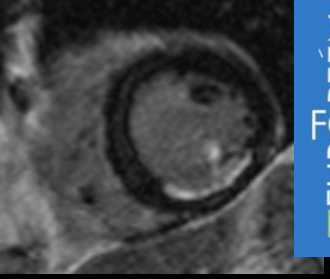


EUROPEEN FORUM CŒUR EXERCICE & PREVENTION

19-20 Mars 2015 PARIS UICP

Quel rôle pour l'IRM dans le post-infarctus en 2015

Marc Sirol, MD, PhD

INSERM U-942

Hôpital Lariboisière, Paris

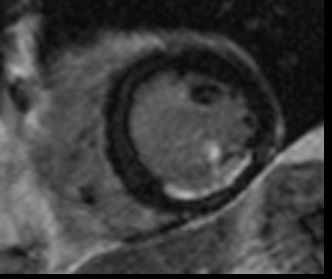
PARIS DIDEROT Université

ASSISTANCE PUBLIQUE HÔPITAUX DE PARIS

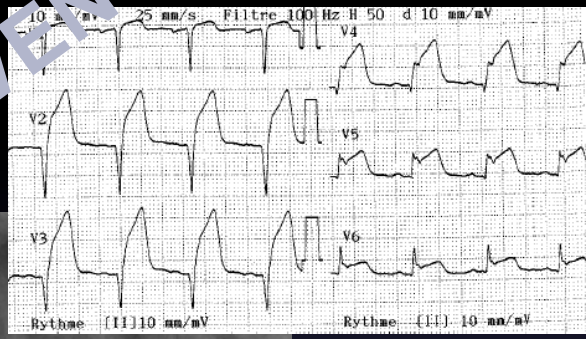
Instituts thématiques Inserm

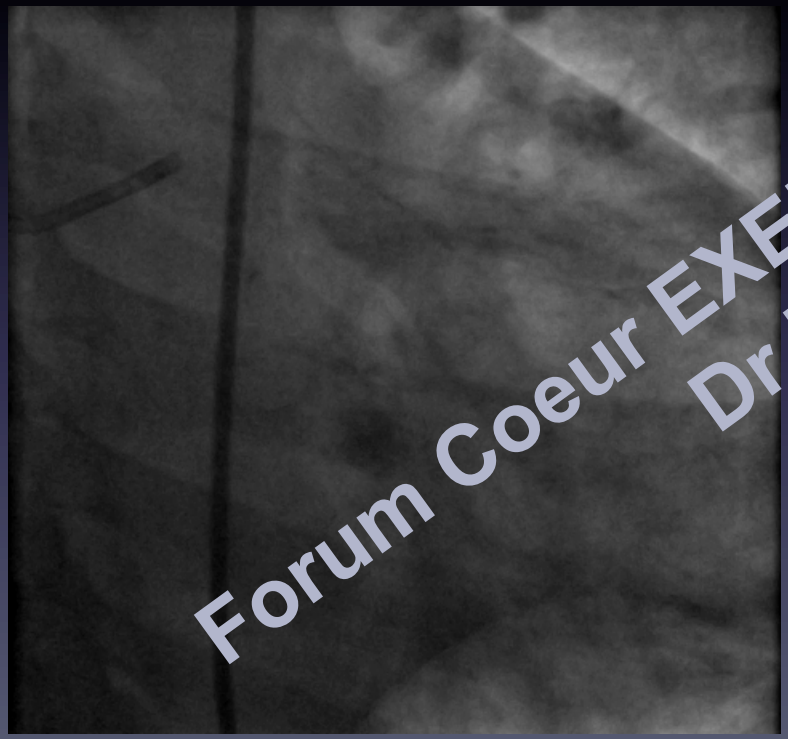
UMR 942

Institut national de la santé et de la recherche médicale



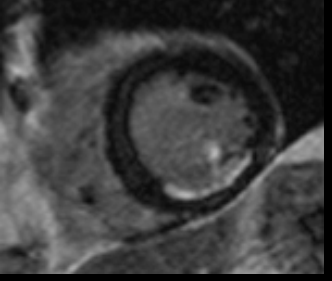
IDM et reperfusion myocardique



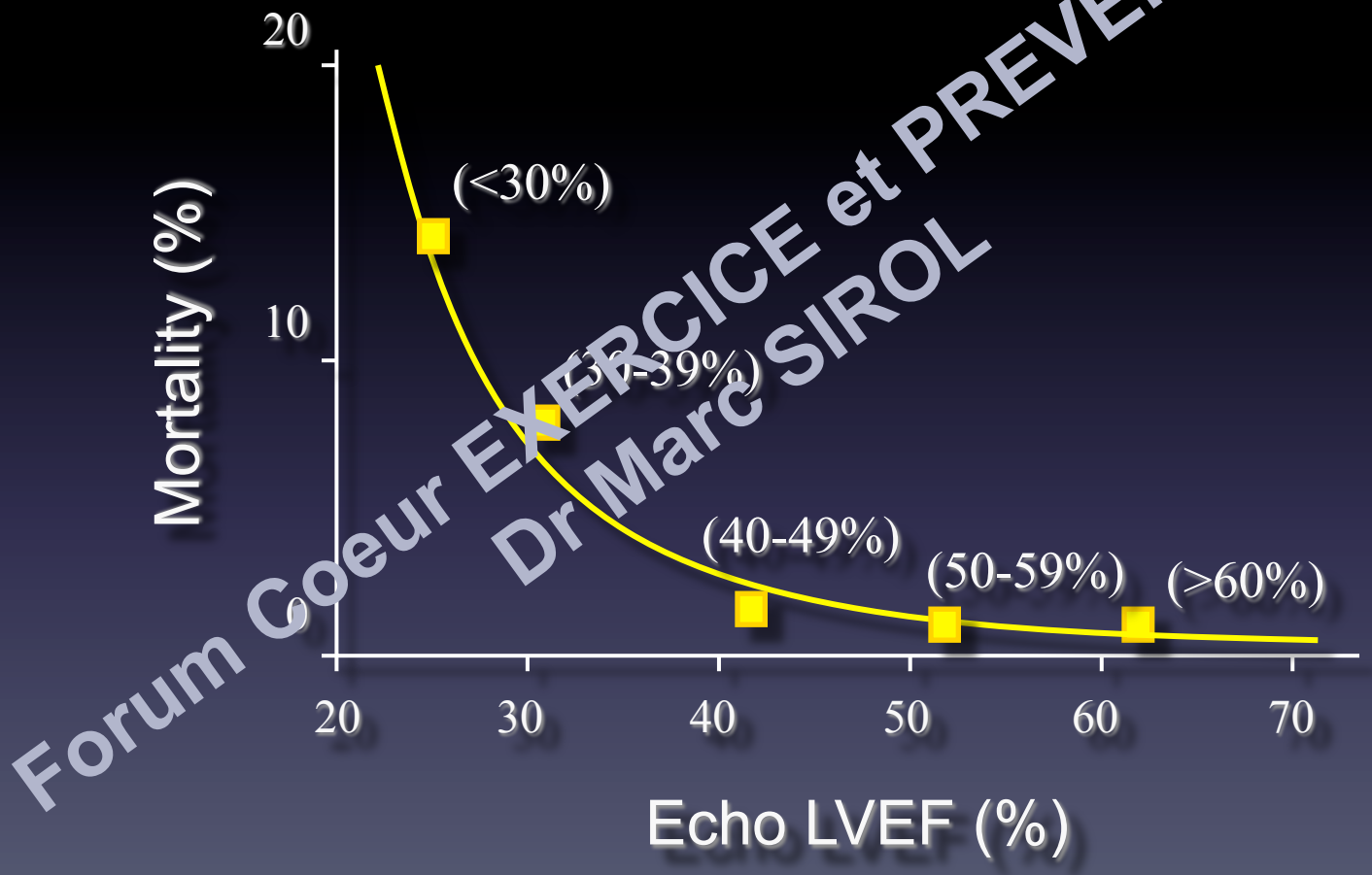


TIMI 0

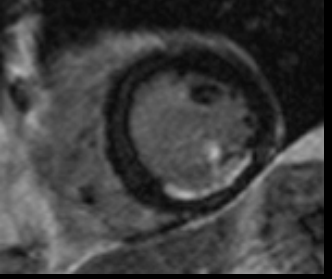
TIMI 3 – H3



Fraction d'Éjection et Pronostic



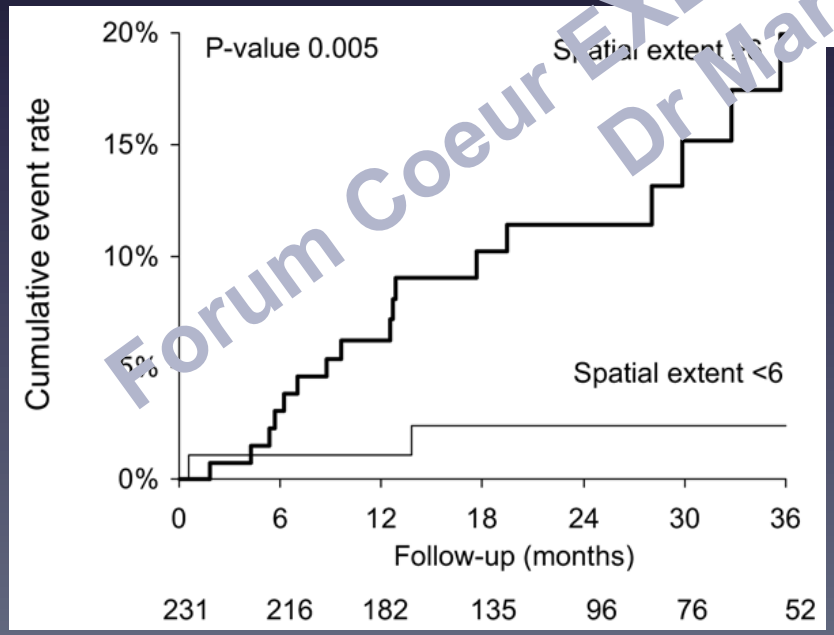
Lederlinck, Circulation. 1995;92:1110-1116



Taille de l'IDM

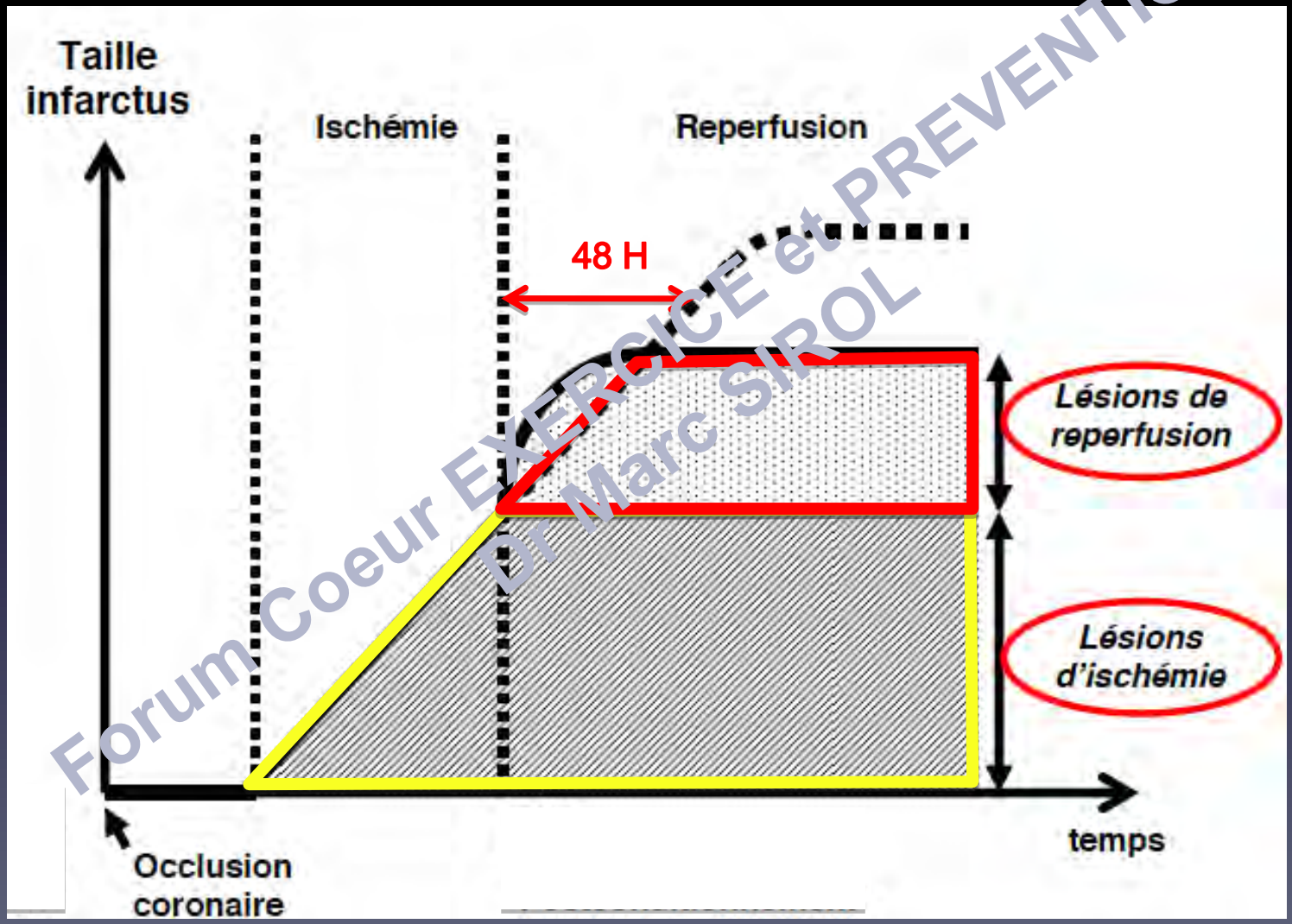
- 231 patients avec IDM suivi 1,7 ans
  - Etendue de la nécrose = meilleur prédicteur de mortalité ; très > FE (OR à 6,1; p = 0.006)

Comparison of Myocardial Infarct Size Assessed With Contrast-Enhanced Magnetic Resonance Imaging and Left Ventricular Function and Volumes to Predict Mortality in Patients With Healed Myocardial Infarction

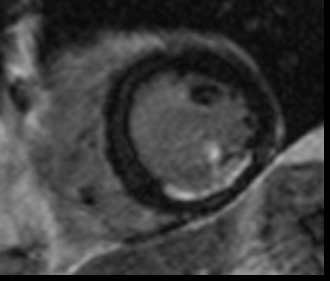


Rose S et al. AJC 2007;100:930-936

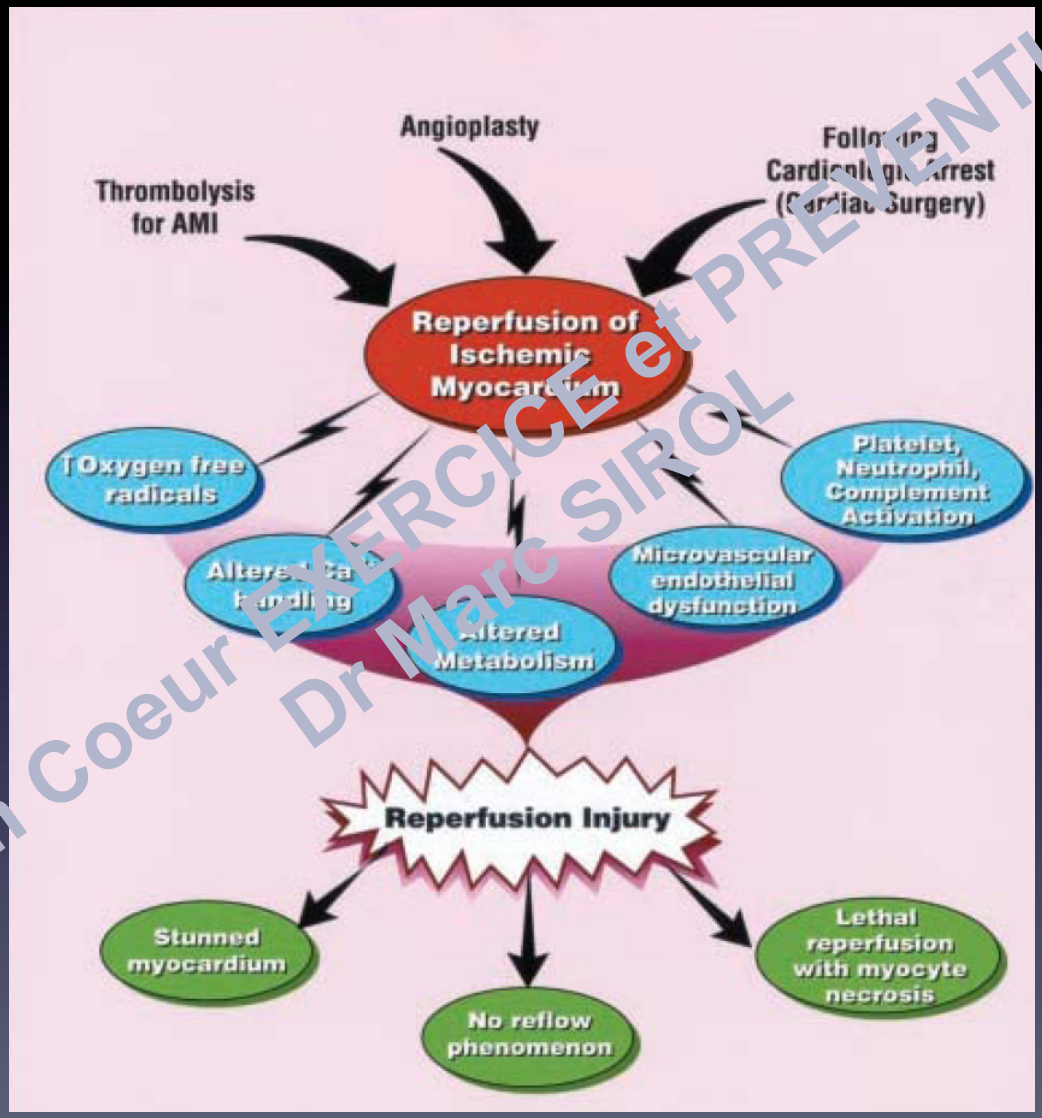
Taille de l'IDM



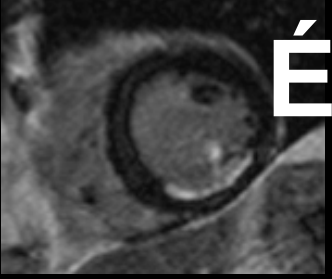
Courtesy: Ovize M - Lyon



Lésions de reperfusion

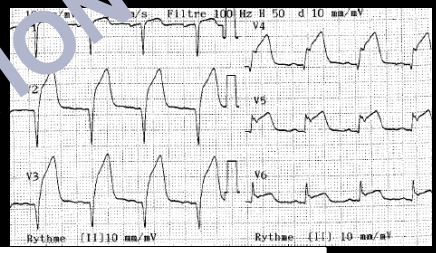


Verma et al. Circulation 2002; 105:2332-2336

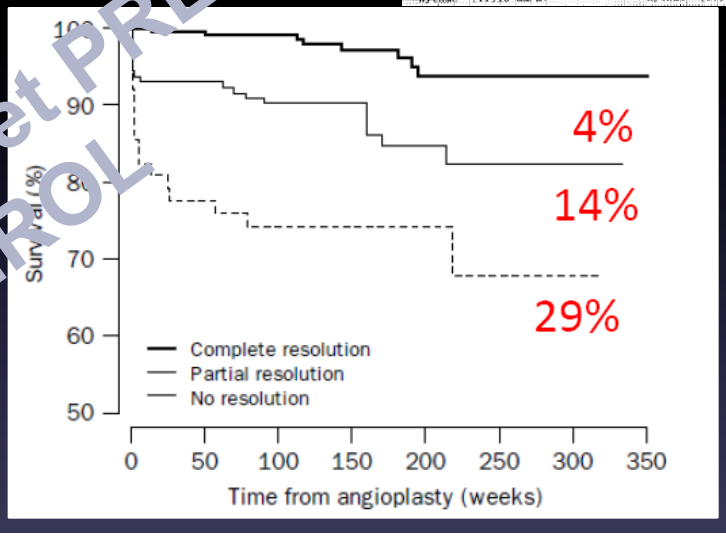


Éléments actuels déterminants le pronostic

- Régression du segment ST



- Grade TIMI 3



- Blush 3

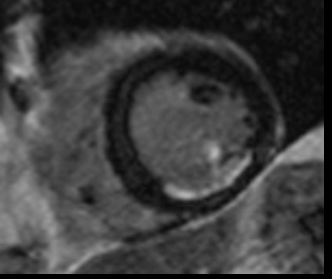
Seulement 65% de résolution du ST malgré TIMI 3 et blush 2 ou 3
(Van t'hof et al. *Circulation* 1998)

30% des TIMI 3 sont en réalité des reperfusions partiellement inefficaces (no-reflow)
(Ito et al. *Circulation* 1996)

TABLE 4. Enzymatic Infarct Size, LVEF, and Mortality

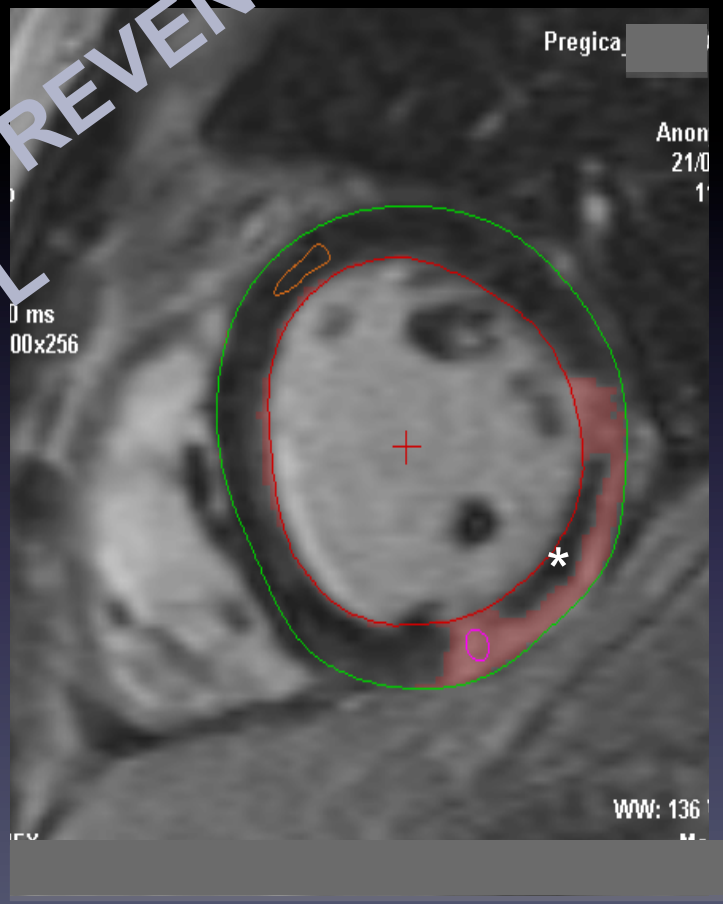
	Myocardial Blush Grade			Trend Analysis, *P*
	3	2	0/1	
$LDHQ_{72}$	757±582	1143±879	1623±1147	<0.0001
LVEF, %	50±10	46±11	39±12	<0.0001
Mortality, %	3	6	23	<0.0001

Van t'hof et al. *Lancet* 1997 et Circ 1998



Cardiovascular Magnetic Resonance (CMR)

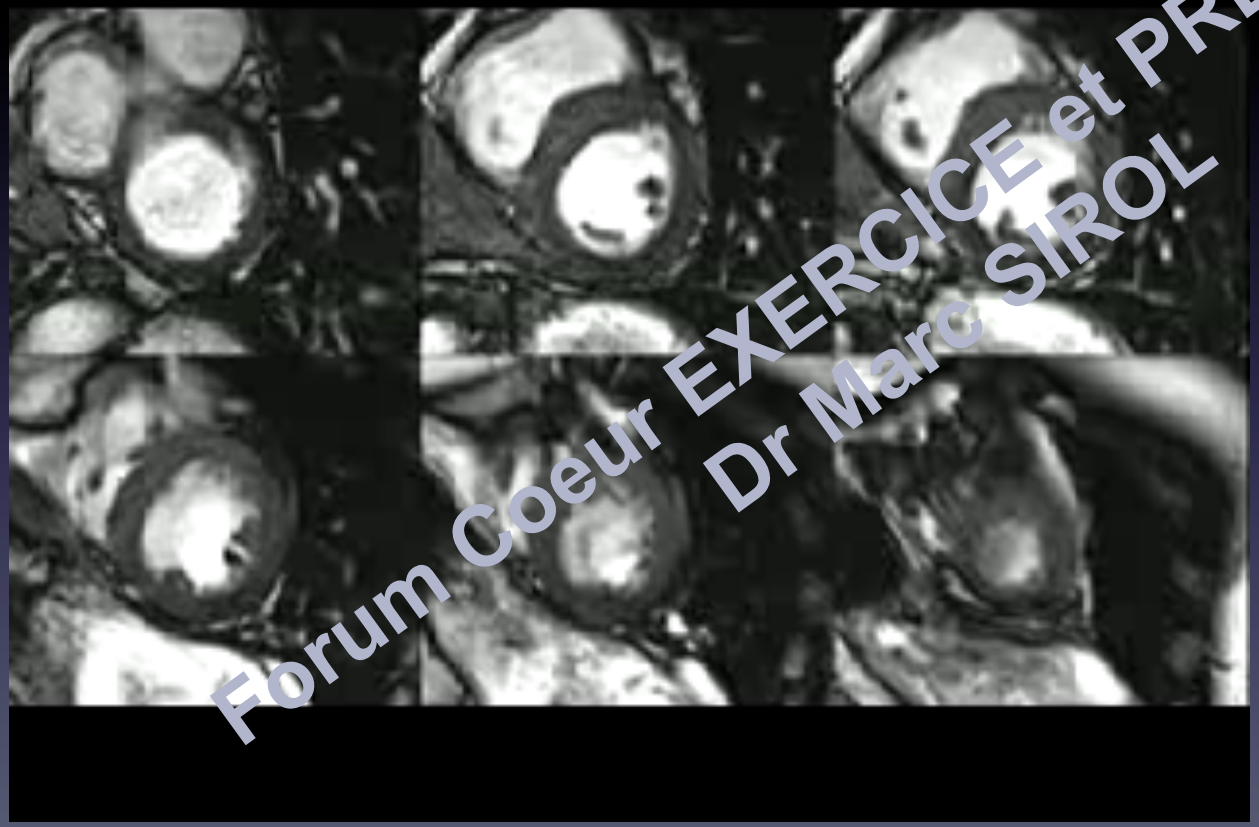
- Current non-invasive gold standard for:
  - LV function
  - LV dimensions
- Assessment of coronary microvascular damage
  - T2 STIR: Area at risk
  - Late Gadolinium Enhancement:
    - Infarct size (IS)
    - Microvascular obstruction (MVO)

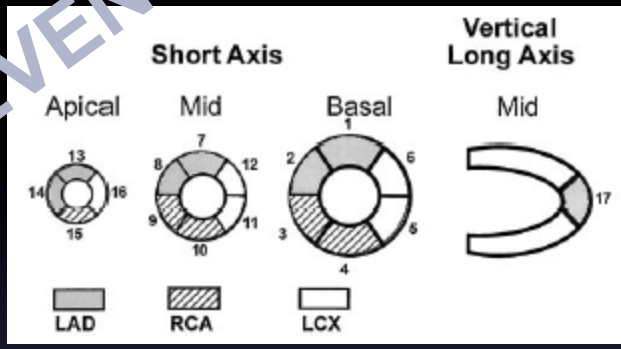


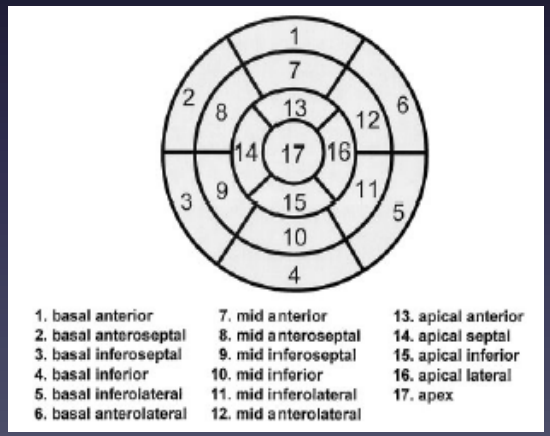
Friedrich MG et al. JACC 2007;50:983-7

PARIS DIDEROT
ASSISTANCE PUBLIQUE HÔPITAUX DE PARIS

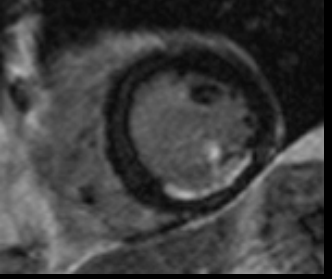
Contractilité segmentaire





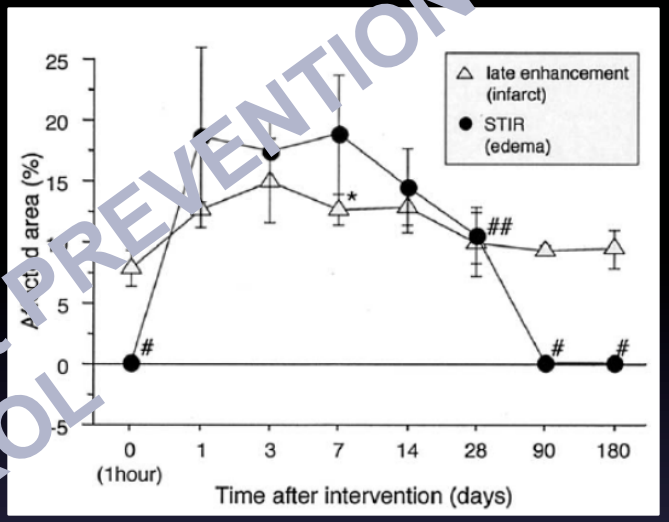


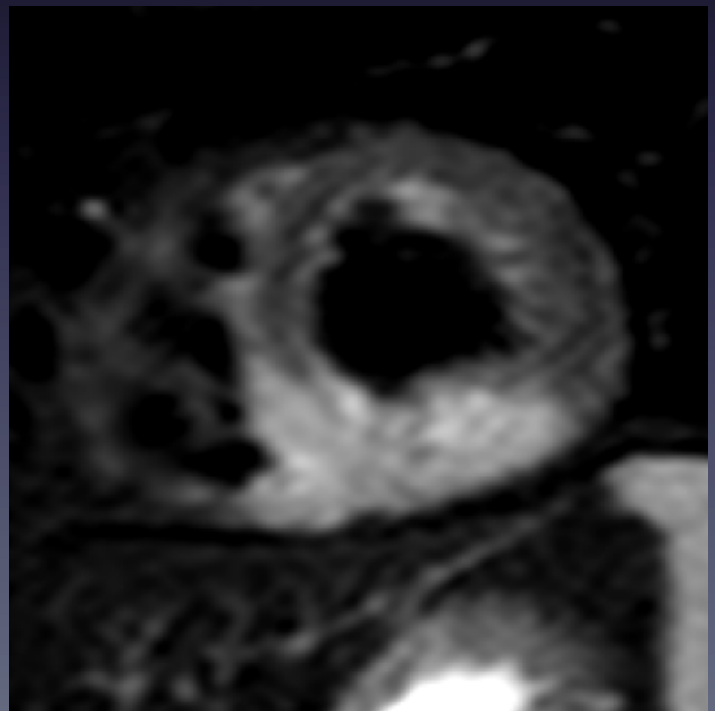
Cerqueira et al. Circulation 2002; 105: 539



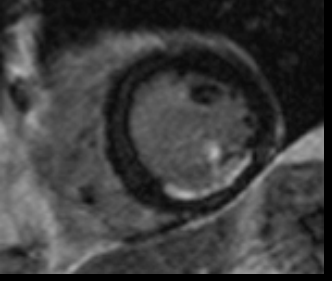
Oedème Myocardique

- Importance de l'œdème en T2 STIR
  - Hyper-signal
- Permet la détermination de la zone à risque

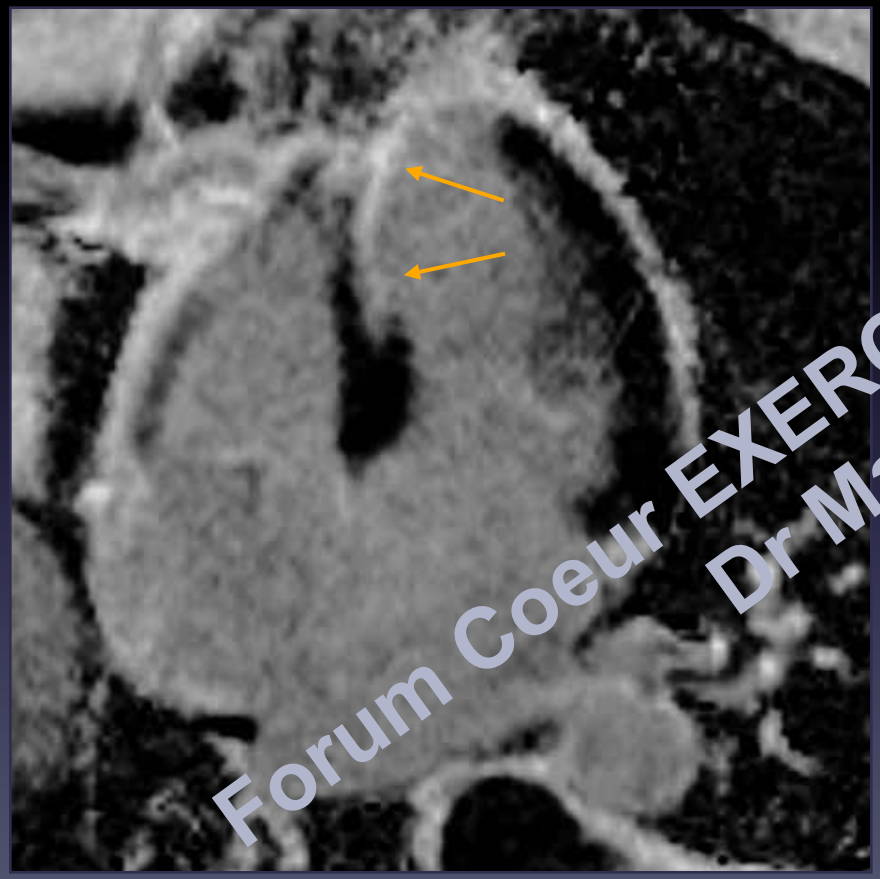


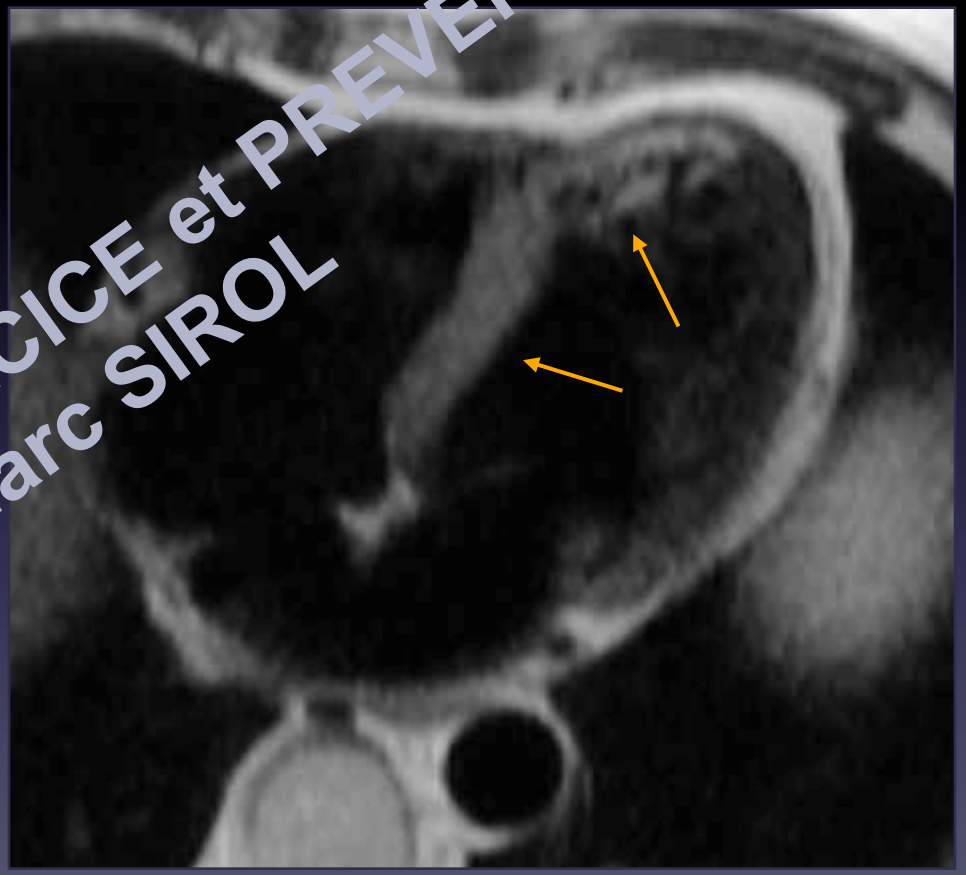


Schulz-Menger et al. JACC 2003

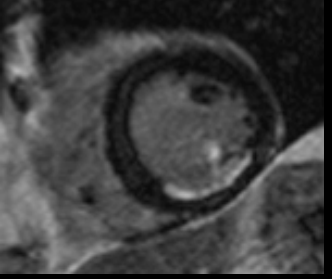


Œdème Myocardique et Zone à Risque



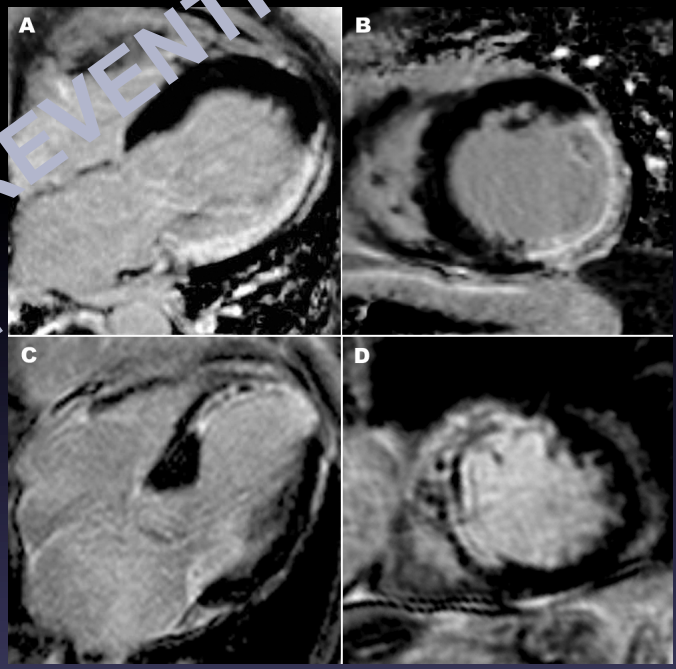


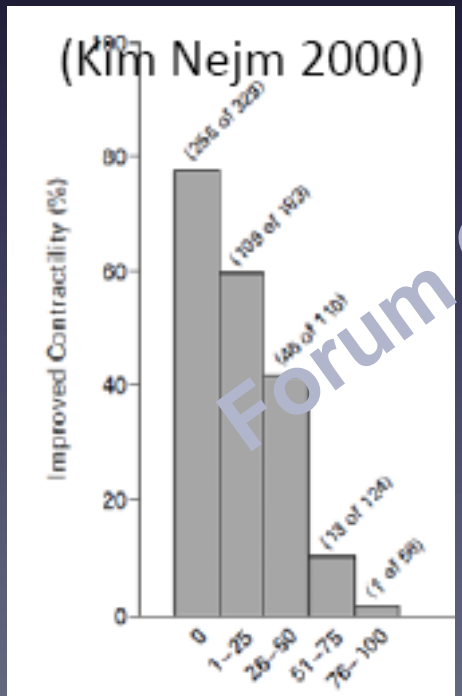
Bouchard A. Am Heart J 89; 117: 281.
Schulz-Menger J. et al. JACC 03; 42: 513.
Abdel-Aty H. Circulation 04; 109: 2411.

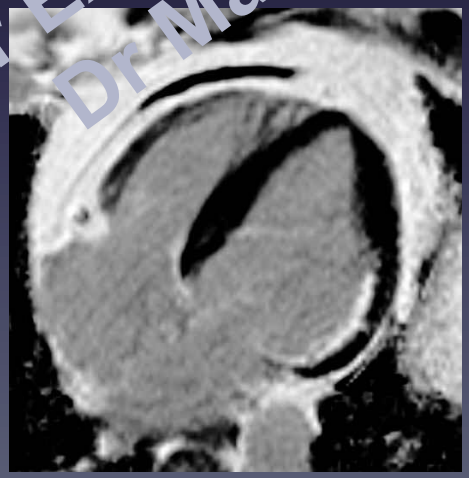


Rehaussement Tardif

- Importance de la transmuralité du rehaussement tardif
  - Directement liée à la récupération de la contractilité myocardique







Kim RJ et al. Circulation 99; 100: 1992; Wu E et al. Lancet 01; 357: 21

Obstruction Microvasculaire

CLINICAL RESEARCH — Myocardial Infarctio

Functional Recovery After Acute Myocardial Infarction

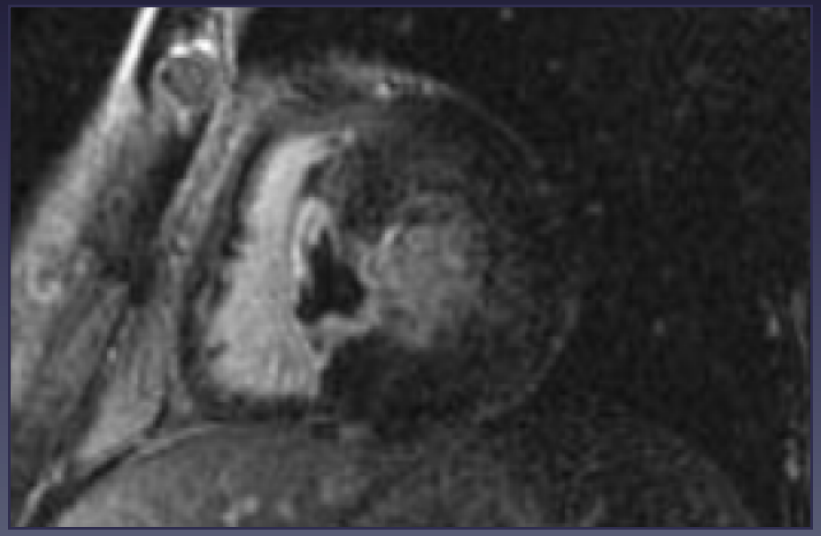
Comparison Between Angiography, Electrocardiography, and Cardiovascular Magnetic Resonance Measures of Microvascular Injury

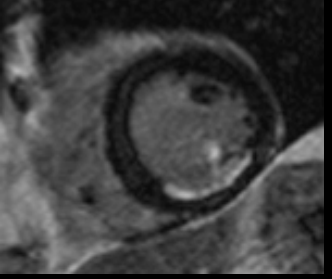
Robin Nijveldt, MD,*§ Aernout M. Beek, MD,* Alexander Hirsch, MD,§‖ Martin G. Stoel, MD,¶ Mark B. M. Hofman, PhD,† Victor A. W. M. Umans, MD, PhD,# Paul [illegible] Algra, MD, PhD,** Jos W. R. Twisk, PhD,‡ Albert C. van Rossum, MD, PhD*§

Amsterdam, Utrecht, Enschede, and Alkmaar, the Netherlands

(Jacc 2008;52;182-189)

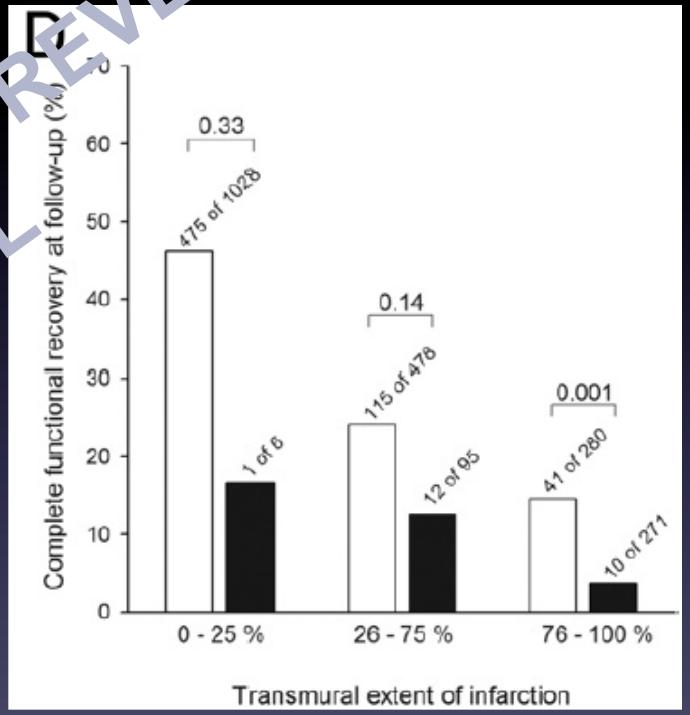
- Obstrcution microvasculaire
  - 58% des patients ont une atteinte de la microcirculation au temps tardif (no-reflow)



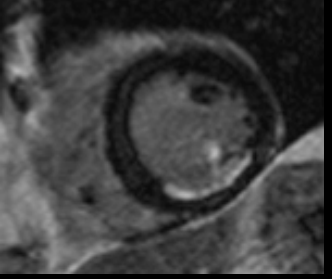


Obstruction Microvasculaire

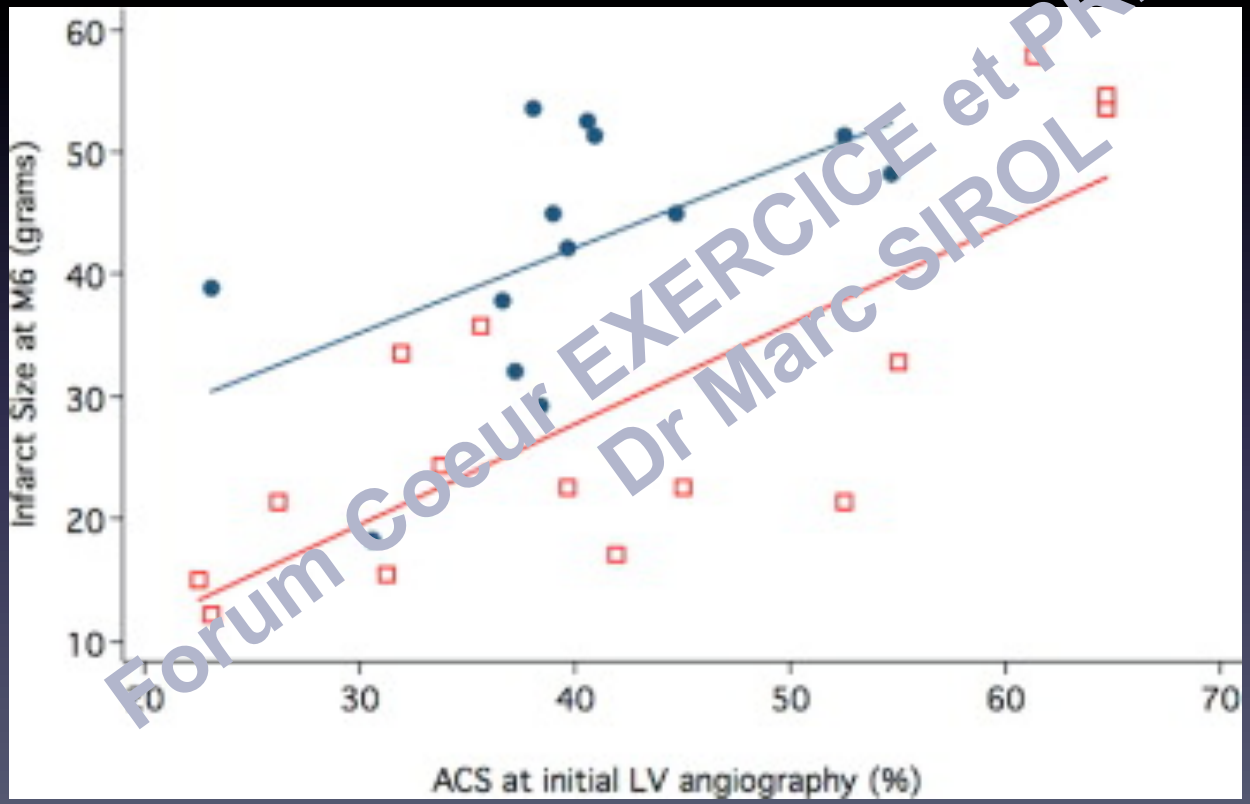
- Imagerie du no-reflow
  - Meilleure valeur prédictive du remodelage VG (FE et Volumes VG; p=0.006)
- Seuls 6% des segments avec no-reflow au temps tardif vont récupérer



Nijveldt R et al. JACC 2008;52:182

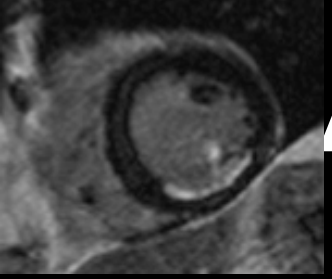


Post conditioning…. intérêt de l'IRM



Cyclosporine réduit la taille de l'IDM

Piot C et al. NEJM 2008;359:473-81
Mewton N et al. J Am Coll Cardiol 2010 (12):1200-5



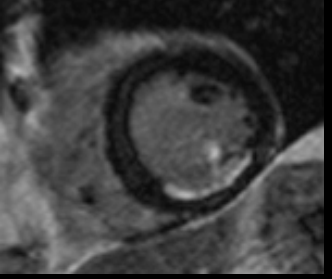
Avantages de l'IRM dans l'IDM

- L'IRM fournit de nombreuses informations cliniquement utiles dans l'IDM
  - Localisation de la nécrose et degré de transmuralité (viabilité)
  - Taille de l'IDM (pronostic)
  - Oedème myocardique (zone à risque)
  - No-reflow ou Obstruction microvasculaire (pronostic)
  - Hémorragie intra-myocardique (risque remodelage VG)

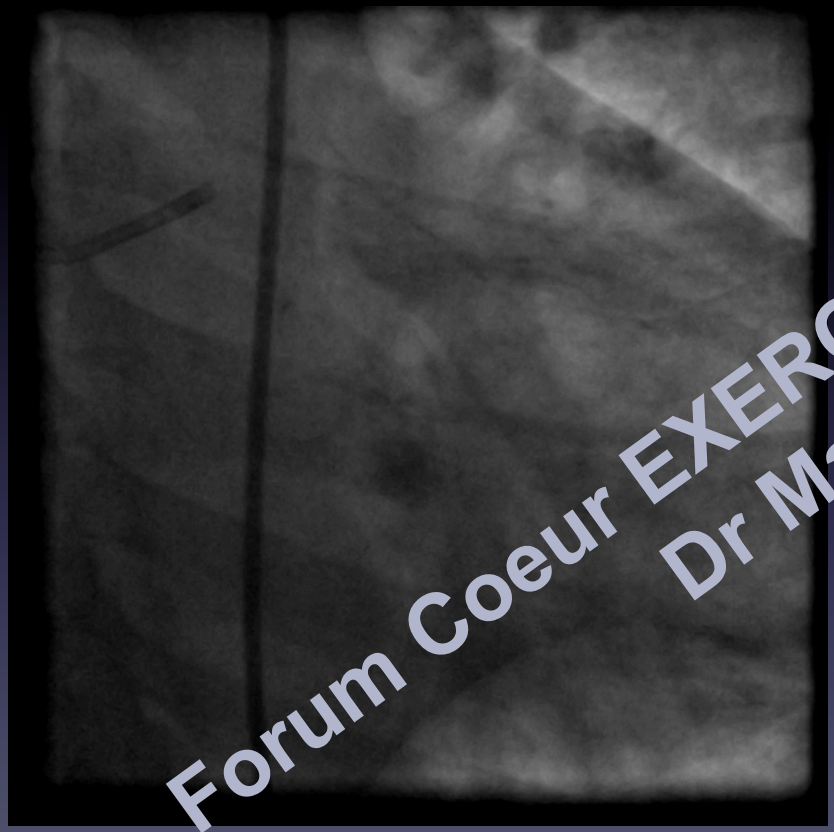
Cohorte PREGICA

- IDM aigu inaugural avec sus-décalage de ST et/ou onde Q
  - Quel que soit son territoire
  - Présentant au moins 3 segments akinétiques à l'échographie réalisée à J4-J1
- Age compris entre 18 et 75 ans
- Résidence en France
- Consentement obtenu auprès du patient ou de la famille ou de la personne de confiance si présente

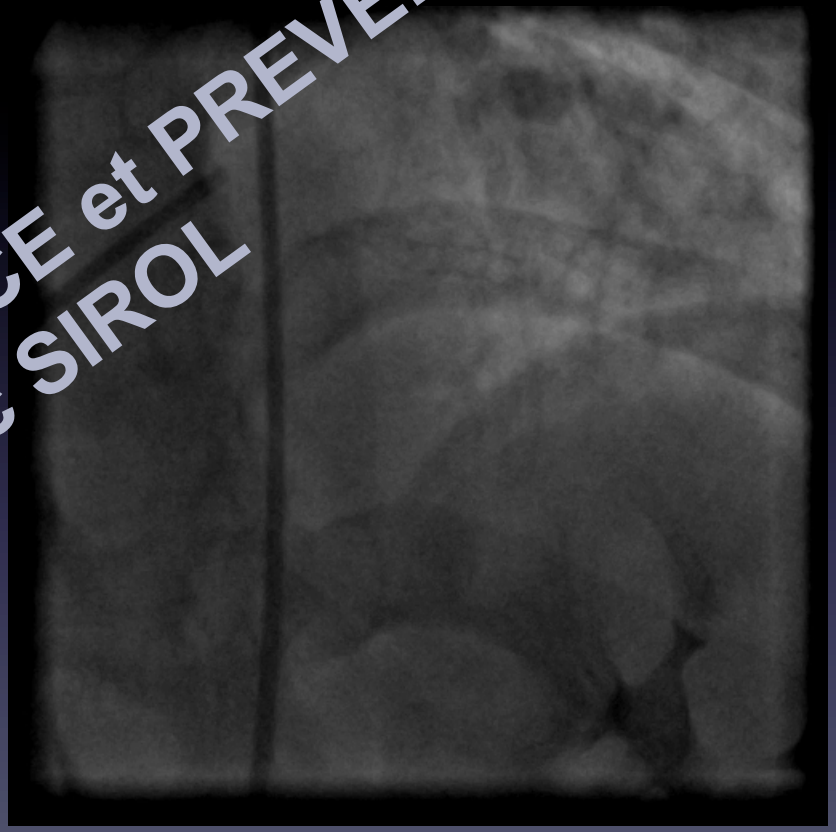
IRM cardiaque à J4 +/- 2 et M6



Acute anterior MI

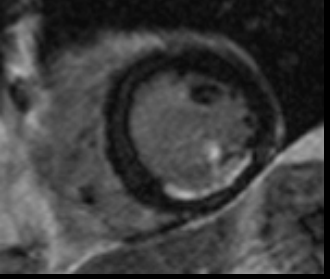


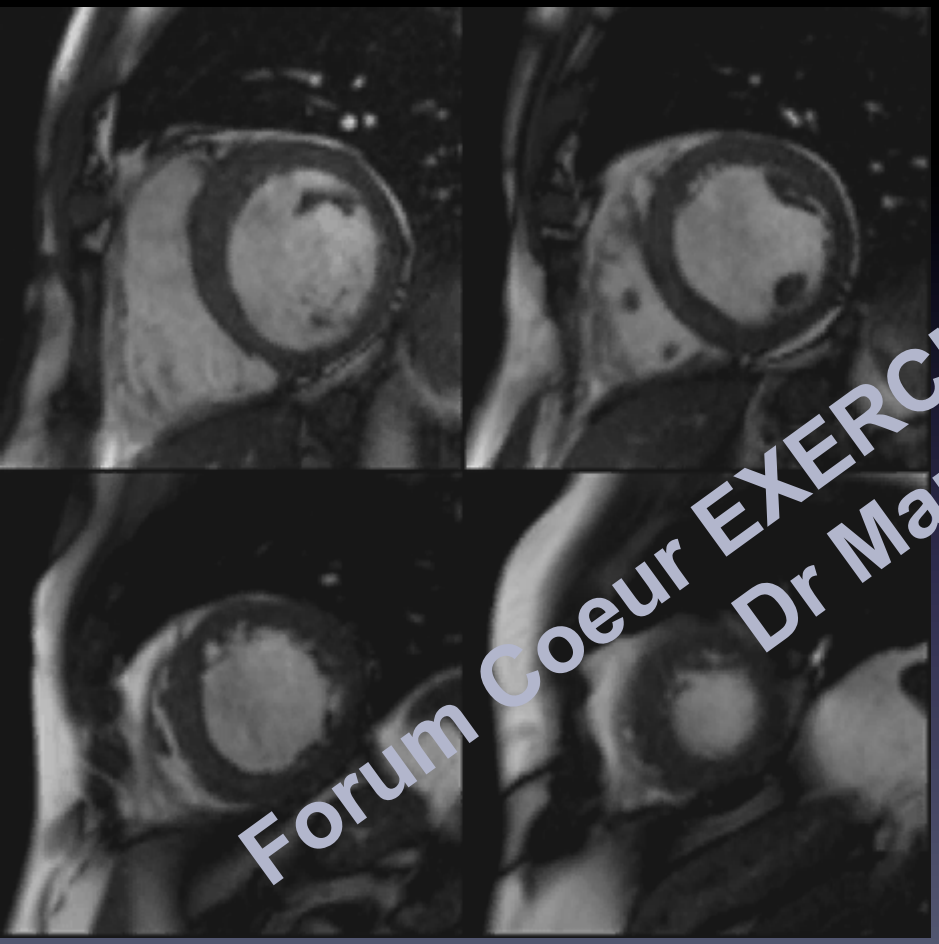
TIMI 0

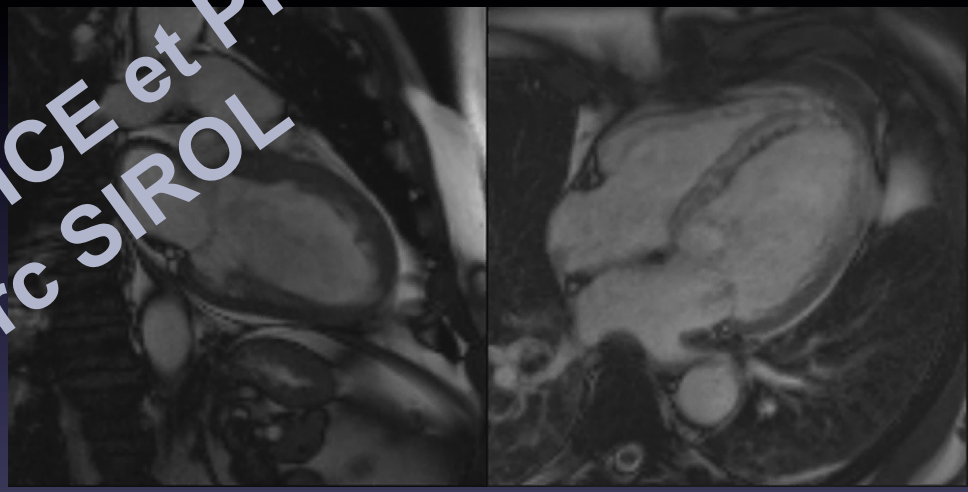


TIMI 3 – 4 hours
after onset of pain

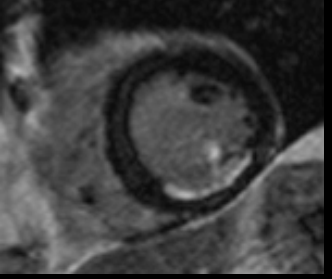
Acute anterior MI – Day 2

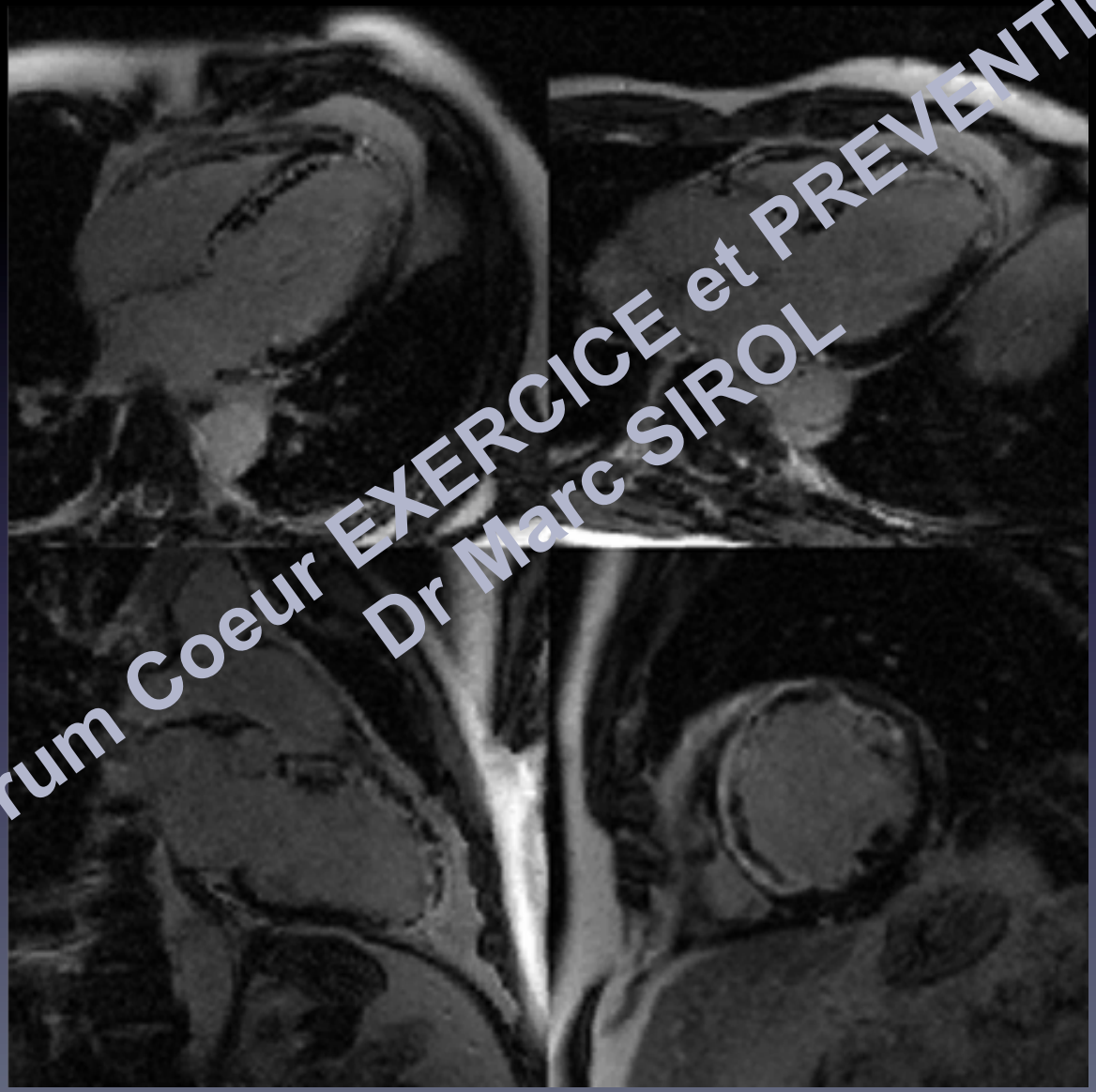




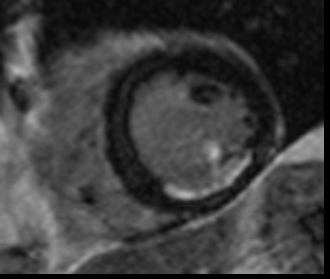


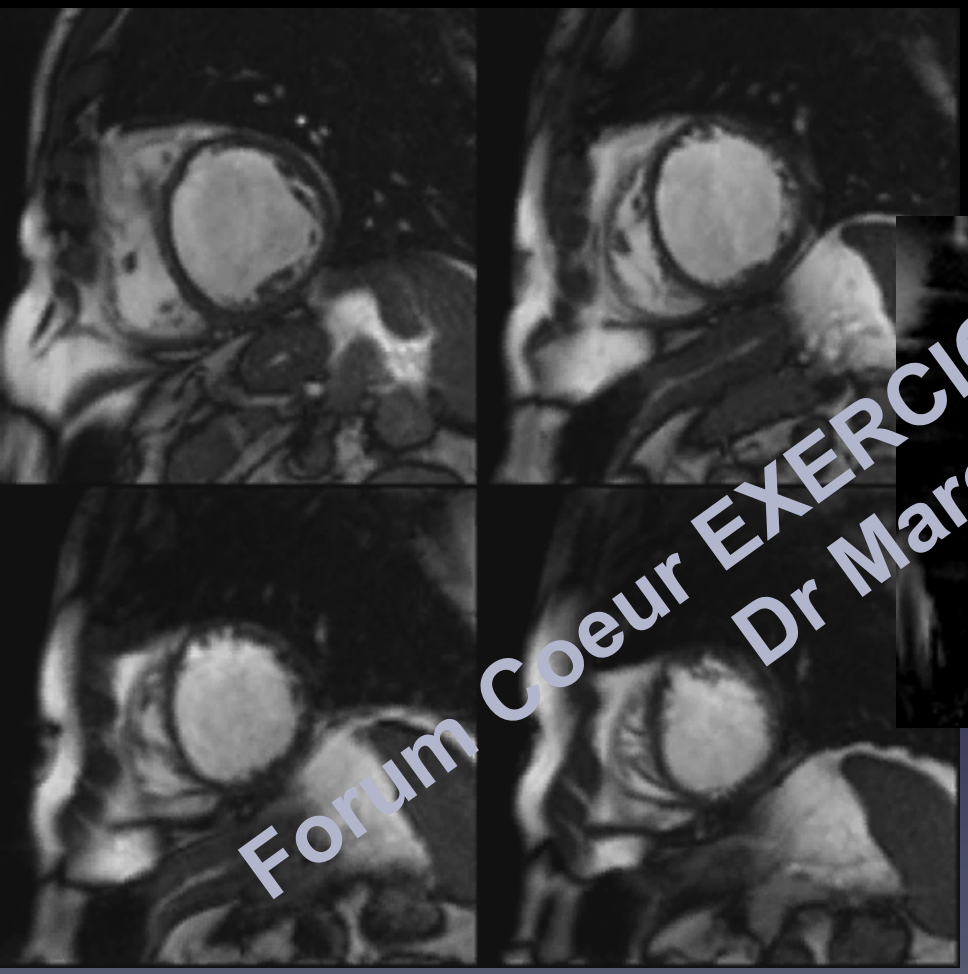
Rehaussement tardif

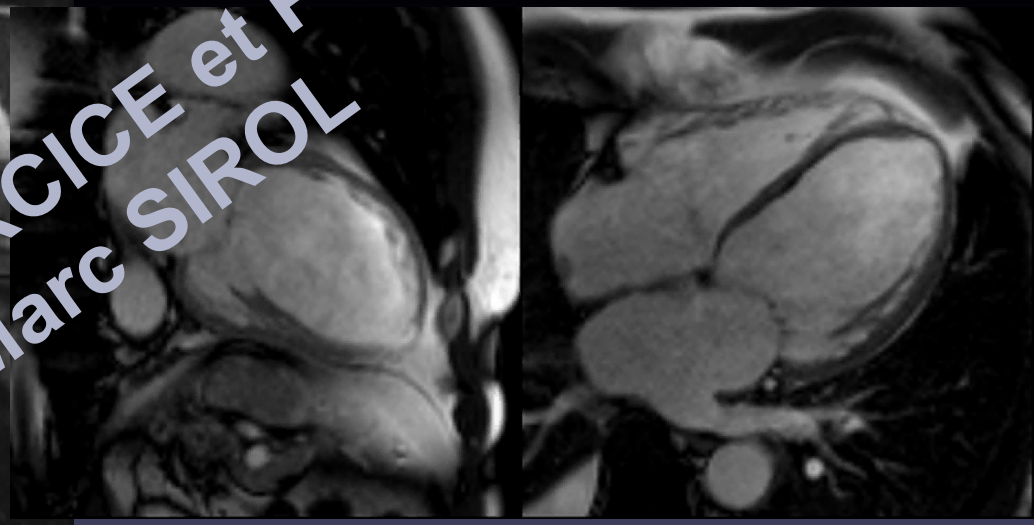




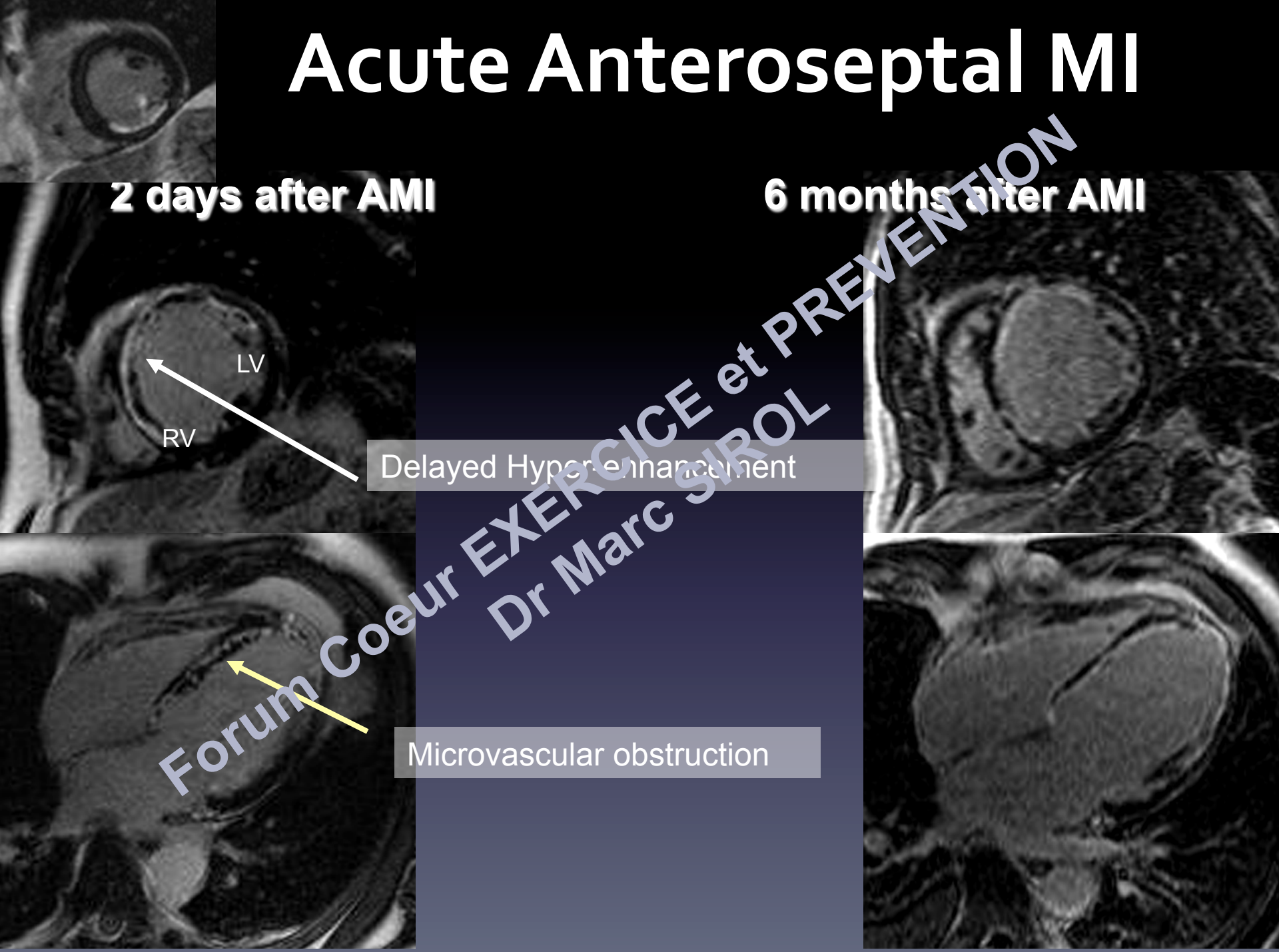
Follow up at 6 months



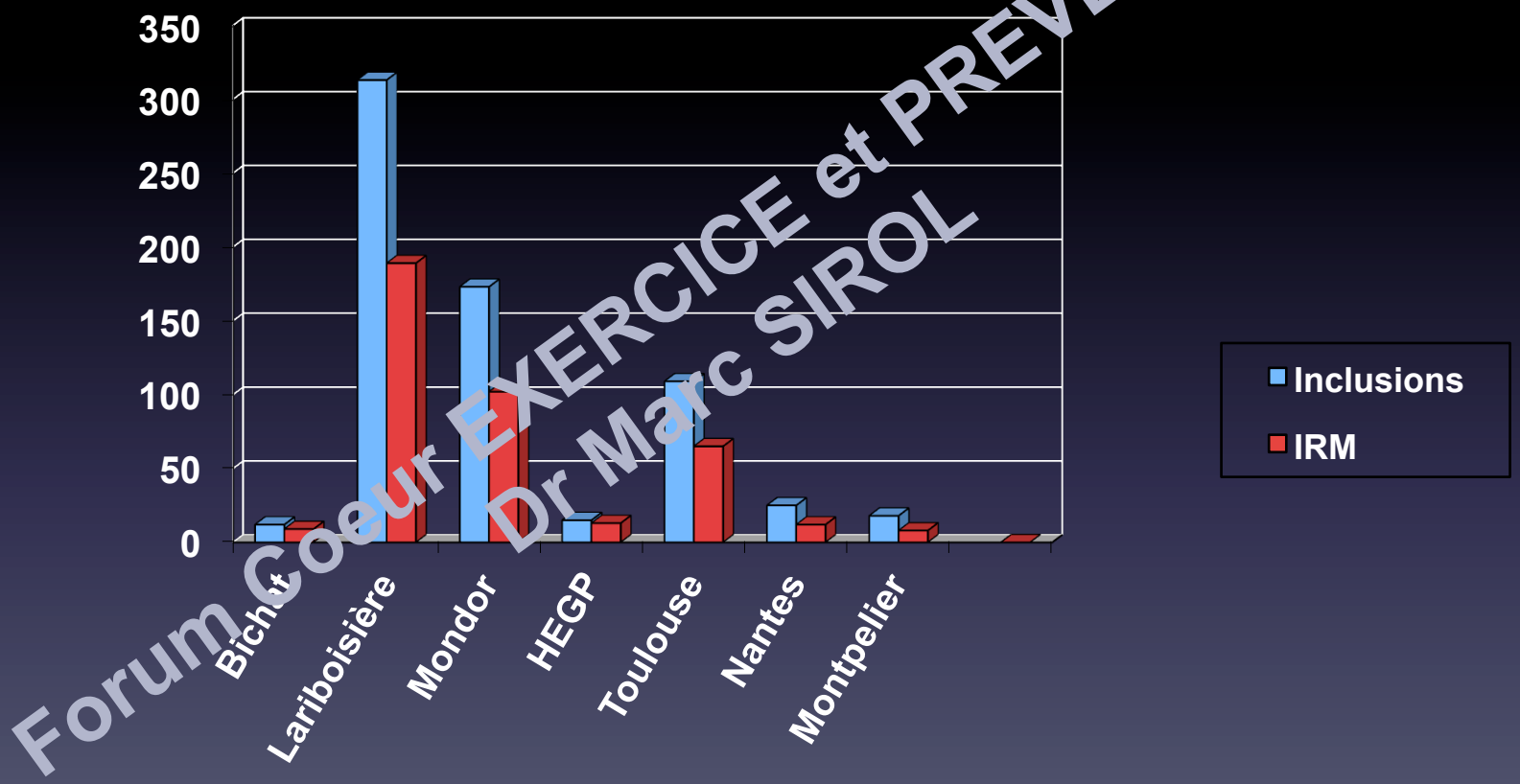




Acute Anteroseptal MI



Inclusions des IRM dans PREGICA



250 IRM réalisées aujourd'hui à J4 et à 6 mois

Conclusion

- Les données cliniques et angiographiques sont insuffisantes…
- L'IRM permet d'évaluer le pronostic en Post-IDM
  - Efficacité de la reperfusion?
  - Evaluer les moyens de limitation des lésions de reperfusion (Thrombo-aspiration; Cyclosporine; Angioplastie en 2 temps….)

marc.sirol@gmail.com

Remerciements

Steering Comitee

- JJ Mercadier
- D Logeart
- M Sirol
- B Gellen
- E Vicaut
- G Perumeaux (core Lab echo)

URC Laribosière

- S Gérard
- C Paré
- V Jouis

L'ensemble des équipes de

- Henri Mondor
- CHU Rangueil-Toulouse
- CH Versailles
- CHU Nantes
- CHU Montpellier
- CHU Bichat