



MESA MRI Committee Meeting

March 7th, 2011



Agenda

Welcome and introductions	João Lima
Operations update	Erin Ricketts
Quality control and protocol adherence	Chia-Ying Liu
Review of interesting cases	Marcelo Nacif
Scar	David Bluemke
BNP	Eui-Young Choi
Ancillary studies	João Lima
Metabolic syndrome	Andre Almeida
Manuscript ideas/topics	All
Longitudinal low risk factor	Adi Jain/John Eng
Closing/Other	All

Operations Update

- 1,433 MRI studies received through 03/01/11
 - 5 studies are re-scans (from Wake Forest)
 - 933 studies are with gadolinium (65.1%)
 - 1,327 (92.6%) results have been sent to the CC for studies through 02/12/11
 - 29 alerts issued to date
 - Wake Forest = 8
 - Columbia = 2
 - Johns Hopkins = 6
 - Minnesota = 5
 - Northwestern = 4
 - UCLA = 4

Quality Control - Scoring System

0=missing; 1=non-diagnostic; 2=acceptable; 3=good

Series	Score	Comments
HLA CINE - SSFP		
Tagging		
SA CINE - SSFP		
VLA CINE - SSFP		
SA DE		
HLA DE		
VLA DE		
HLA CINE - FGRE		
SA CINE - FGRE		
VLAA CINE - FGRE		

Quality Control - Scoring System

- 1=non-diagnostic: Severe imaging artifacts, wrong imaging position or not enough images to analyze
- 2=acceptable: artifacts, but not severe, protocol deviation but image quality is still good
- 3=good: None of above
- Study will **not be accepted** if cardiac function (based on SSFP CINE) cannot be assessed.

Image Quality and Protocol Adherence

Site #	Site	# Scans	Mean quality score	SD
3	Wake Forest	262	2.84	0.32
4	Columbia	214	2.90	0.21
5	Johns Hopkins	193	2.92	0.18
6	Minnesota	239	2.90	0.18
7	Northwestern	305	2.83	0.27
8	UCLA	192	2.94	0.18
Overall		1,405	2.88	0.24

Image Quality and Protocol Adherence

Site #	Site	# Scans	Number not accepted ¹	Percent not accepted
3	Wake Forest	262	10	3.8
4	Columbia	214	2	0.9
5	Johns Hopkins	193	2	1.0
6	Minnesota	239	0	0.0
7	Northwestern	305	2	0.7
8	UCLA	192	1	0.5
Overall		1,405	17	1.2

¹examples of reasons why scans are not accepted include: scan not completed, not enough cardiac phases, slices don't cover whole heart, blurred images, and bad gating

Exam 5 MRI Scan Times

Site #	Site Name	# scans	Mean time (mins)	SD
3	Wake Forest	252	48.4	9.4
4	Columbia	208	44.5	6.6
5	Johns Hopkins	180	42.2	5.0
6	Minnesota	225	42.5	7.2
7	Northwestern	296	40.6	7.0
8	UCLA	182	45.9	7.3
Overall		1,343	43.9	7.8

Exam 5 MRI Scan Times

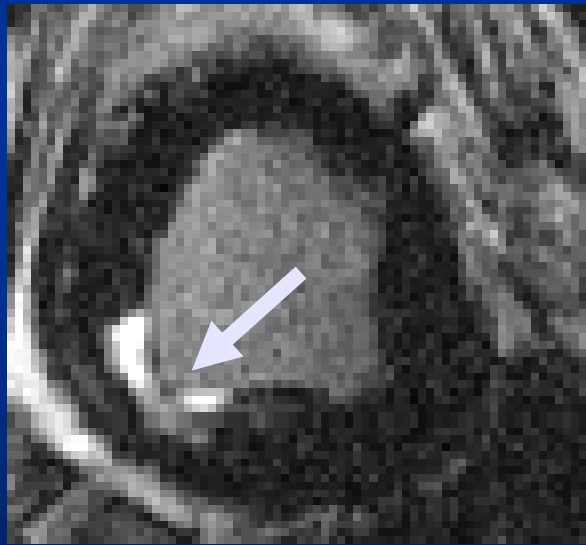
Site #	Site Name	# scans	75 th %	Max	% meeting target of 45 minutes
3	Wake Forest	252	54.2	72.2	26.6
4	Columbia	208	48.0	63.2	49.0
5	Johns Hopkins	180	45.6	55.8	71.1
6	Minnesota	225	46.2	88.6	69.8
7	Northwestern	296	45.2	65.8	74.0
8	UCLA	182	49.7	74.2	40.7
Overall		1,343	48.2	88.6	55.6

MESA: Myocardial Scar

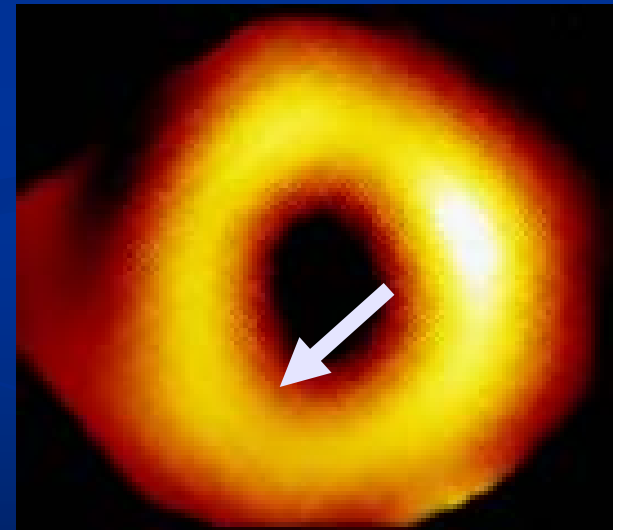
Gadolinium MRI is the clinical and research standard of reference for noninvasive detection of myocardial scar



Path



MRI



SPECT

MESA 5 Design: Gadolinium MRI

- Main study: funded 1,000 participants with gadolinium MRI
- Goal: determine the functional and clinical correlates of myocardial scar
- *Ancillary funding: Bayer, 2,000 additional participants (3,000 gad total/4,000 MRI's expected, 75%)*

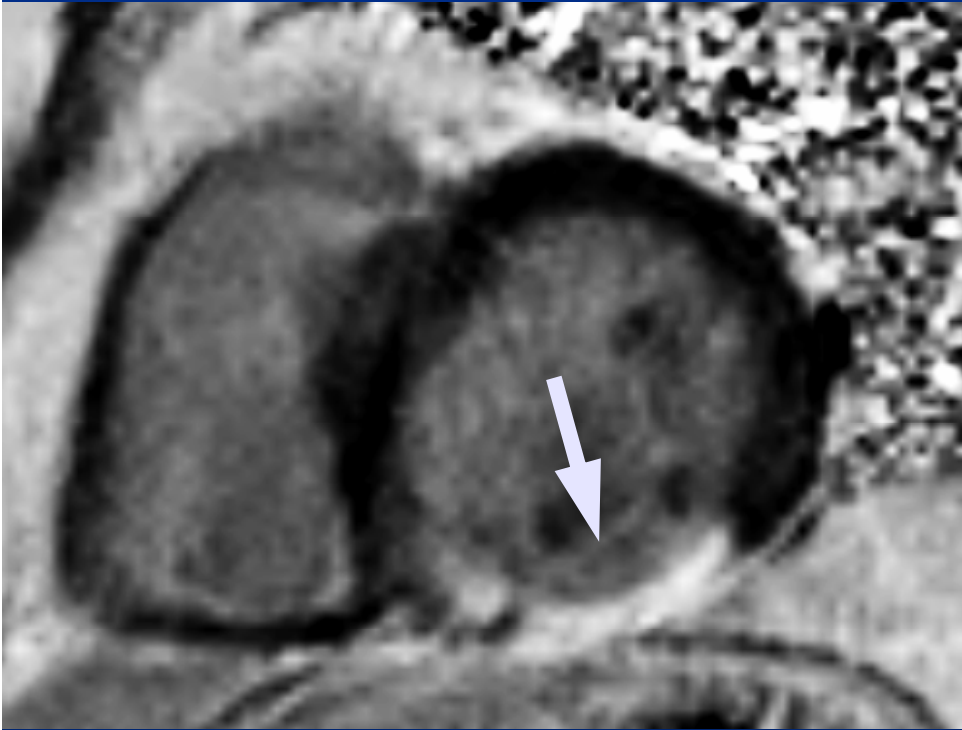
MESA 5 Design: Gadolinium MRI eGFR

- Most sites: <45 ml/min/ 1.73 m² excluded
- Northwestern: <60 ml/min/ 1.73 m² excluded
 (“moderate” dysfunction excluded)
- FDA: 30 ml/min/ 1.73 m² for patients, <30 stage 4
 severe dysfunction

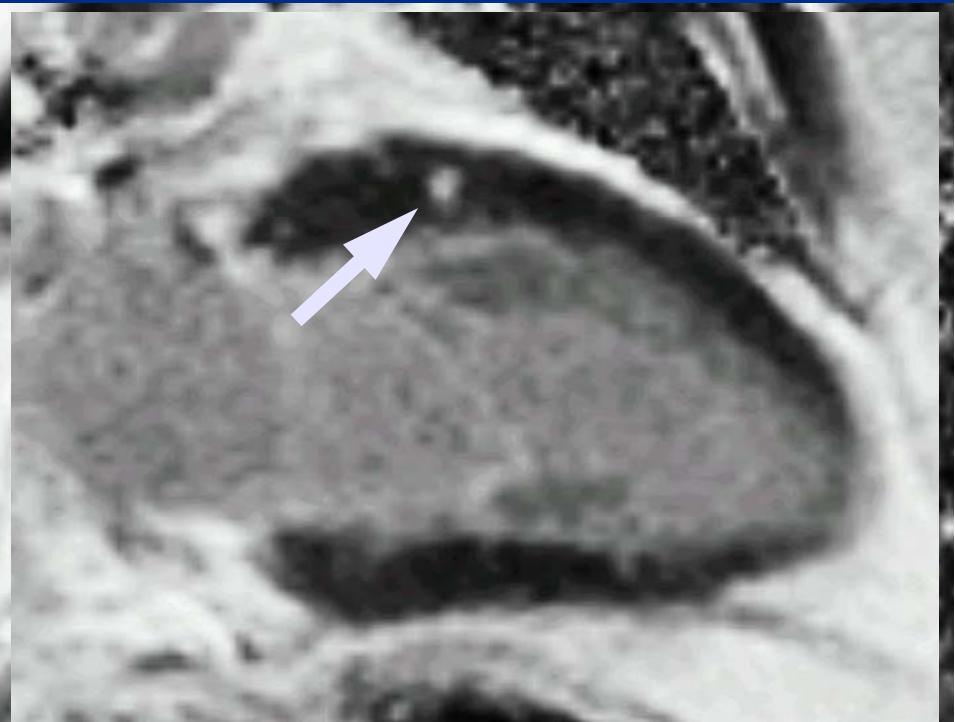
Myocardial Scar

- Kwong et al. (Circ. 2008; 118:1011):
 - Symptomatic T2 diabetics referred to MRI for CAD
 - Prevalence of scar: 28% (30/107 patients)
- Barbier et al. (JACC 2006; 48:765):
 - Age: survey of 70 year olds in Upsalla, Sweden
 - Prevalence of scar: 24% (72/248 patients)
- Meijs MF et al. Heart (2009;95:728-32)
 - Age 53: patients with manifest “arterial disease”
 - Prevalence of scar: 9.4% (45/480 patients)
- Turkbey et al. Submitted
 - Age 49: type 1 diabetes
 - Prevalence of scar: 4.3% (32/749 patients)
- Risk factors: high LV mass, HTN, kidney dz, DM

EDIC: Typical infarct, transmural (50% of cases)



Typical infarct
50% of participants



Atypical/nonischemic
50% of participants

MESA preliminary data (Nacif)

- MESA 5 = 883/1,345 (65%) studies with gad (target was 75%)
- 65/883 (7.3%) have scar
- Average age: ? (69 average MESA age)
- 55/65 men (85%)
- 29 ischemic scars (27M:2W)
- 36 nonischemic scars (28M:8W)

Ancillary Studies - Completed

- MRI tagging
- MRI carotid imaging
- MESA RV
- MESA Echo
- MESA BNP

Ancillary Studies - Ongoing

- Aortic structure and function
- MESA COPD
- MESA fibrosis (T1 mapping)
- CAP (Atlas project)
- EDIC/MESA comparison
- MESA SHARe (LV structure and function working group)

MESA Paper Proposals...

1. Incidence of myocardial scar in the MESA population
2. Relationship between myocardial scar and myocardial strain
3. Relationship between traditional risk factors and change in myocardial mass, structure and function
4. Age-related changes in myocardial mass: longitudinal analysis
5. Myocardial strain changes relative to risk factors and subclinical LV disease
6. Aortic structural changes and risk factors and subclinical LV disease