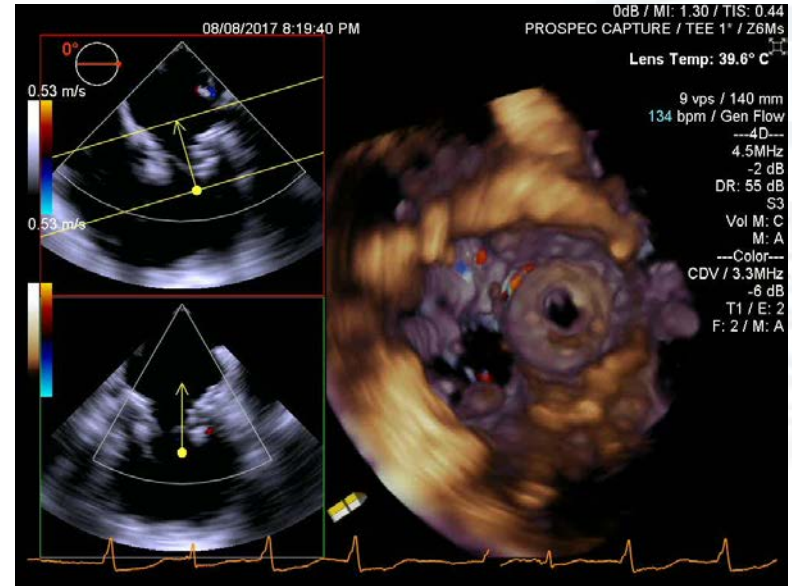
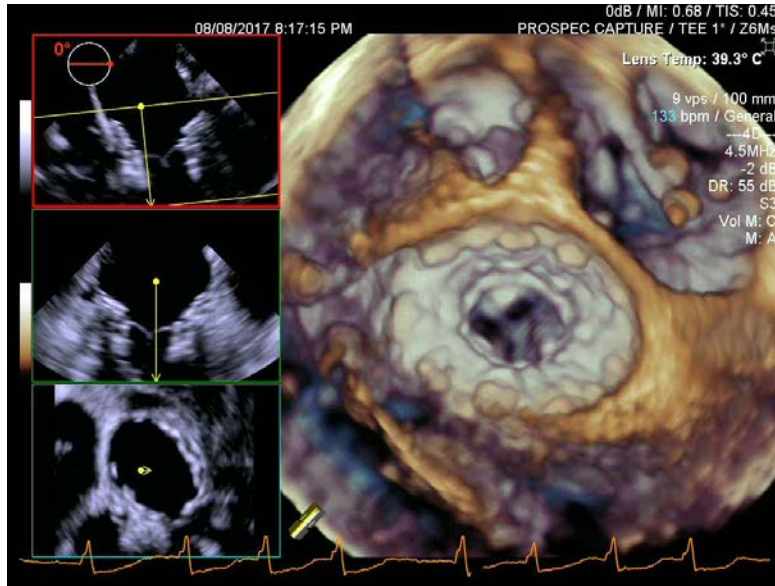
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# Device Deployment Final Result



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# Device Deployment Final Result



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# 4-month Follow-Up



- Patient doing well
- Currently asymptomatic
- Resumed normal life style



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Thank You

