2017 AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease (2014 guideline with 2017 focused update incorporated)

Developed in Collaboration with the American Association for Thoracic Surgery, American Society of Echocardiography, Society for Cardiovascular Angiography and Interventions, Society of Cardiovascular Anesthesiologists, and Society of Thoracic Surgeons

2014 AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease

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WRITING COMMITTEE MEMBERS*

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General Concepts

A Multiple randomized trials or meta-analysis

B Single randomized trial or non-randomized studies

C Consensus, case reports, standard of care

Class I Benefit >>> risk / Should be

Class IIa Benefit >> risk/ Reasonable

Class IIb Benefit ≥ risk/ Could be

Class C No benefit / harm

Table 1. Applying Class of Recommendation and Level of Evidence to Clinical Strategies, Interventions, Treatments, or Diagnostic Testing in Patient Care*

(Updated August 2015)

(Used in the 2017 VHD Focused Update)

CLASS (STRENGTH) OF RECOMMENDATION	
CLASS I (STRONG)	**Benefit >>> Risk**

Suggested phrases for writing recommendations:
▪ Is recommended
▪ Is indicated/useful/effective/beneficial
▪ Should be performed/administered/other
▪ Comparative-Effectiveness Phrases†:
  ○ Treatment/strategy A is recommended/indicated in preference to treatment B
  ○ Treatment A should be chosen over treatment B	

CLASS IIa (MODERATE)	**Benefit >> Risk**

Suggested phrases for writing recommendations:
▪ Is reasonable
▪ Can be useful/effective/beneficial
▪ Comparative-Effectiveness Phrases†:
  ○ Treatment/strategy A is probably recommended/indicated in preference to treatment B
  ○ It is reasonable to choose treatment A over treatment B	

CLASS IIb (WEAK)	**Benefit ≥ Risk**
Suggested phrases for writing recommendations: ▪ May/might be reasonable ▪ May/might be considered ▪ Usefulness/effectiveness is unknown/unclear/uncertain or not well established	
CLASS III: No Benefit (MODERATE) *(Generally, LOE A or B use only)*	**Benefit = Risk**
Suggested phrases for writing recommendations: ▪ Is not recommended ▪ Is not indicated/useful/effective/beneficial ▪ Should not be performed/administered/other	
CLASS III: Harm (STRONG)	**Risk > Benefit**
Suggested phrases for writing recommendations: ▪ Potentially harmful ▪ Causes harm ▪ Associated with excess morbidity/mortality ▪ Should not be performed/administered/other	

LEVEL (QUALITY) OF EVIDENCE‡	
LEVEL A	
▪ High-quality evidence‡ from more than 1 RCT ▪ Meta-analyses of high-quality RCTs ▪ One or more RCTs corroborated by high-quality registry studies	
LEVEL B-R	**(Randomized)**
▪ Moderate-quality evidence‡ from 1 or more RCTs ▪ Meta-analyses of moderate-quality RCTs	
LEVEL B-NR	**(Nonrandomized)**
▪ Moderate-quality evidence‡ from 1 or more well-designed, well-executed nonrandomized studies, observational studies, or registry studies ▪ Meta-analyses of such studies	
LEVEL C-LD	**(Limited Data)**
▪ Randomized or nonrandomized observational or registry studies with limitations of design or execution ▪ Meta-analyses of such studies ▪ Physiological or mechanistic studies in human subjects	
LEVEL C-EO	**(Expert Opinion)**
Consensus of expert opinion based on clinical experience	

COR and LOE are determined independently (any COR may be paired with any LOE).

A recommendation with LOE C does not imply that the recommendation is weak. Many important clinical questions addressed in guidelines do not lend themselves to clinical trials. Although RCTs are unavailable, there may be a very clear clinical consensus that a particular test or therapy is useful or effective.

* The outcome or result of the intervention should be specified (an improved clinical outcome or increased diagnostic accuracy or incremental prognostic information).

† For comparative-effectiveness recommendations (COR I and IIa; LOE A and B only), studies that support the use of comparator verbs should involve direct comparisons of the treatments or strategies being evaluated.

‡ The method of assessing quality is evolving, including the application of standardized, widely used, and preferably validated evidence grading tools; and for systematic reviews, the incorporation of an Evidence Review Committee.

COR indicates Class of Recommendation; EO, expert opinion; LD, limited data; LOE, Level of Evidence; NR, nonrandomized; R, randomized; and RCT, randomized controlled trial.

NEW CONCEPTS!!

Chronic Severe *Secondary* Mitral Regurgitation: Intervention

Recommendations	COR	LOE
MV surgery is reasonable for patients with chronic severe secondary MR (stages C and D) who are undergoing CABG or AVR	IIa	C
New: It is reasonable to choose chordal-sparing MVR over downsized annuloplasty repair if operation is considered for severely symptomatic patients (NYHA class III to IV) with chronic severe ischemic MR (stage D) and persistent symptoms despite GDMT for HF	IIa	B-R
MV surgery may be considered for severely symptomatic patients (NYHA class III-IV) with chronic severe secondary MR (stage D) who have persistent symptoms despite optimal GDMT for HF	IIb	B
Modified: In patients with chronic, moderate, ischemic MR (stage B) undergoing CABG, the usefulness of mitral valve repair is uncertain	IIb	B-R

76 yo female // 2013

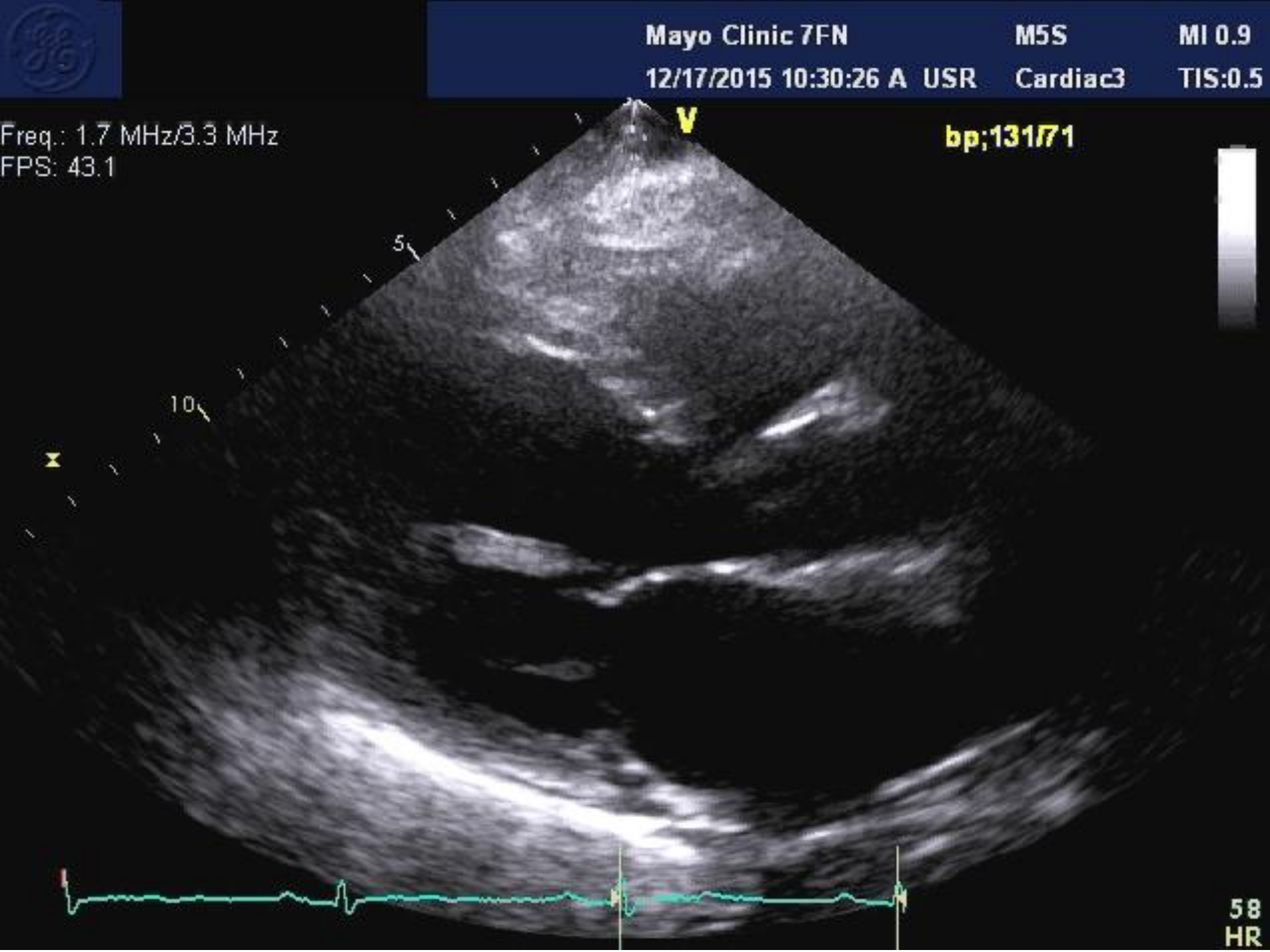
- S/P IWMI
- Stents to RCA LAD 2013
- LVEF 60%
- Moderate IMR
- Good medical Rx
- PAF

- 2015 NYHA IV(I was on trip)
- Afib
- Severe HF

- Diuresis
- Sinus Rhythm
- Narrow QRS
- Persistent SOB
- Echo

Echo

- LVEDD 64 mm
- LVESD 40mm
- LVEF 60%
- Severe MR
- Rvol 75 cc/beat
- LA 58 cc/m2
- Postero-inf regionals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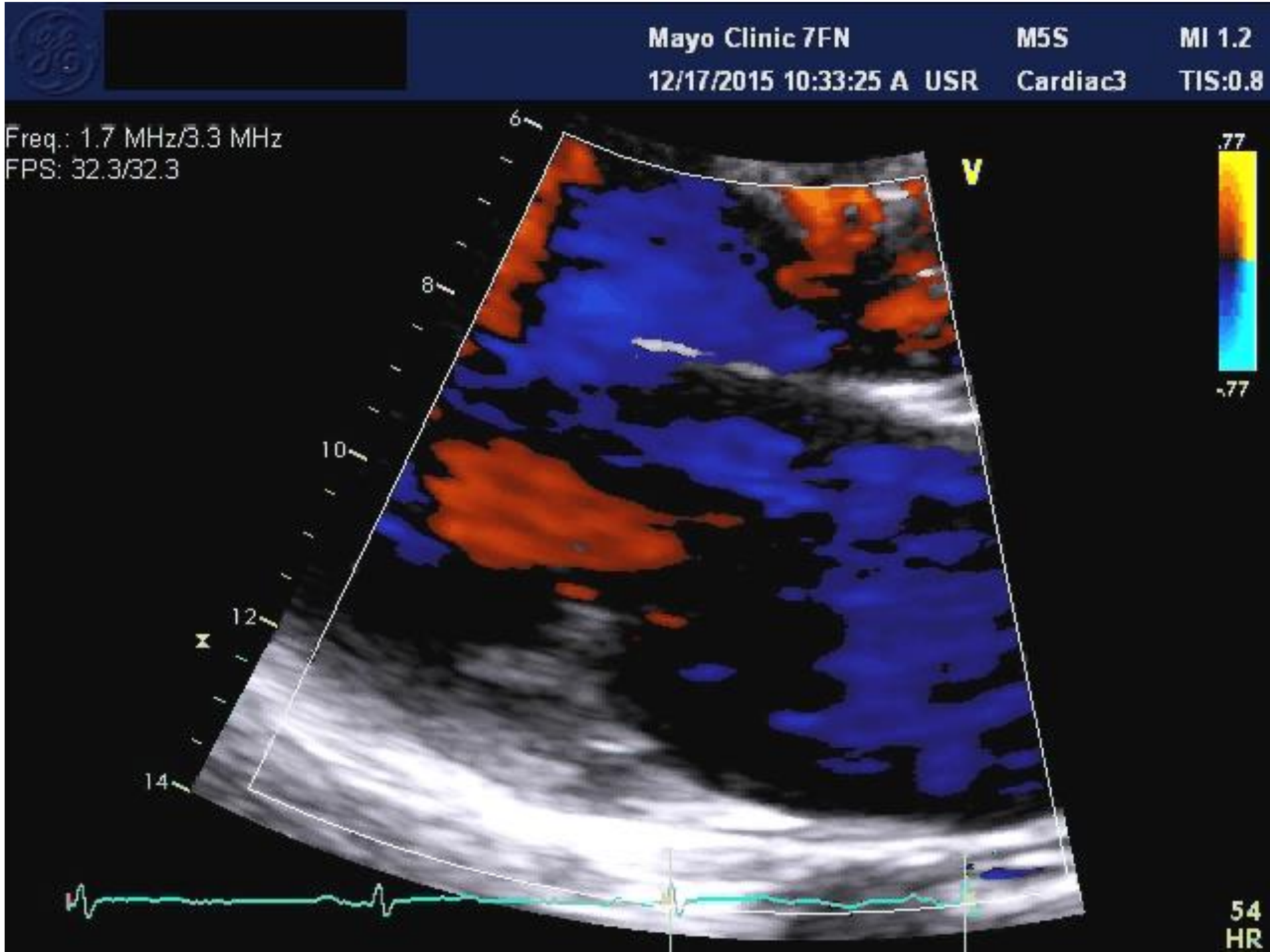
bp;131/71
5
10
58
HR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6
8
10
12
14
V
.77
-.77
54
HR


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Adult Echo
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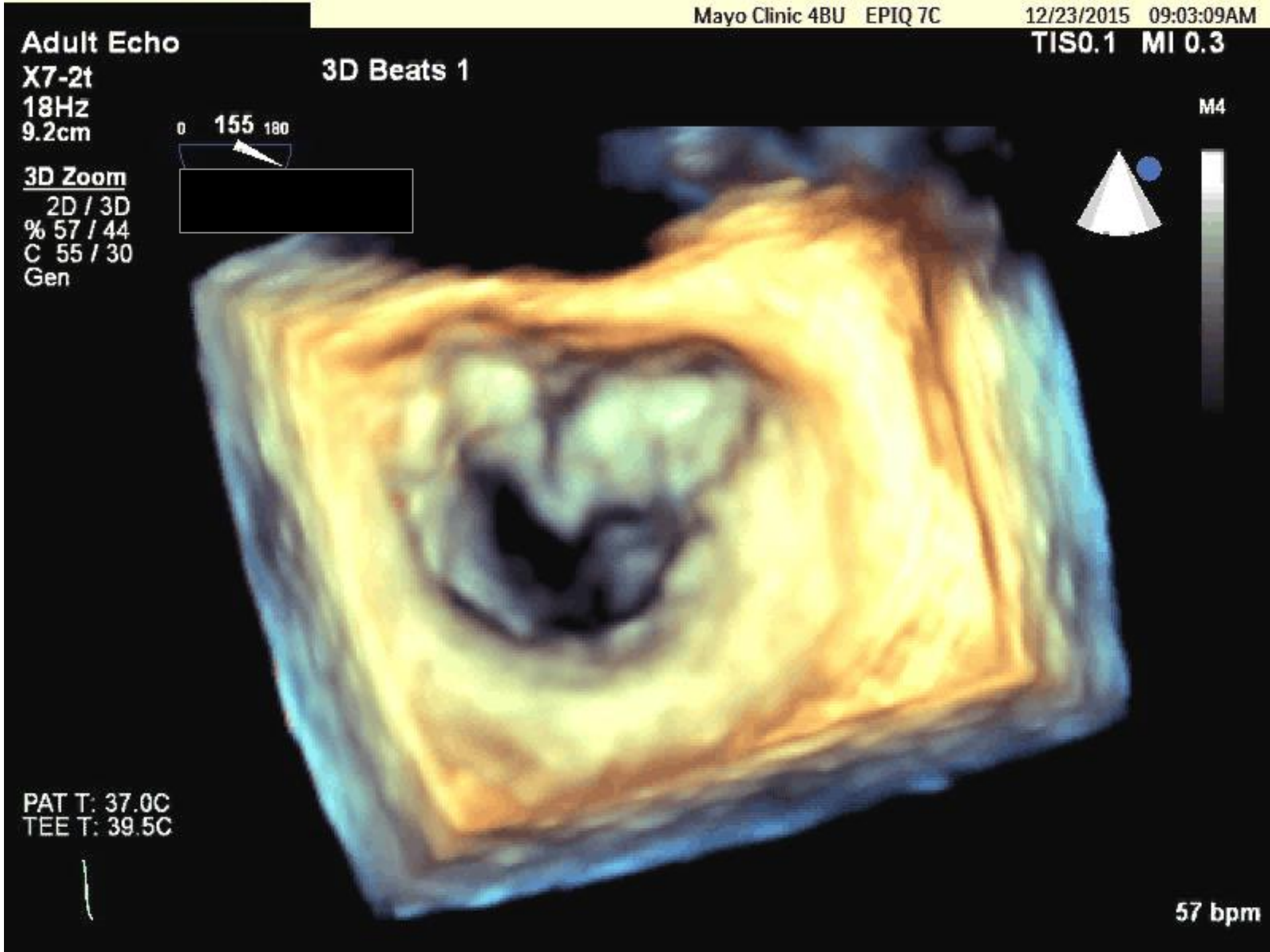
53Hz
13cm
TIS0.1 MI 0.4
0 10 180
2D
64%
C 50
P Off
Gen
M4
0
5
10
X3
G
P
R
PAT T: 37.0C
TEE T: 38.4C
51 bpm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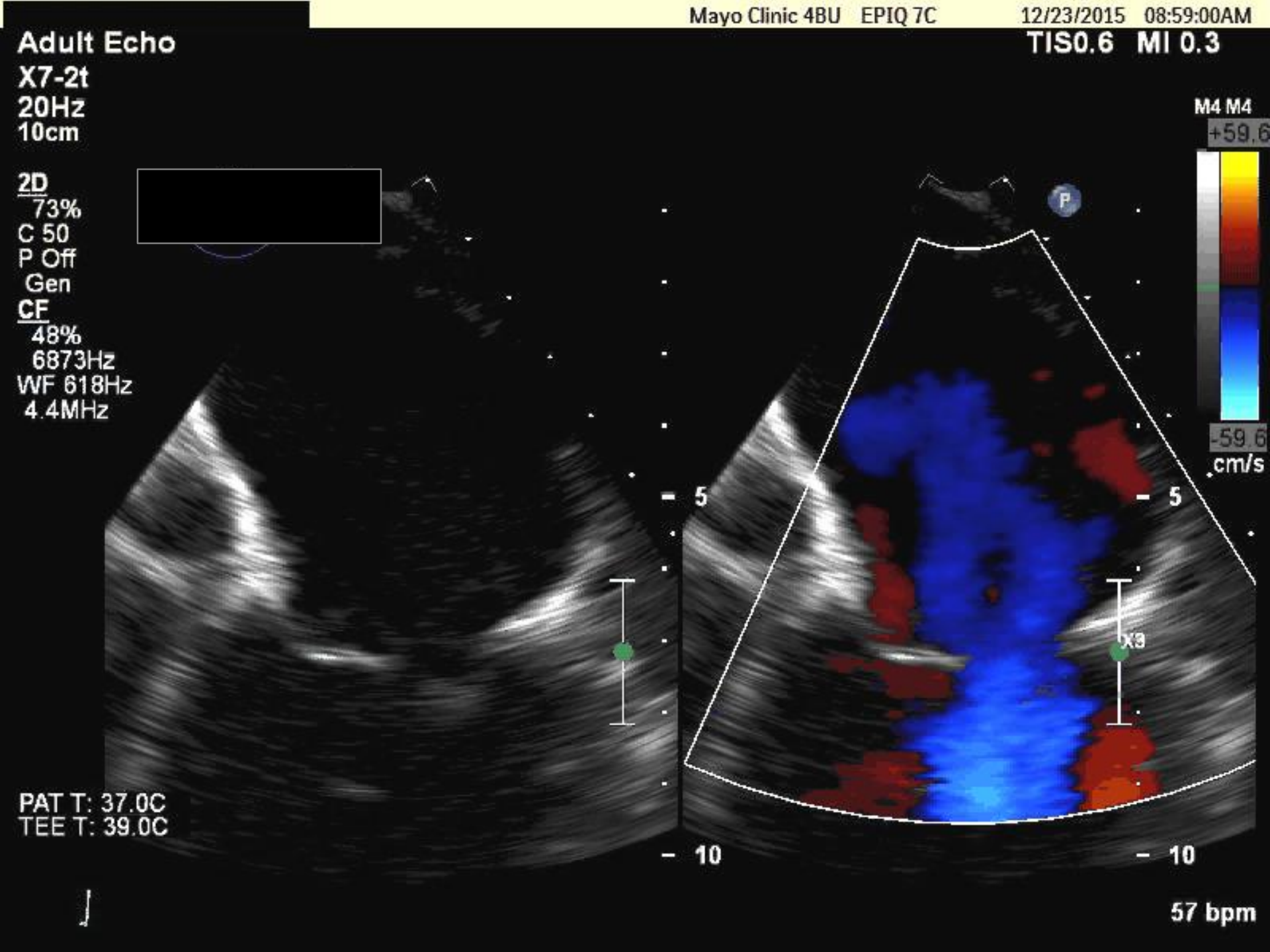
0 155 180
M4
3D Zoom
2D / 3D
% 57 / 44
C 55 / 30
Gen
PAT T: 37.0C
TEE T: 39.5C
57 bpm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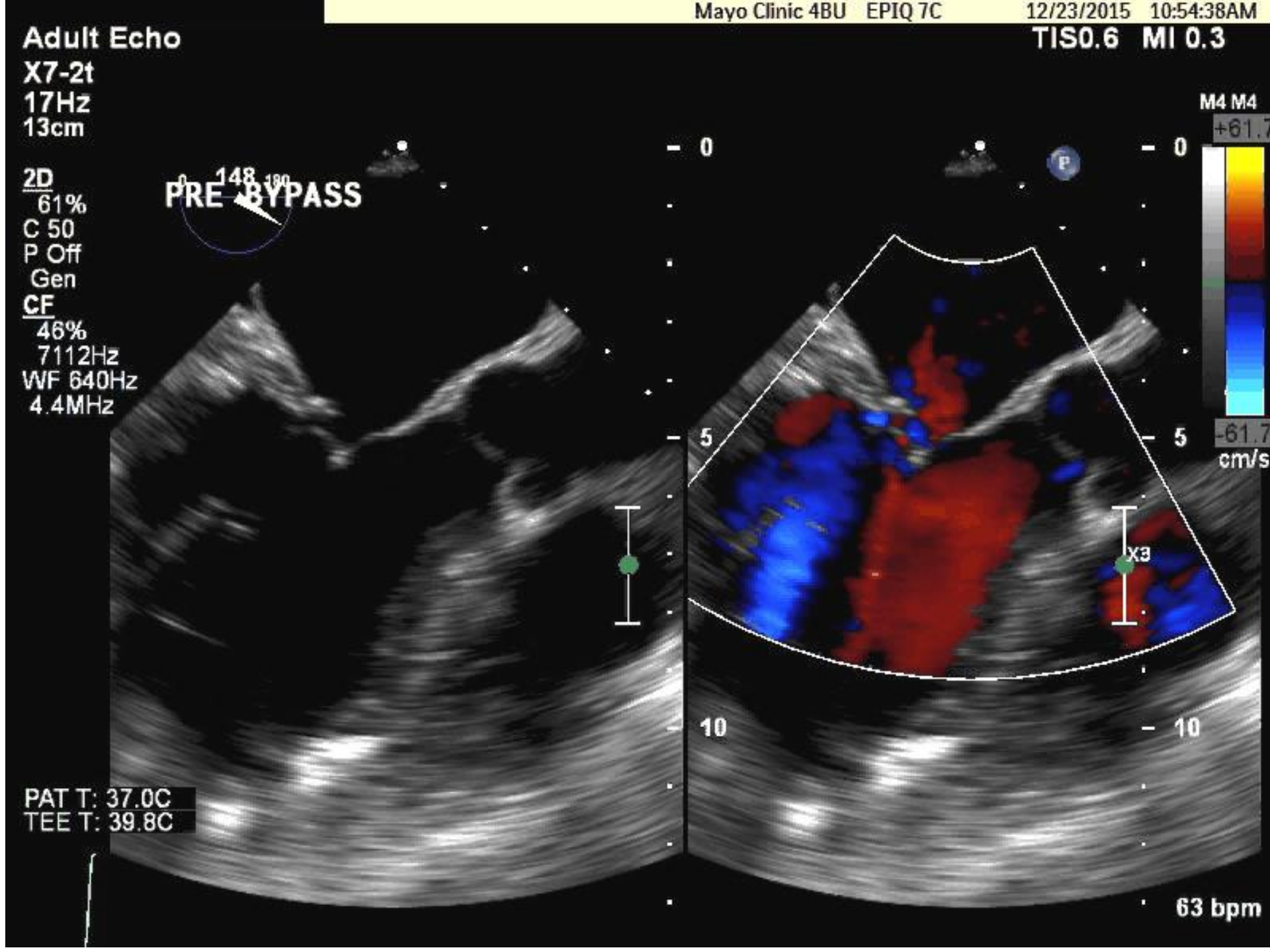
-59.6
cm/s
2D
73%
C 50
P Off
Gen
CF
48%
6873Hz
WF 618Hz
4.4MHz
5
5
10
10
PAT T: 37.0C
TEE T: 39.0C
57 bpm

What to do?

1. Resynchronization therapy
2. Mitraclip
3. Mitral repair/ complete ring
4. Mitral replacement with chordal preservation
5. Mitral repair/ papillary muscle repositioning and incomplete ring
6. Continue Medical therapy, consider antiarrhythmic

Our patient: What was done…

Restrictive annuloplasty with complete ring + MAZE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2D
61%
C 50
P Off
Gen
CF
46%
7112Hz
WF 640Hz
4.4MHz
PRE BYPASS
M4 M4
+61.7
-61.7
cm/s
PAT T: 37.0C
TEE T: 39.8C
63 bpm

CRITICAL PRINCIPLES

Philosophic

Basic Principle…
"AND / OR"

When submitting a patient to the risk of surgery, we must guarantee*:

- Increased Survival
- Decreased morbidity
- Improvement in symptoms / QOL

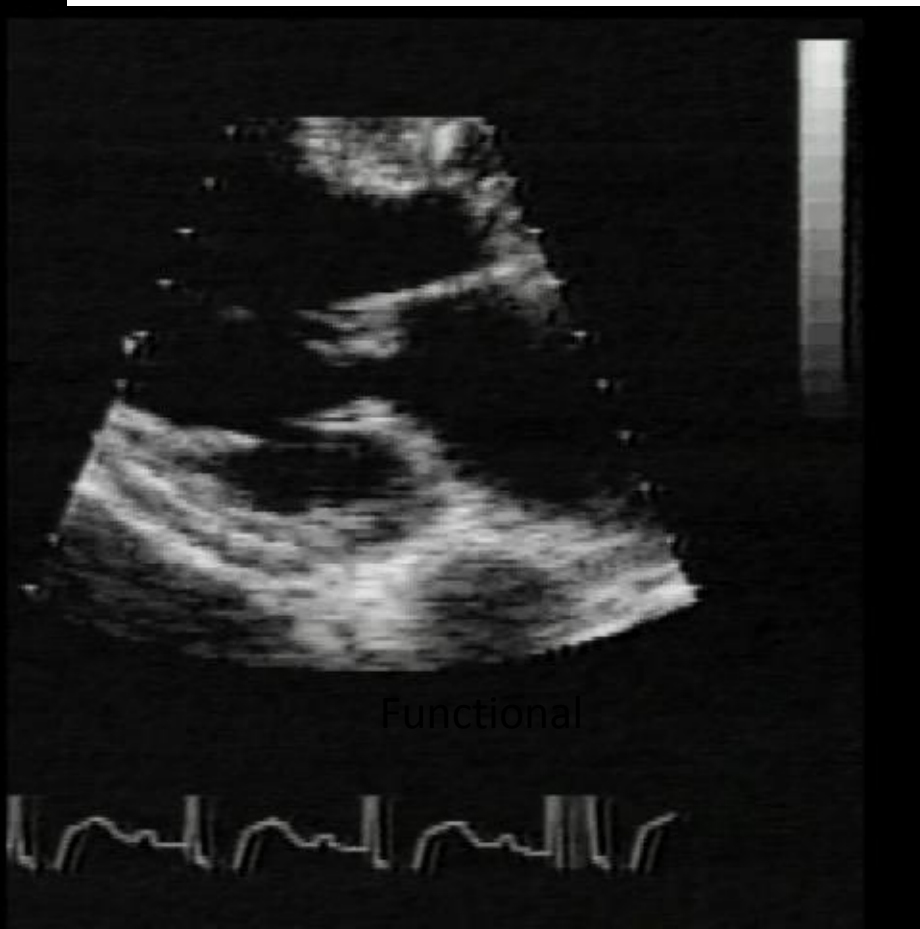
Asymptomatic IMR do not treat surgically unless undergoing revascularization

Why IMR?

American Heart Association®

Echocardiographic

Mitral Valve Mechanisms



Functional

Helping Cardiovascular Professionals
Learn. Advance. Heal.

Etiology and Mechanisms in MR

ORGANIC

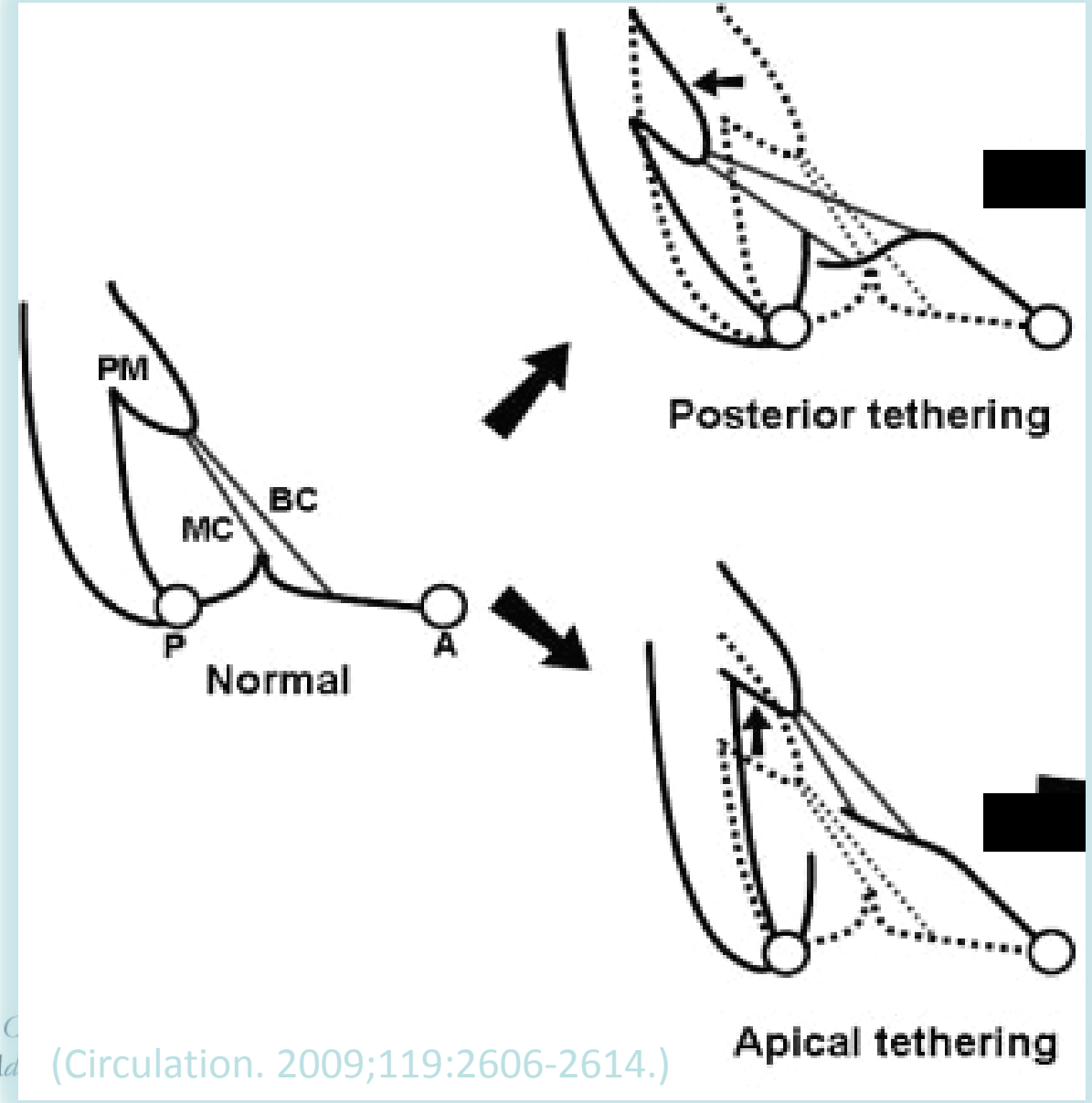
Excess tissue / length

Triangular resection

99% repair rate


Functional
Ischemic
repair rate???

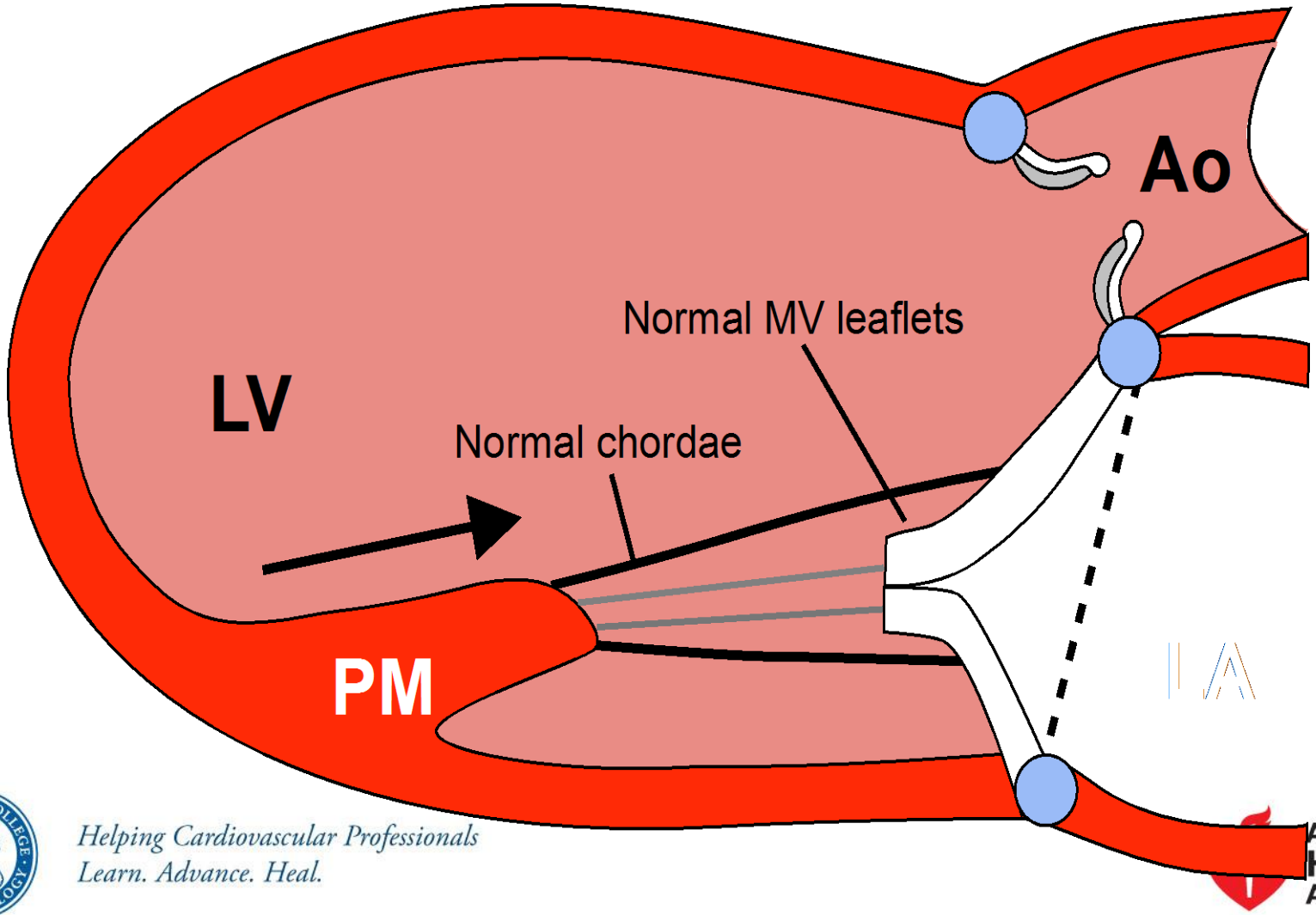
2 types tethering



(Circulation. 2009;119:2606-2614.)

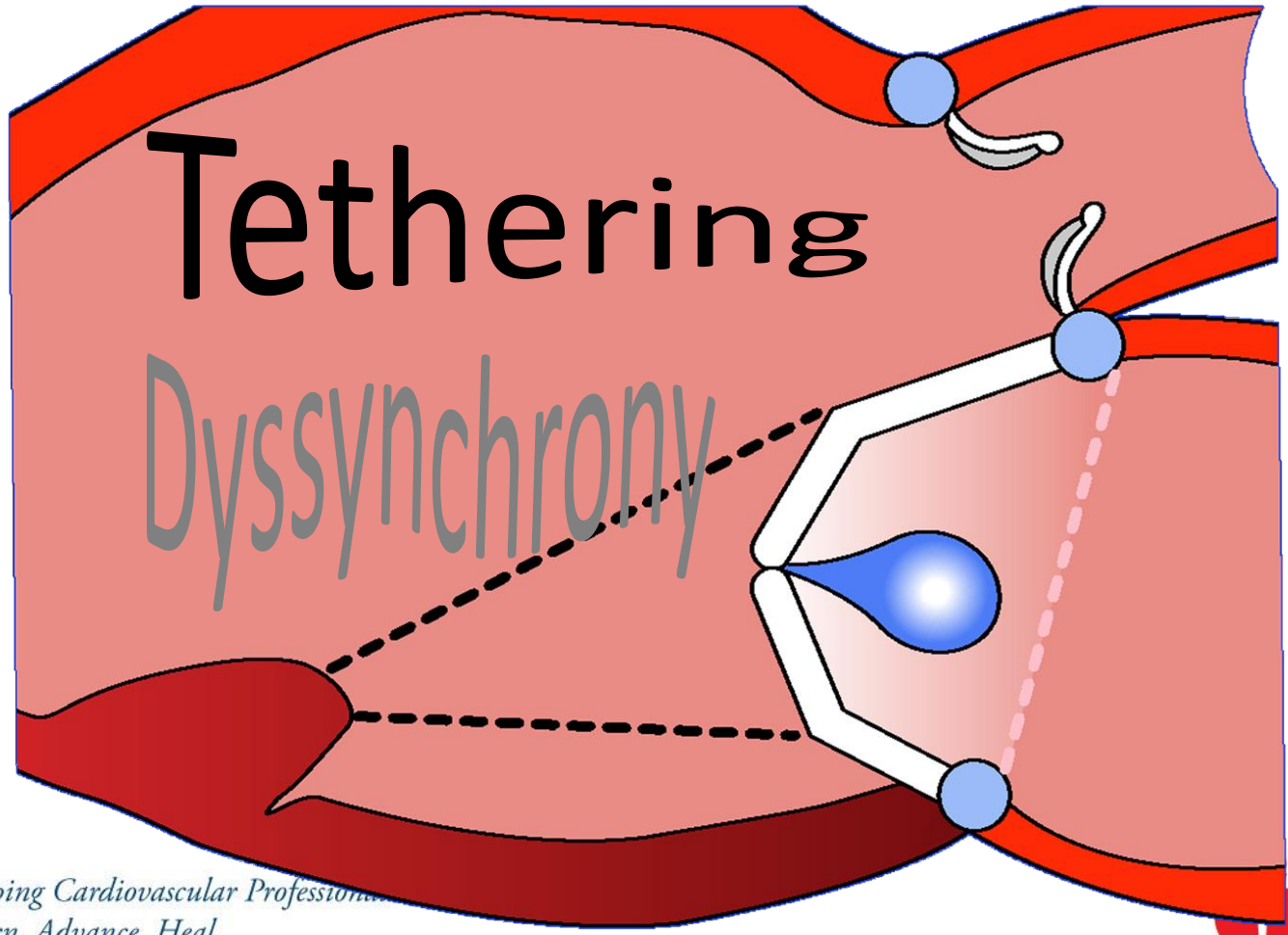
Myocardial infarction without MR

Normal Mitral Closure



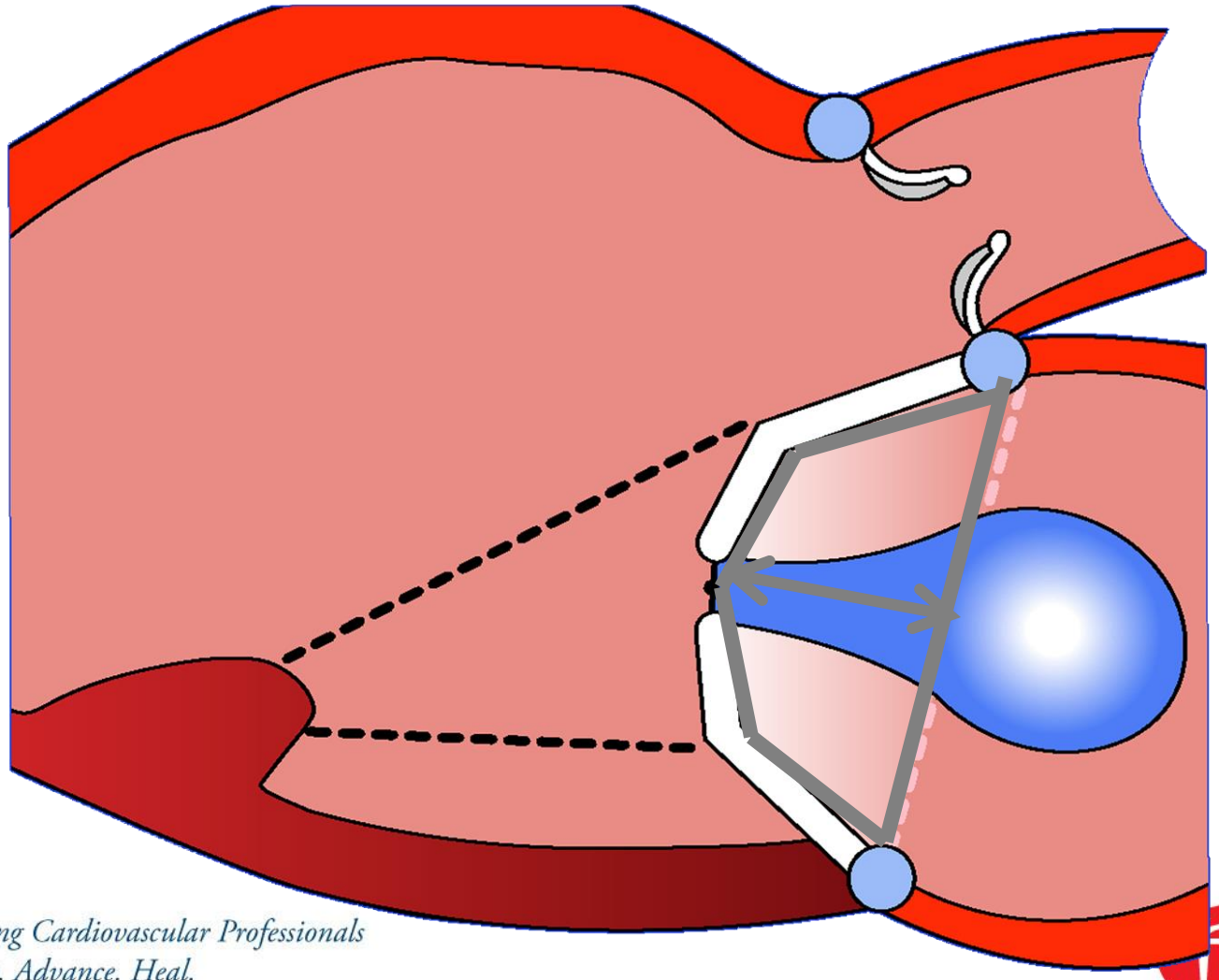
Ischemic MR

A disease of the LV



Ischemic MR

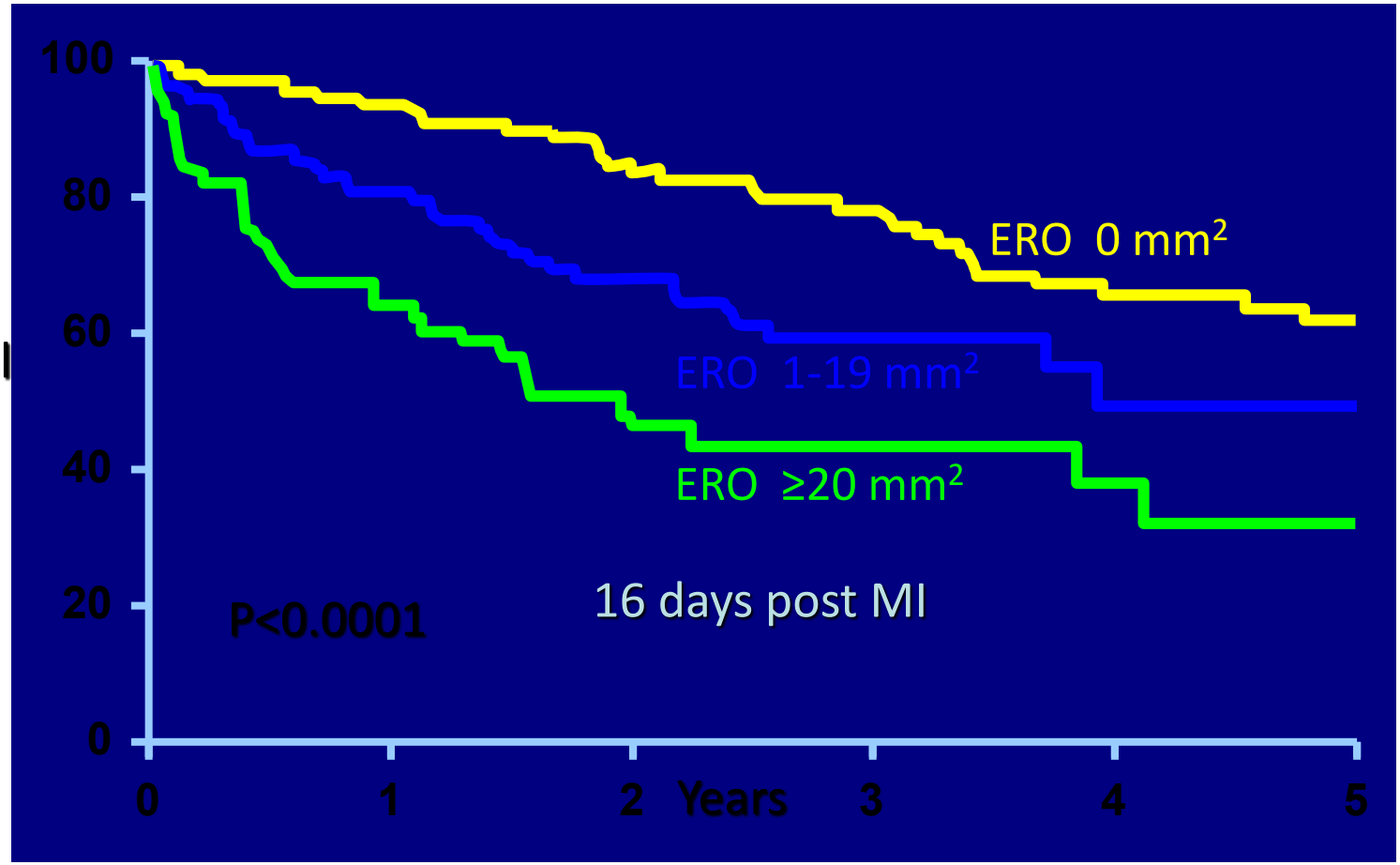
Tenting + Loss of Annular Contraction



What we know about IMR

Outcome After Q-MI

Impact of Quantified IMR on Survival (n=303)



Grigioni et al: Circ 103:1759, 2001

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C	Asymptomatic severe MR	• Regional wall motion abnormalities and/or LV dilation with severe tethering of mitral leaflet • Annular dilation with severe loss of central coaptation of the mitral leaflets	• ERO ≥ 0.20 cm^2† • Regurgitant volume ≥ 30 mL • Regurgitant fraction $\geq 50\%$

WE ASSUME THAT FIXING IMR WILL IMPROVE SURVIVAL BUT WE DO NOT REALLY KNOW!!

LV vs MR?

Asymptomatic IMR do not treat surgically unless undergoing revascularization

Isolated severe symp IMR treat surgically after Meds and resync failed—symptom relief

Surgical Principles

Mitral-Valve Repair versus Replacement for Severe Ischemic Mitral Regurgitation

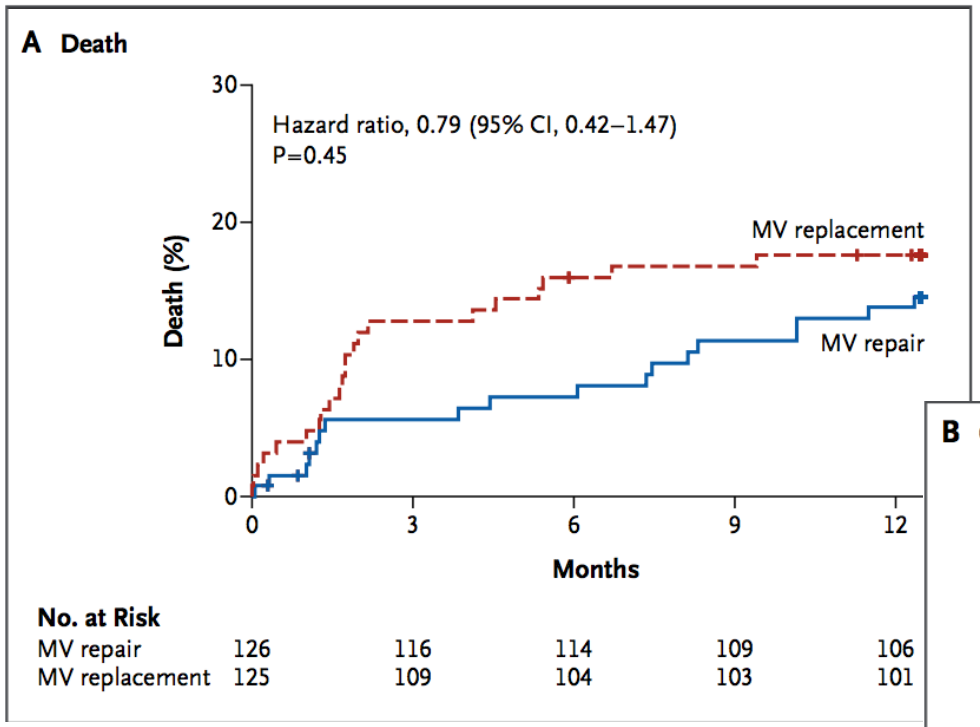
N Engl J Med 2014;370:23-32.

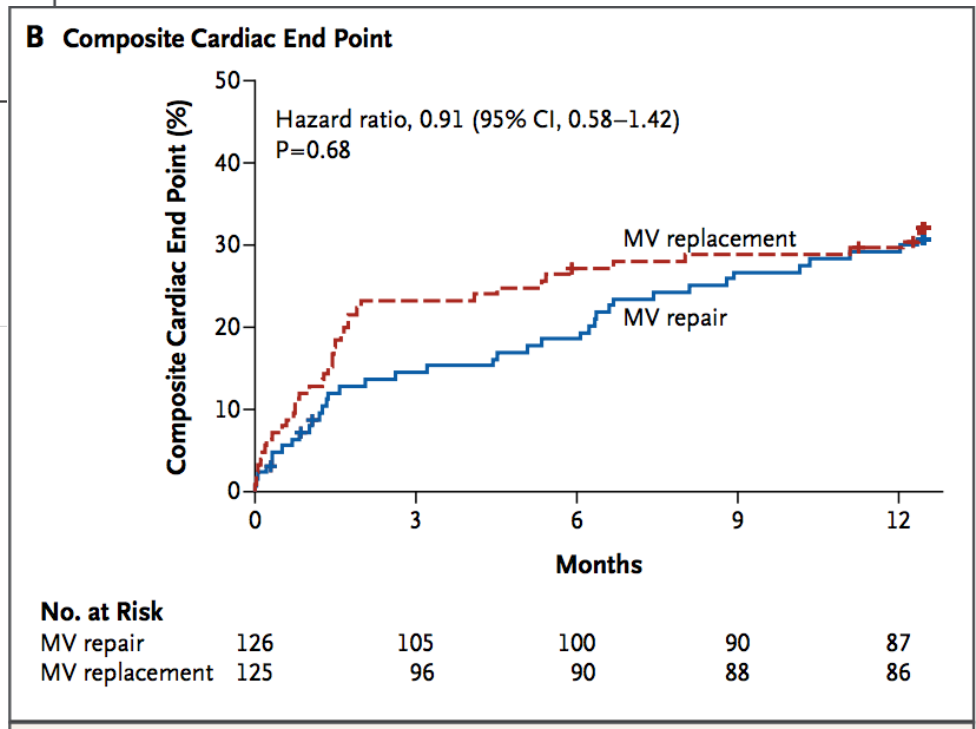
Male 61%
Age 68 ±10 yo
White 80%
LVEF 41 ±10%
ERO 0.4 ±0.1 cm2
NYHA III or IV 59%
Concom CABG 74%
ConcomTV repair 15%

MVR with sub- preservation
vs
Complete annuloplasty repair

Mitral-Valve Repair versus Replacement for Severe Ischemic Mitral Regurgitation

N Engl J Med 2014;370:23-32.





Mitral-Valve Repair versus Replacement for Severe Ischemic Mitral Regurgitation

N Engl J Med 2014;370:23-32.

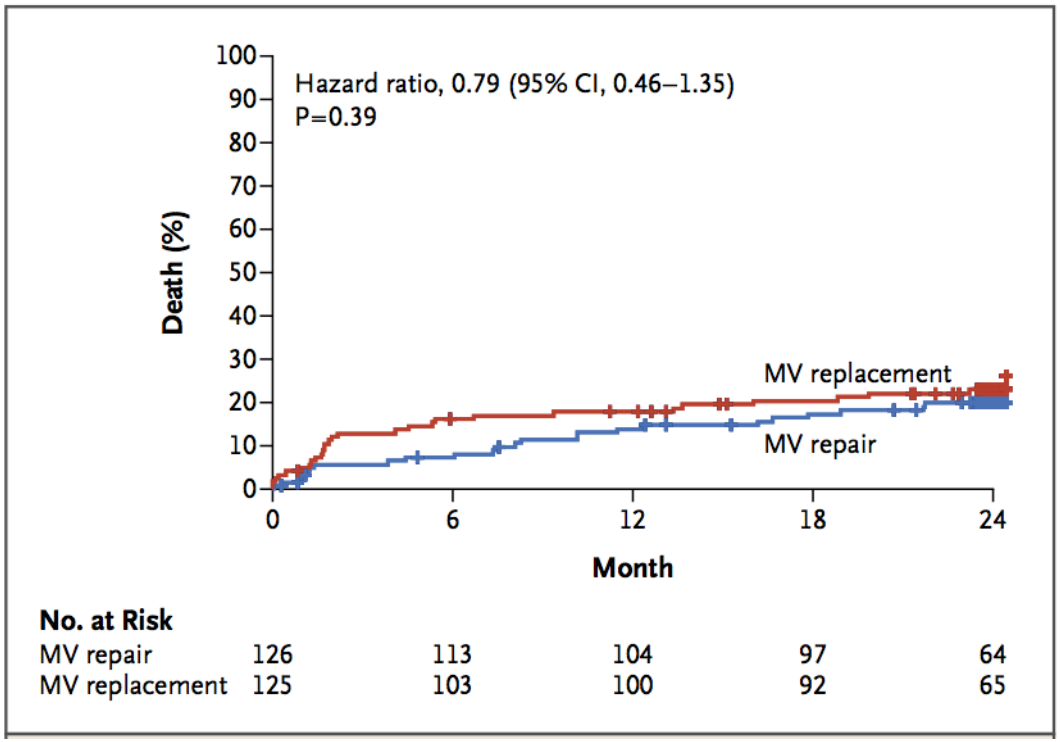
CONCLUSIONS

We observed no significant difference in left ventricular reverse remodeling or survival at 12 months between patients who underwent mitral-valve repair and those who underwent mitral-valve replacement. Replacement provided a more durable correction of mitral regurgitation, but there was no significant between-group difference in clinical outcomes. (Funded by the National Institutes of Health and the Canadian Institutes of Health; ClinicalTrials.gov number, NCT00807040.)

32% mod or severe recurrent MR
vs 2% P<0.001

Two-Year Outcomes of Surgical Treatment of Severe Ischemic Mitral Regurgitation

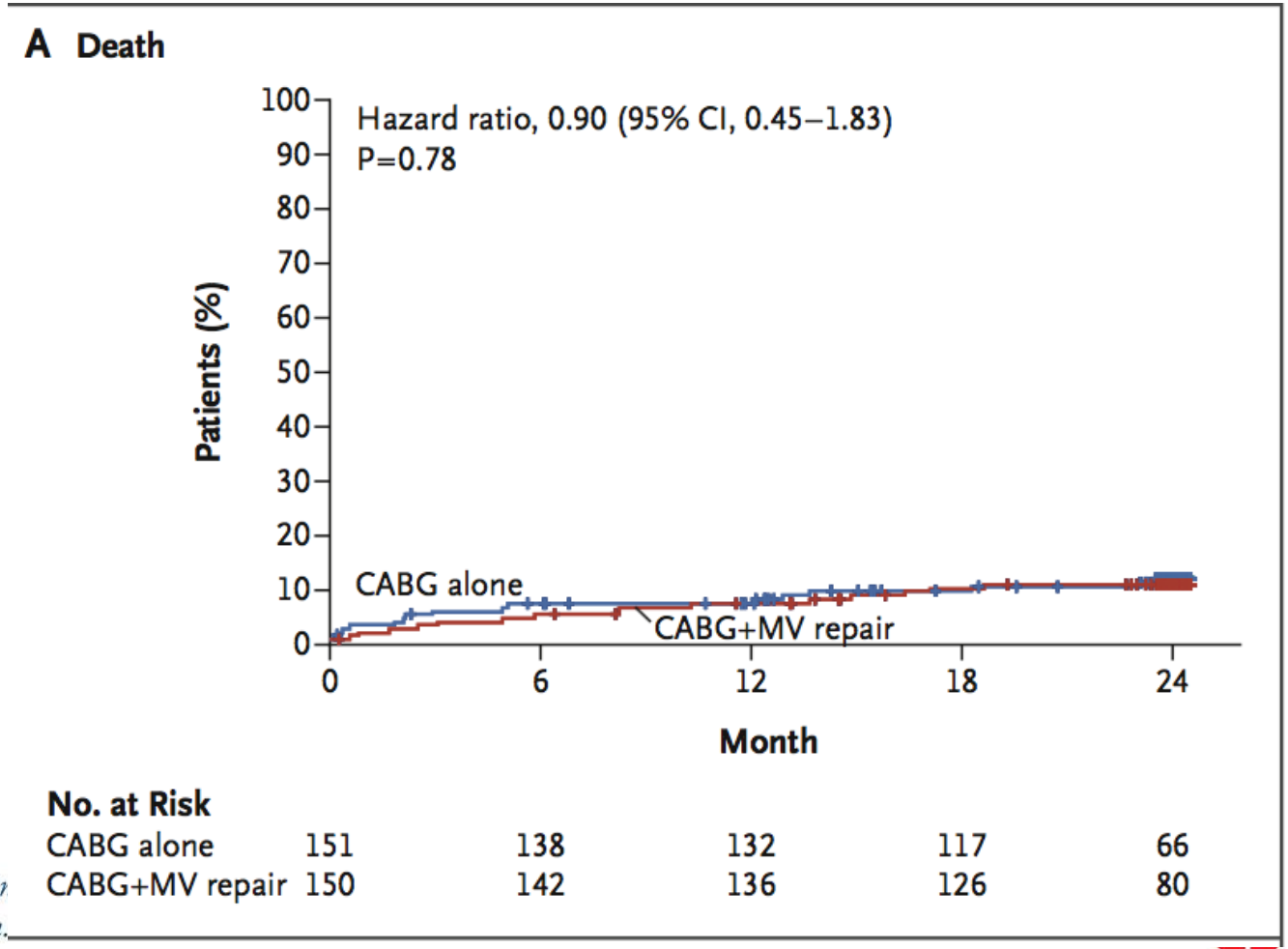
N Engl J Med 2016;374:344-53.



Variable	Repair (N=126)	Replacement (N=125)	P Value*
	no./total no. of patients (%)		
Moderate or severe recurrent mitral regurgitation	57/97 (58.8)	3/79 (3.8)	<0.001
Heart failure	48 (24.0)	29 (15.2)	0.05
Readmission for cardiovascular event	93 (48.3)	59 (32.2)	0.01

Two-Year Outcomes of Surgical Treatment of Moderate Ischemic Mitral Regurgitation

N Engl J Med 2016;374:1932-41.



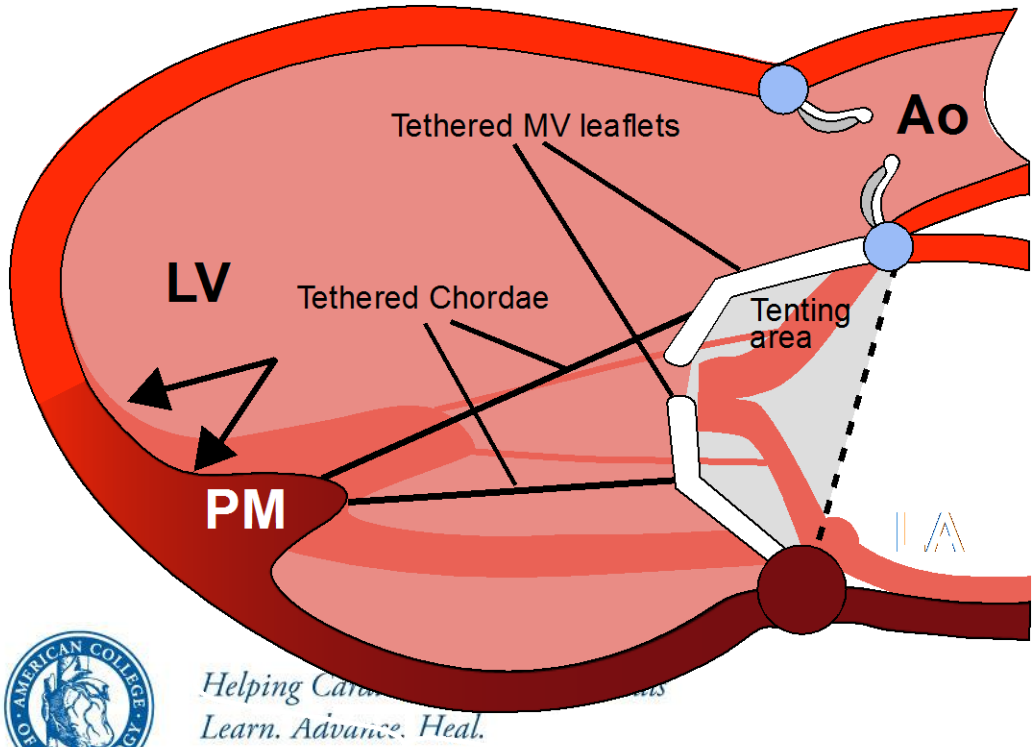
Two-Year Outcomes of Surgical Treatment of Moderate Ischemic Mitral Regurgitation

N Engl J Med 2016;374:1932-41.

CONCLUSIONS

In patients with moderate ischemic mitral regurgitation undergoing CABG, the addition of mitral-valve repair did not lead to significant differences in left ventricular reverse remodeling at 2 years. Mitral-valve repair provided a more durable correction of mitral regurgitation but did not significantly improve survival or reduce overall adverse events or readmissions and was associated with an early hazard of increased neurologic events and supraventricular arrhythmias. (Funded by the National Institutes of Health and Canadian Institutes of Health Research; ClinicalTrials.gov number, NCT00806988.)

Trying to find an annular solution to a ventricular problem is destined to fail…



Helping Ca… Learn. Advance. Heal.

Local left ventricular remodeling

5 mo later SOB again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Mayo Adult
X5-1
50Hz
13cm
2D
53%
C 48
P Off
HGen
TIS0.4 MI 1.2
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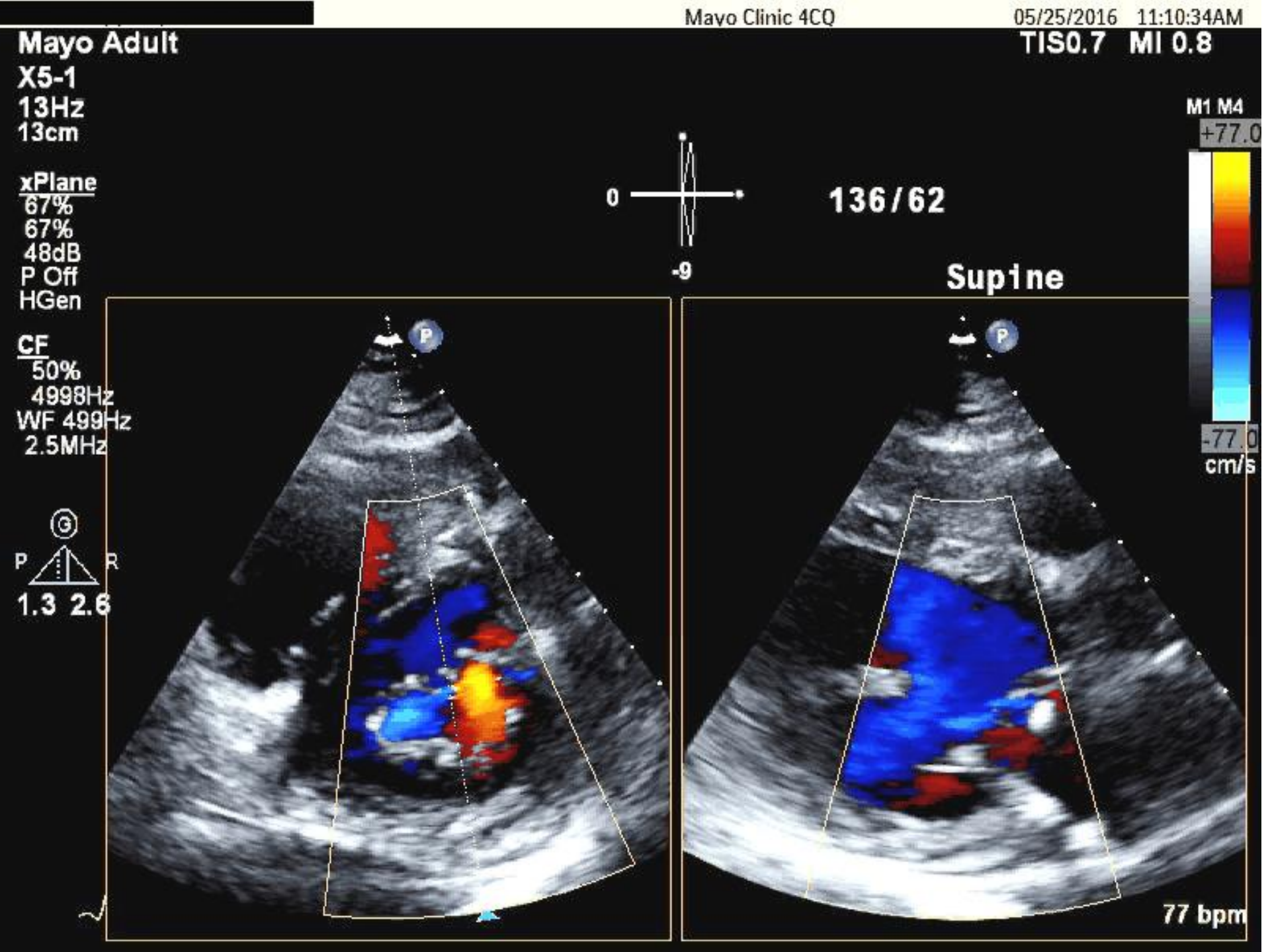
M1
136/62
5
10
X2
P
R
1.3 2.6
78 bpm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M1 M4
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-77.0
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xPlane
67%
67%
48dB
P Off
HGen
CF
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WF 499Hz
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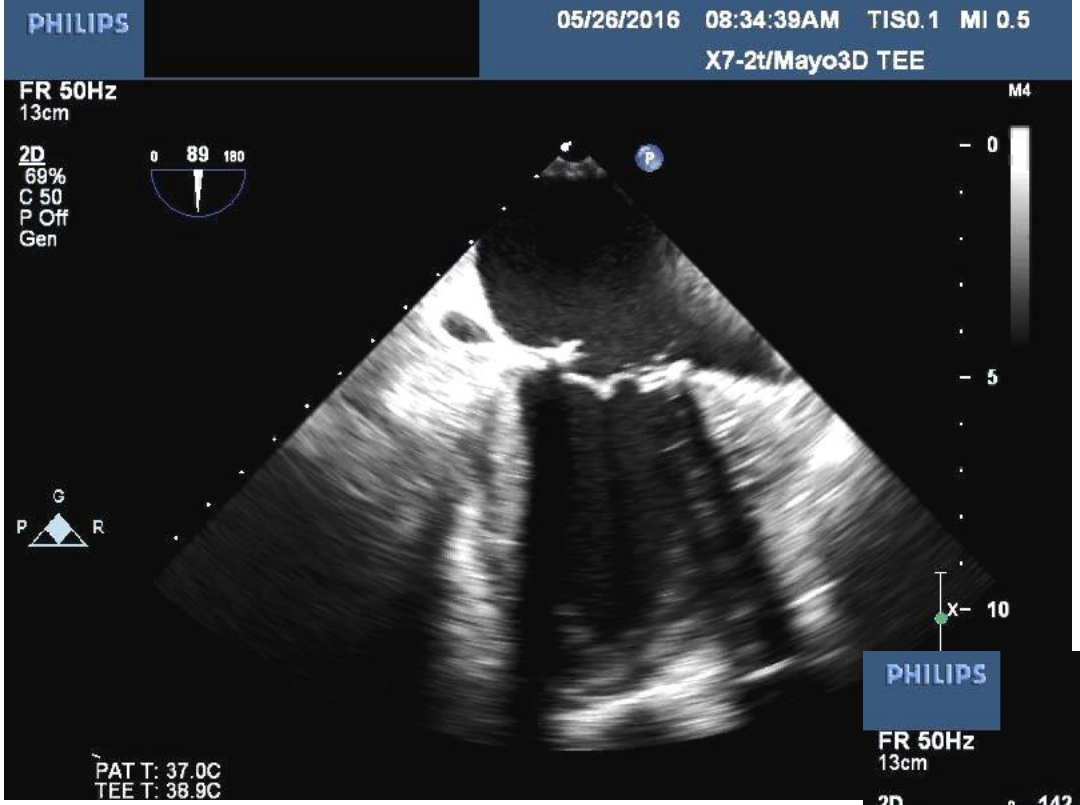
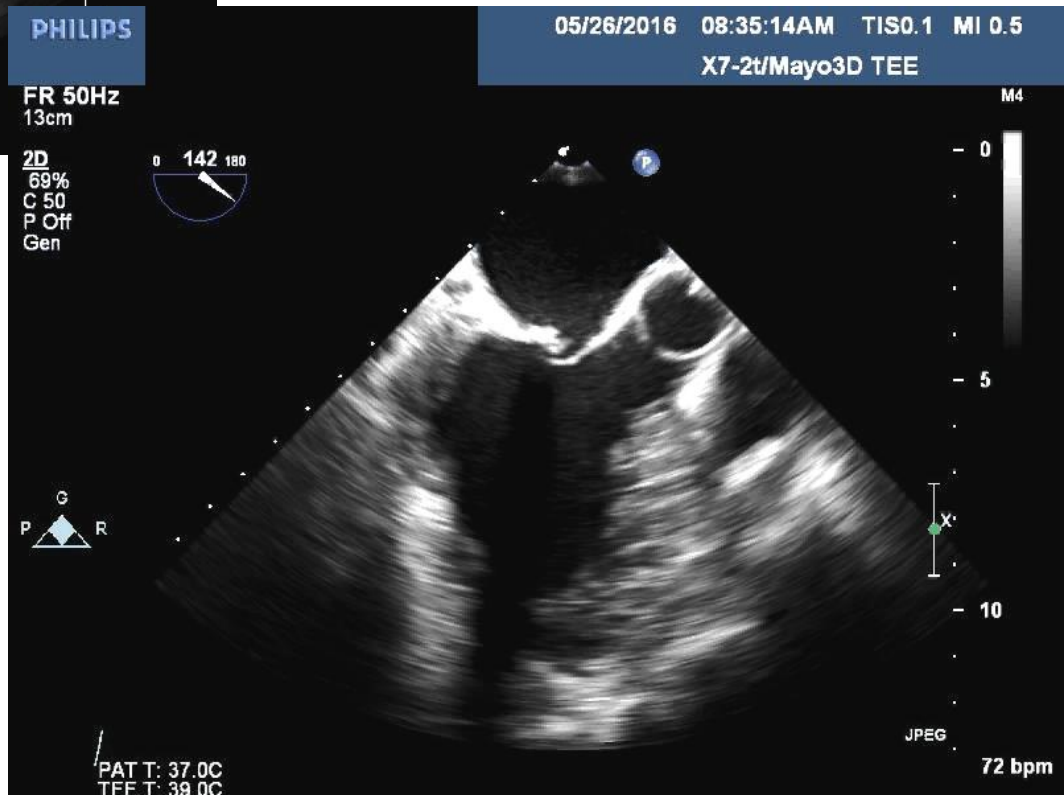
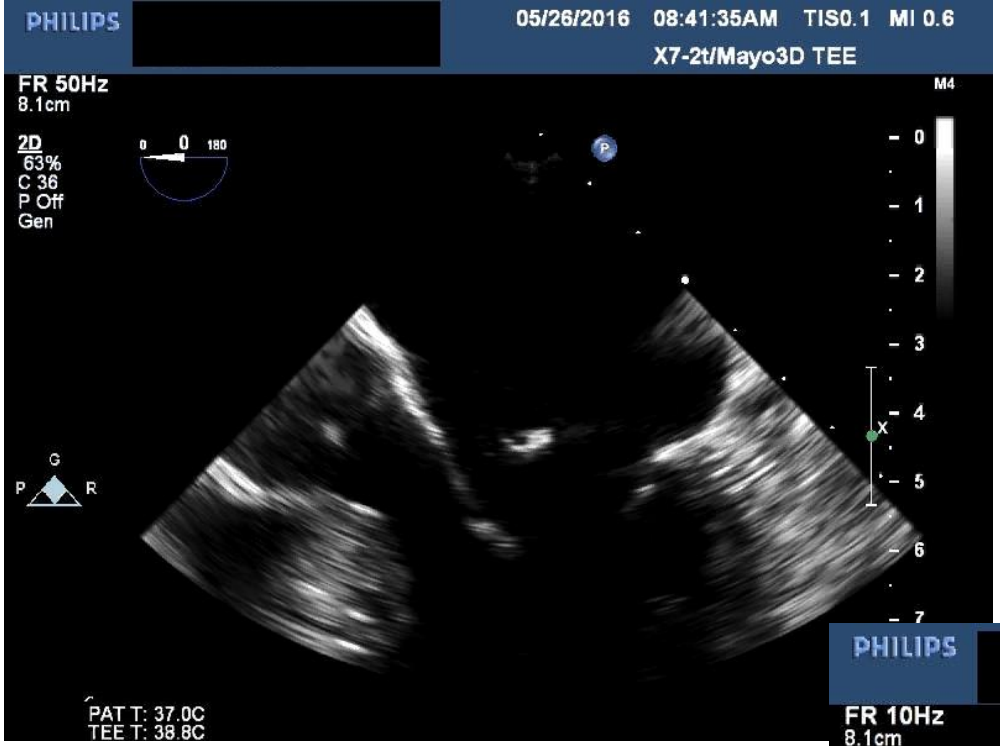
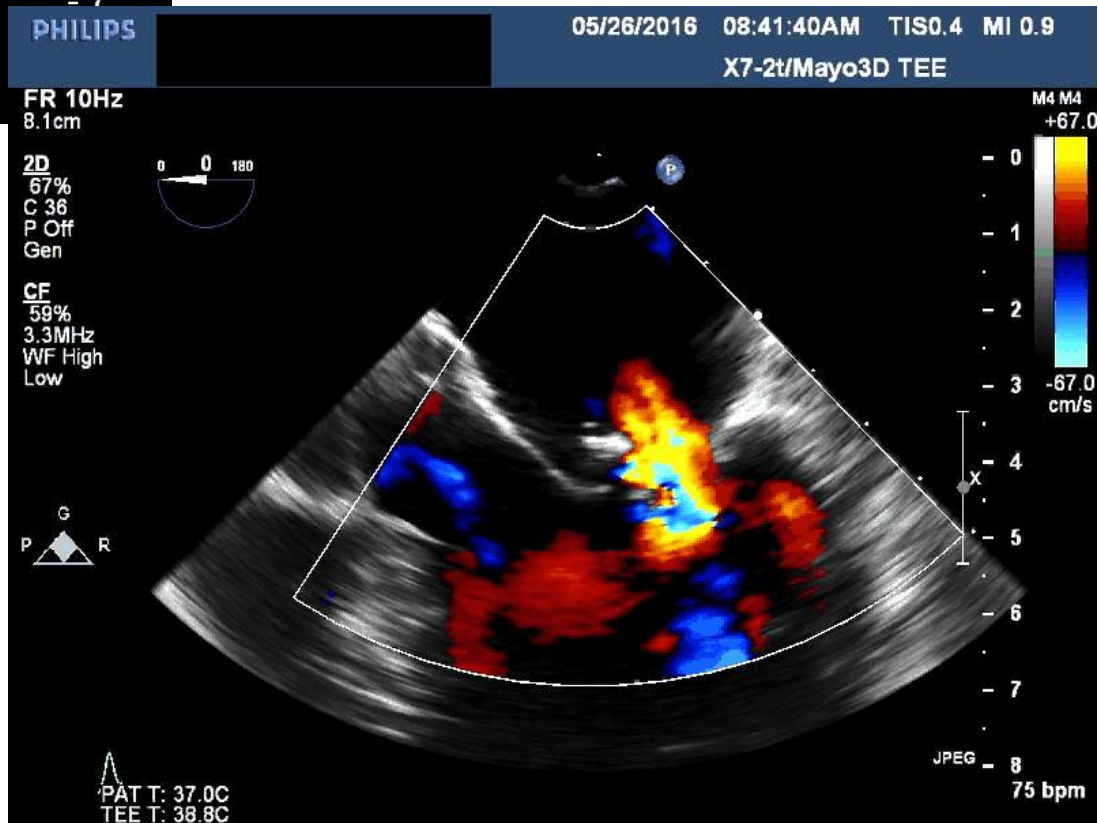
136/62
Supine
P
R
1.3 2.6
77 bpm









(I was on trip)

TAKE-HOME

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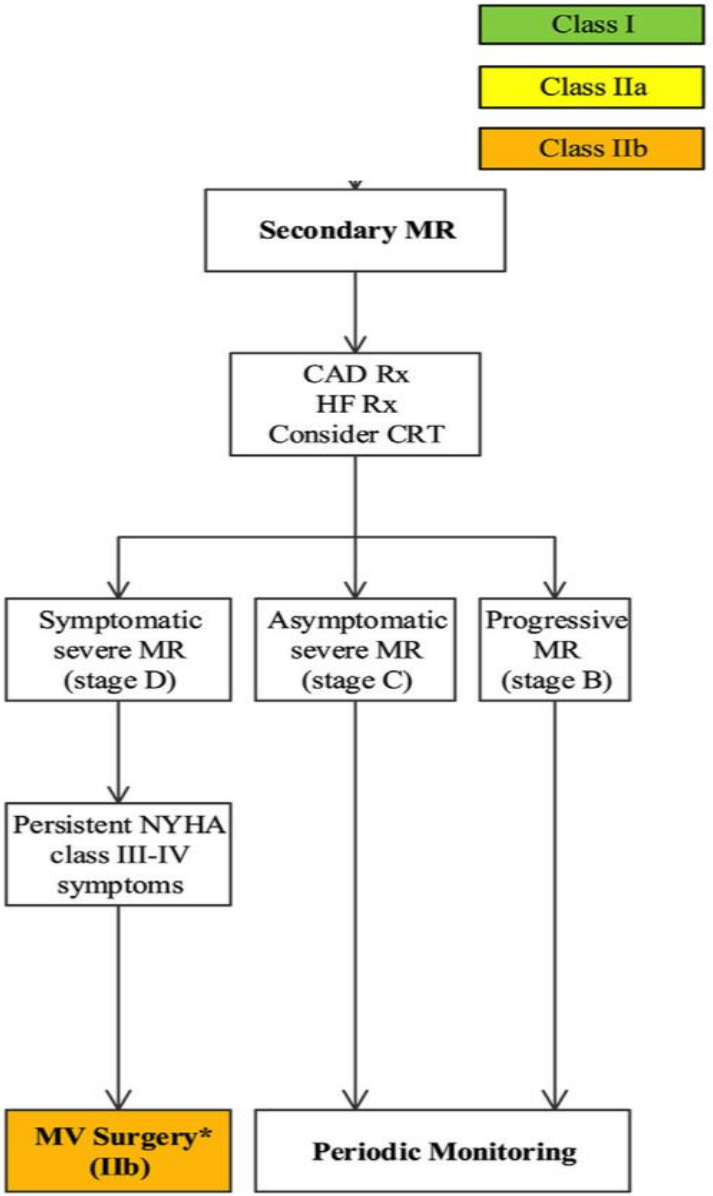

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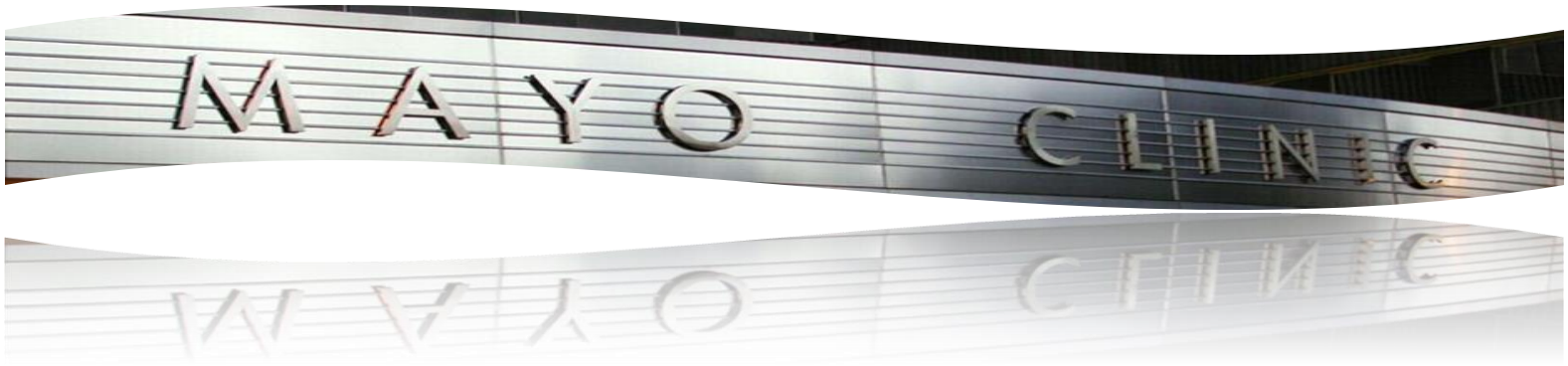
Recommendations	COR	LOE
MV surgery is reasonable for patients with chronic severe secondary MR (stages C and D) who are undergoing CABG or AVR	IIa	C
New: It is reasonable to choose chordal-sparing MVR over downsized annuloplasty repair if operation is considered for severely symptomatic patients (NYHA class III to IV) with chronic severe ischemic MR (stage D) and persistent symptoms despite GDMT for HF	IIa	B-R
MV surgery may be considered for severely symptomatic patients (NYHA class III-IV) with chronic severe secondary MR (stage D) who have persistent symptoms despite optimal GDMT for HF	IIb	B
Modified: In patients with chronic, moderate, ischemic MR (stage B) undergoing CABG, the usefulness of mitral valve repair is uncertain	IIb	B-R



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