



Il incontro: applicazioni attuali della TC e RM nella cardiopatia ischemica

Ruolo della cardio RM nelle sindromi coronariche acute

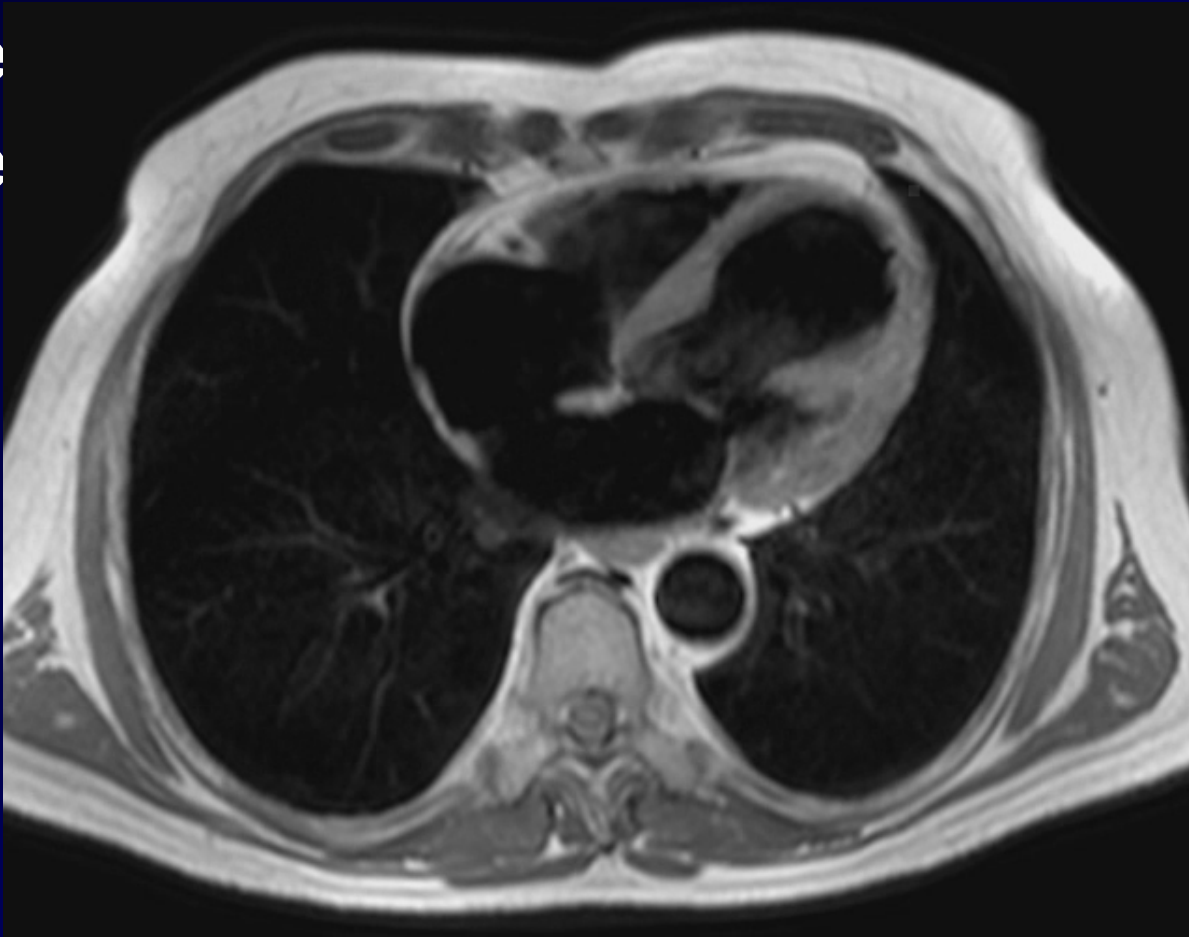
Come inserire la cardio RM negli algoritmi diagnostici tradizionali?

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Cosa si vede nelle SCA con la RMC

- Alterazioni dello spessore di parete
- Alte
- Alte



Cosa si vede nelle SCA con la RMC

- Altera
- Altera
- Altera



Cosa si vede nelle SCA con la RMC



Immagine SE (T1 pesate)

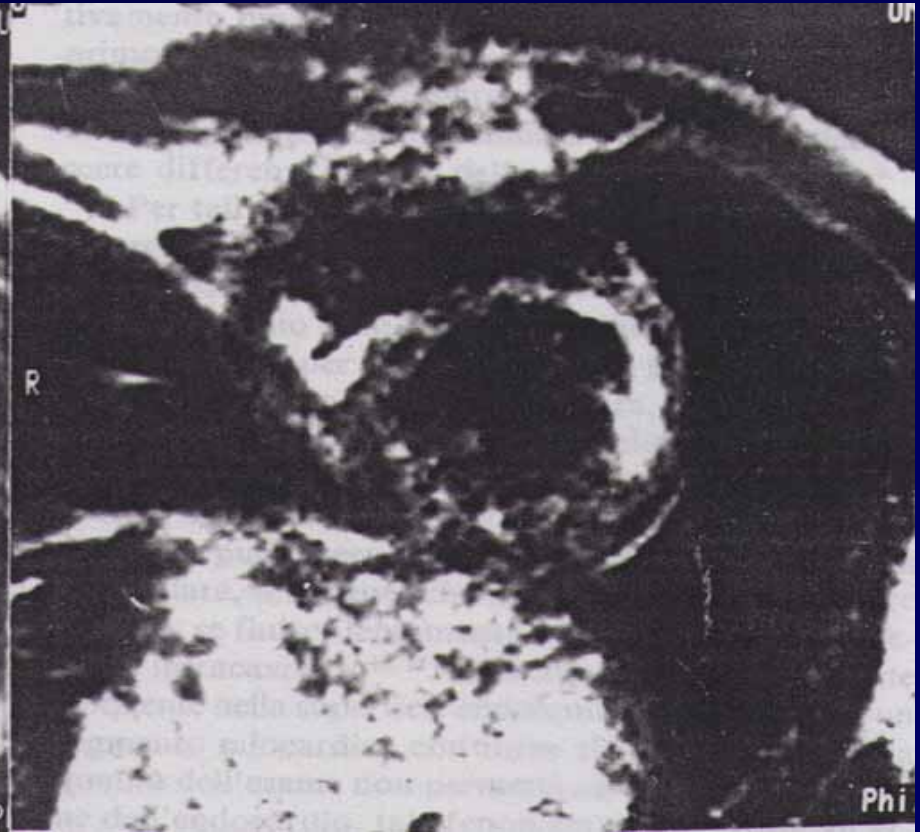
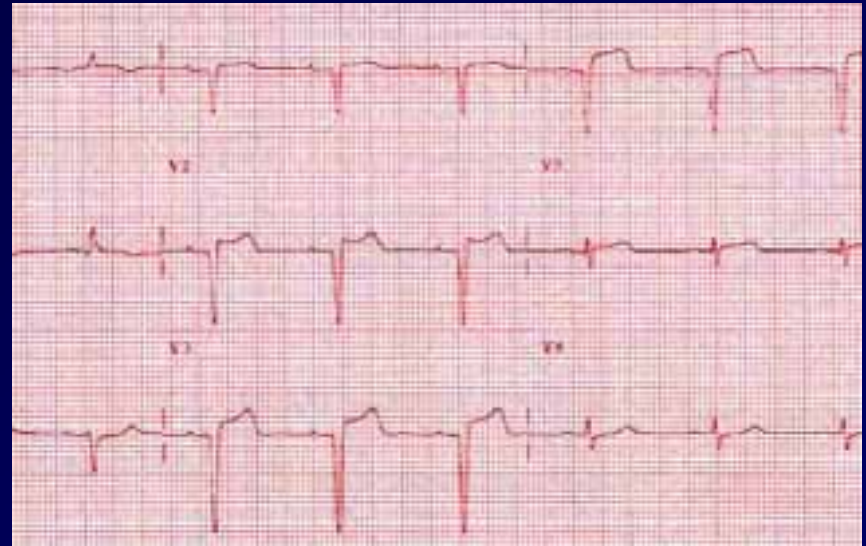
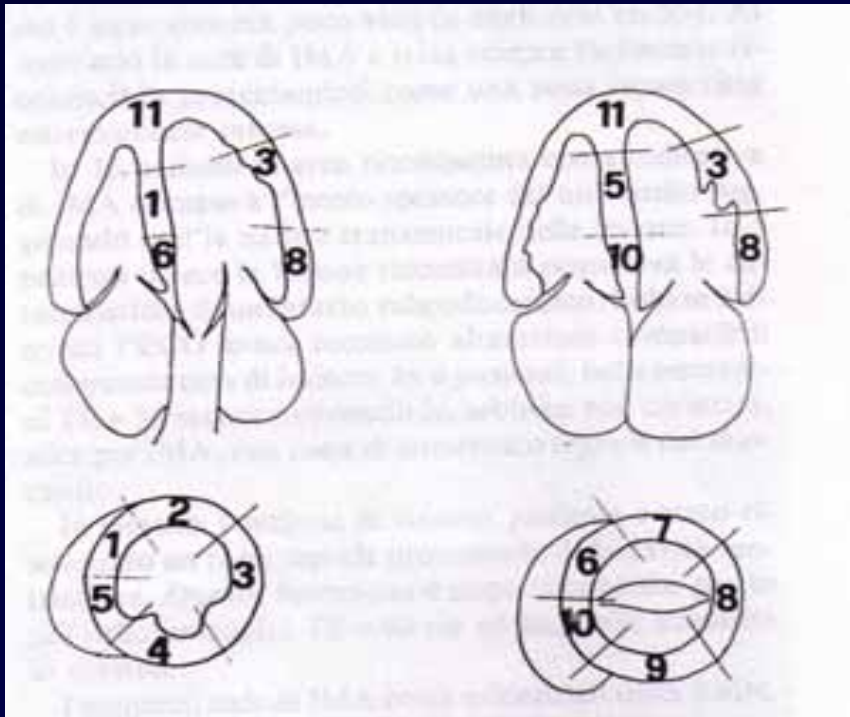


Immagine SE (TE 90msec
T2 pesate)

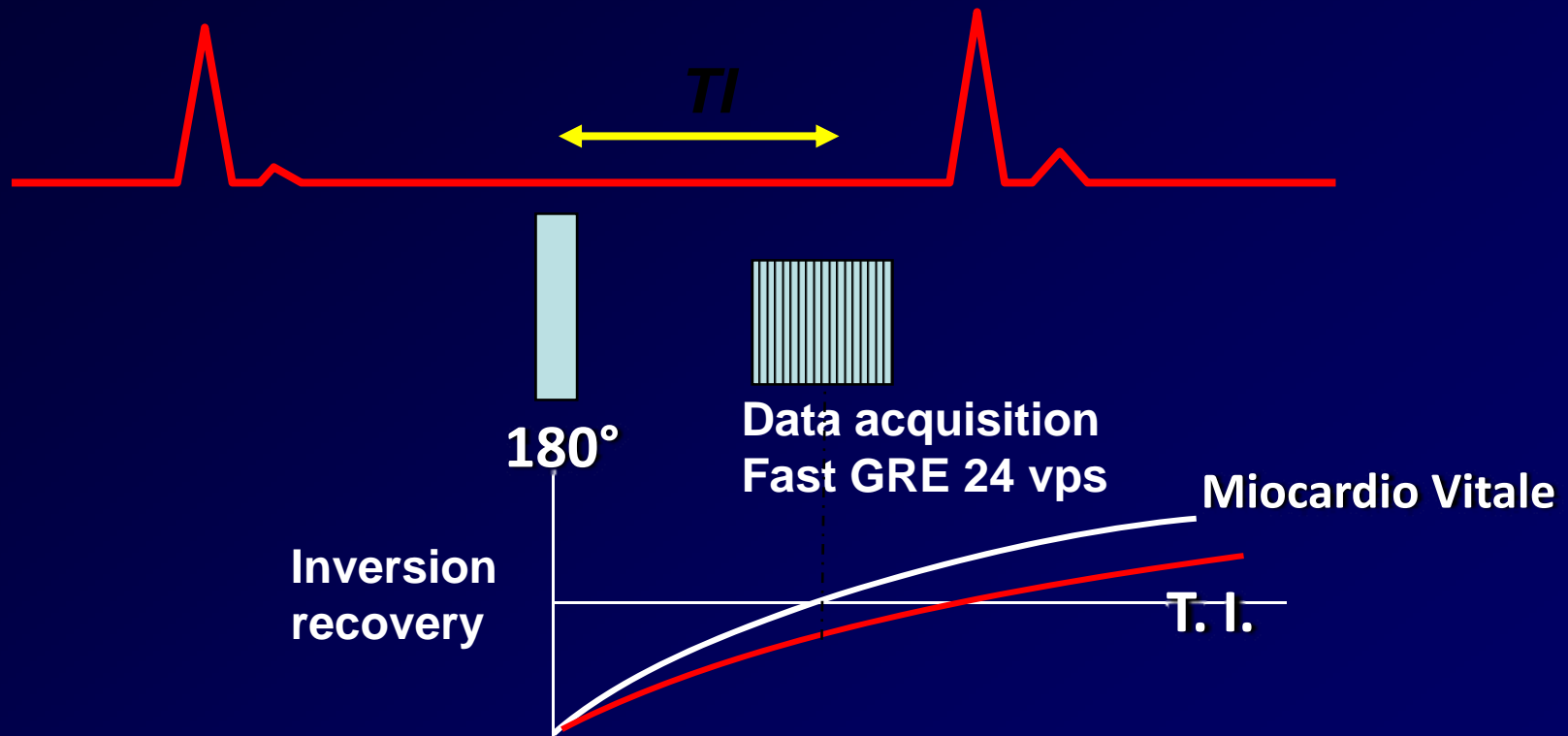
RM e IMA : un lungo viaggio



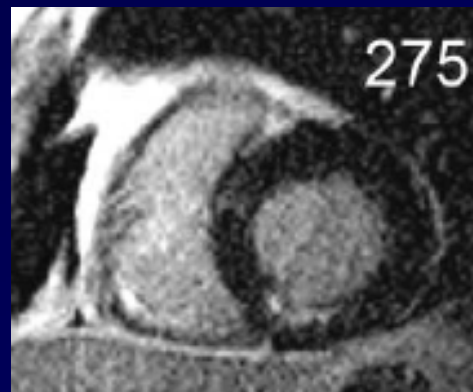
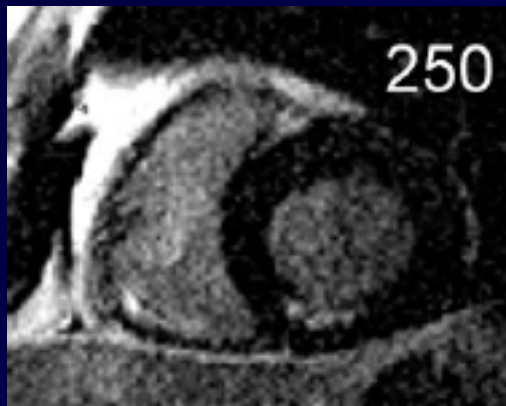
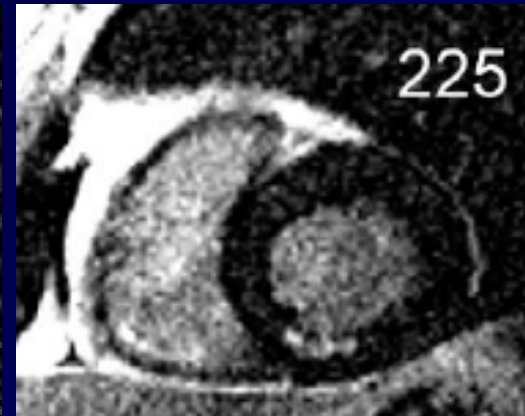
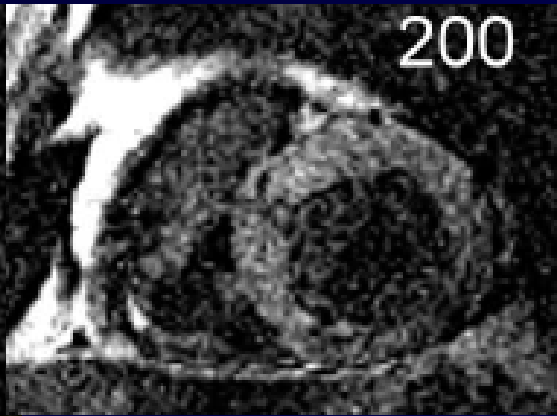
Demonstration of acute myocardial infarction by nuclear magnetic resonance: comparison with 2-dimensional echocardiography in localization of the necrotic area

Casolo et Al. *Cardiologia*. 1989 Mar; 34 (3):229-36

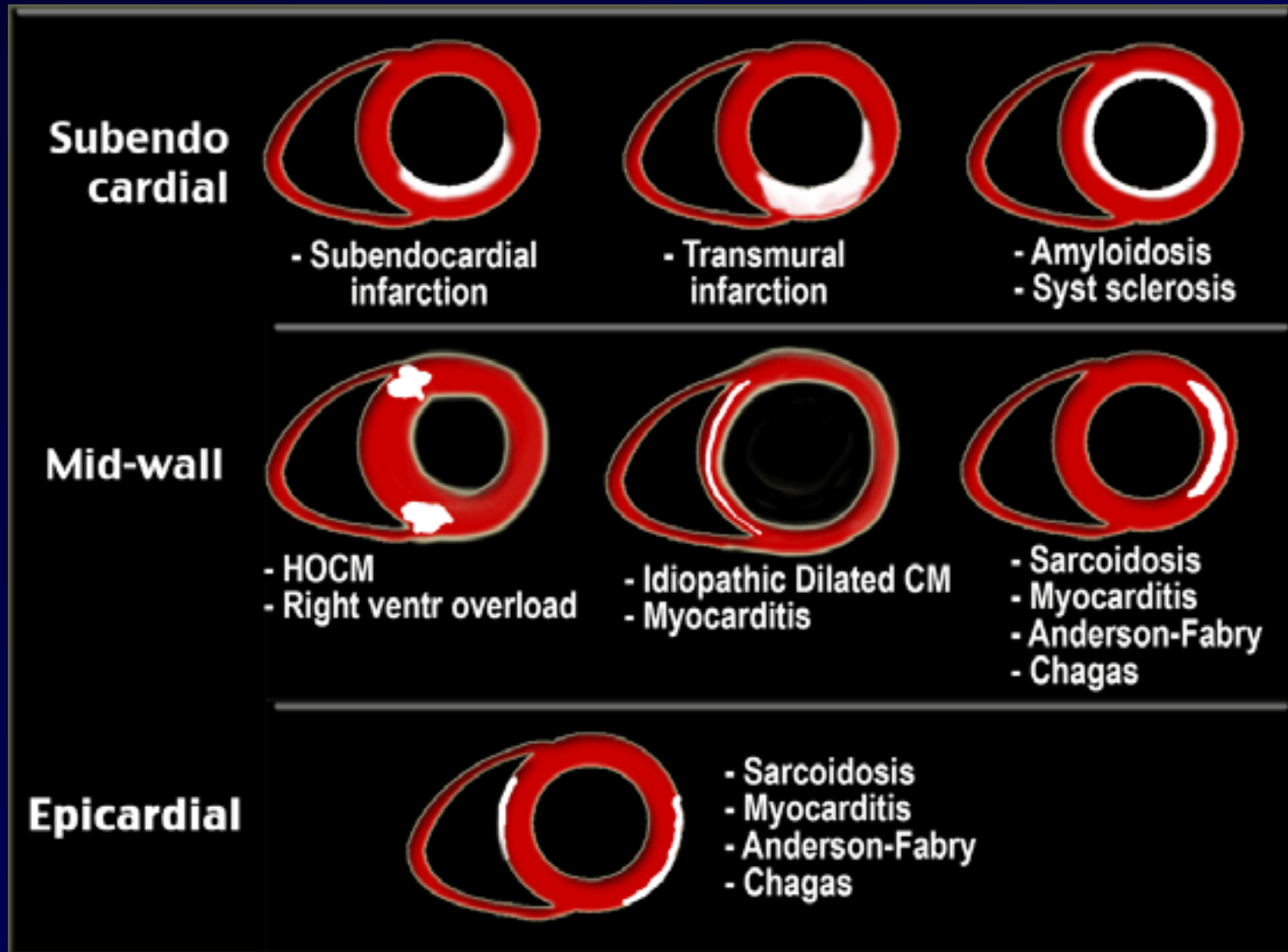
Delayed enhancement



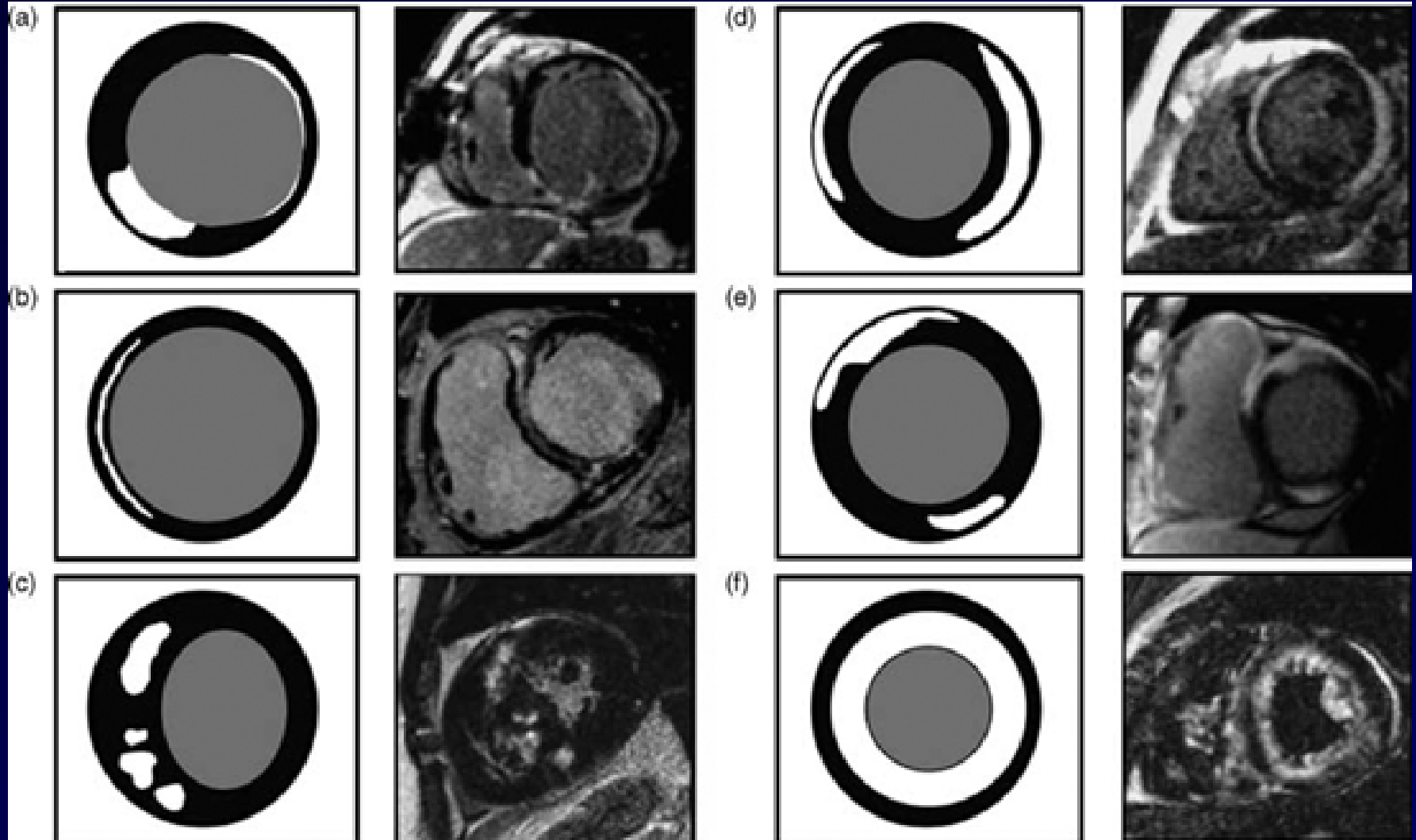
- ❖ Inversion recovery prepared FastGRE
- ❖ L'impulso IR da' pesatura T_1 e sopprime il miocardio sano IR ≈ 200 ms
- ❖ 1 slice per Breath-hold



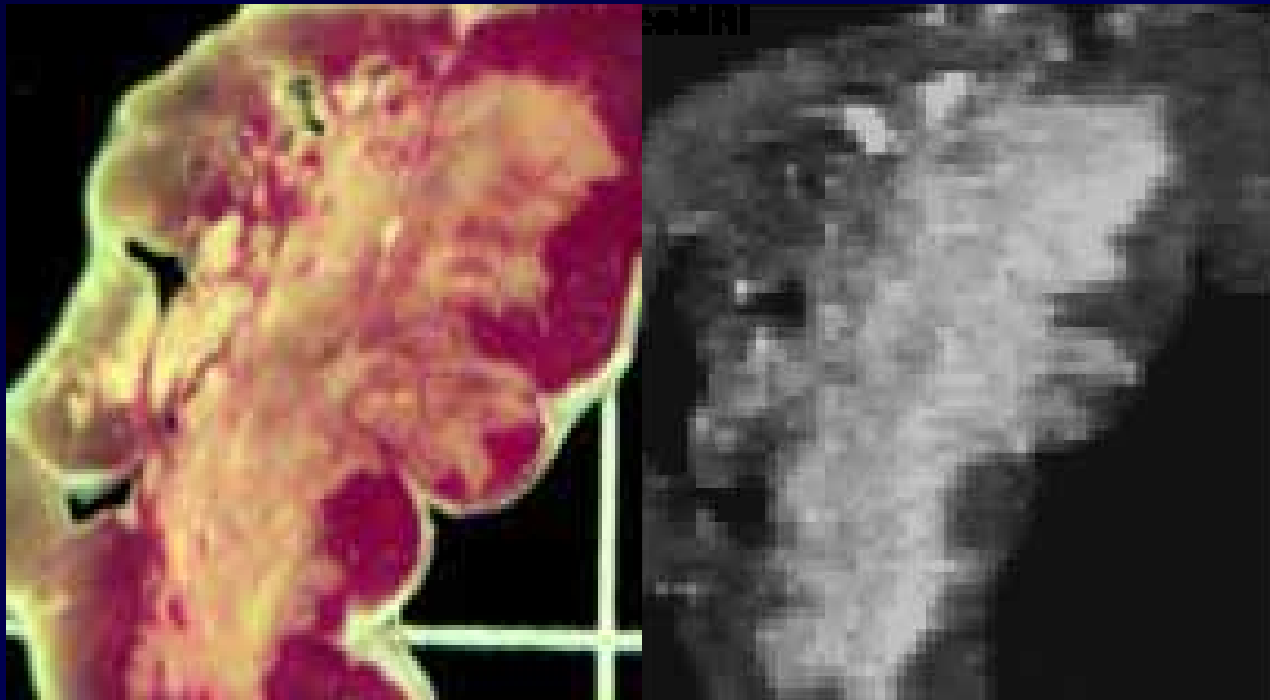
Late enhancement



Delayed enhancement

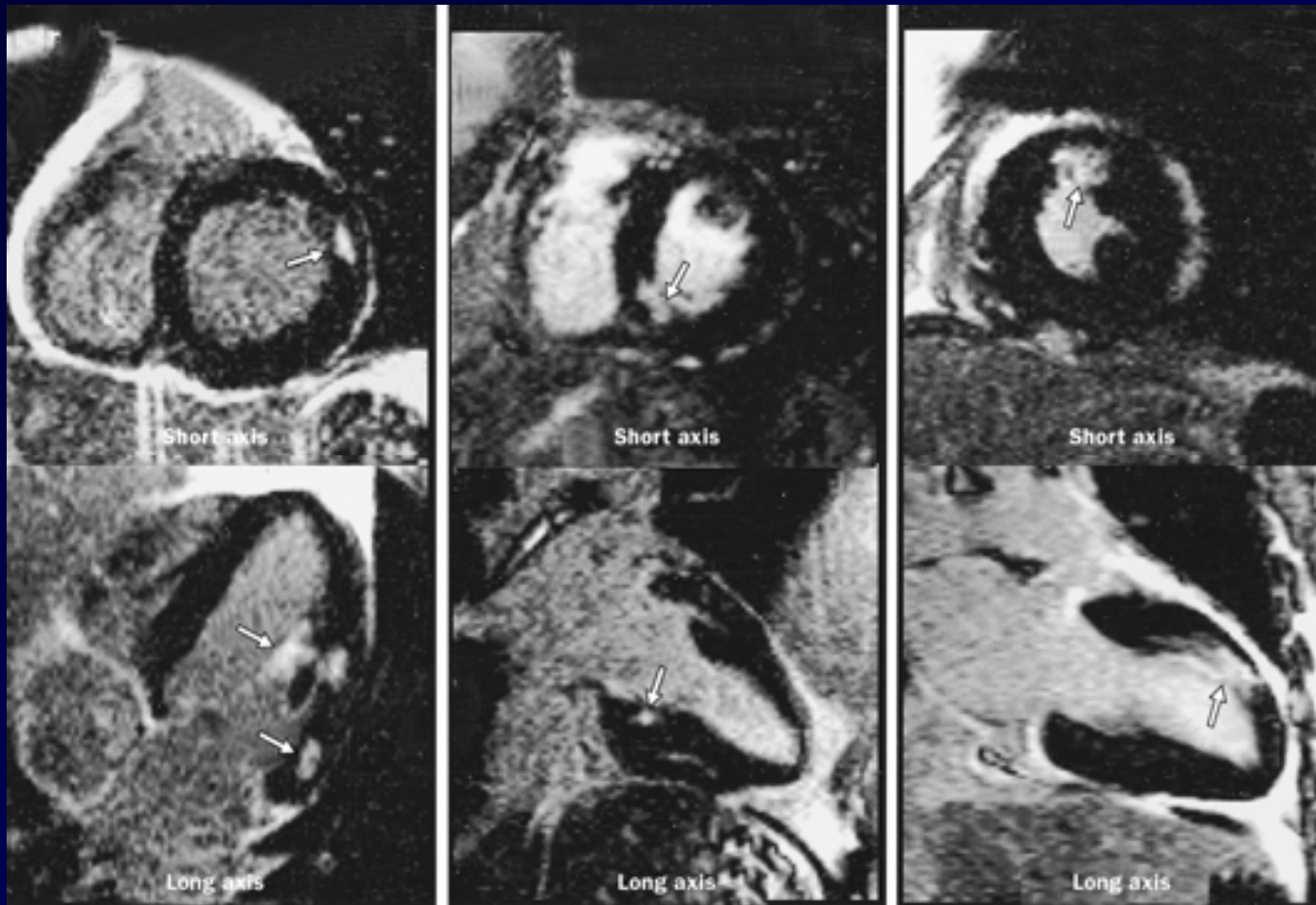


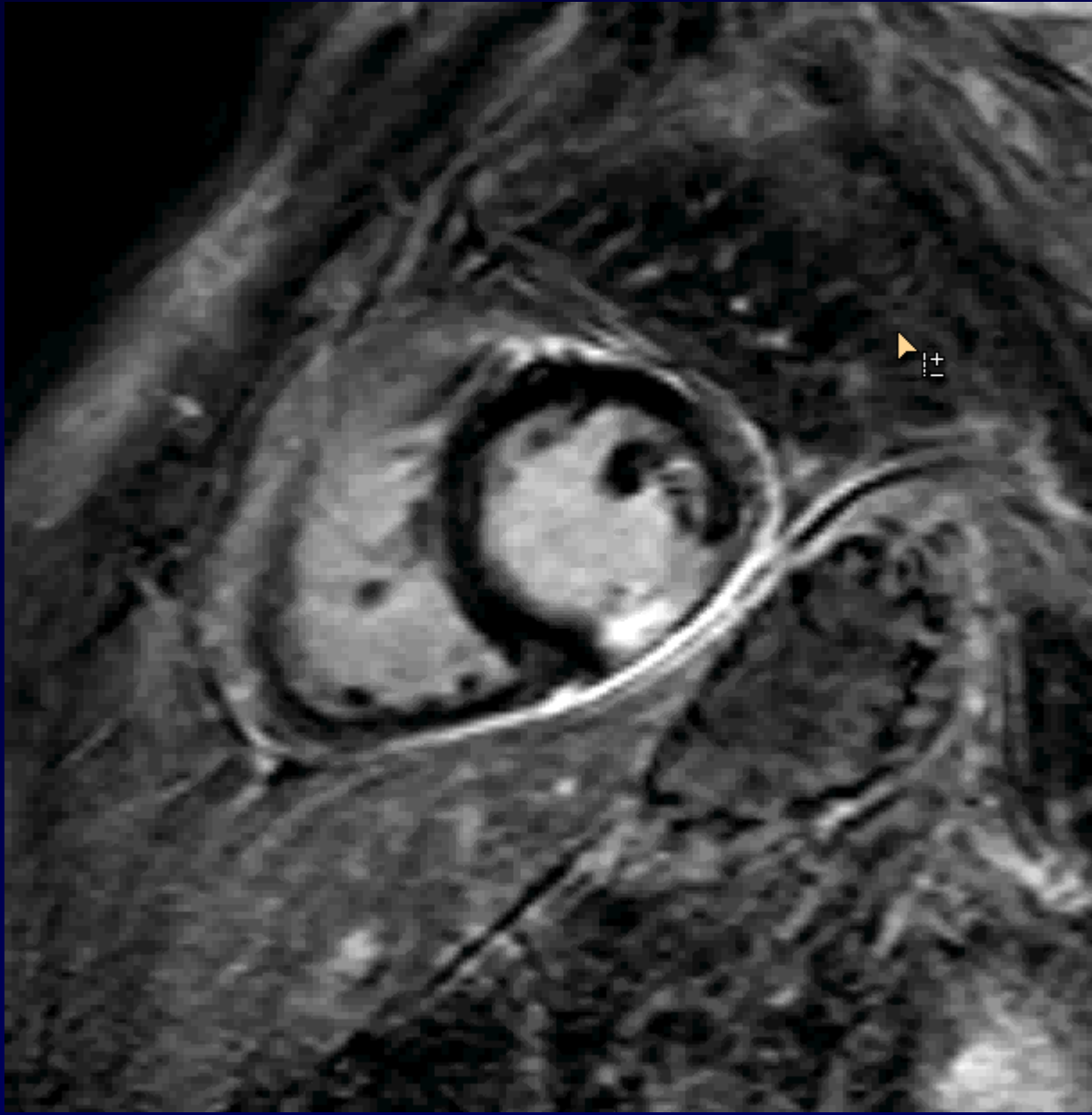
Delayed enhancement e necrosi



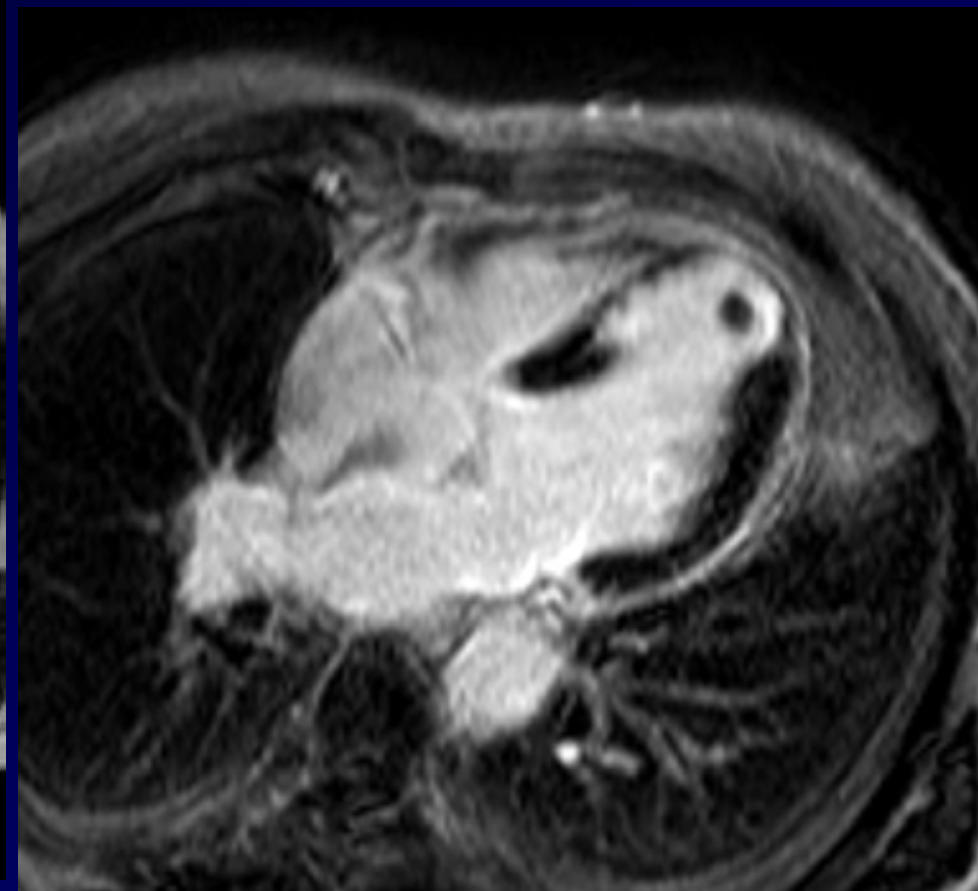
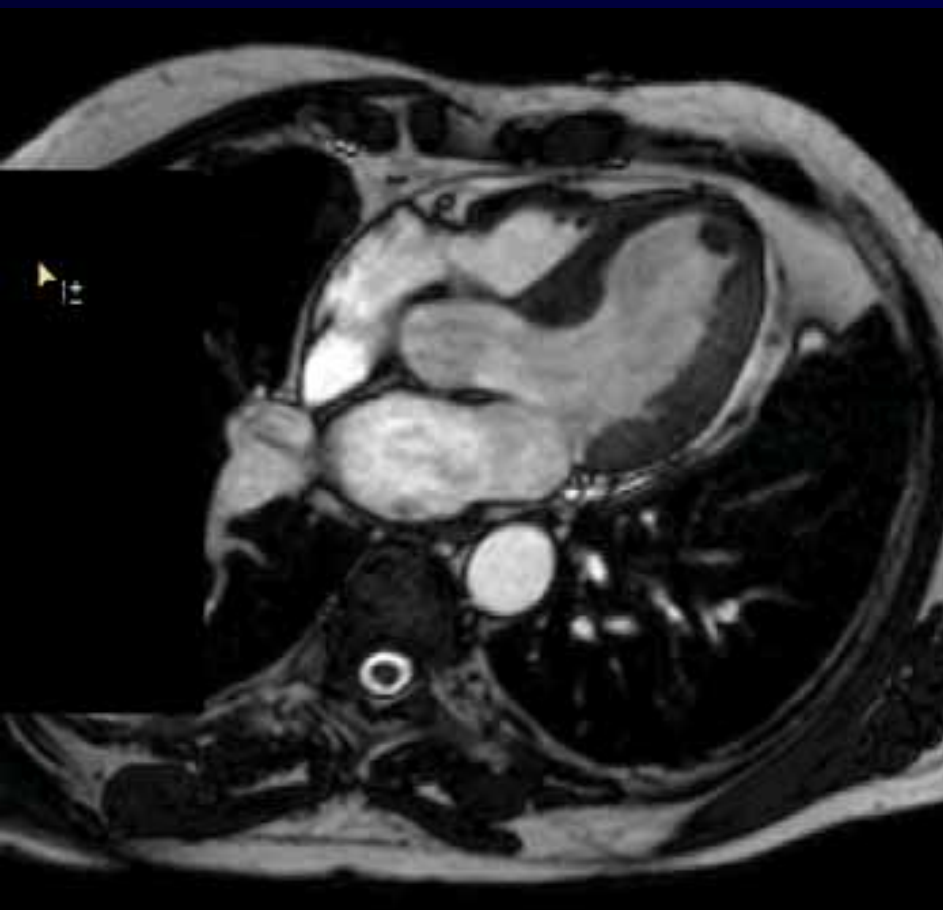
Kim e Coll. Circulation, 1999

Delayed enhancement e Infarto miocardico

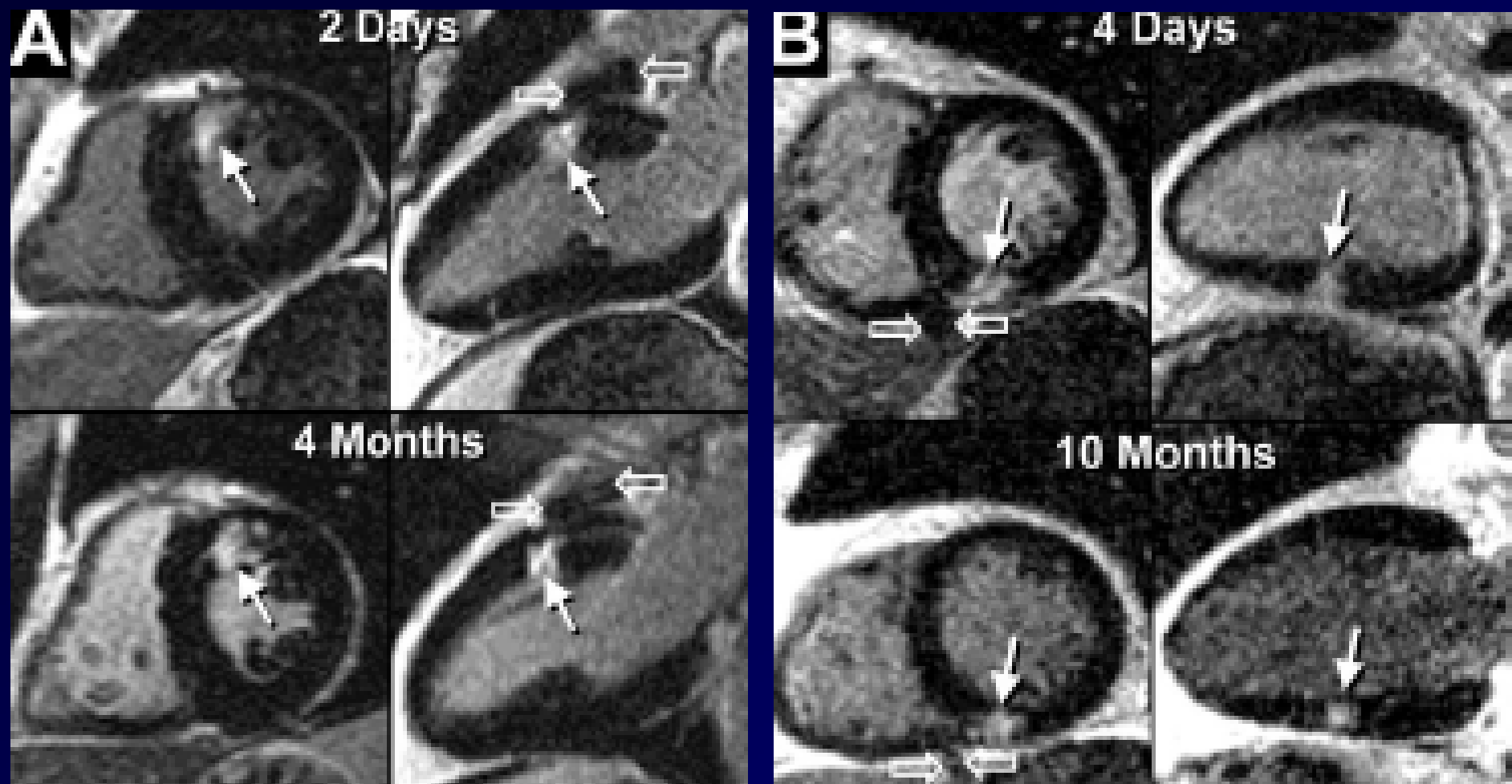




Delayed enhancement

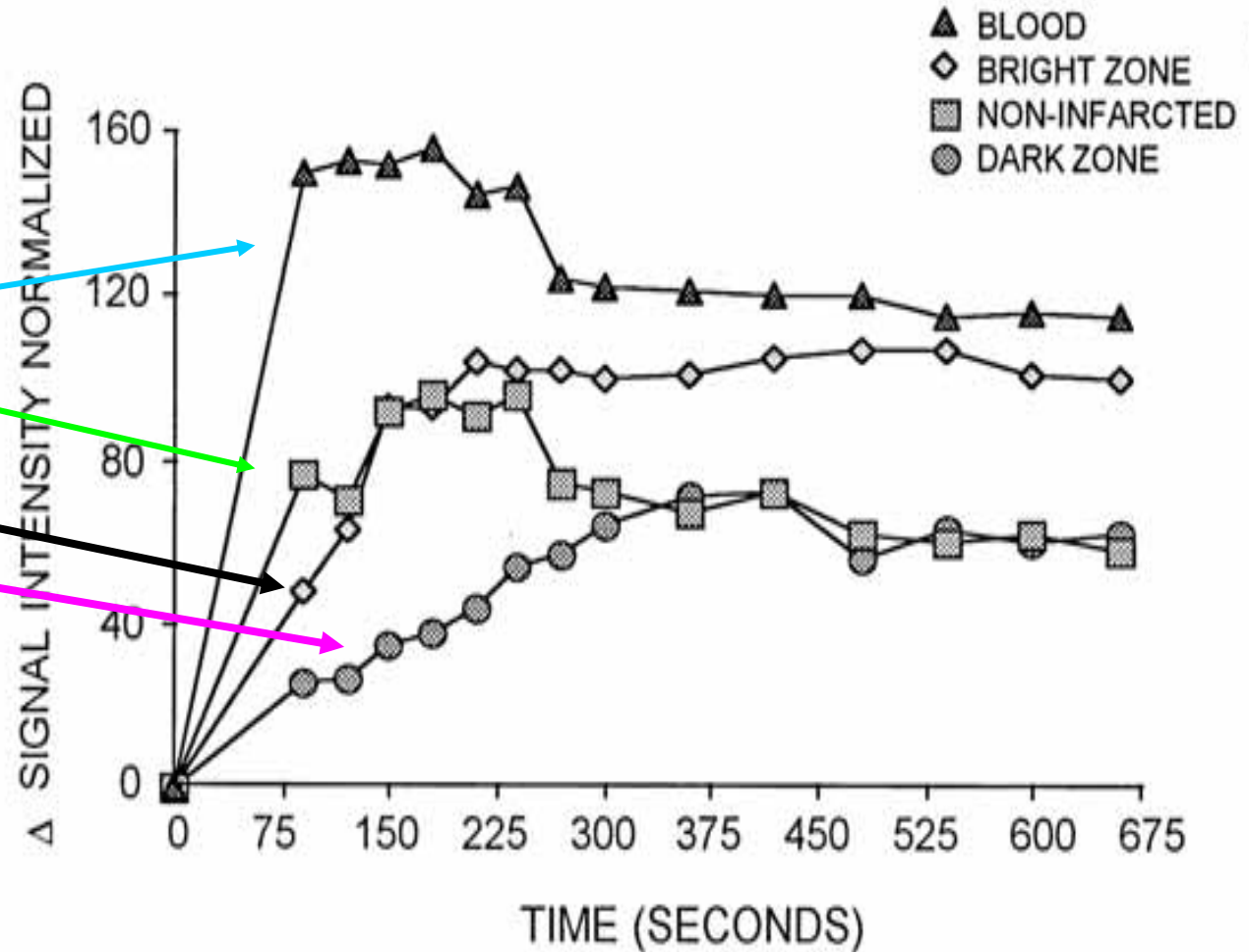
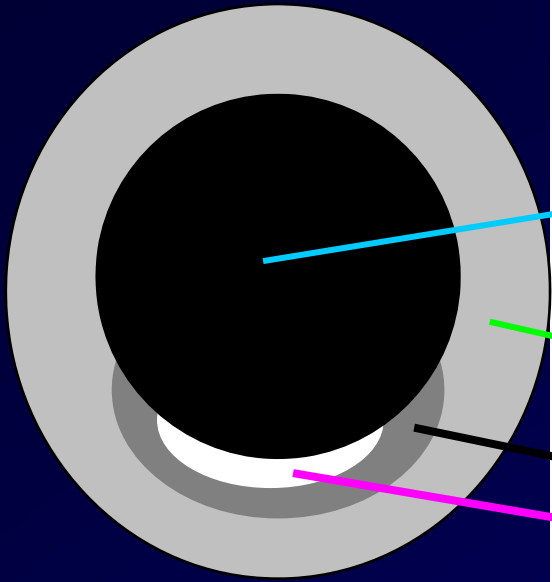


Rilievo di microinfarti dopo angioplastica coronarica



Ricciardi M et Al. Circulation. 2001;103:2780-2783

Myocardial contrast uptake in AMI



Lima et Al. Circulation, 1995

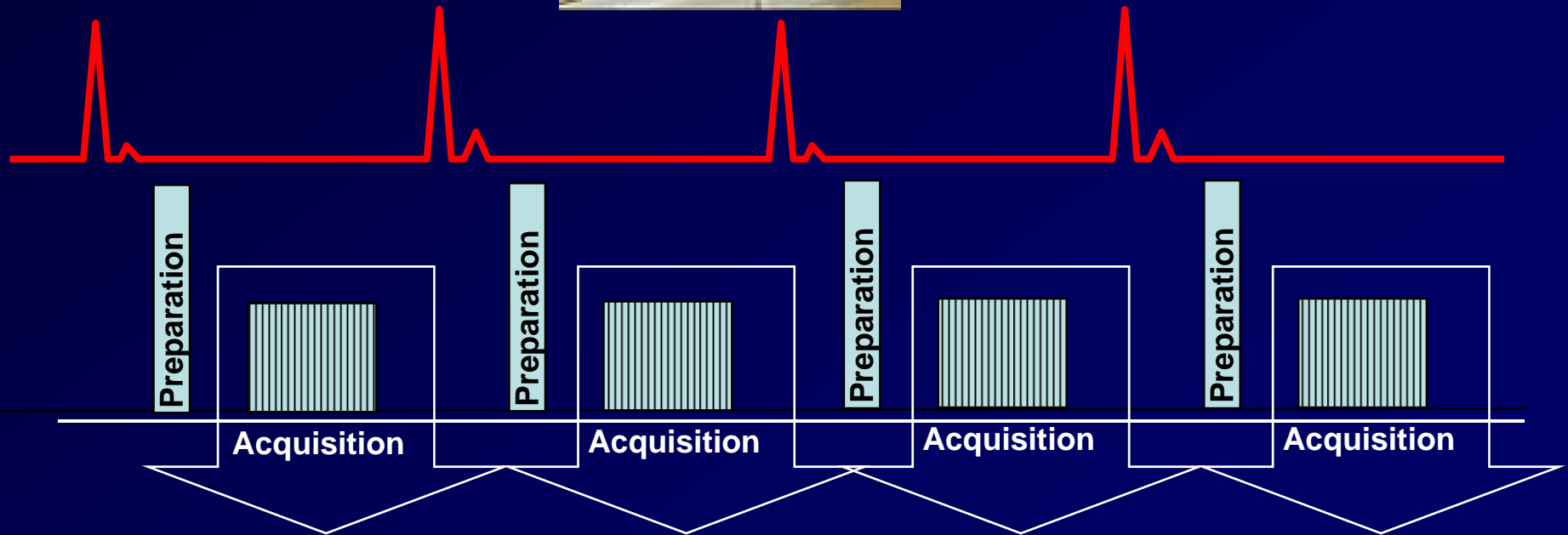
Studio del circolo coronarico



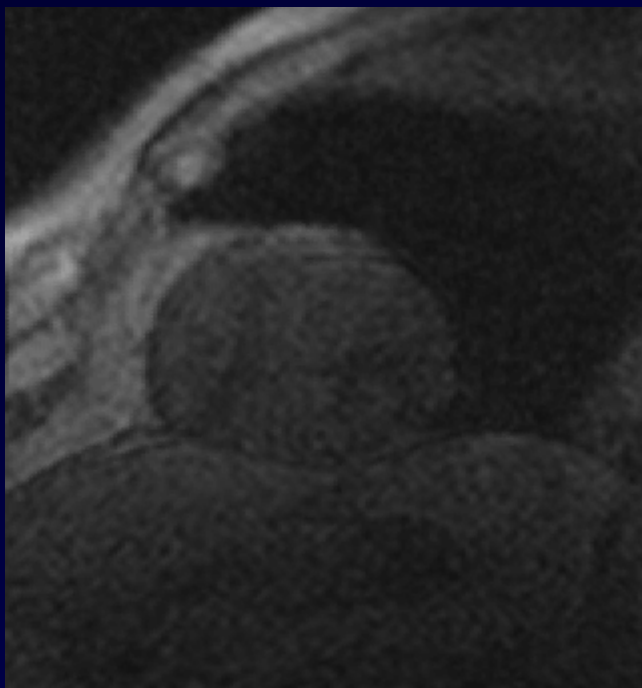
Perfusion analysis by CMR



- T1 weighted
- IR-GRE-EPI
- SENSE
- 0.05mM/Kg Gd-DTPA



Dipiridamolo o Adenosina: target perfusione



Iniezione endovenosa periferica
Gd-DTPA 0.025-0.05 mM/Kg

Contrasto IV
Sequenza RM



Recupero

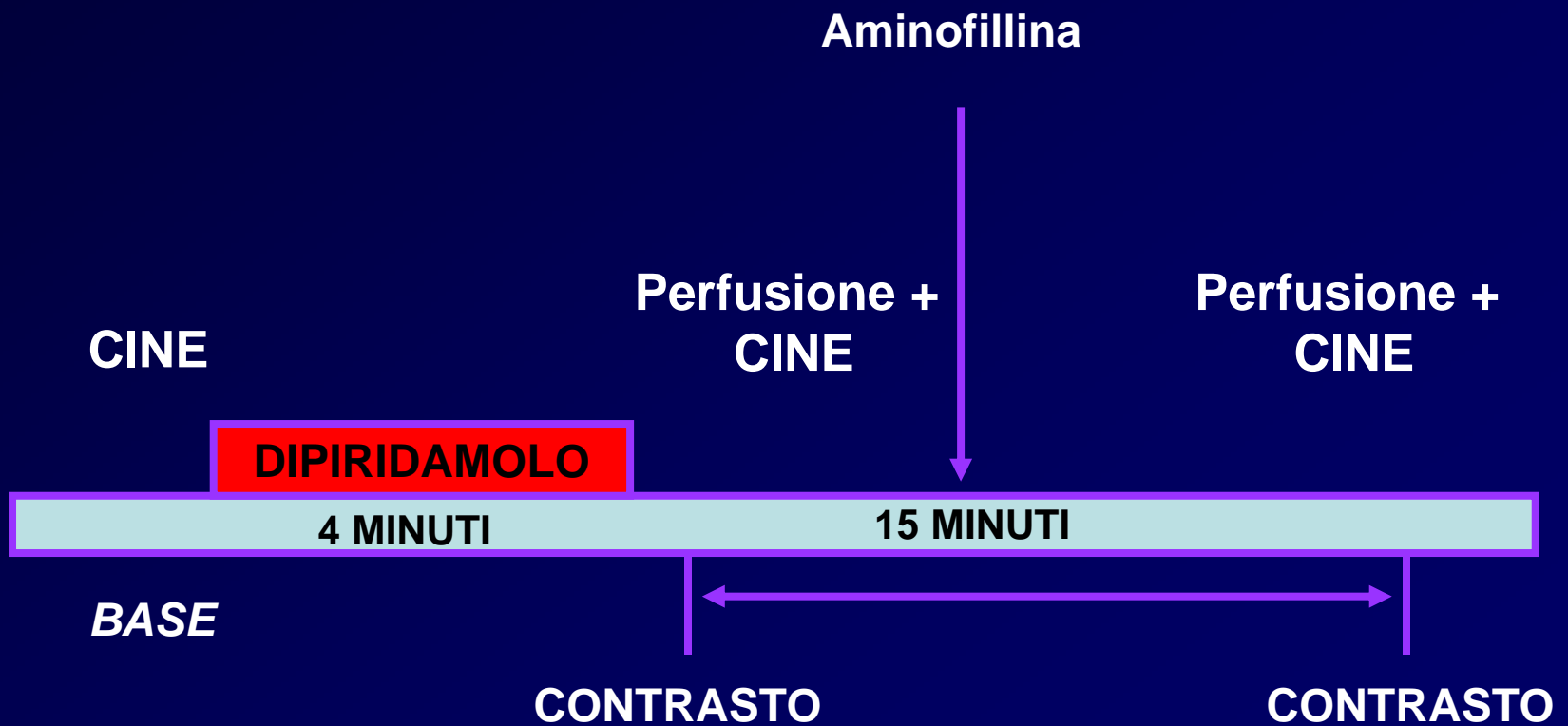
Contrasto IV
Sequenza RM



Dipi o Adenosina

15 minuti

Approccio combinato perfusione/cinetica “single-agent”



Perfusion (MTR) (Non-contrast)

 Name:

20 - Case 1 PERF on C4 - F

 Application:

 Perfusion:

 Mode:

 Slice:

Results window

Result display

 Result type:

 - Mean perf

 - Max perf

 - Min perf

 - Std perf

Automatic segmentation

 - Dynamic motion

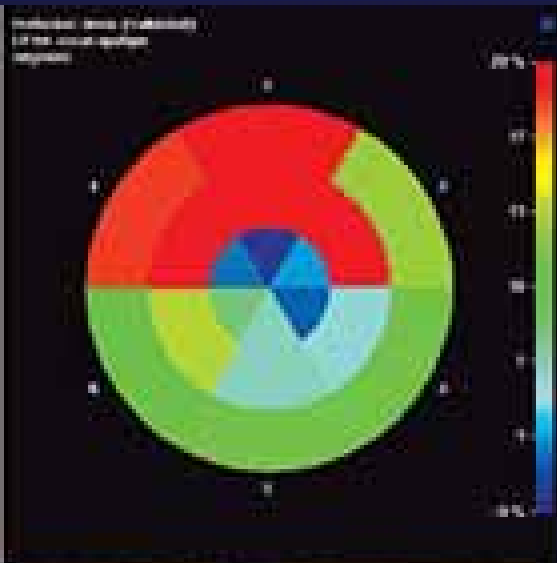
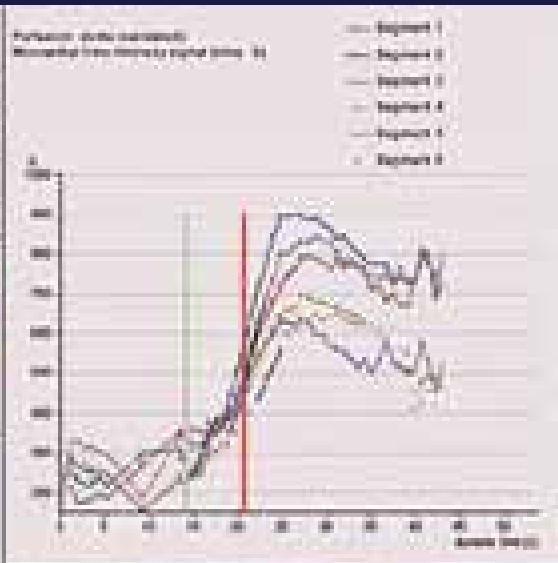
 - All slices

 - Resection

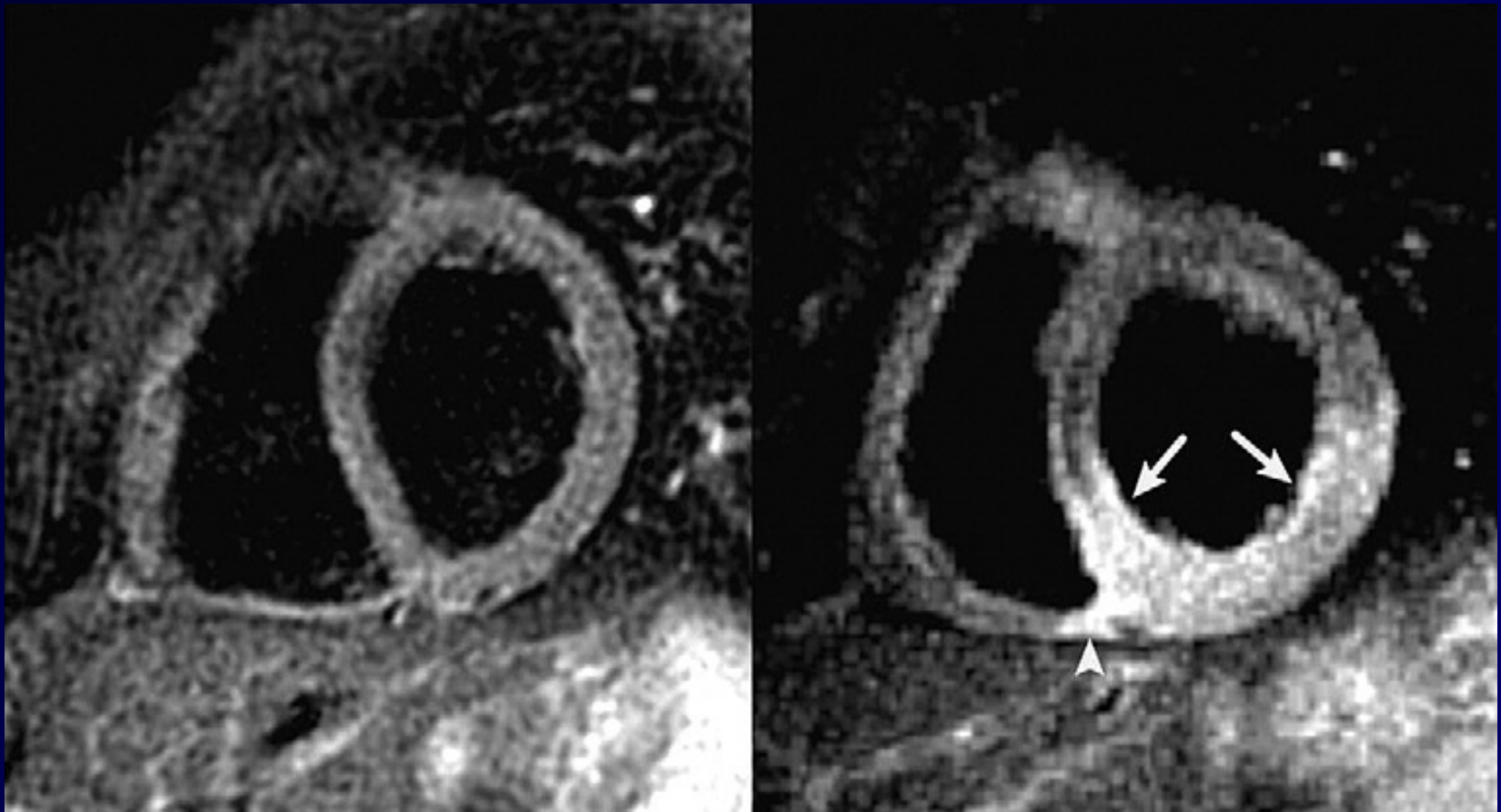
Display parameters

Tools

Help

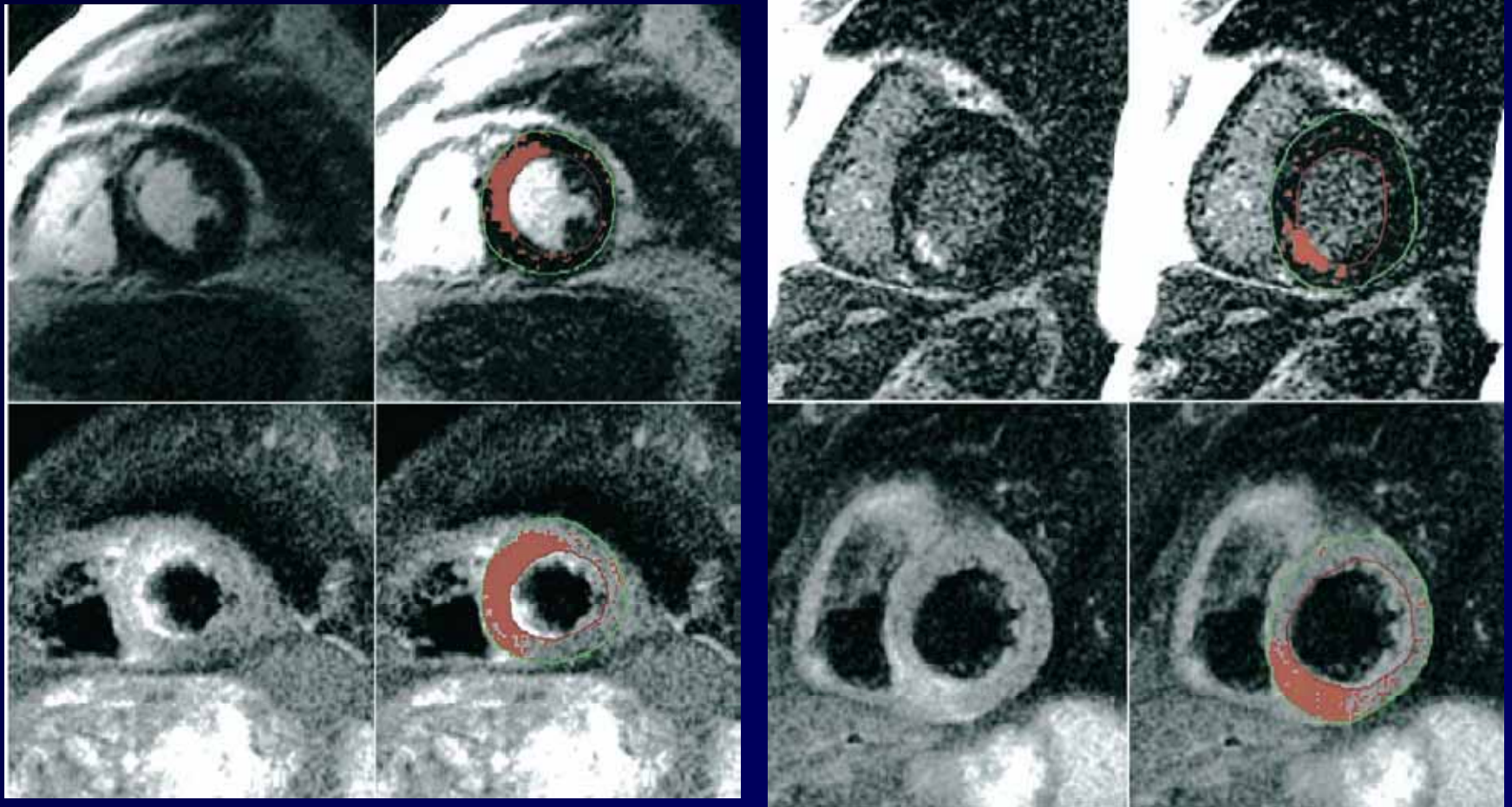


Imaging dell'edema



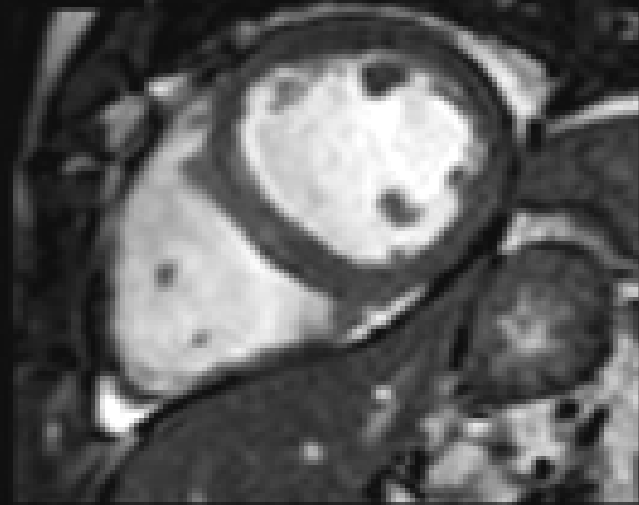
T2 weighted sequence/image (BH-no contrast)

The Salvaged Area at Risk in Reperfused Acute Myocardial Infarction

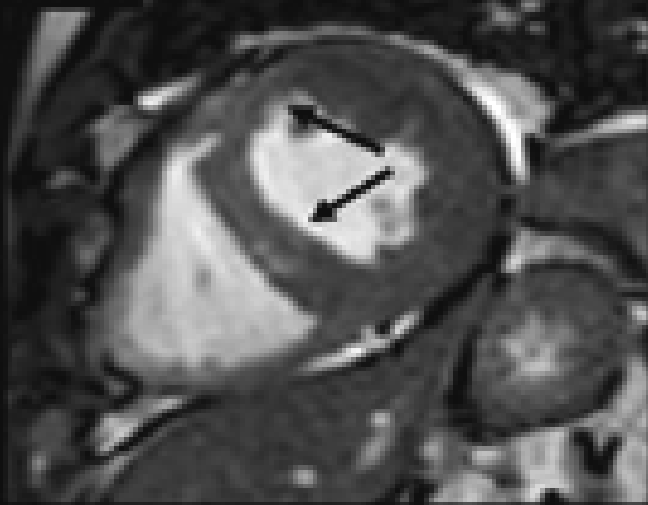


Patient 1

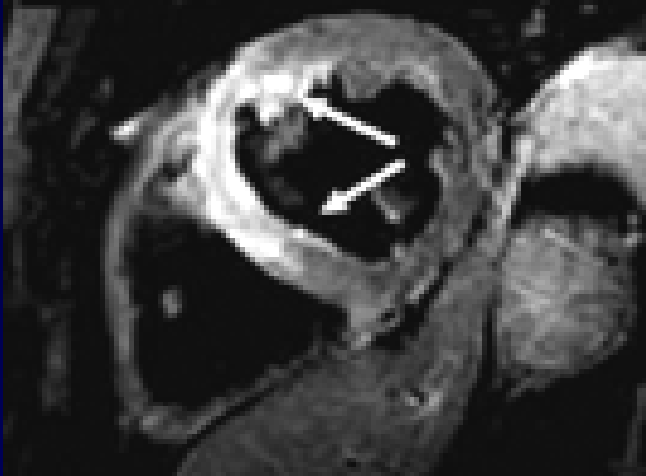
ED



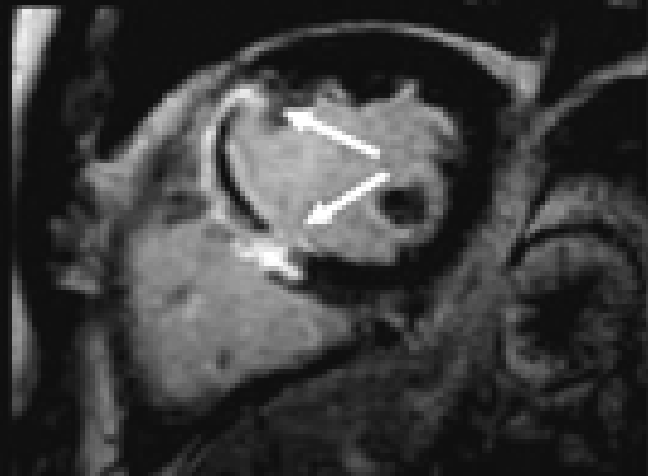
ES



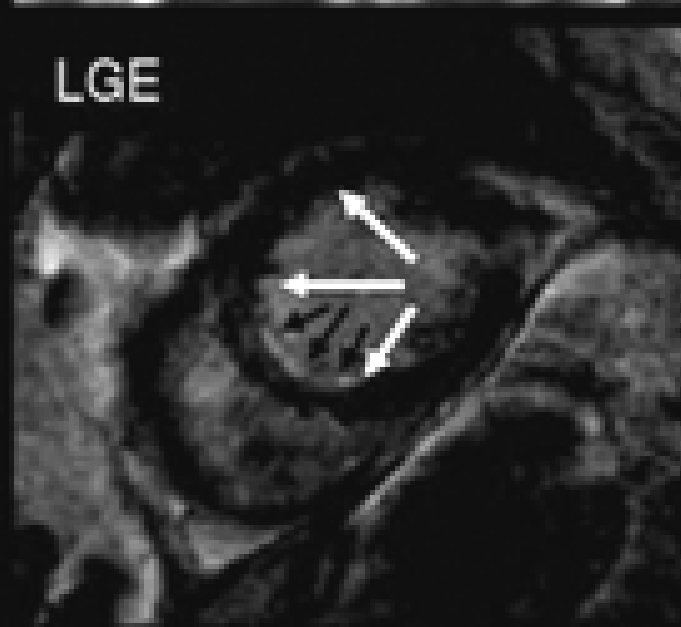
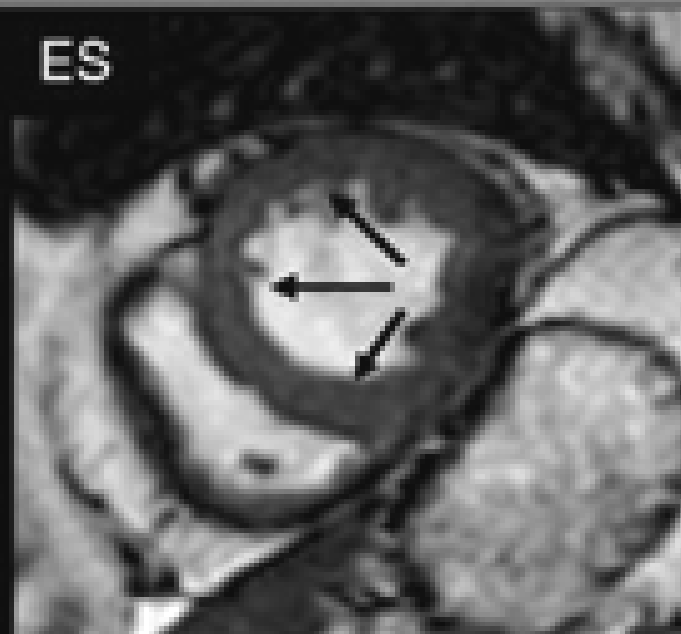
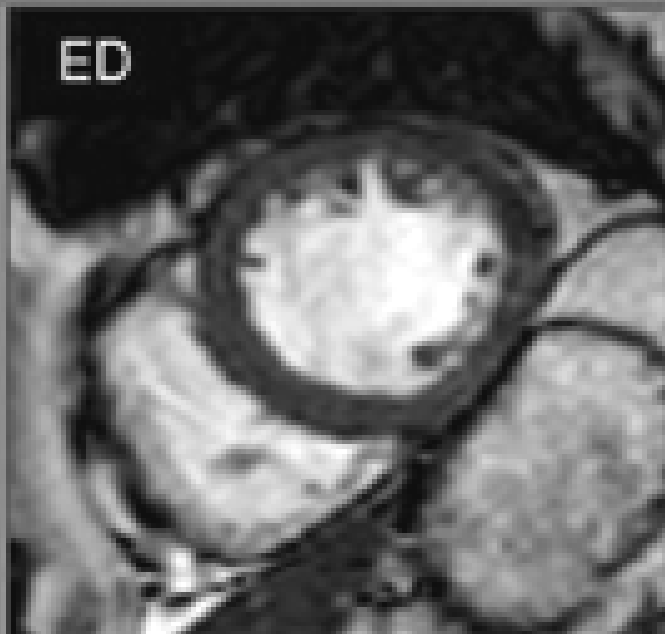
T2



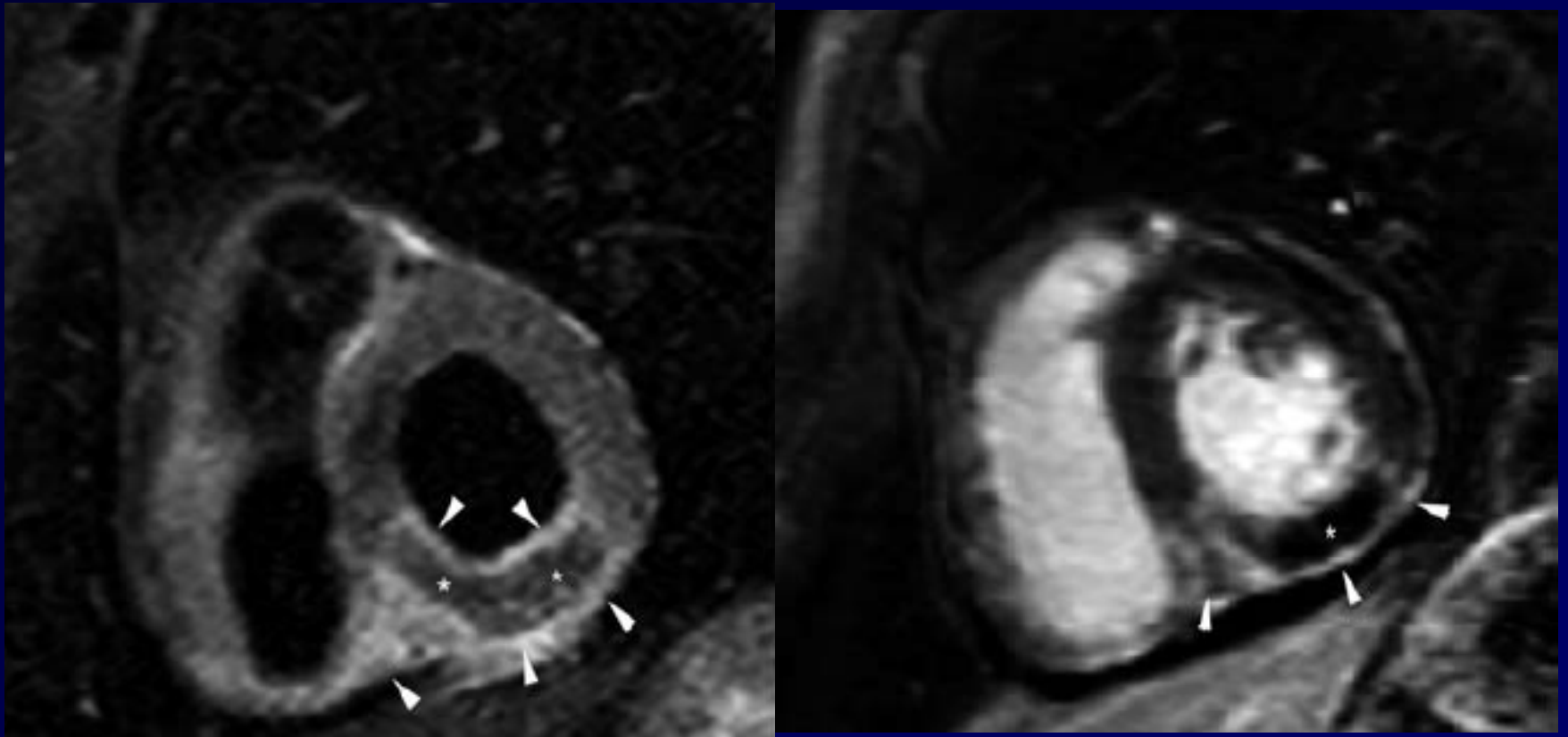
LGE



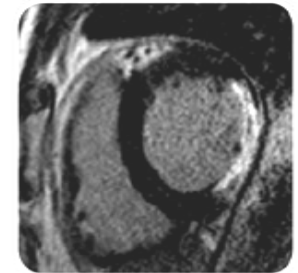
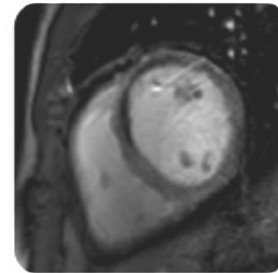
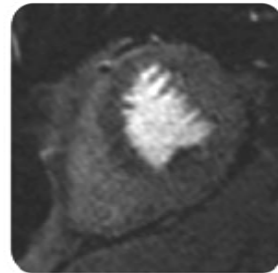
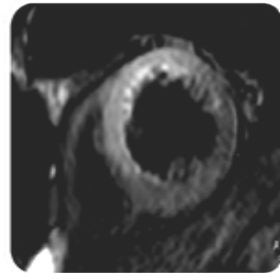
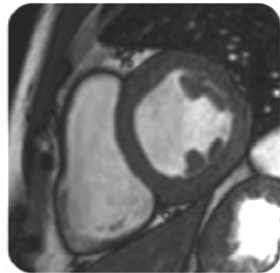
Patient 2



Emorragia durante IM



RMC e SCA : tecnica e targets



**Cine Imaging
(rest/stress)**

T2-Weighted Imaging

**First Pass Perfusion
(rest/stress)**

**Early Gadolinium
Enhancement**

**Late Gadolinium
Enhancement**

Contractile function

Tissue edema

Regional myocardial
blood flow

Microvascular integrity

Myocardial
necrosis/fibrosis

LV function/
ischemia/viability

Infarct age/ myocardial
salvage

MVO/ischemia

No reflow/ MVO

Infarct size/viability

Survey

Cine
stack

T2
weighted

Rest
perfusion

Early Gd

Late Gd

Cardio RM e SCA

- Guidelines nessuna indicazione
- Appropriatazza nessuna indicazione

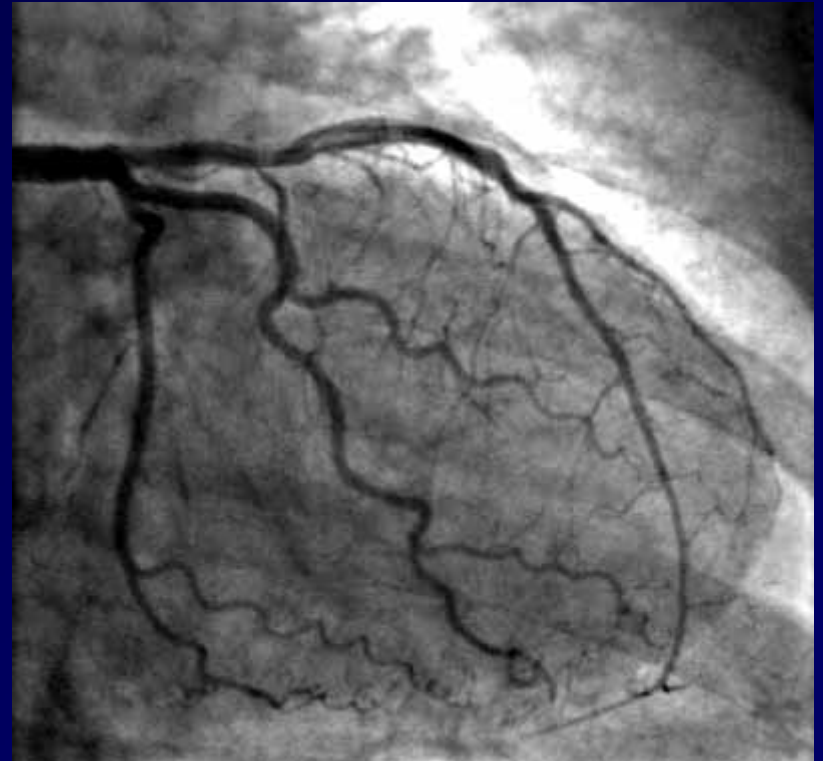
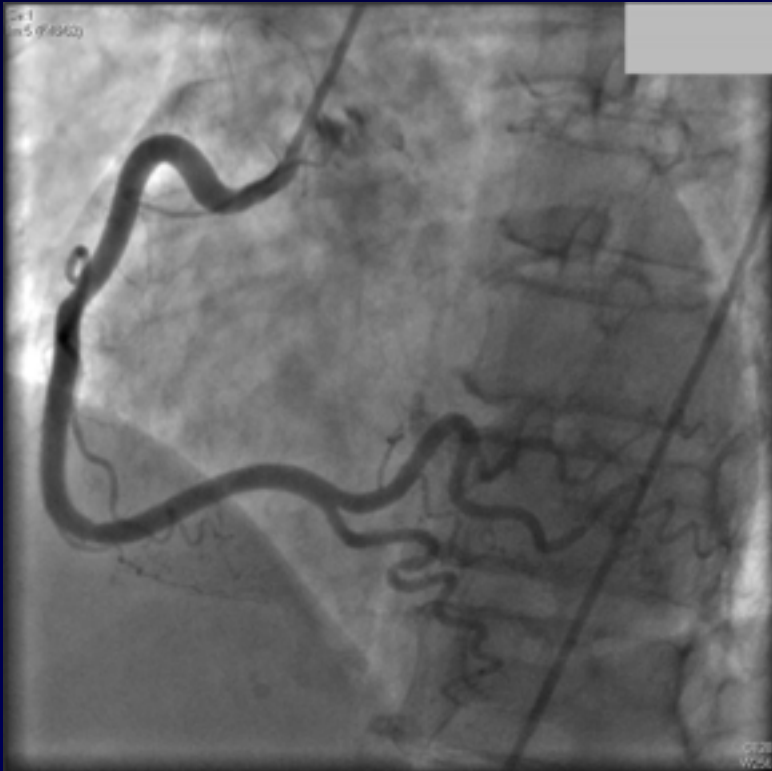
Caso 1

- Donna aa 40
- Dolore toracico tipico
- Ecg Ip/c sincope inferolaterale



Caso 1

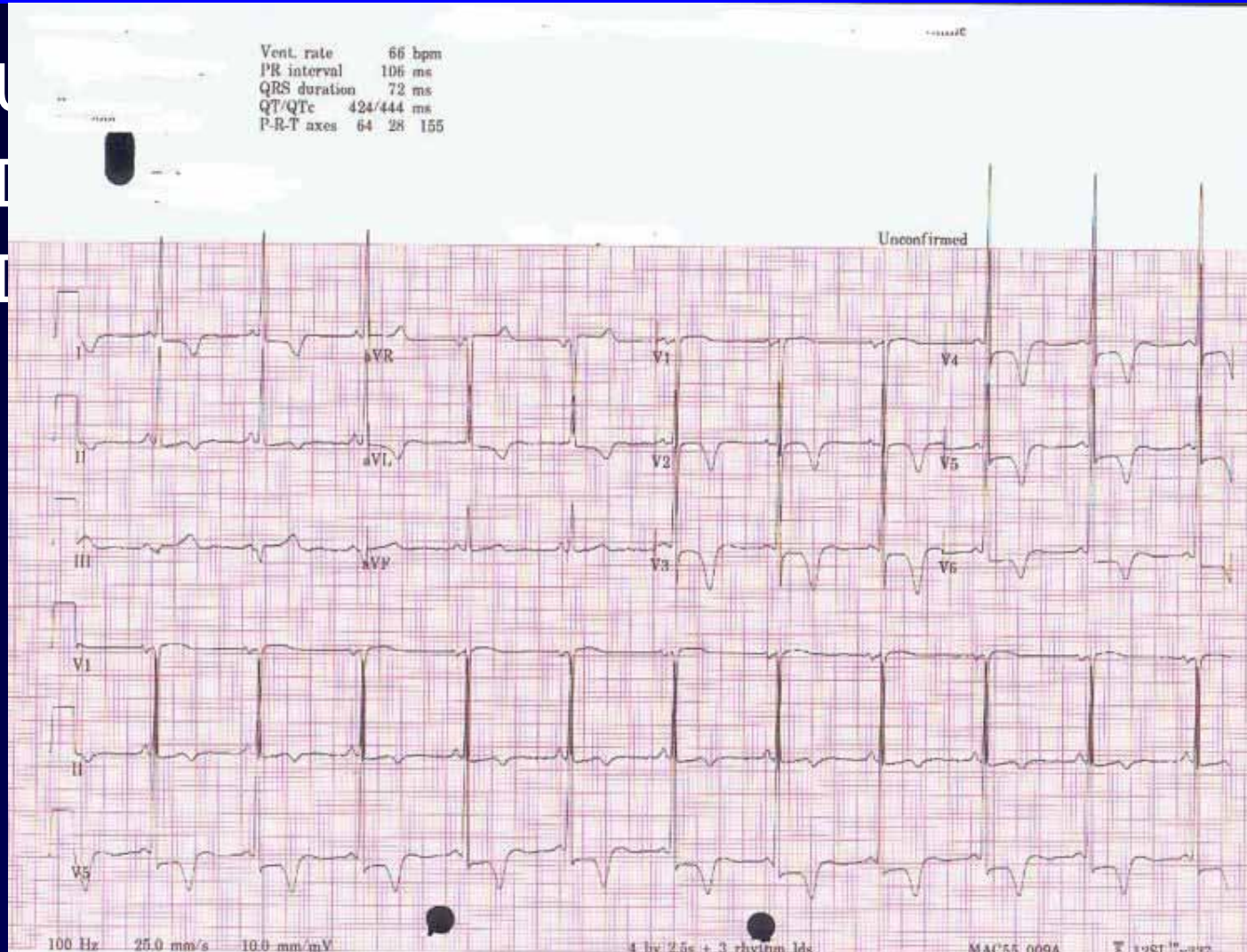
- Trop +
- Storia di recente episodio infuenzale



Caso 1



Caso 2

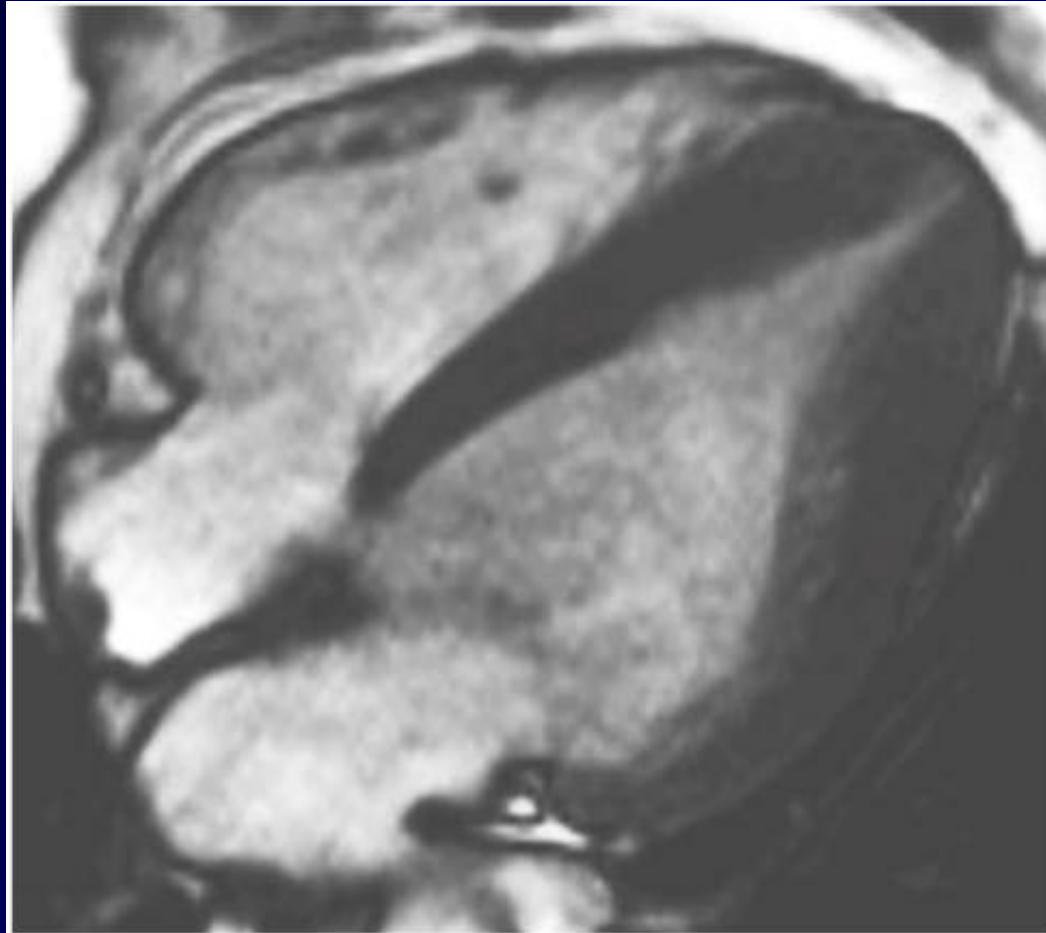


Caso 2

- Clop
- Eco
- Sos



Caso 2



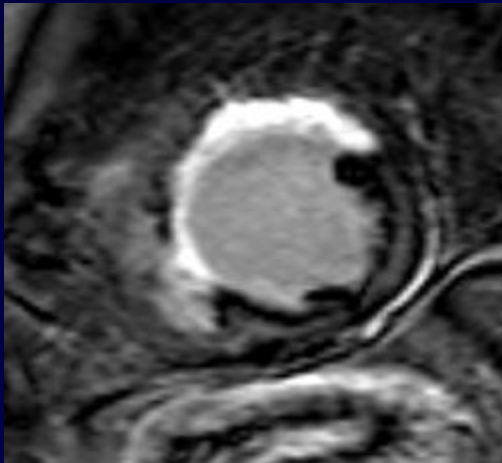
Caso 3

- Uol
- Dol
- EC
- ant



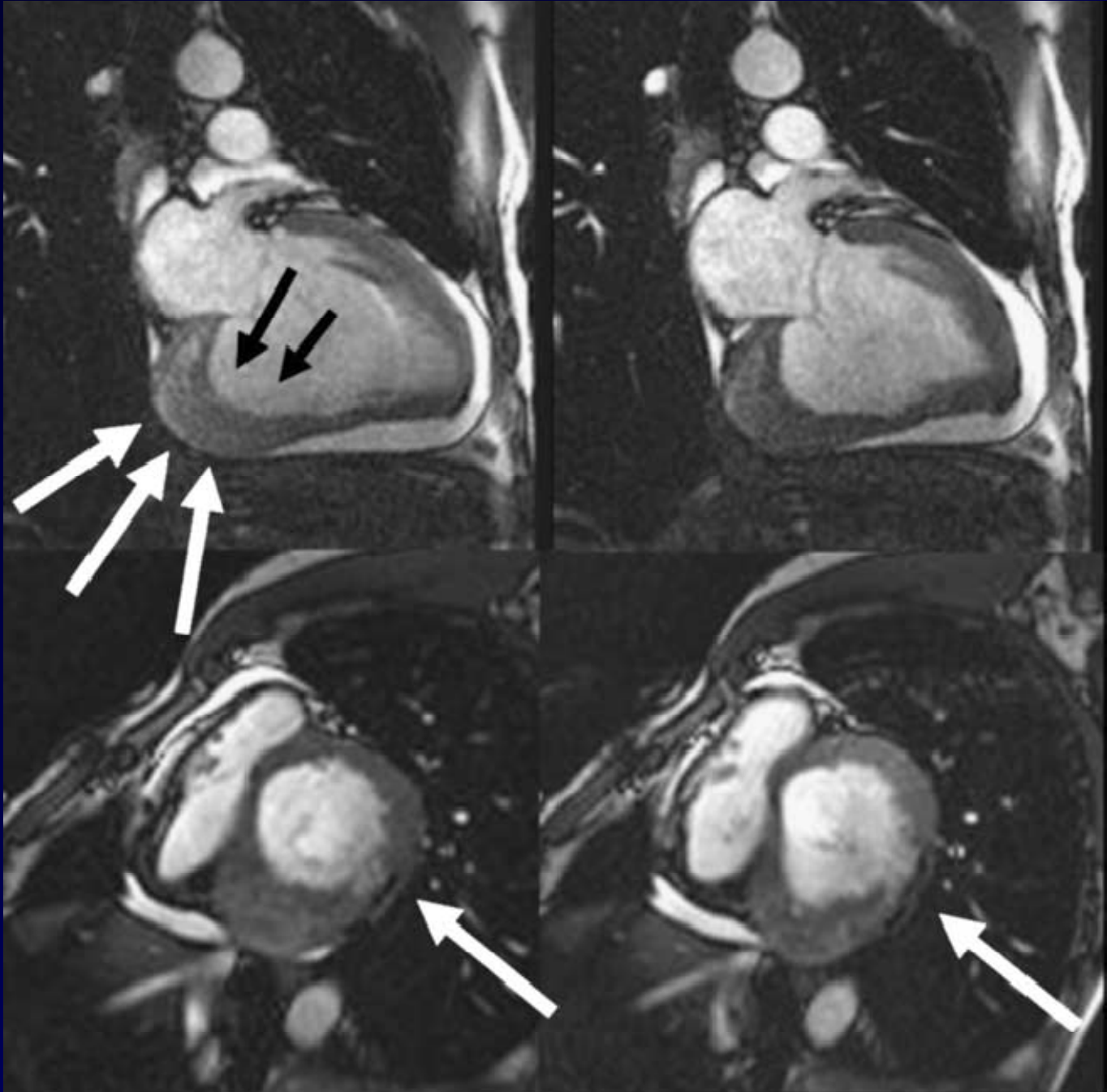
Caso 3

- Coronarie indenni
- Acinesia anteriore
- Trop +



Caso N° 4

- Dolore toracico
- Diagnosi di STEMI
- PCI efficace su CDx e Cx
- Aneurisma della parete inferiore



Quando usare la CMR nelle SCA

- Diagnosi di SCA al PS
 - Poco pratica e realistica
 - Non raccomandata
 - Scarsamente efficace
- Evidenze scientifiche di singoli centri su possibile costo-efficacia del rule-out

Dopo PCI primaria

- Valutazione della vitalità miocardica
 - Ai fini del recupero contrattile
 - Ai fini della valutazione prognostica
 - Ai fini della riuscita della PCI stessa
- Evidenze scientifiche sulla utilità nella definizione sia dell'emorragia che dell'Area a rischio

Nelle SCA senza riscontro di coronaropatia

- Nel riconoscimento/esclusione di miocarditi, miocardiopatie, forme secondarie varie
- Nell'attribuire un significato al riscontro di SCA
- Evidenze scientifiche ne sostengono l'uso per spiegare un aumento della troponina

Fino al 30% delle angiografie coronariche nelle ACS non dimostrano lesioni

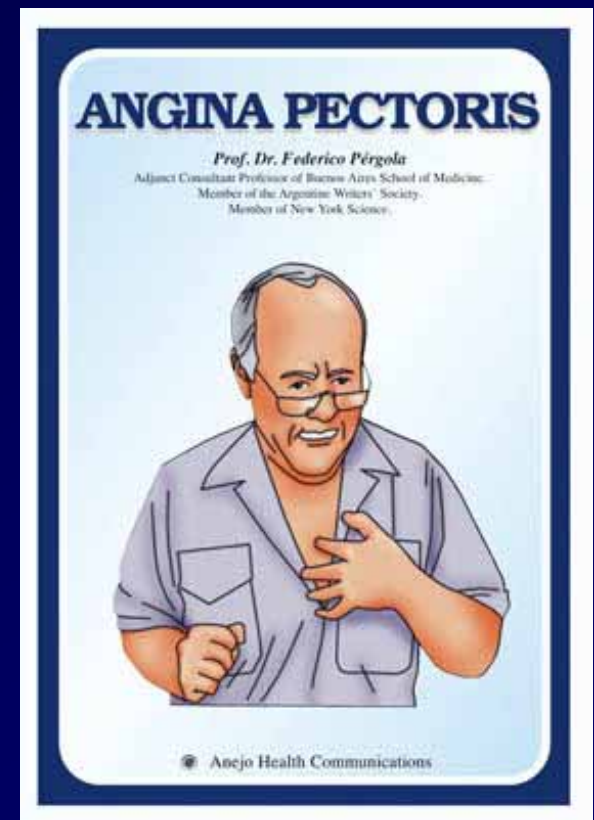
TABLE 2. SEVERITY OF CORONARY ARTERY DISEASE AMONG WOMEN AS COMPARED WITH MEN ACCORDING TO CORONARY SYNDROME AND SEX.*

SEVERITY OF DISEASE	MYOCARDIAL INFARCTION WITH ST ELEVATION			MYOCARDIAL INFARCTION WITH NO ST ELEVATION			UNSTABLE ANGINA		
	MEN (N=1759)	WOMEN (N=492)	P VALUE	MEN (N=1299)	WOMEN (N=450)	P VALUE	MEN (N=1580)	WOMEN (N=826)	P VALUE
	no. (%)			no. (%)			no. (%)		
No. of diseased vessels			0.07			0.001			<0.001
0	119 (6.8)	50 (10.2)†		55 (4.2)	41 (9.1)‡		220 (13.9)	252 (30.5)§	
1	820 (46.6)	226 (45.9)		409 (31.5)	147 (32.7)		464 (29.4)	217 (26.3)	
2	469 (26.7)	130 (26.4)		406 (31.3)	130 (28.9)		430 (27.2)	169 (20.5)	
3	351 (20.0)	86 (17.5)		429 (33.0)	132 (29.3)		466 (29.5)	188 (22.8)	

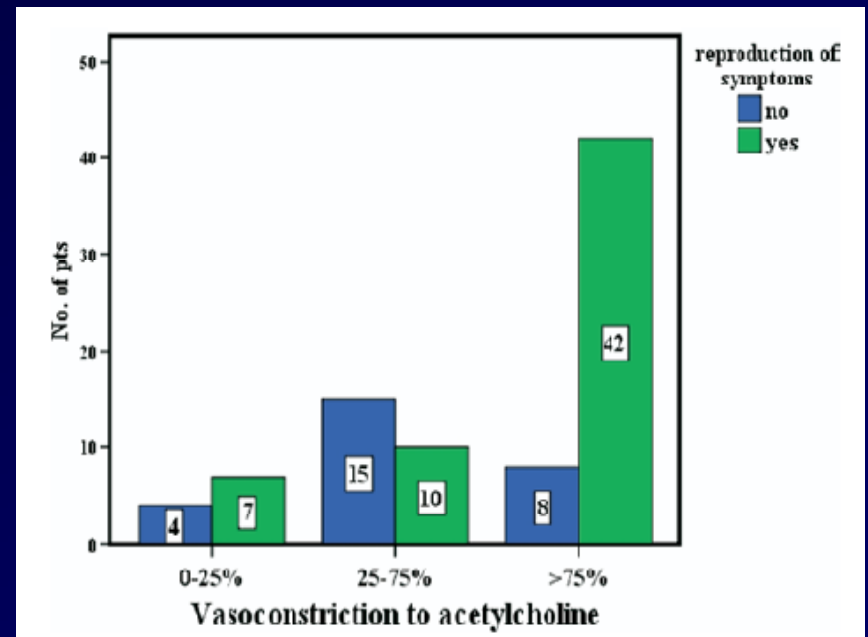
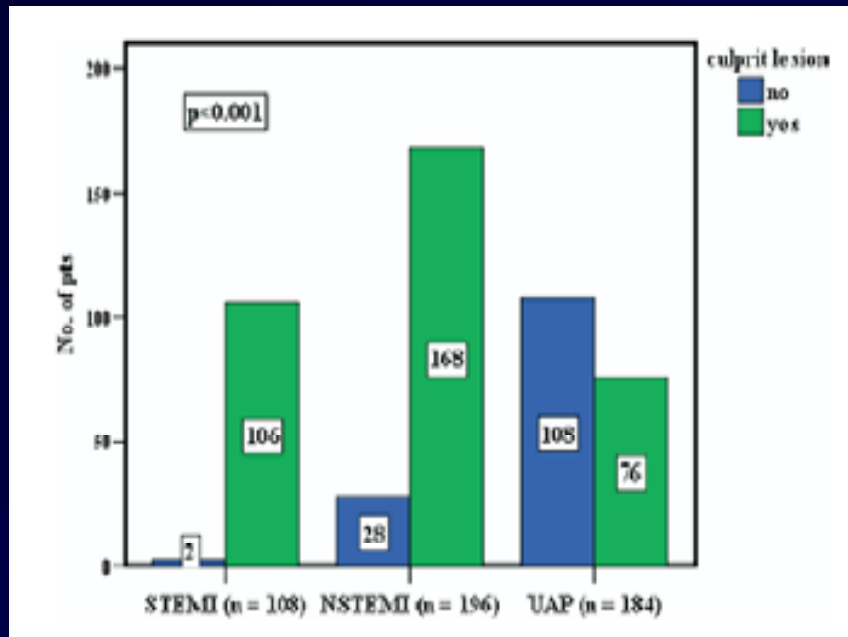
Influenza del tipo di virus sulle caratteristiche cliniche

Comparison of Patient Groups by Fisher Exact Test

Symptom Forcing Patient to Seek Medical Attention	<i>P</i> , PVB19 vs HHV6	<i>P</i> , PVB19 vs PVB+HHV	<i>P</i> , HHV6 vs PVB+HHV
Chest pain	<0.0001	<0.0001	0.23
Heart failure	<0.0001	<0.0001	0.27
Other	0.0005	0.002	1

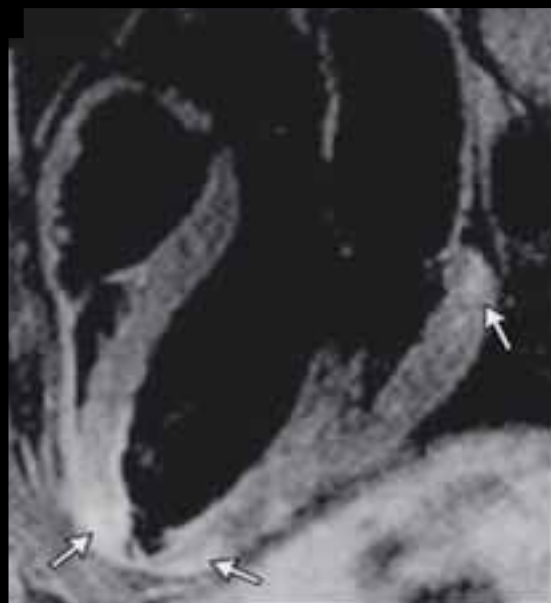
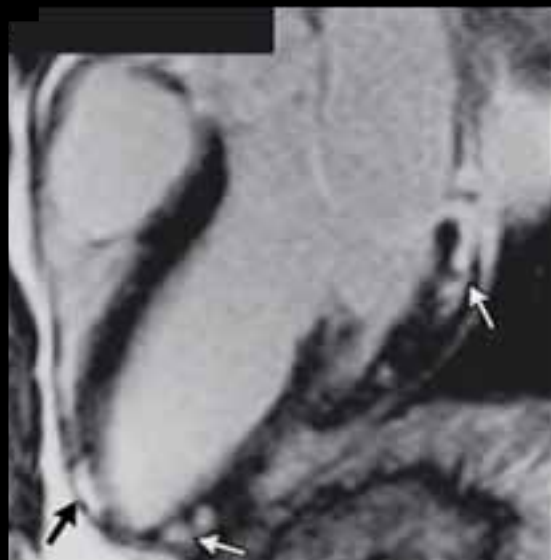
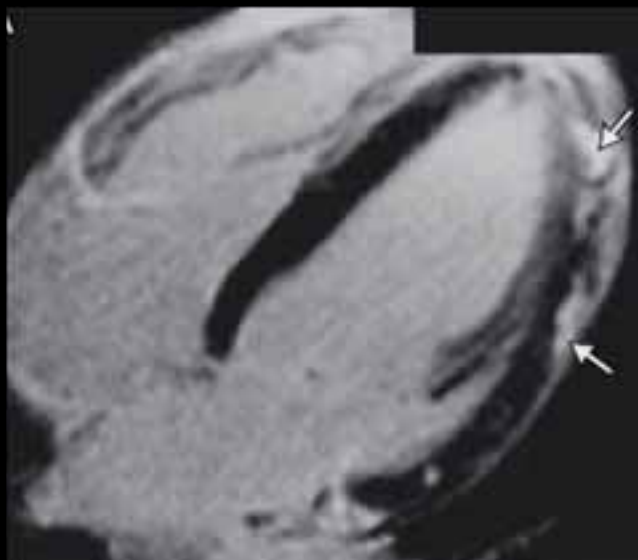


Ruolo dello spasmo coronarico nelle sindromi coronariche acute



Circa 1 pz su 4 non ha CAD alla coronarografia eseguita per ACS
Il 50% di costoro ha uno spasmo provocabile con ACh

6.5% diagnosi di miocardite





European Heart Journal (2007) 28, 1242–1249
doi:10.1093/eurheartj/ehm113

Clinical research
Imaging

The role of cardiovascular magnetic resonance in patients presenting with chest pain, raised troponin, and unobstructed coronary arteries

Ravi G. Assomull^{1,2}, Jonathan C. Lyne¹, Niall Keenan¹, Ankur Gulati¹, Nicholas H. Bunce³, Simon W. Davies¹, Dudley J. Pennell^{1,2}, and Sanjay K. Prasad*

Methods and results Sixty consecutive patients (mean age 44 years, 72% male) with a troponin-positive episode of chest pain and unobstructed coronary arteries were recruited within 3 months of initial presentation. All patients underwent CMR with cine imaging, T2-weighted imaging for detection of inflammation, and late gadolinium enhancement imaging for detection of infarction/fibrosis. An identifiable basis for troponin elevation was established in 65% of patients. The commonest underlying cause was myocarditis (50%), followed by myocardial infarction (11.6%) and cardiomyopathy (3.4%). In the 35% of patients where no clear diagnosis was identified by CMR, significant myocardial infarction/fibrosis was excluded.

Conclusioni

- La CMR è una tecnica diagnostica molto importante nel mondo delle SCA
- Non si ravvisano al momento aspetti che la privilegino nell'impiego nelle prime fasi
- Un ruolo fondamentale si va configurando dopo il trattamento interventistico e nei casi in cui emergano elementi di incertezza sulla etiologia

