Houston Methodist Hospital
12th Annual Multimodality CV Imaging for the Clinician

CMR for Acute Coronary Syndromes

Raymond Y Kwong, MD, MPH
Director, Cardiac Magnetic Resonance Imaging
Cardiovascular Division, Department of Medicine, Brigham and Women's Hospital

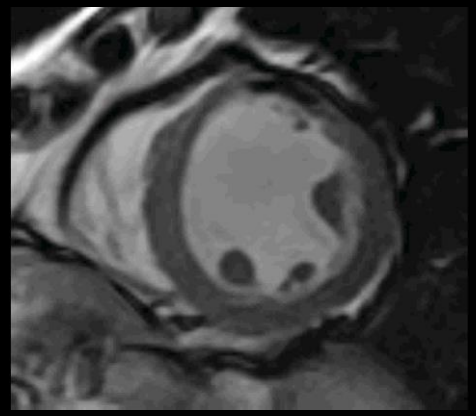
Professor of Medicine, Harvard Medical School

Presenter Disclosure Information

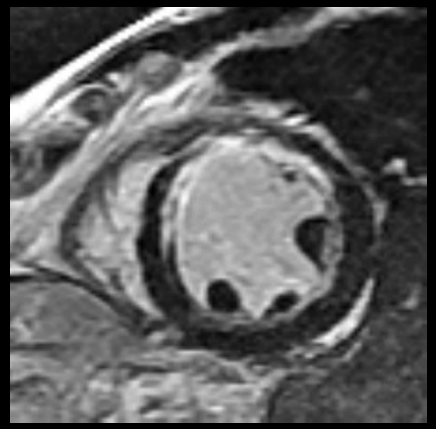
I have the following relevant financial relationships to disclose:

Employee of:	Brigham and Women's Hospital
Consultant for:	Bayer AG, Xylocor, Valo Health
Stockholder in:	None
Research support from:	NHLBI
	Bristol-Myers Squibb
	Alynlam Inc.
	Cytokinetics
Honoraria from:	None

Cardiac MRI for Acute CP Syndromes

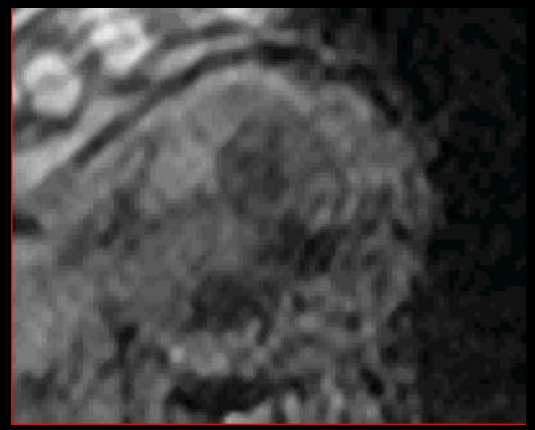


Function

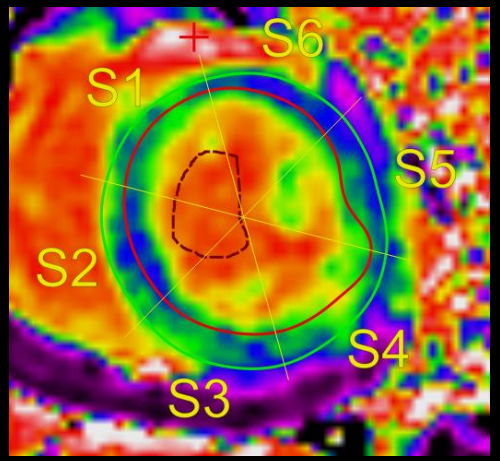


LGE (Scar)

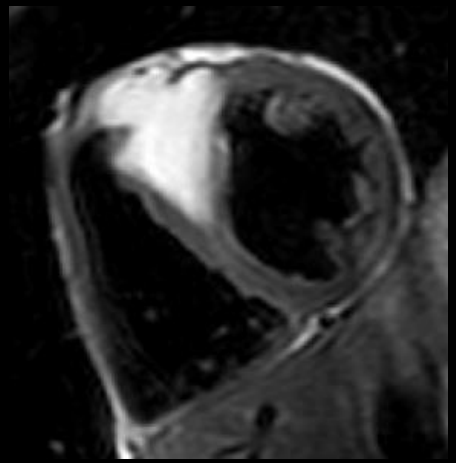
T2W = edema



Perfusion



Tissue Mapping (T1 and T2)

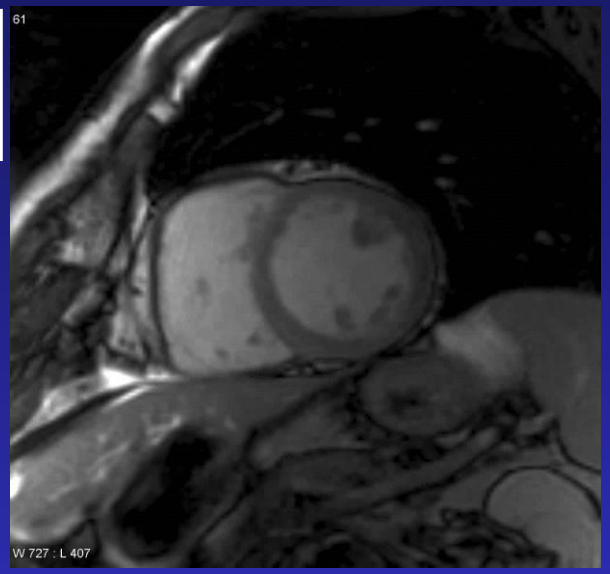


Fatty Infiltration

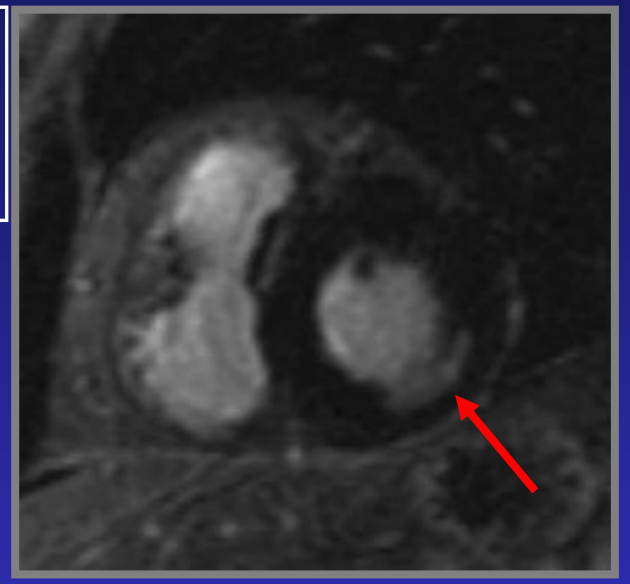
Case 1

63 y/o male MGH ER with intermittent CP, negative trop and negative rest ECG

Cine show wall motion



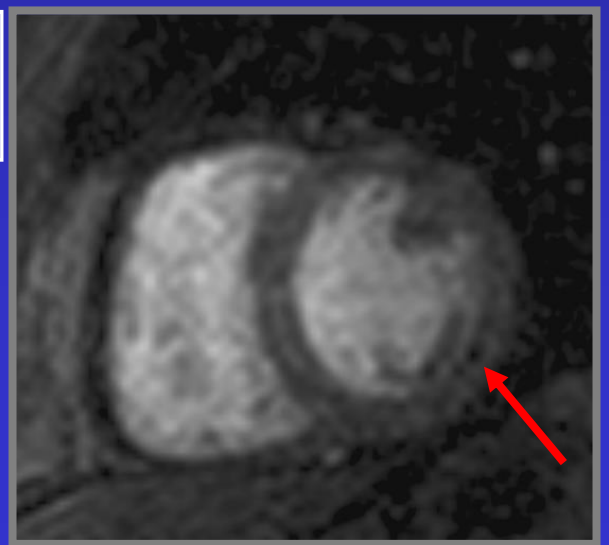
LGE shows infarct



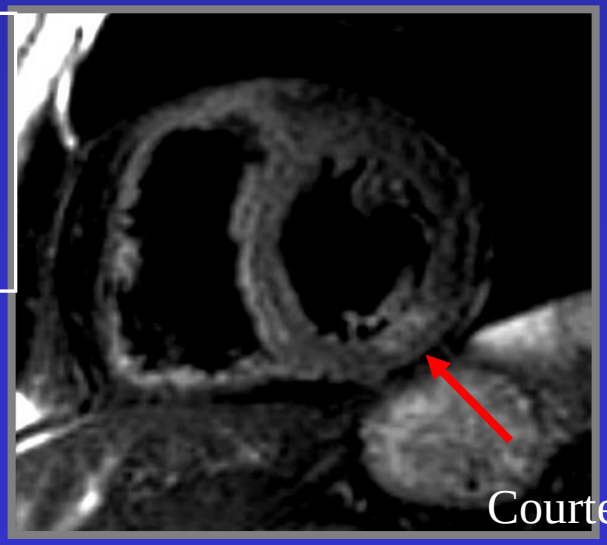
Cath:
Non-dominant LCx thrombus

ACS

Perfusion deficit



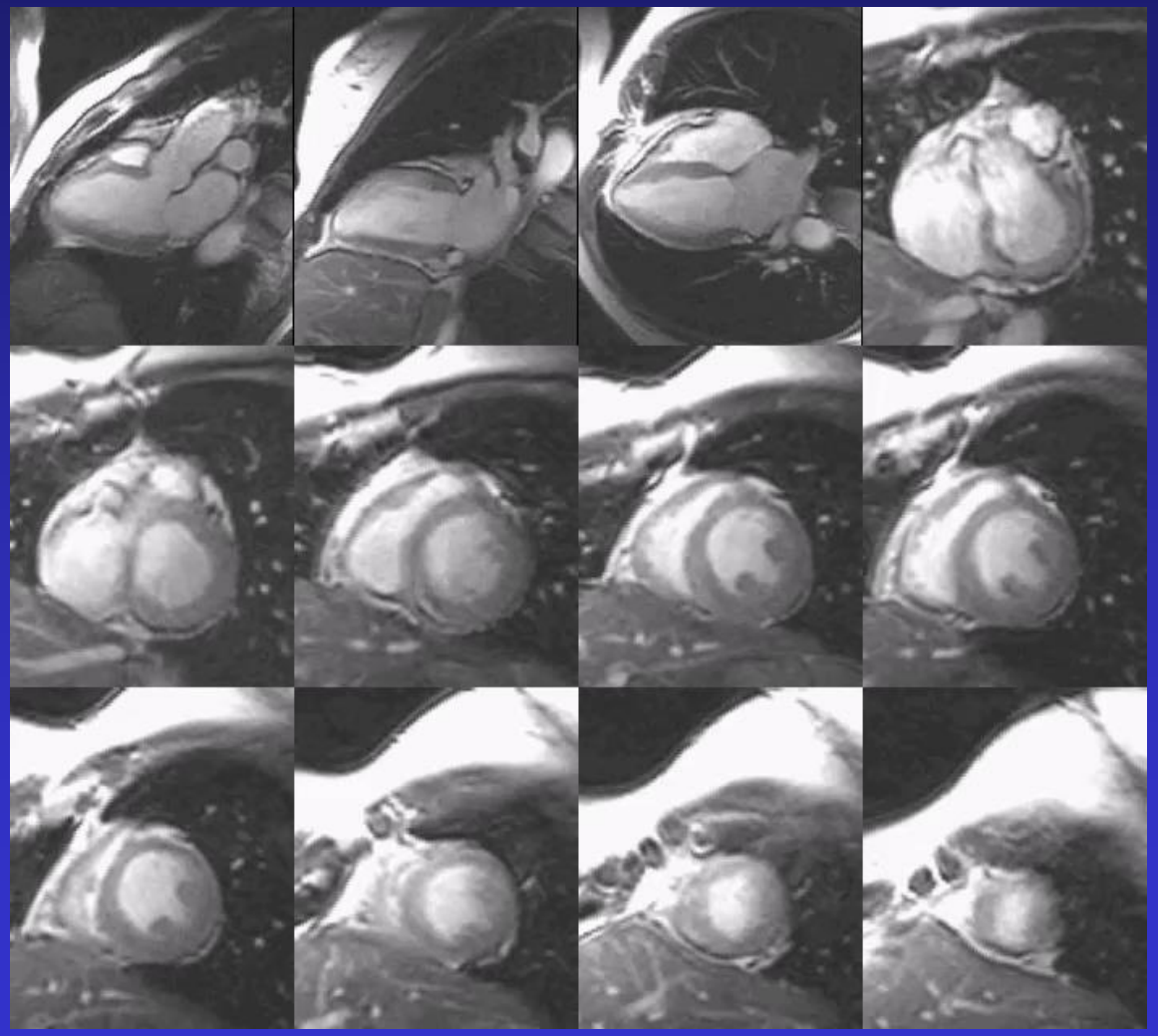
T2W: edema from acute injury

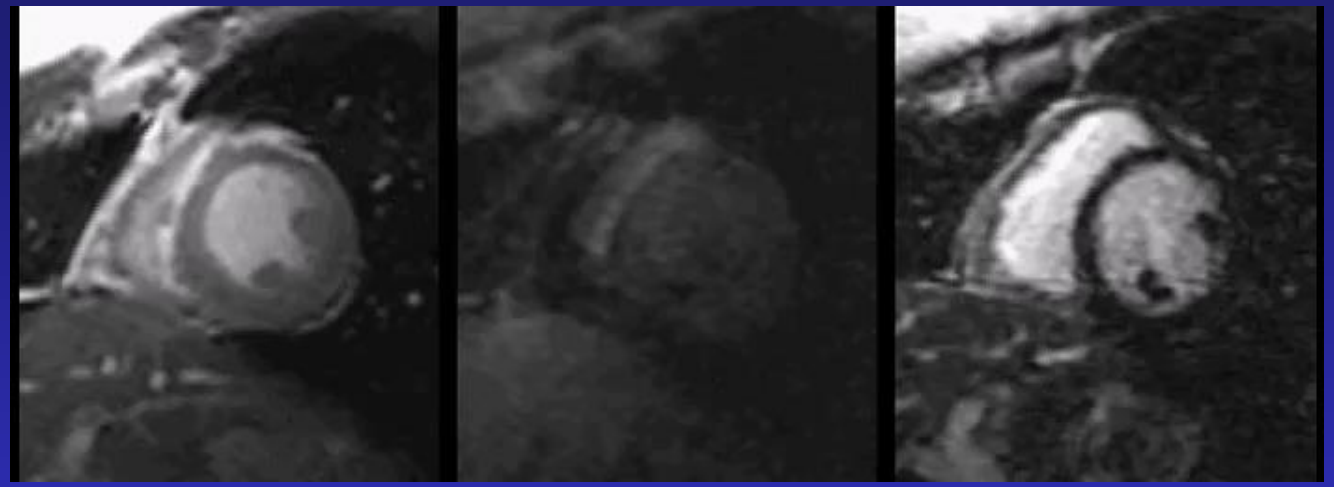


Courtesy of Cury R, Circulation 2004

Case 2

65 y/o female intermittent CP x 3 days, negative trop and biphasic T waves V1-V3





Cath:
Proximal LAD >90% w thrombus

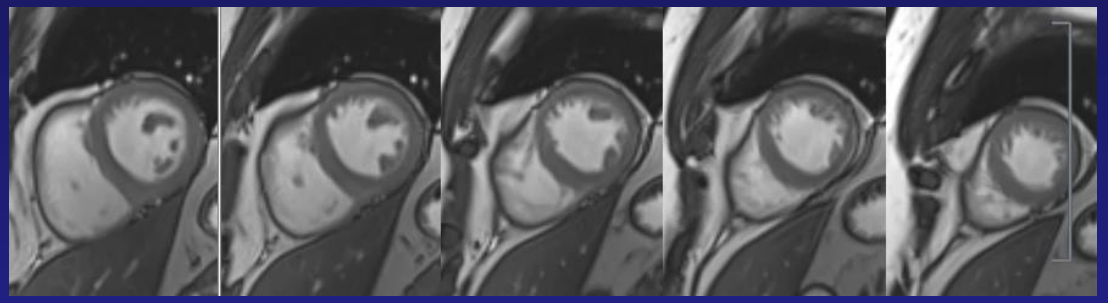
ACS: viable and hibernating myocardium

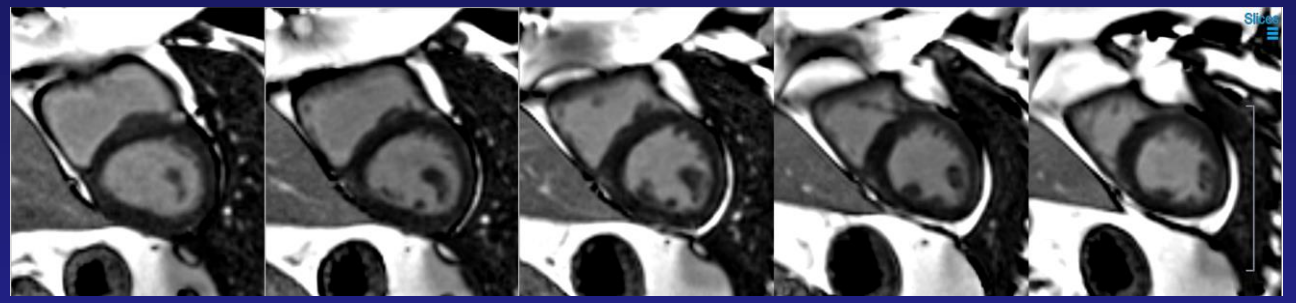
Urgent PCI at 3 am

Initial Presentation

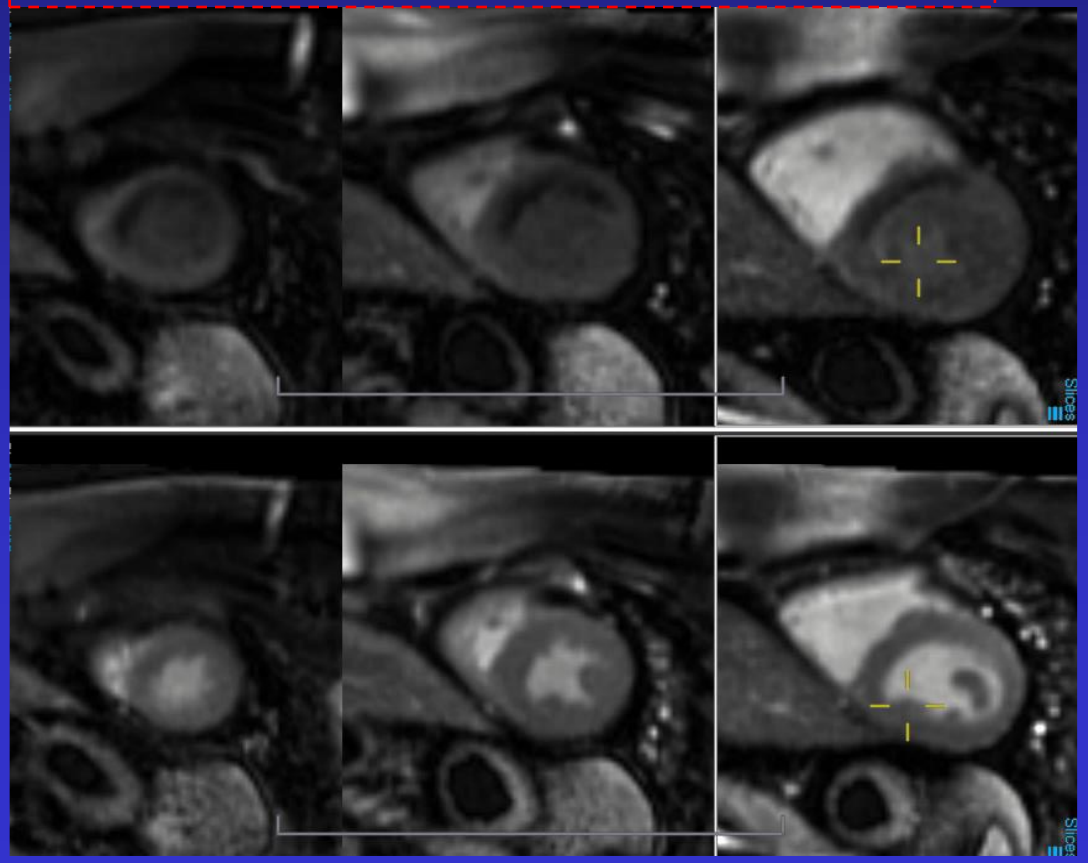
1 Month after LAD PCI

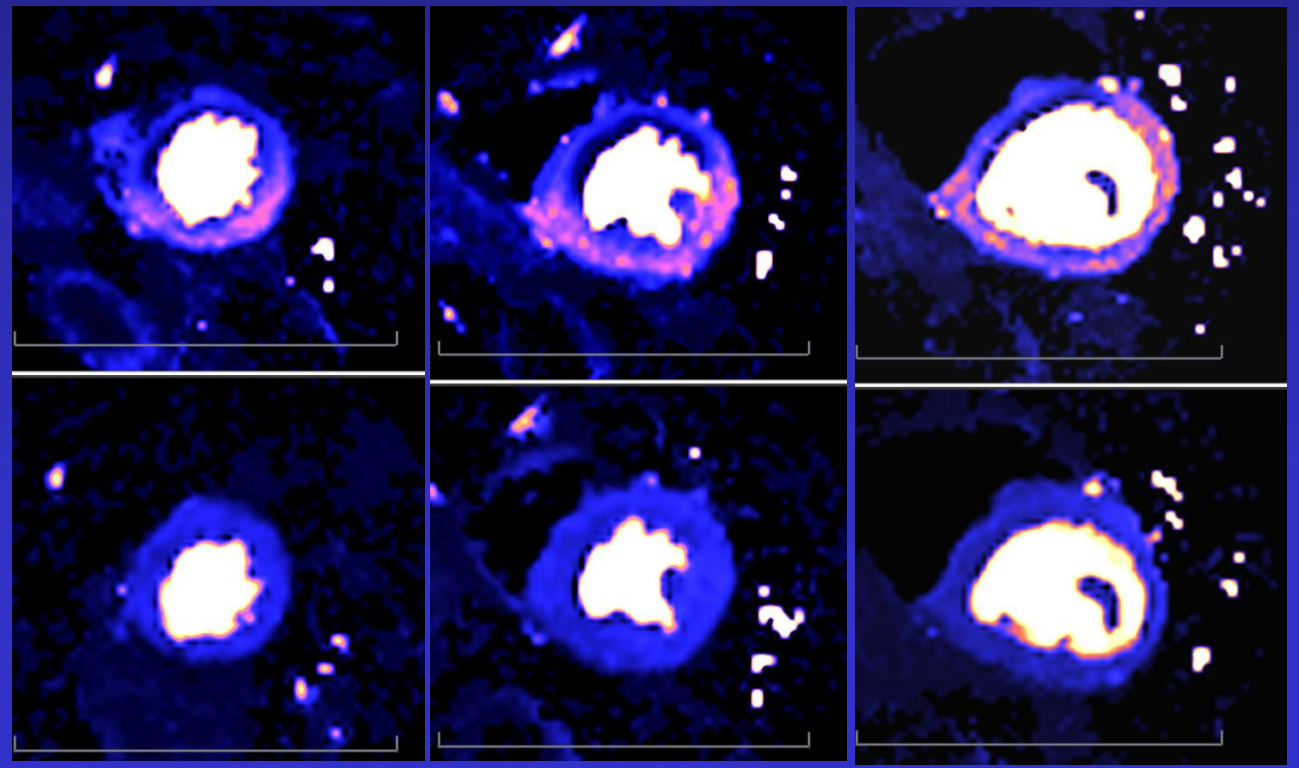
Case 3: Acute CP in ER, - trop and ECG, CMR Study in 25 minutes



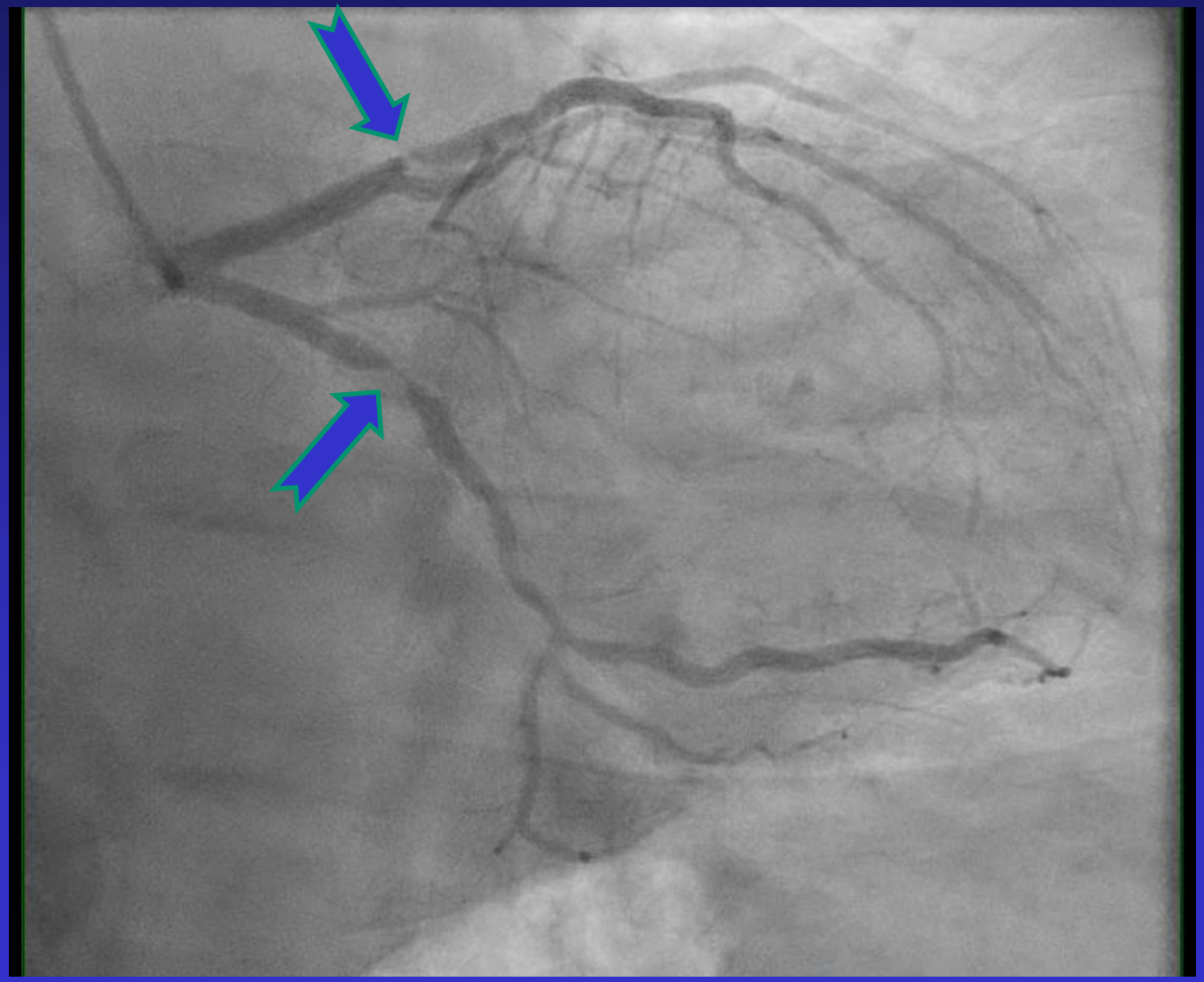


Regadenoson Stress then Rest CMR Perfusion





Acute chest pain, negative Trop: CMR Study in 25 minutes



Acute Ischemia

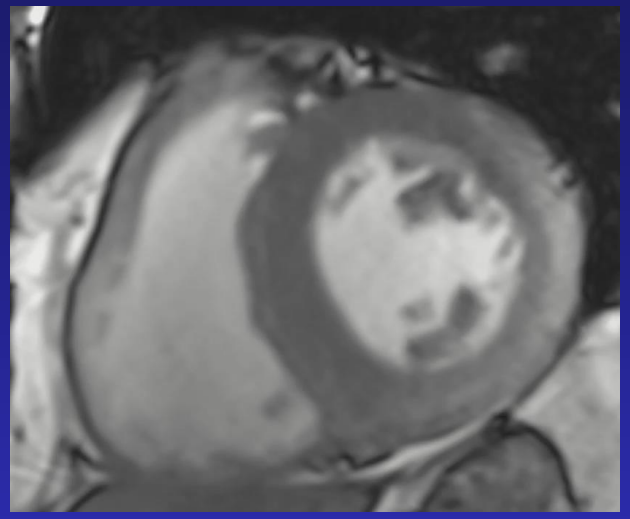
CP subsided after PCI

Case 4

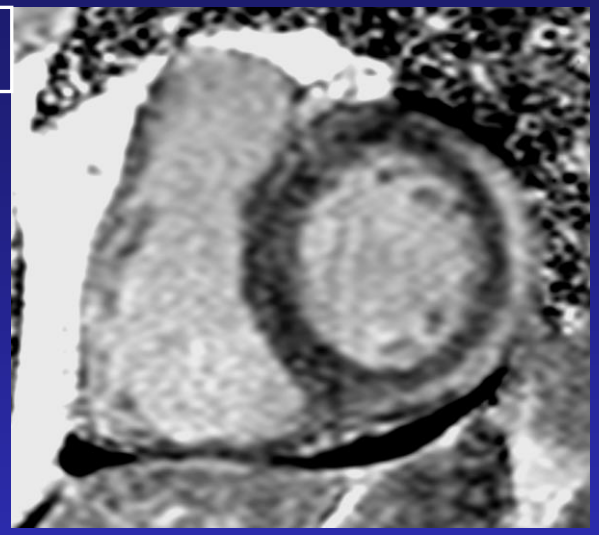
53 y/o male w acute CP, multiple coronary risk factors, STE V1-V4, STD inferior leads, Trop 1200 (nl<18)

Cath: No coronary stenosis, told probably spasm

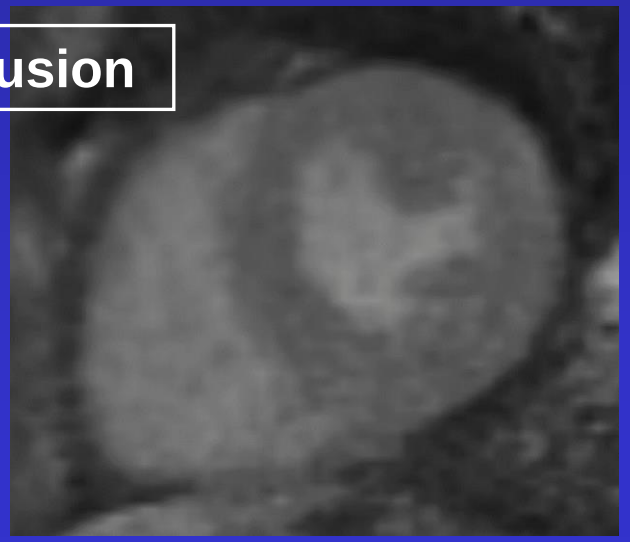
Cine



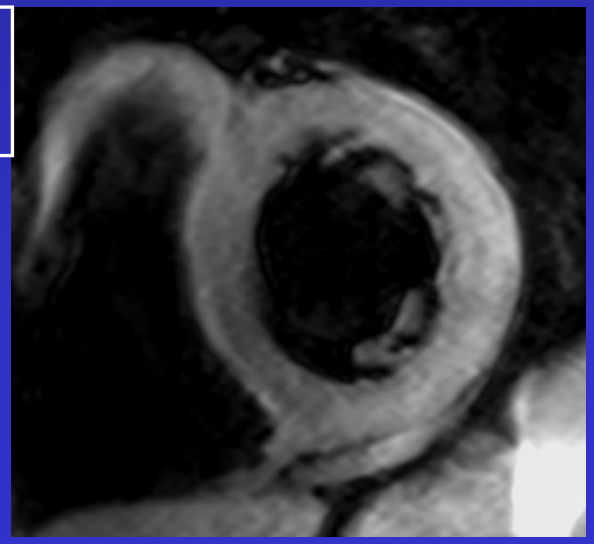
LGE



Perfusion



T2W: edema



Acute myocarditis

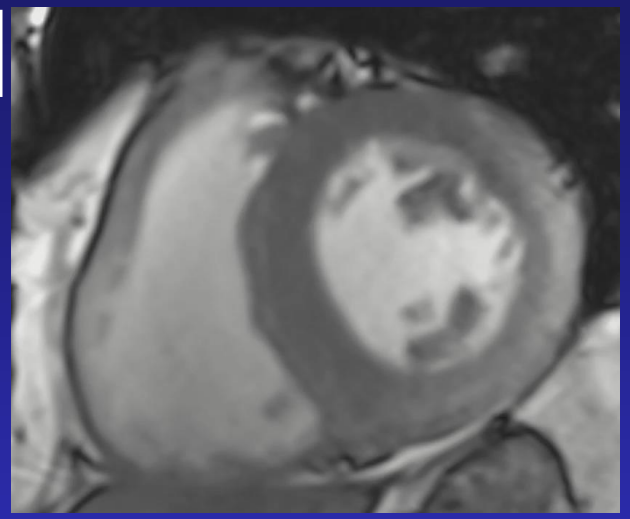
Parvo 16: IgG positive

Case 4

53 y/o male physician with STE V1-V4, STD inferior leads, Trop 1200 (nl<18)

Initial Presentation

Cine



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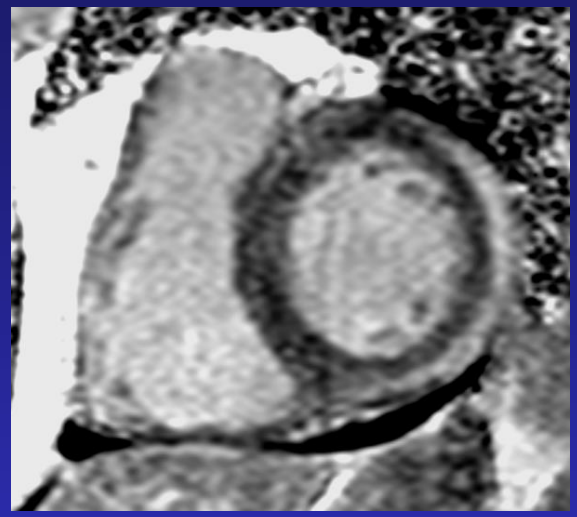
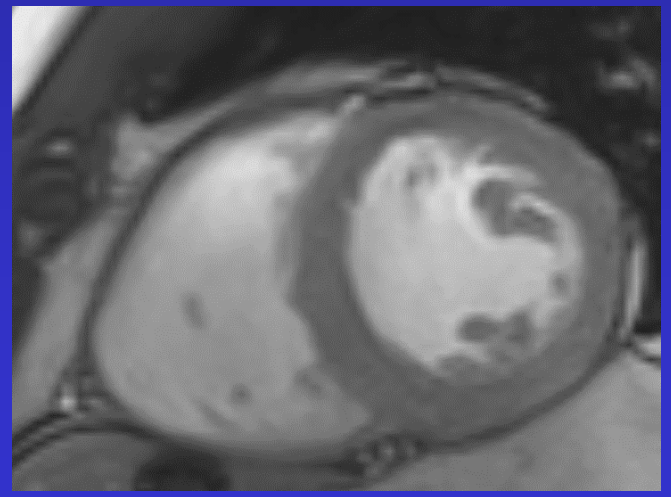
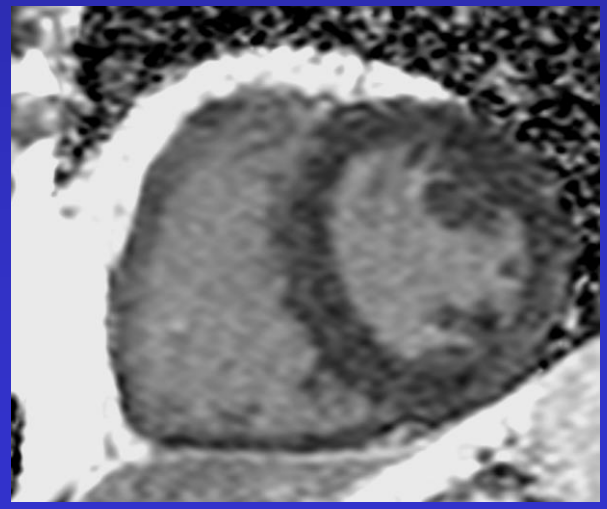


6 Months Later

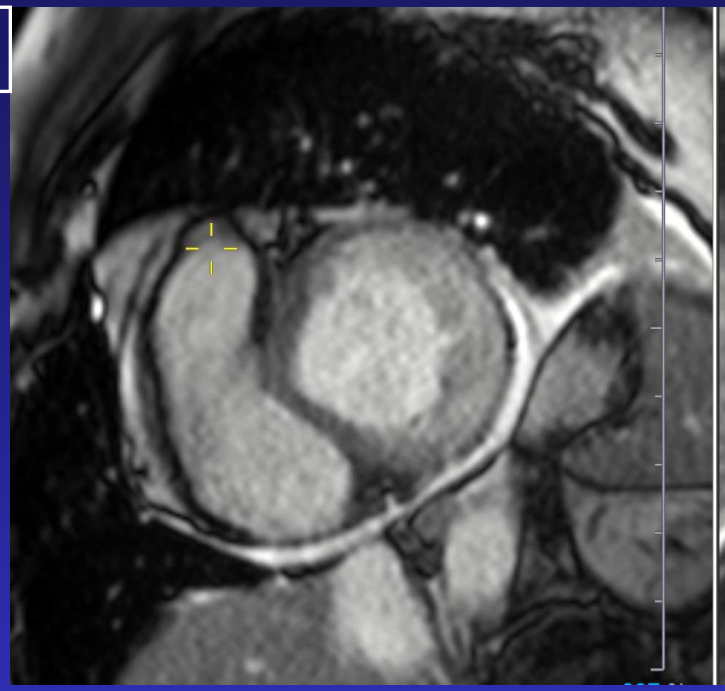




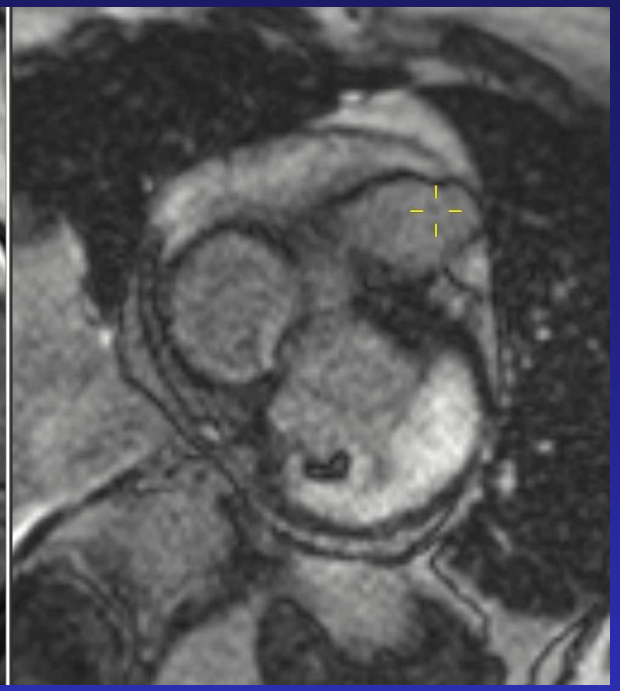
Case 5

70 y/o female intermittent CP, VT storm, neg ECG, Trop 400 (nl<18), no stenosis on cath
hsCRP 40, ESR 50, FDG PET: cardiac sarcoid

Cine



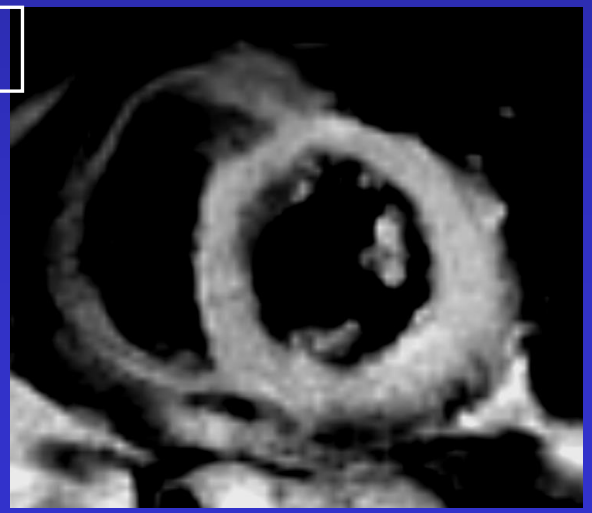
LGE



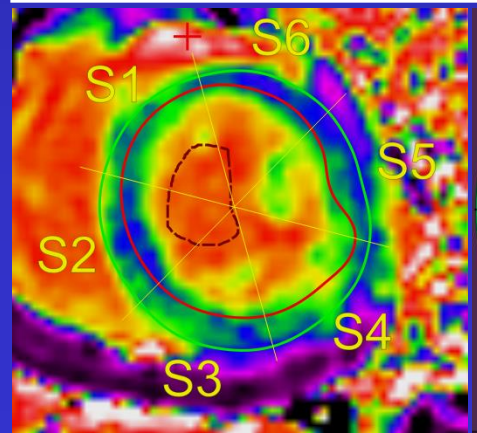
Biopsy:

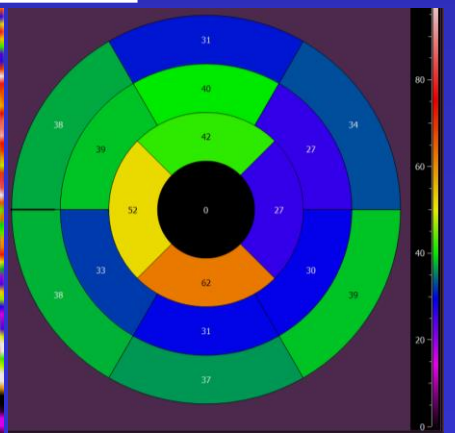
Giant cell myocarditis

T2W

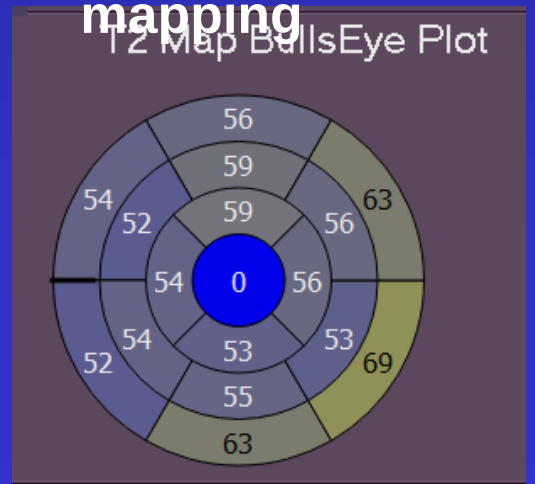


T1 and ECV mapping





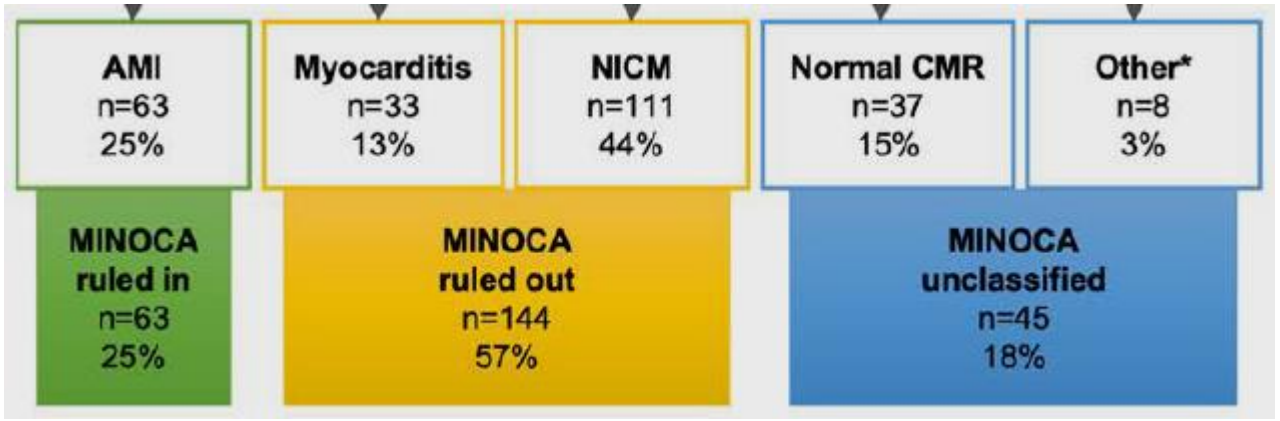
T2 mapping

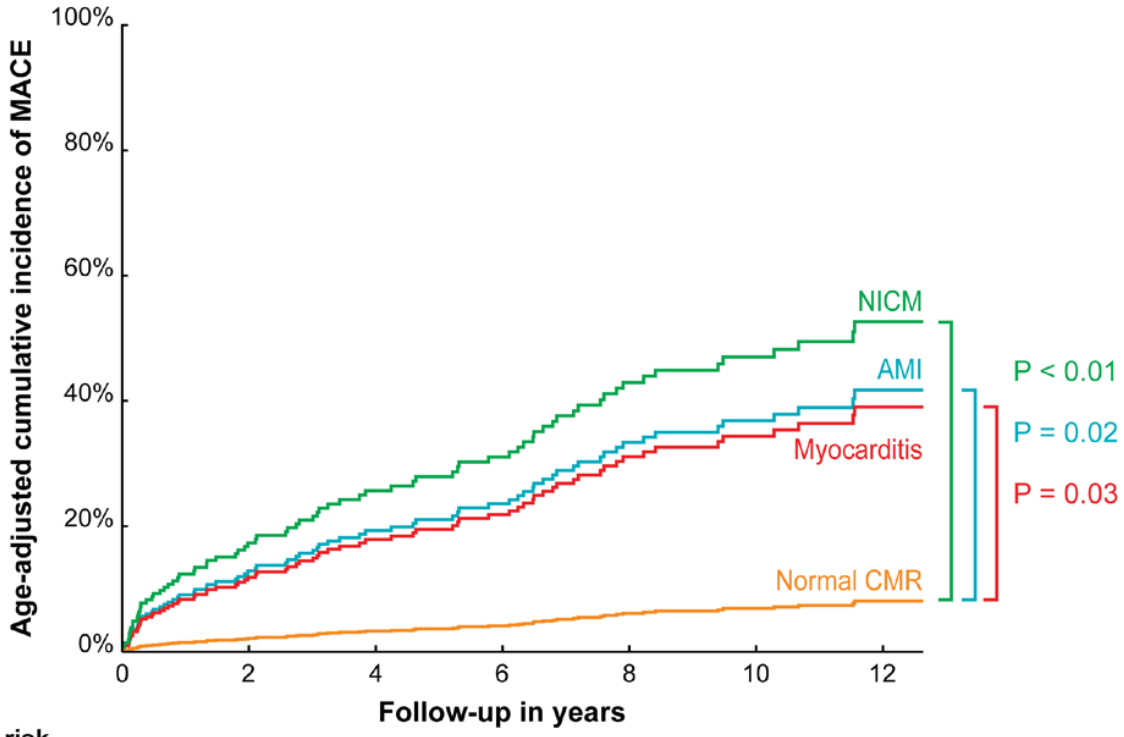


Prognosis by CMR Findings

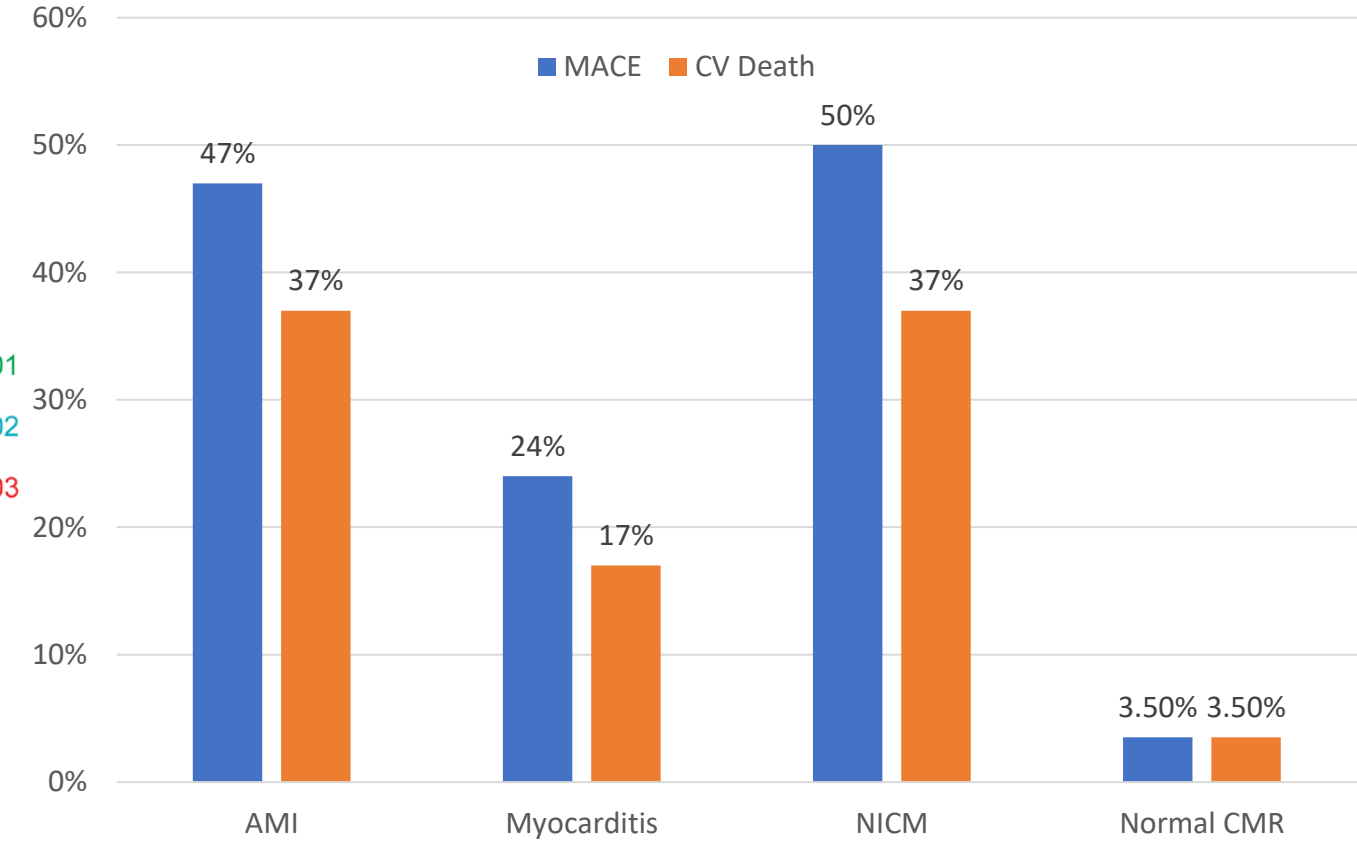
252 acute CP pts with + Trop and no coronary stenosis followed for > 10 years

MINOCA unlikely were excluded



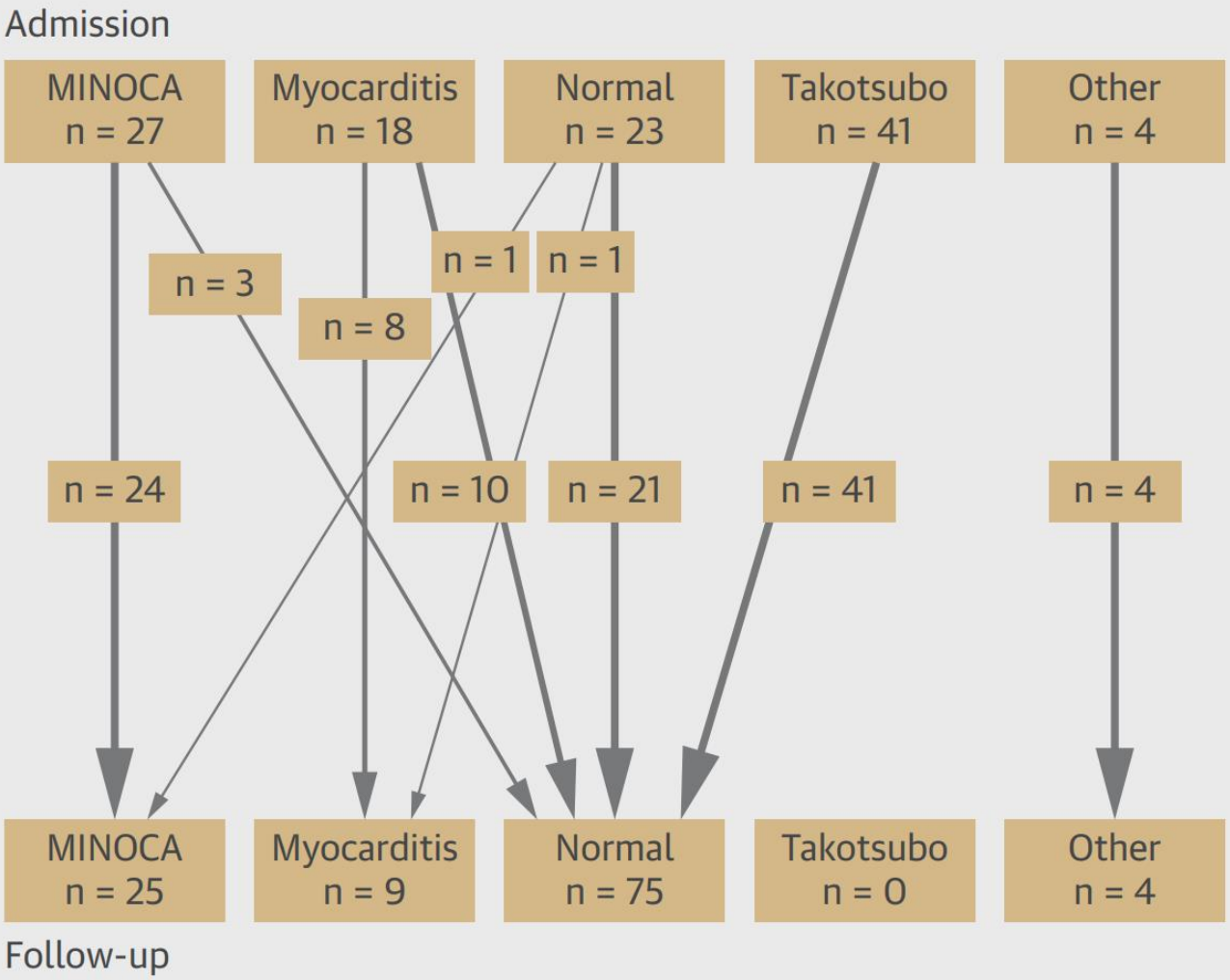


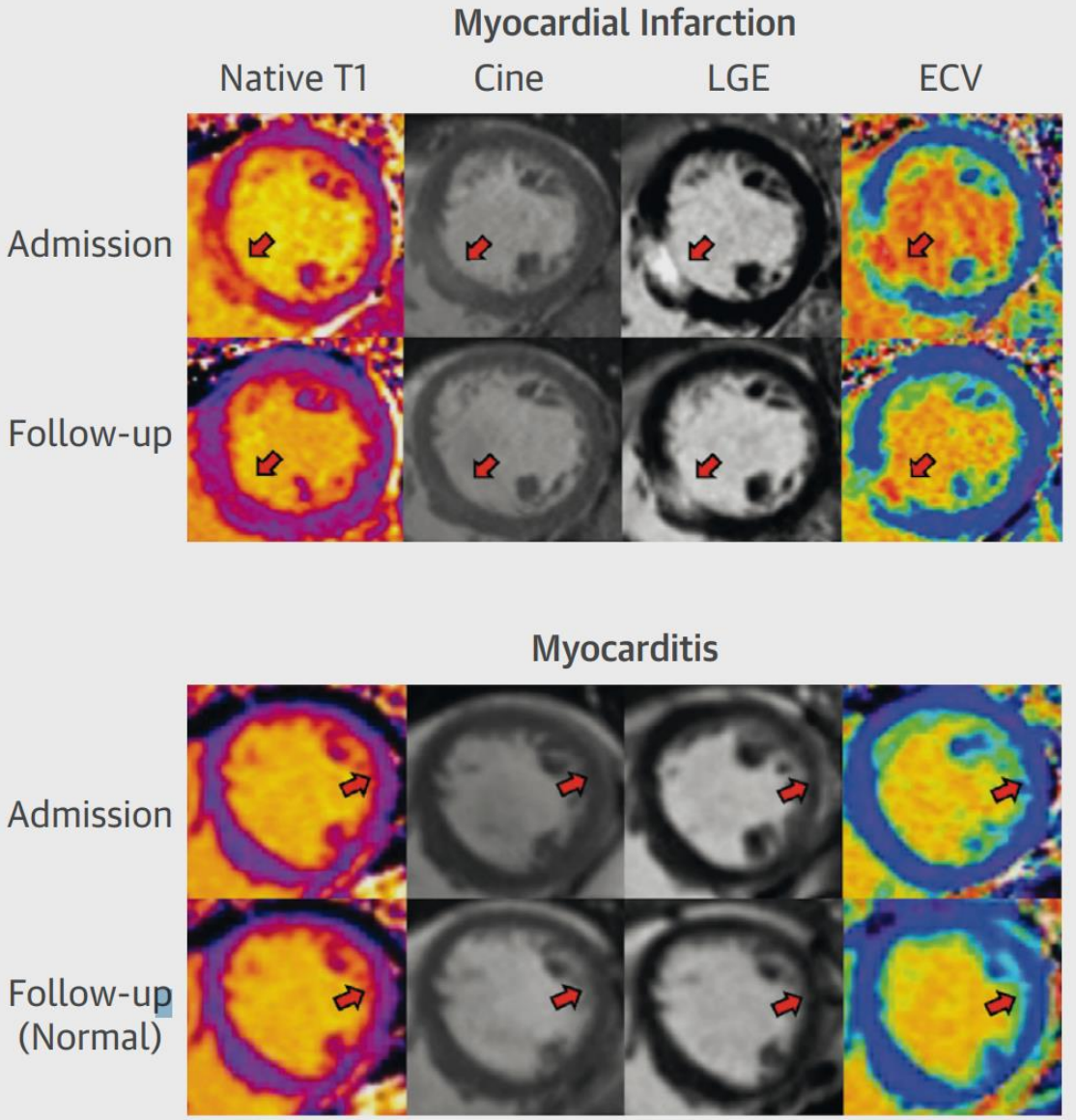
No. at risk							
AMI	63	44	32	28	20	13	9
Myocarditis	33	25	19	18	16	15	9
NICM	111	74	56	49	35	29	19
Normal CMR	37	33	27	25	17	15	9



Konst R, Kim, R et al Circulation: CV Imaging 2023; 16 DOI:10.1161

CMR during acute (days) and chronic (3 month) phases
N=110 acute CP, + trop





Nickander J Sorensson P et al JACC CV imaging 2023; 16:128

Summary

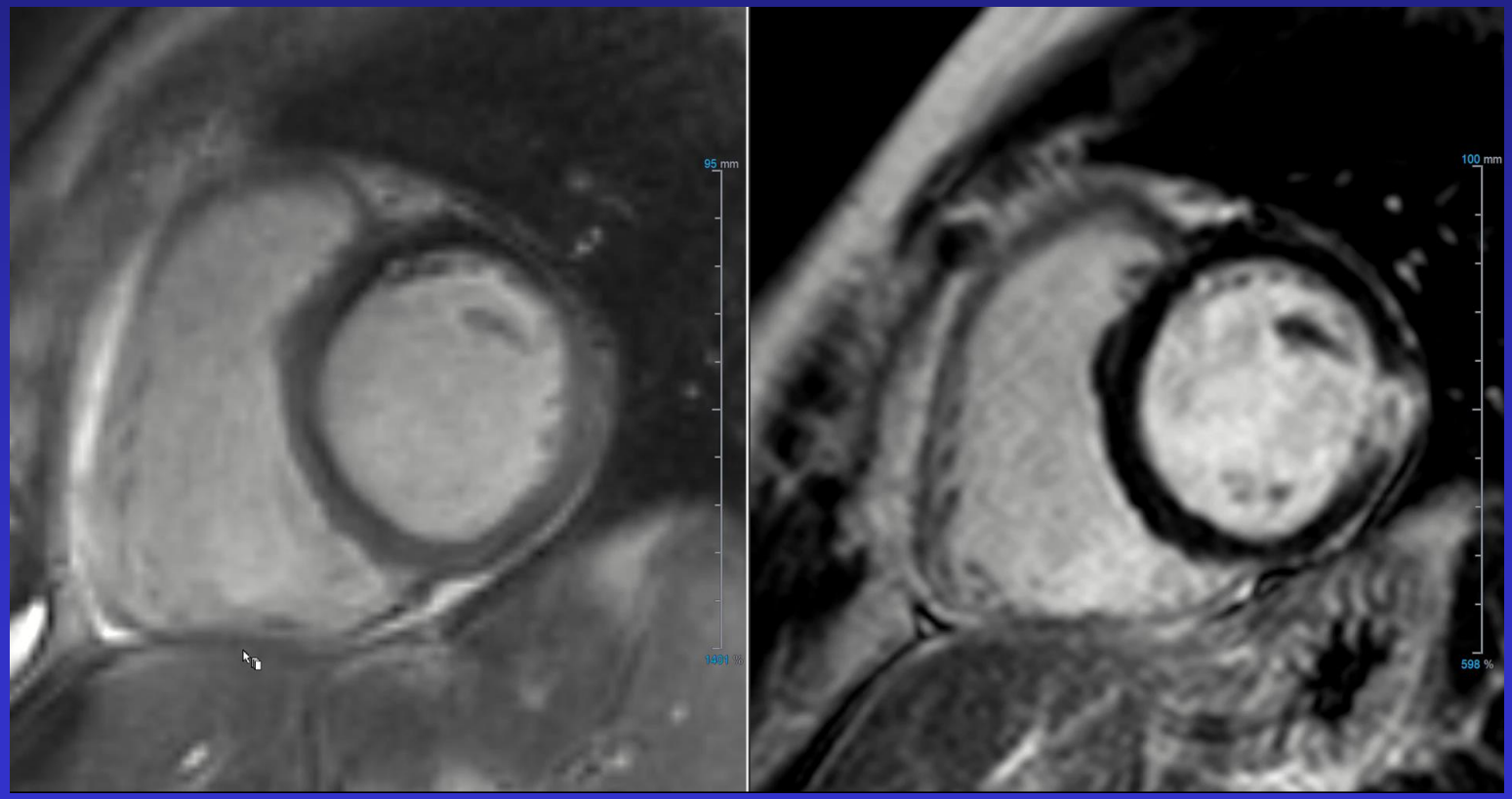
- Co-registered multi-component imaging by CMR can differentiate the etiologies of acute but stable CP patients with positive troponins.
- CMR can diagnose about 70-80%, with myocarditis and non-ischemic cardiomyopathies accounting for ~50%, MINOCA ~25%.
- Abnormality findings on CMR can become undetectable after initial weeks of tissue healing.
- A normal CMR during the acute phase is associated with a favorable clinical outcome.

Thank you

CMR indications in Chest Pain Syndromes in the *2021 AHA/ACC/ASE/CHEST/SAEM/SCCT/SCMR Guideline for the Evaluation and Diagnosis of Chest Pain*

Circulation 2021 Vol. 144 Issue 22

Acute chest pain	Stable chest pain
Class 1: Suspected MINOCA/myopericarditis	**Class 1**: Stable chest pain with no known CAD
Class 1: Acute chest pain with no known CAD	**Class 1**: Stable chest pain with obstructive CAD
Class 1: Acute chest pain with prior CABG	**Class 2a**: Suspected INOCA
Class 2a: Acute chest pain with known CAD	**Class 2a**: Stable chest pain with prior CABG
Class 2a: Acute chest pain with known valve disease	**Class 2a**: Stable chest pain and non-obstructive CAD


95 mm
1401 %
100 mm
598 %

worldwide EXCELLENCE for young cardiologists

Diagnostic and prognostic value of cardiac magnetic resonance tissue characterization

Raymond Kwong, MD, MPH, FACC, FSCMR
Director of CMR Imaging, Brigham and Women's Hospital

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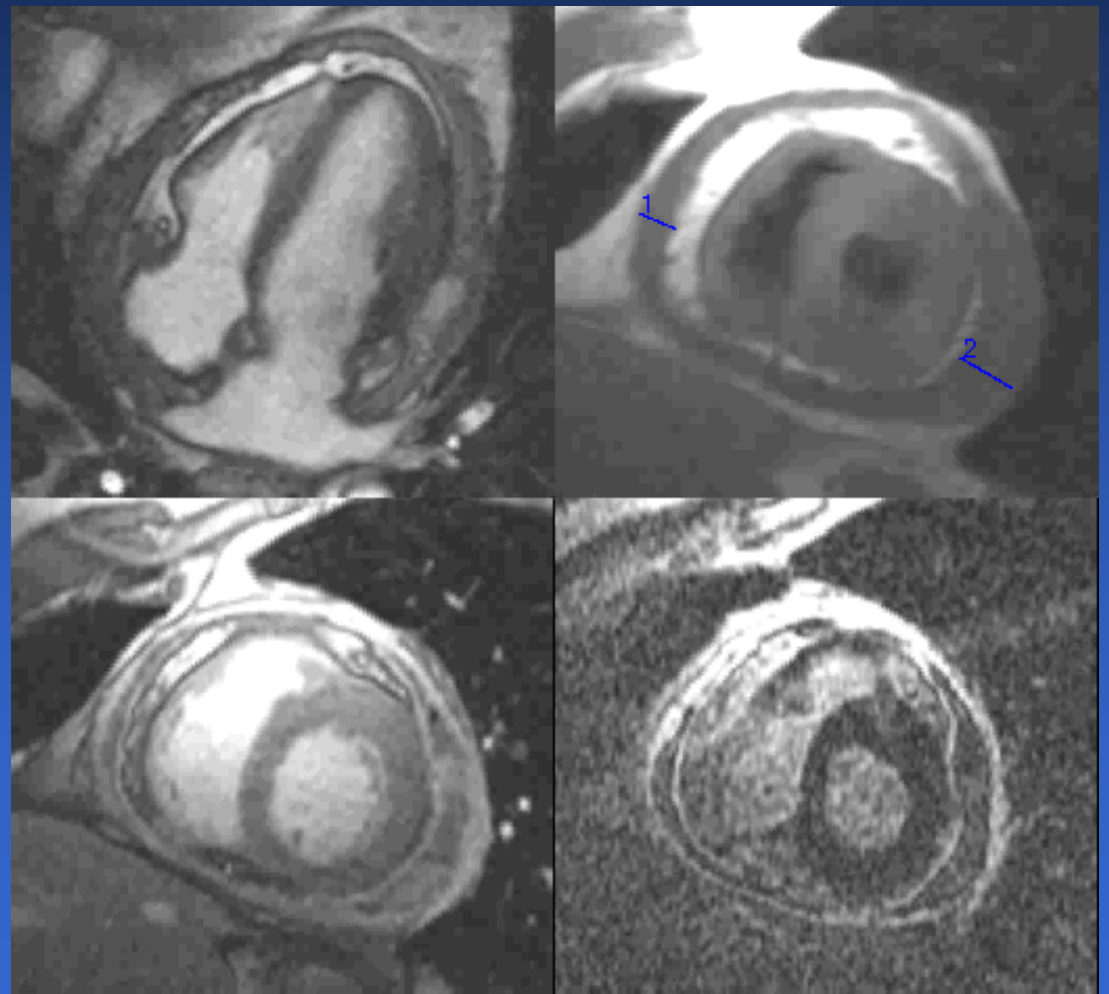
Pericardial Diseases

Chronic Constrictive Pericarditis



T1W image

Acute Effusive Pericarditis

(Exudative effusion)