



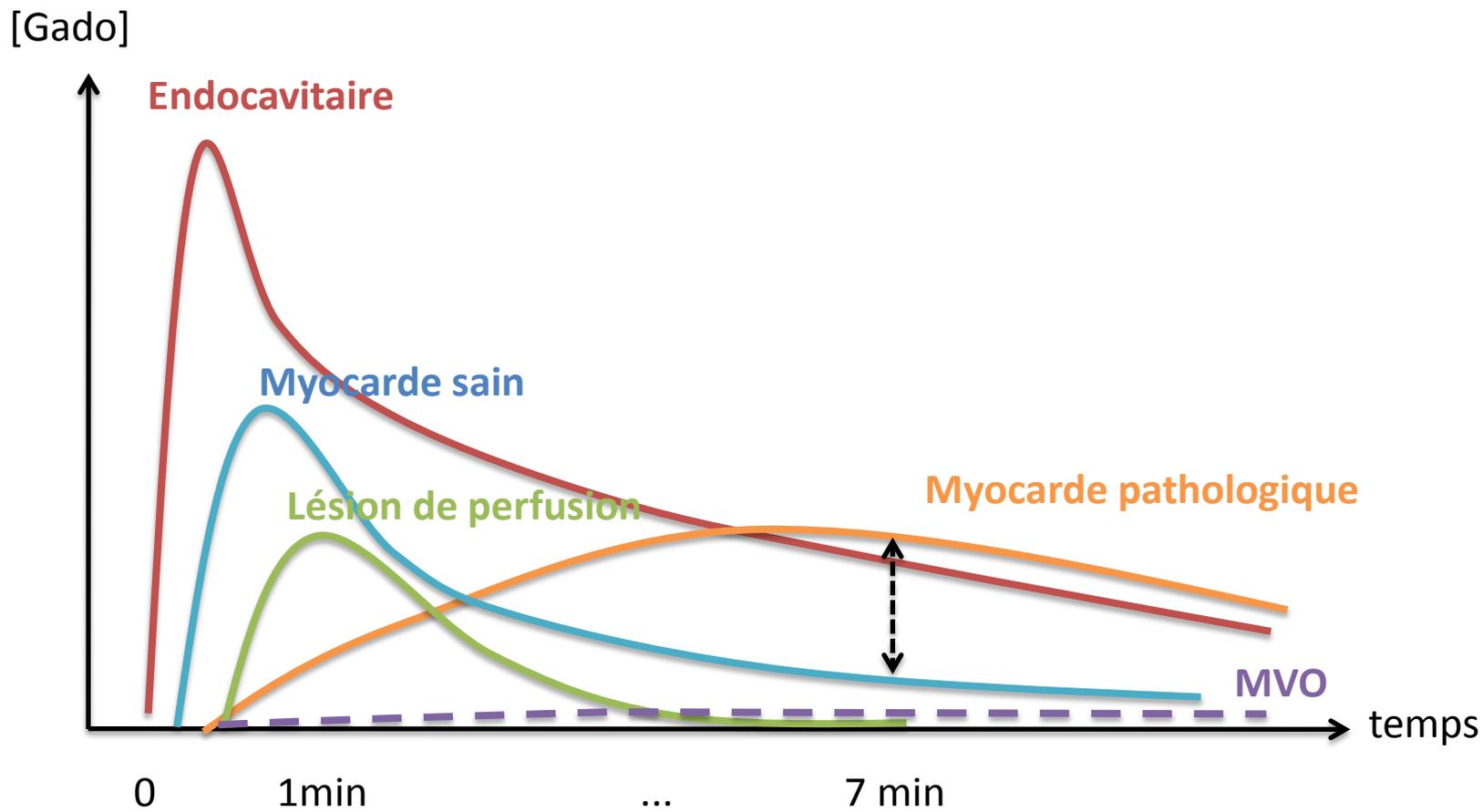
INTERET CLINIQUE DE LA SEQUENCE DE TI-SCOUT

Loïc BIERE¹, Louis-Marie LEIBER², Serge WILLOTEAUX² et Alain FURBER¹

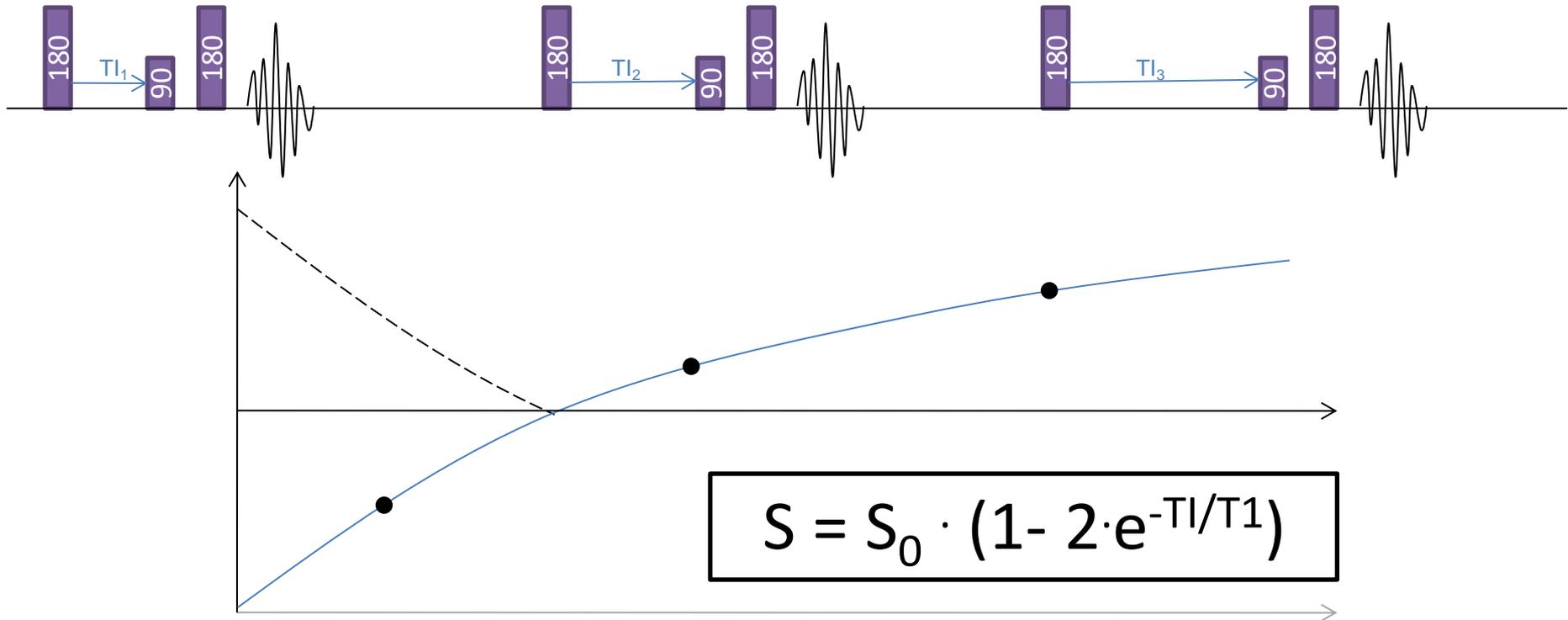
¹Service de Cardiologie et de ² Radiologie CHU d'ANGERS

Quels sont les outils disponibles dans le cadre des difficultés d'interprétation du rehaussement tardif?

- Séquences TSE de pondération T1 ou T2
- Séquences de perfusion premier passage
- Séquences de cine-IRM (pondération T2/T1)
- PSIR
- Mapping
- TI scout (look-locker)



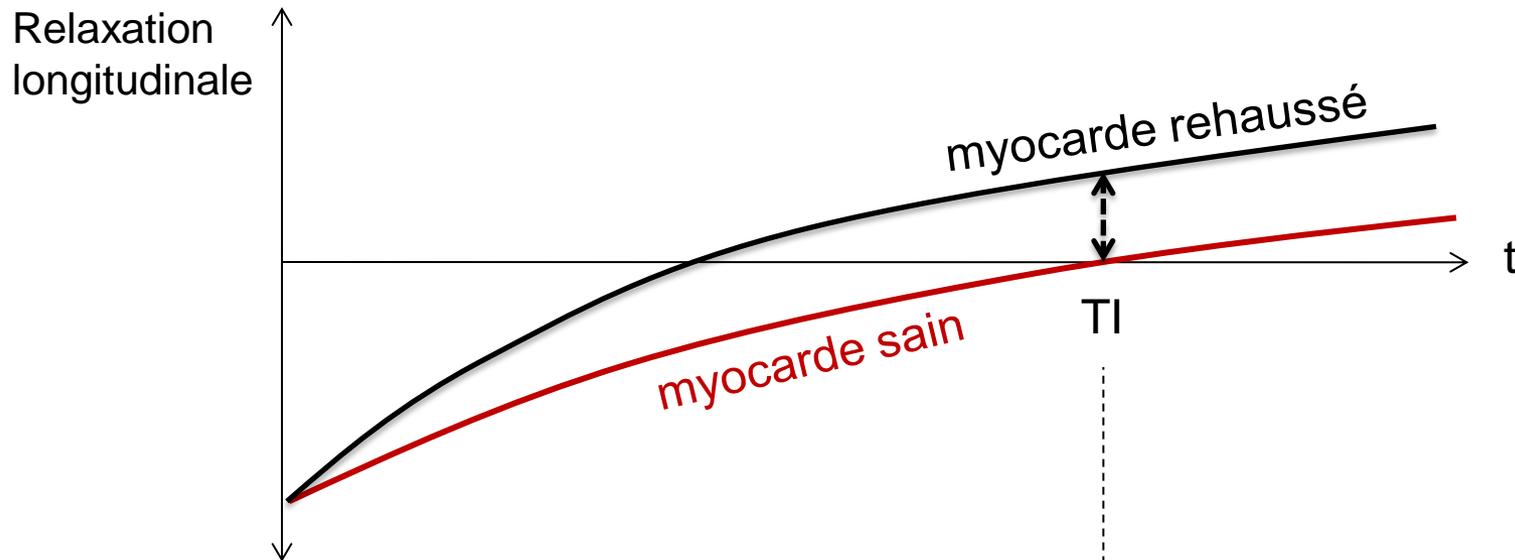
La séquence de T1 scout



On peut donc extraire la valeur du T1 de chaque voxel et le représenter sur une image : c'est la cartographie T1

Rehaussement tardif

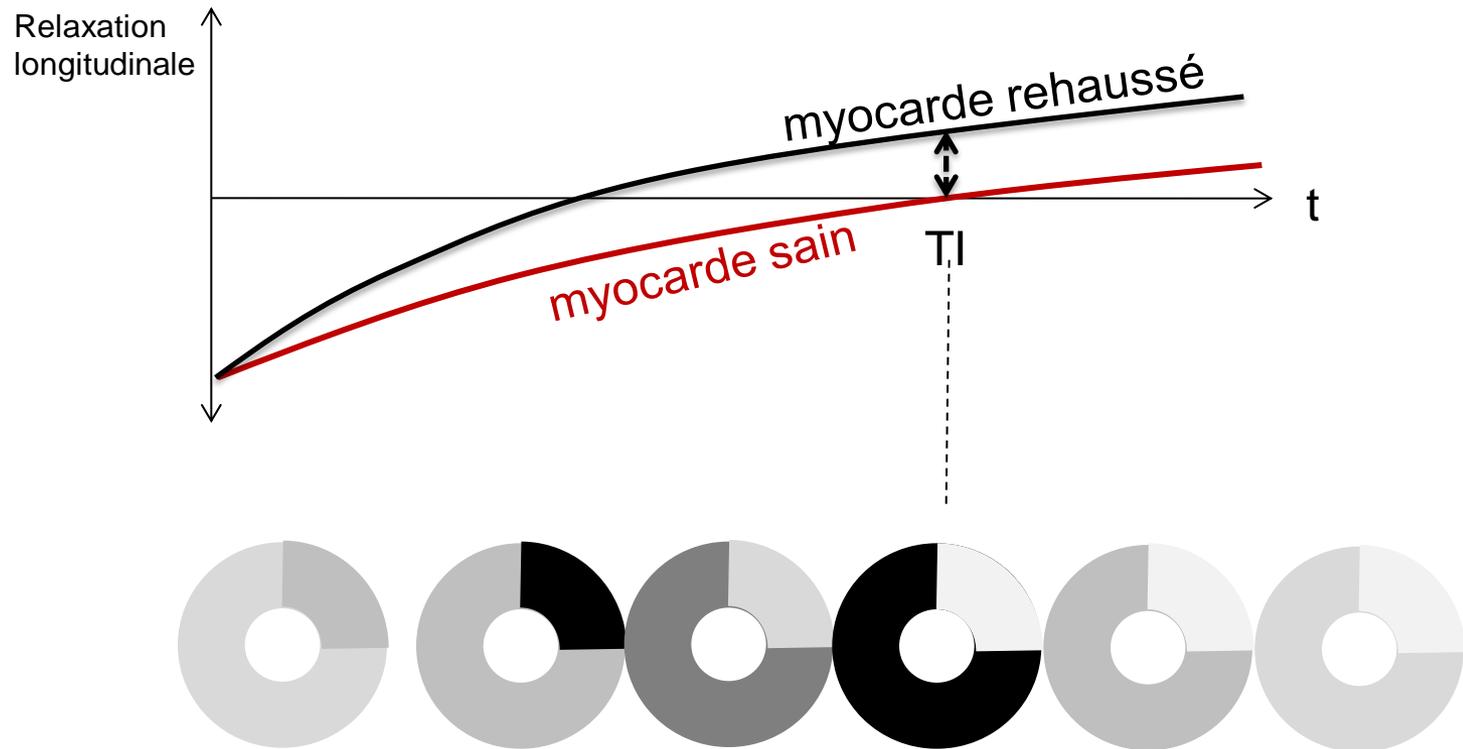
Séquence d'inversion récupération



TI	92 ms	145 ms	170 ms	195 ms	222 ms	298 ms	475 ms
SI Myocarde sain	140	70	50	20	2.5	30	100
SI Nécrose	100	10	50	70	120	160	240
Ratio	0.71	0.14	1	3.5	48	5.33	2.4

Rehaussement tardif

Séquence d'inversion récupération



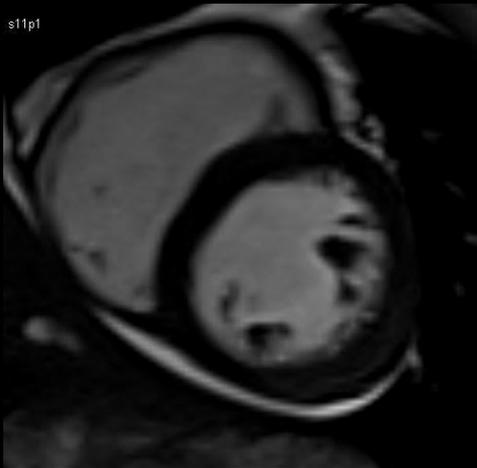
Difficultés d'interprétation du rehaussement tardif

exemples de cas

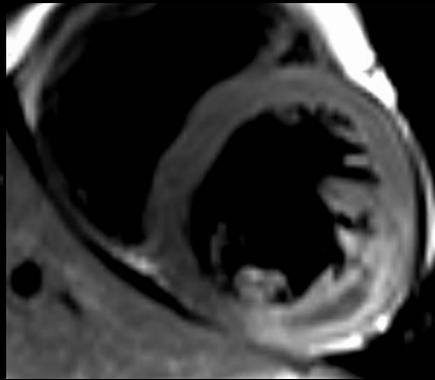
- Infarctus hémorragique
- Thrombus
- Cardiopathie de surcharge

Exemple 1: Obstruction microvasculaire sévère Infarctus hémorragique

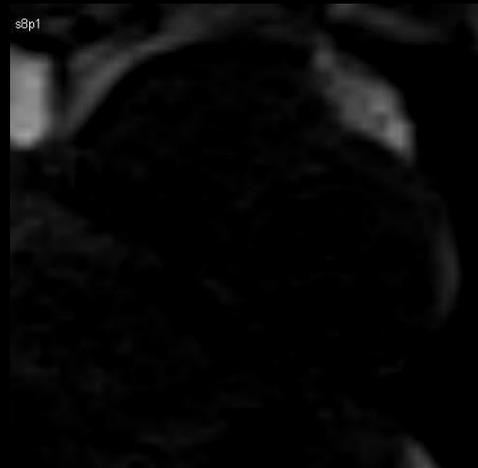
- SCA ST+ inféro-latéral – revascularisation précoce
- Franc hyposignal central (T2 & rehaussement tardif)



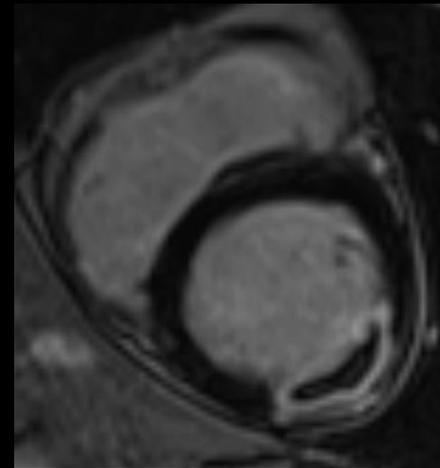
CINE PA



TSE T2

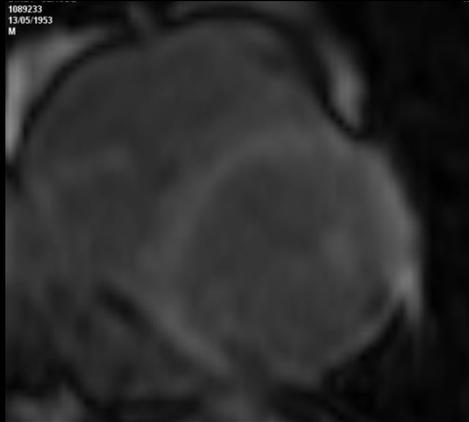


PERFUSION PREMIER PASSAGE



REHAUSSEMENT TARDIF

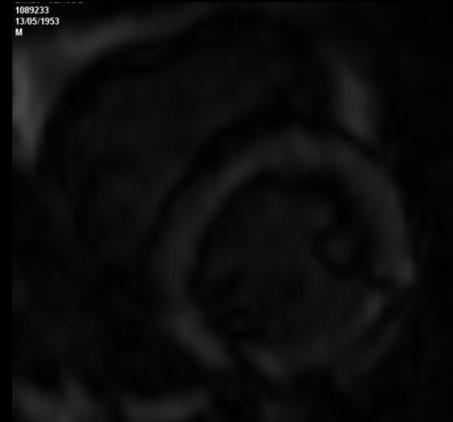
92ms



145ms



170ms

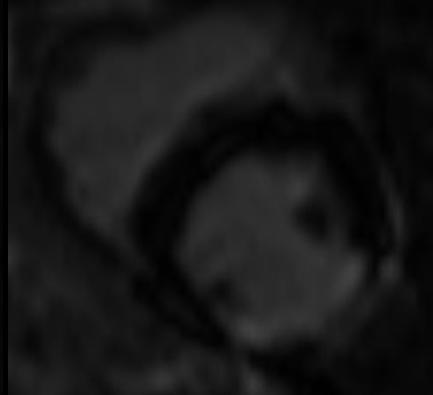


89233
05/1953



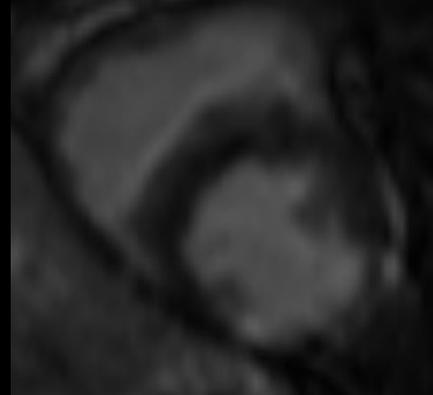
195ms

89233
05/1953



222ms

89233
05/1953

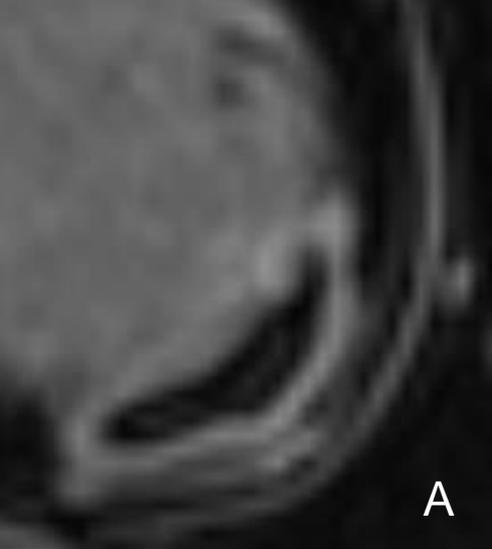


298ms

89233
05/1953

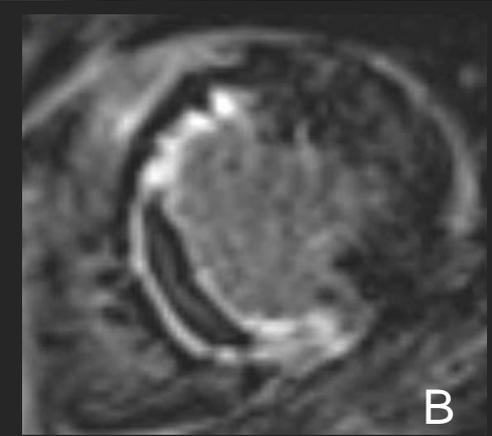


452ms



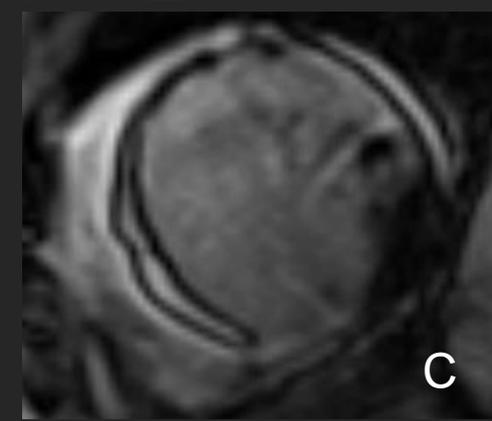
A

Endocavitaire
Myocarde « sain »
« No reflow »
 Graisse
 Muscle squelettique



B

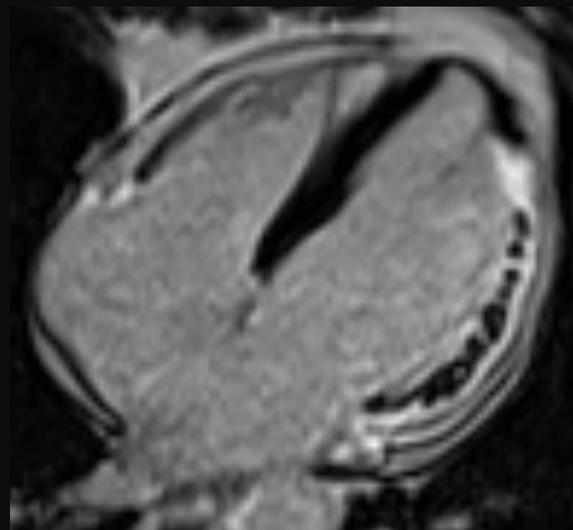
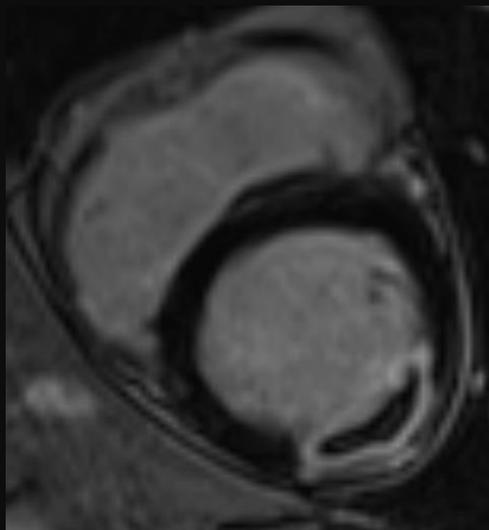
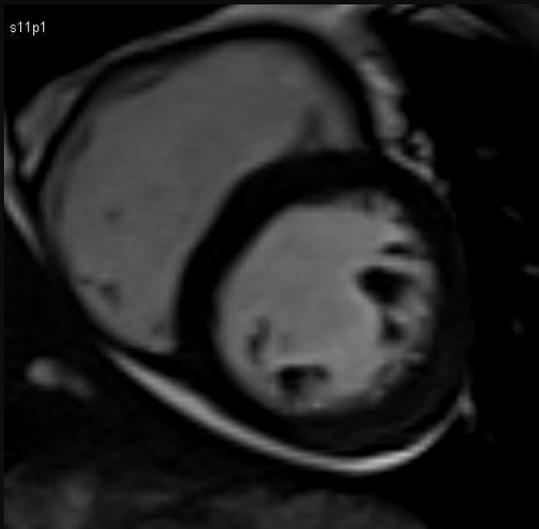
Myocarde rehaussé



C

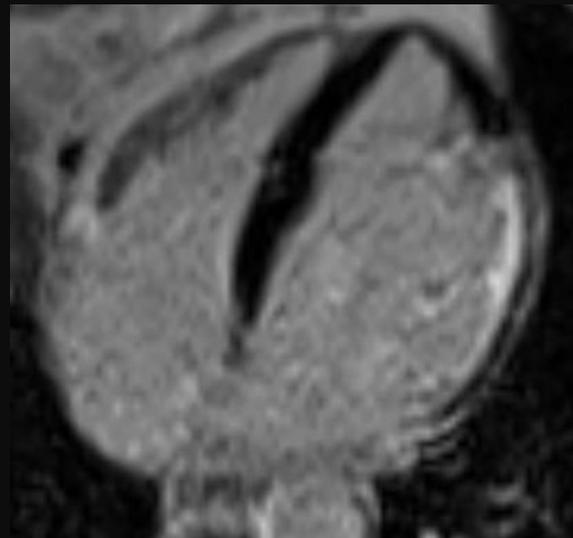
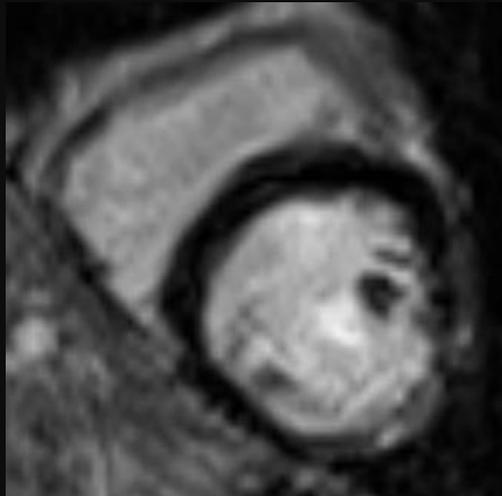
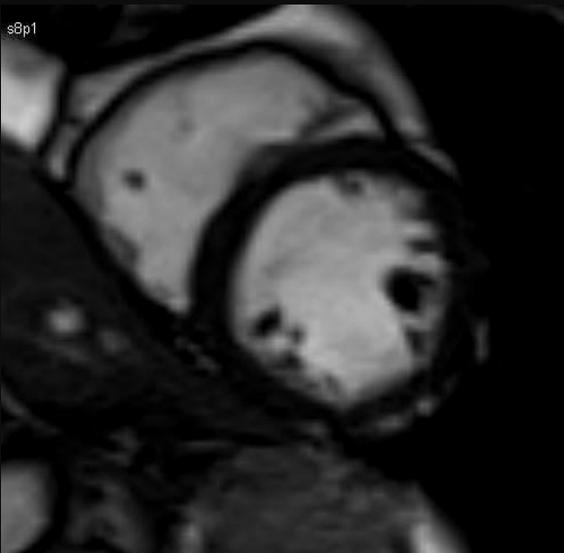
J5

s11p1



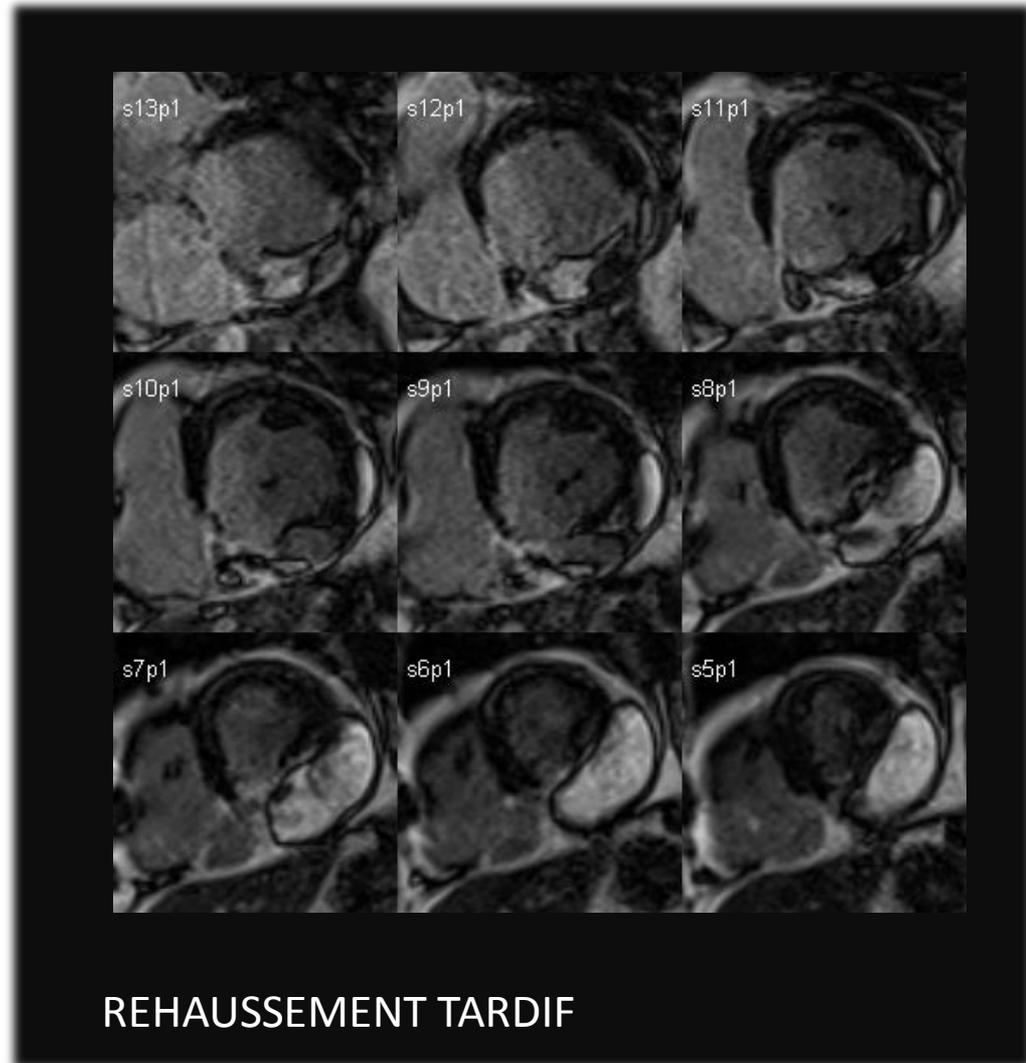
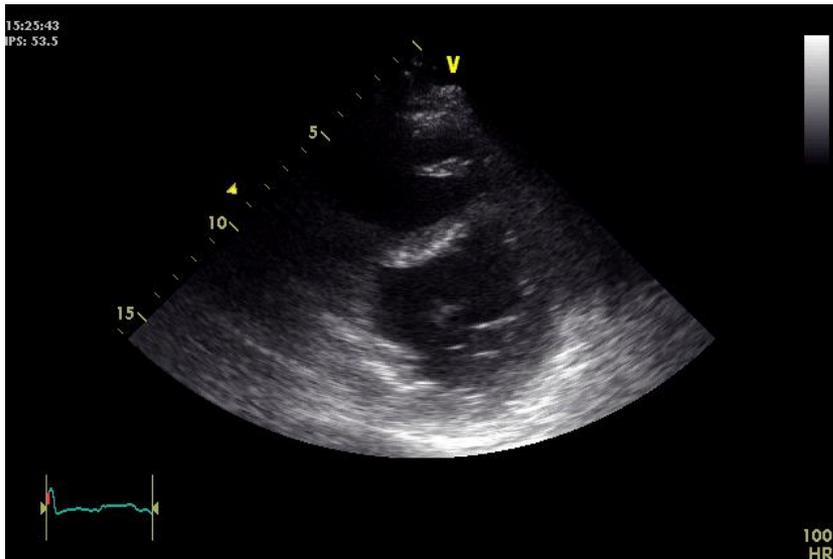
M3

s8p1

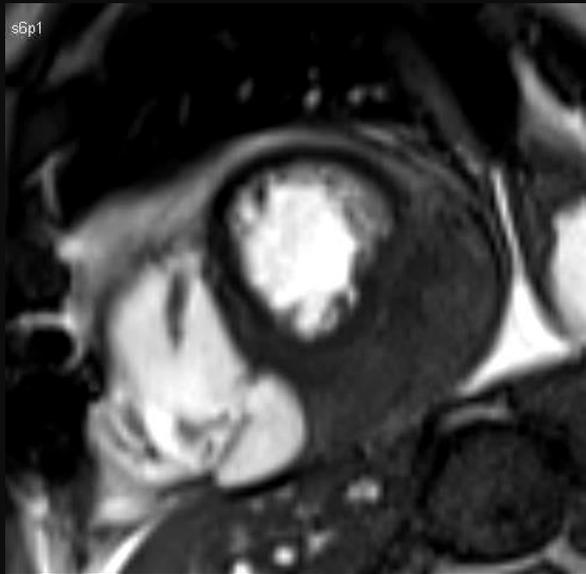


Exemple 2: Thrombus

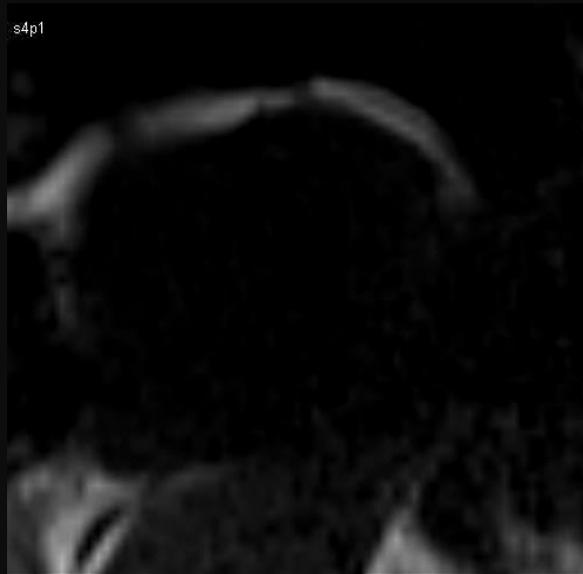
- Instabilité clinique à 3 semaines de la mise en place d'un patch pour rupture myocardique en phase aigue d'infarctus
- Épaississement en regard de la paroi inférieure



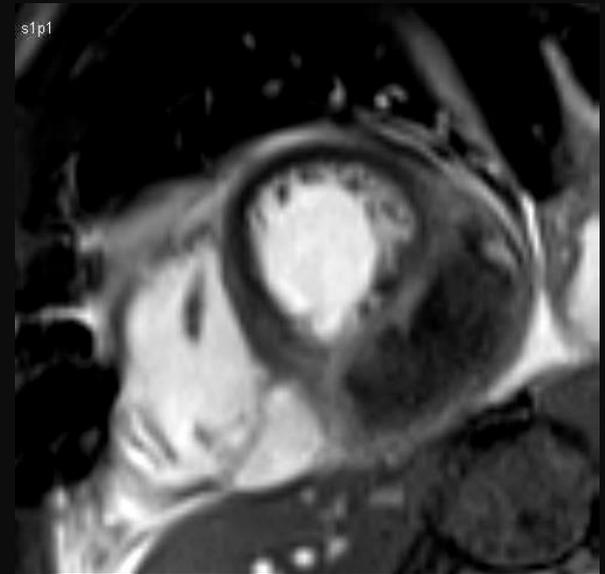
CINE PA



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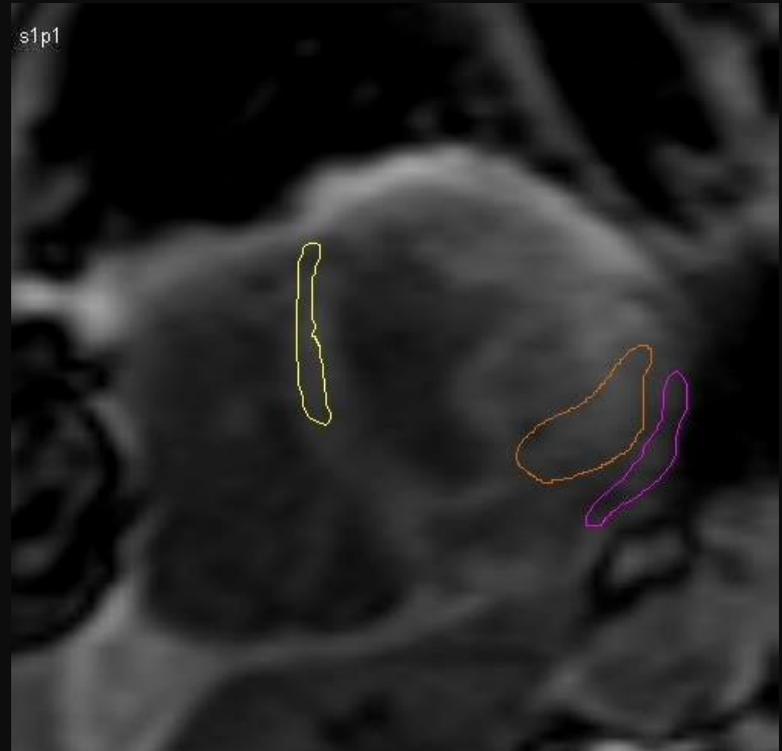
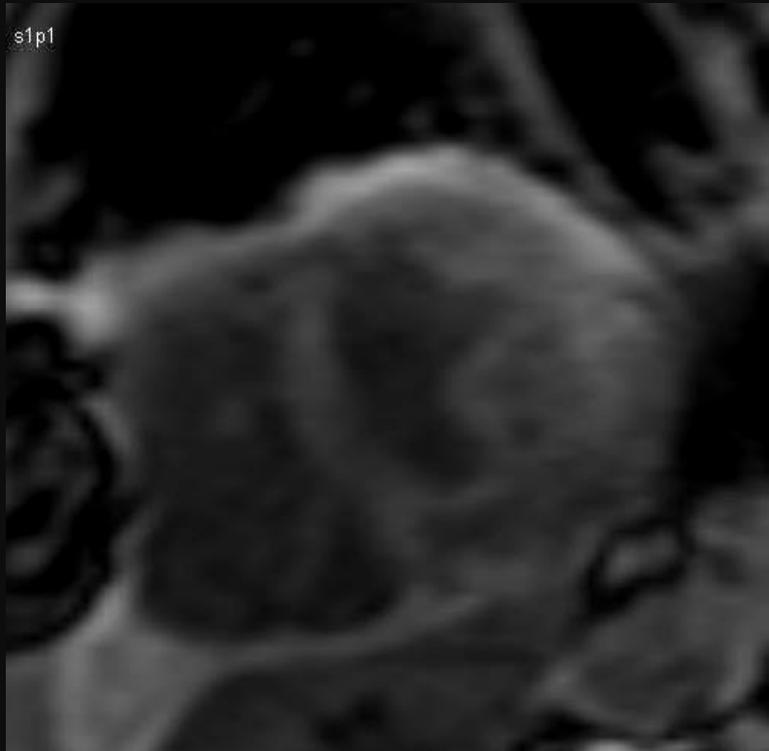
CINE PA après GADO



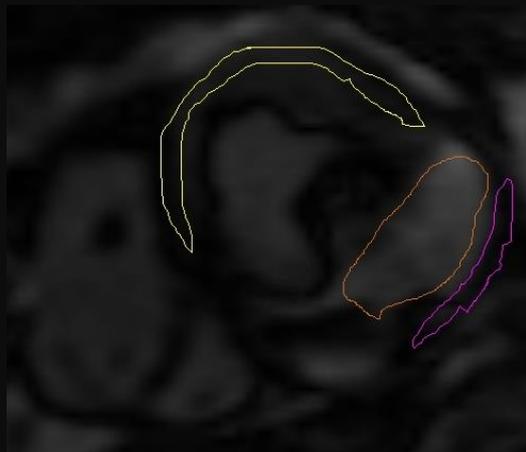
Hypothèses diagnostiques:

- Thrombus endocavitaire
- Rupture et hématome en péricarde cloisonné.

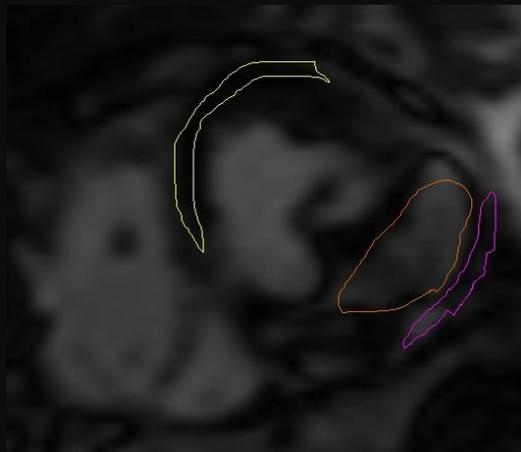
Valeur de l'hypersignal sur la séquence de rehaussement tardif ?



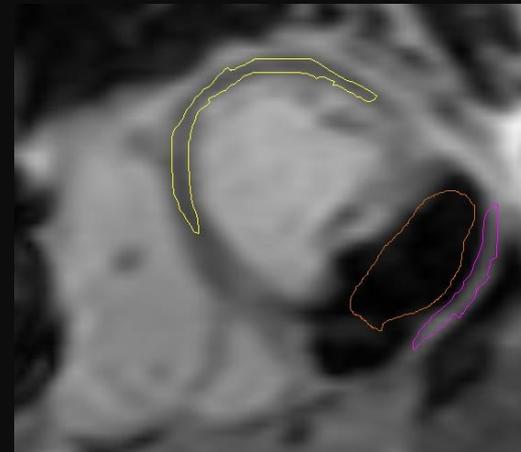
TI SCOUT



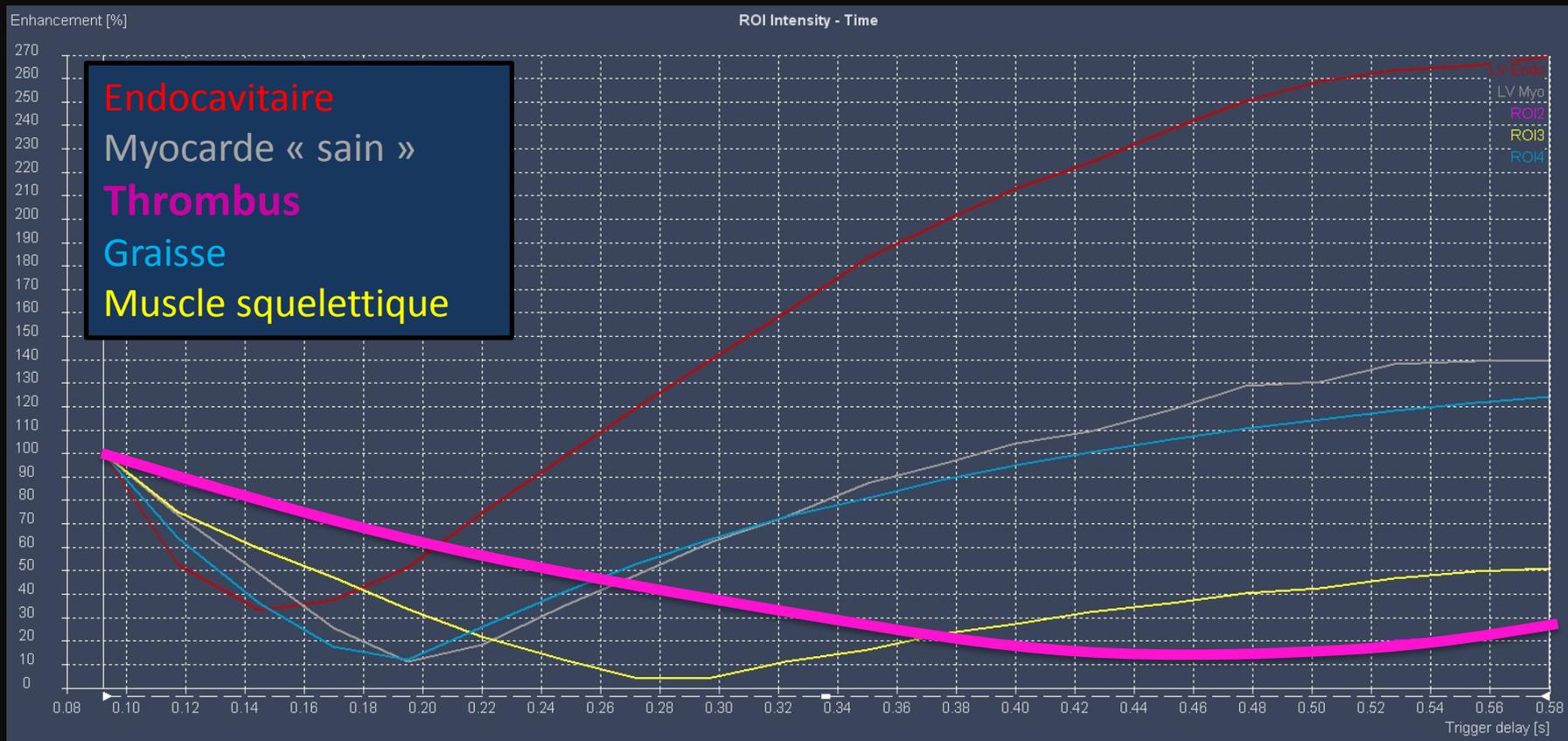
150ms



222ms

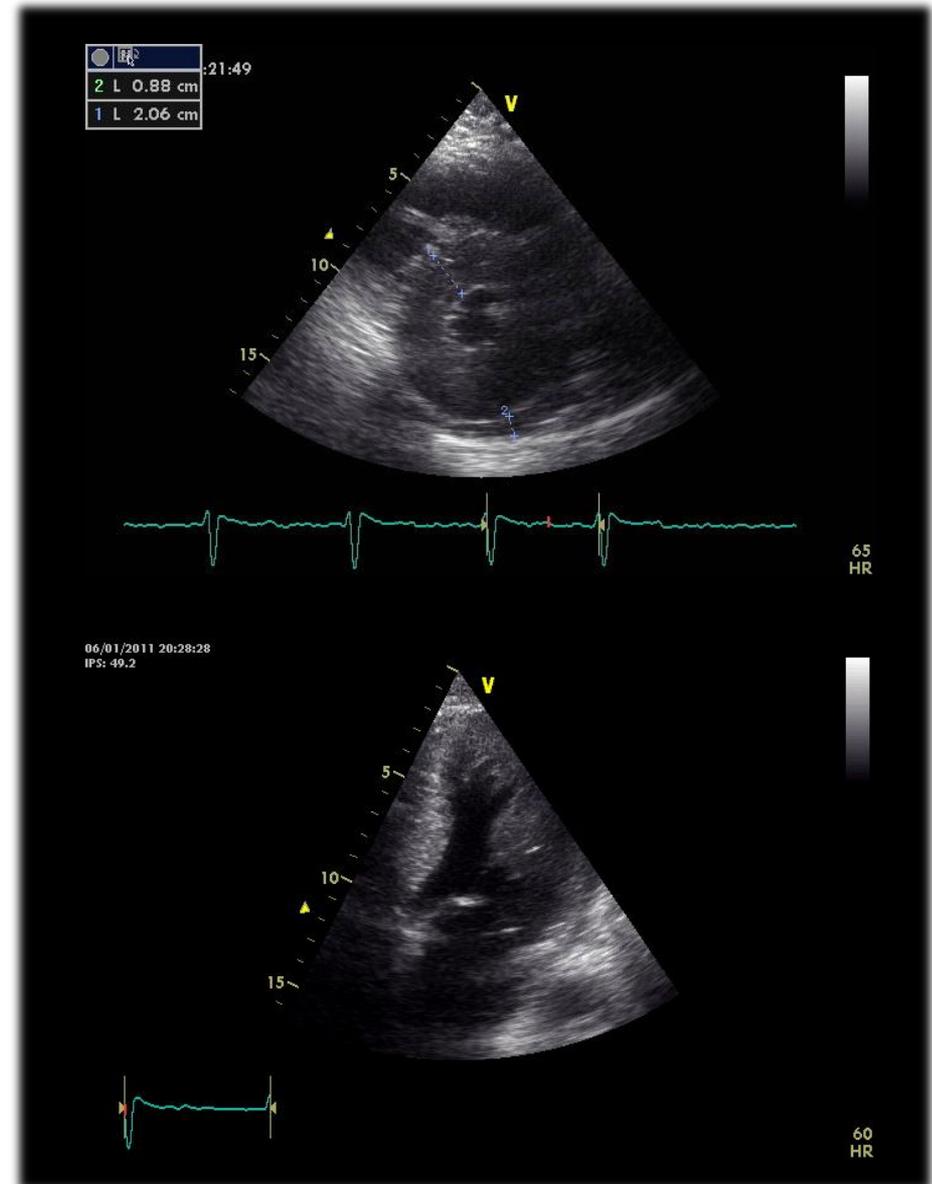


502ms



Exemple 3: Cardiopathie de surcharge

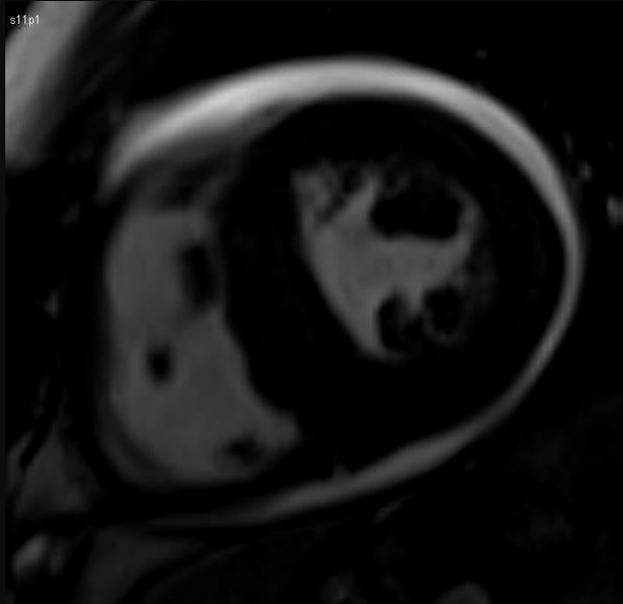
- Mr L
- CMH & IVG
- SIV: 21mm
- Hypertrophie à prédominance septale
- Aspect granité
- Profil mitral restrictif



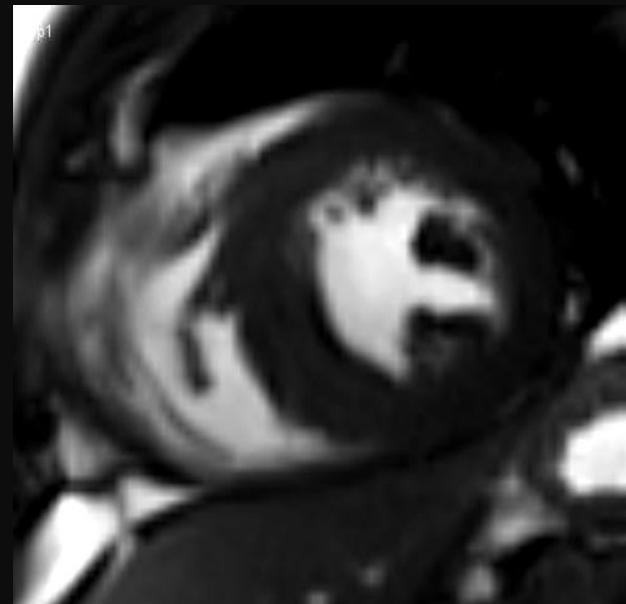
Exemple 4: Cardiopathie de surcharge

- Mr L
- CMH & IVG
- SIV: 21mm

- Mr R
- CMH
- SIV: 19mm



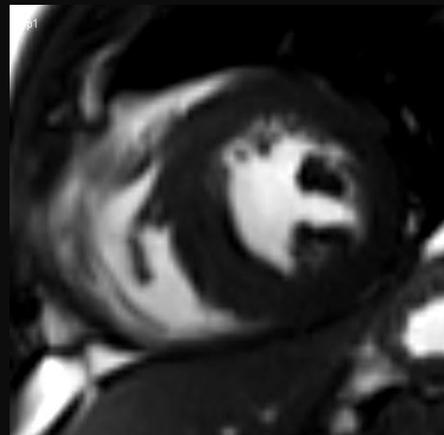
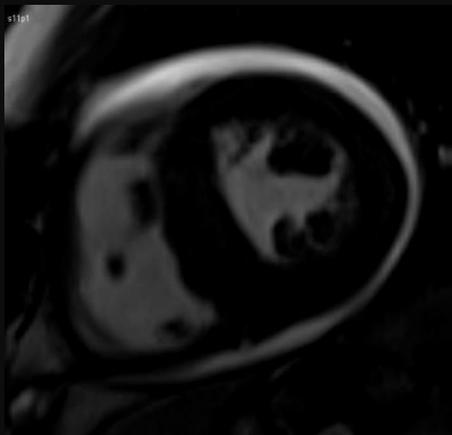
CINE PA



CINE PA

Mr L. / Mr R.

CINE

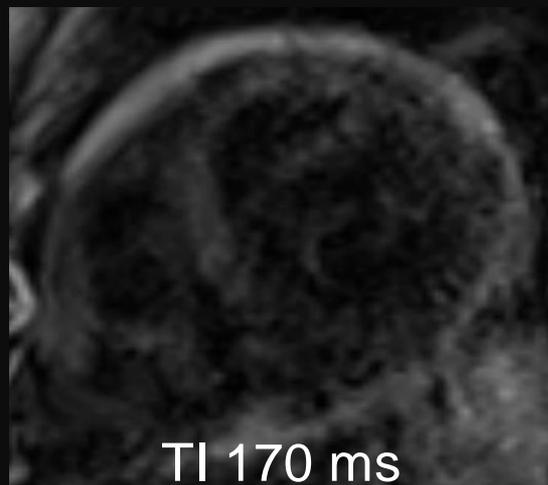


1stPASS

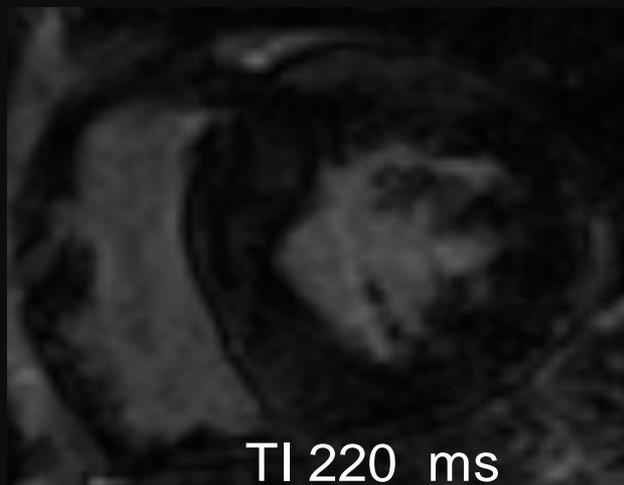


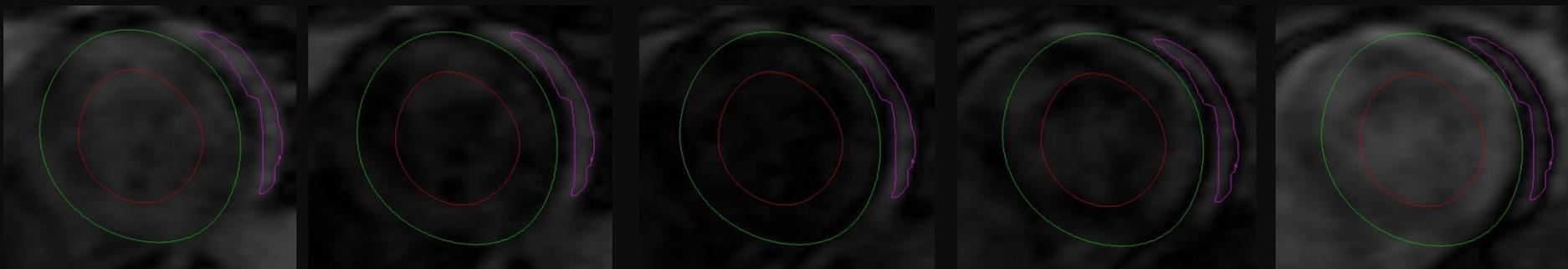
DE

TI 170 ms



TI 220 ms





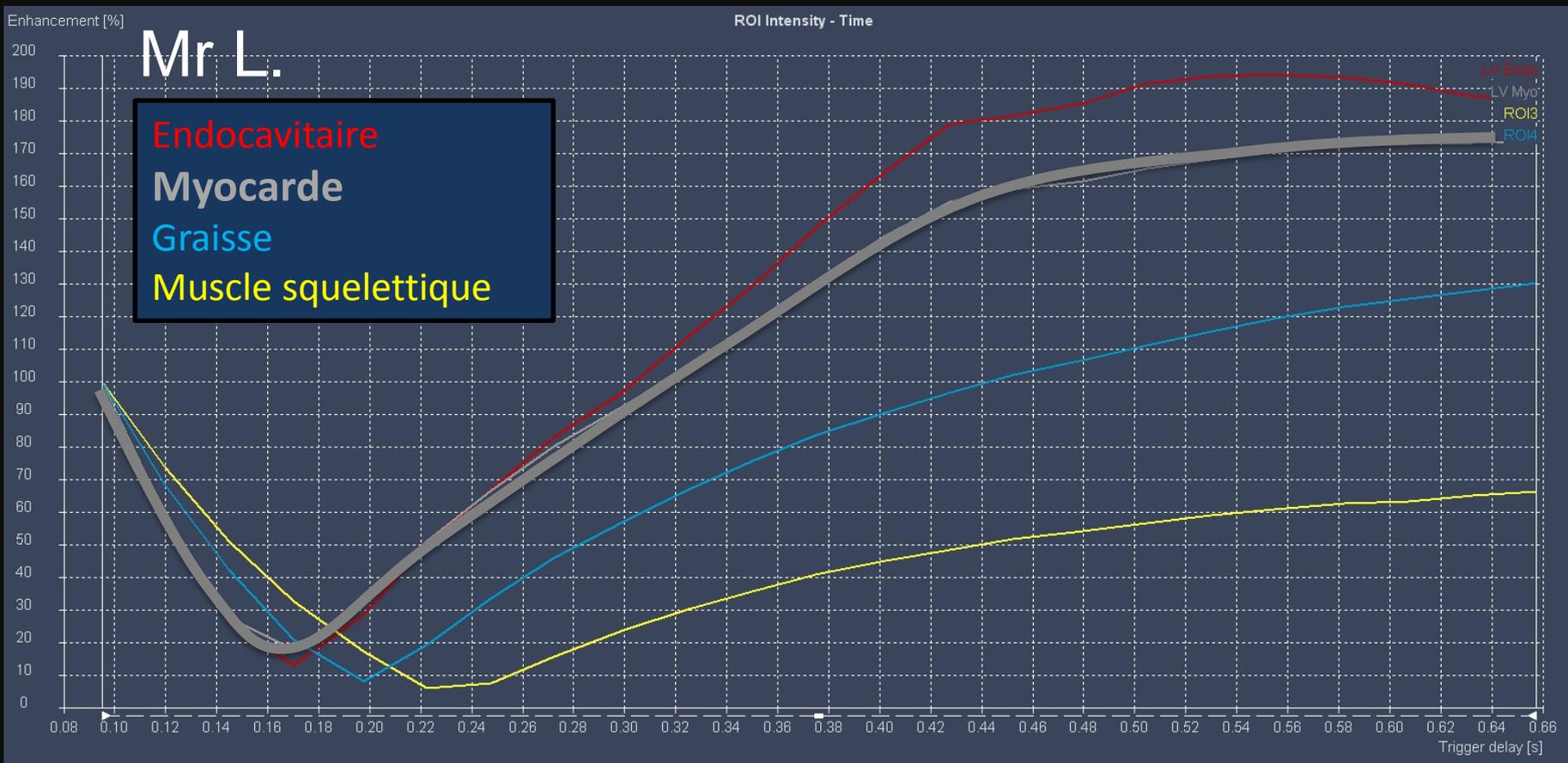
120ms

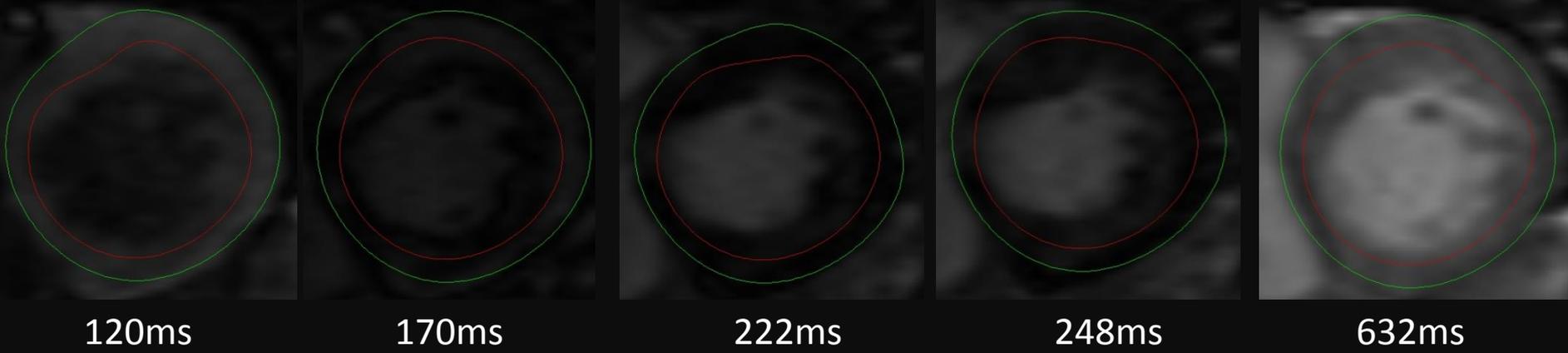
145ms

170ms

198ms

272ms





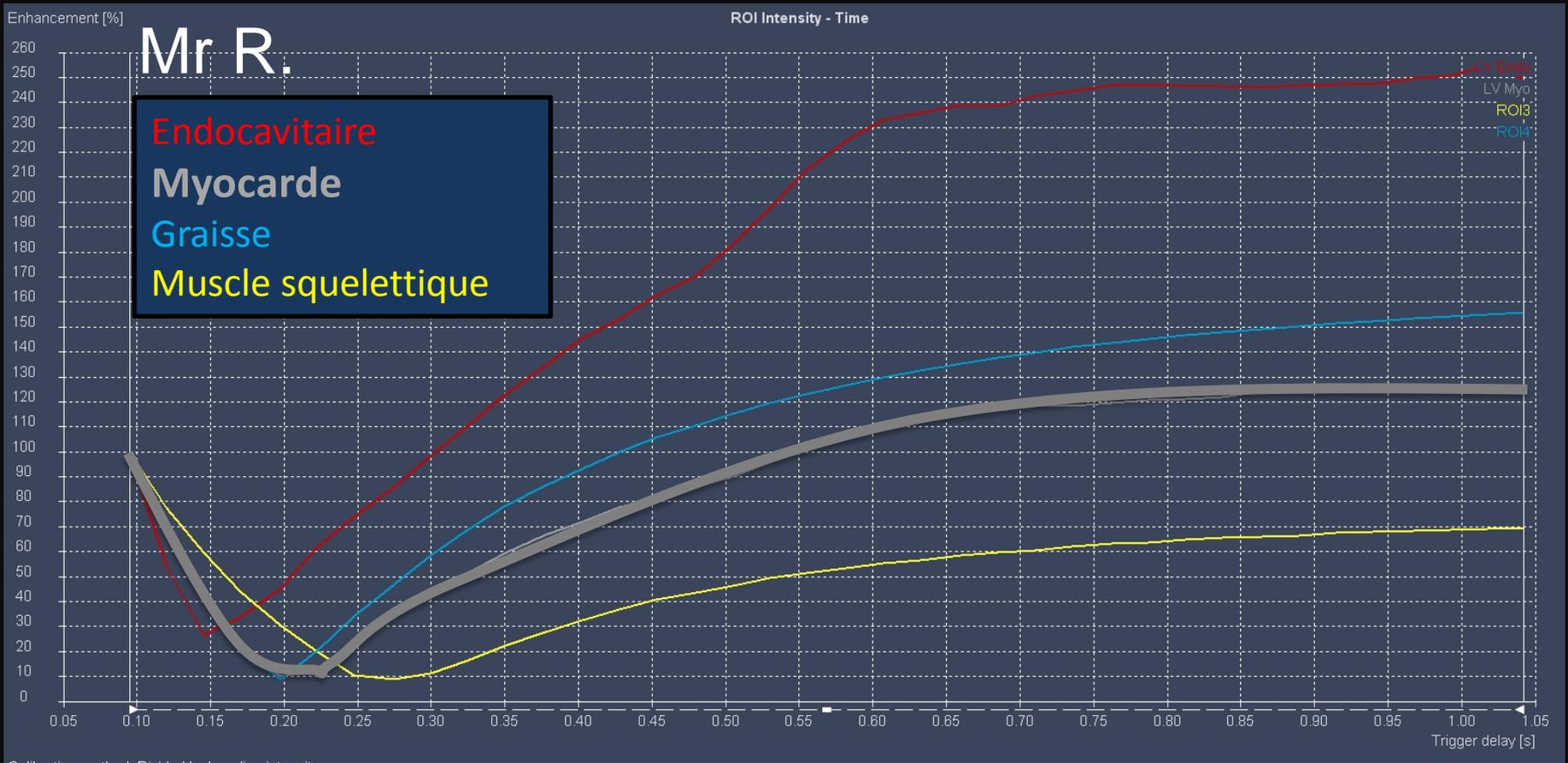
120ms

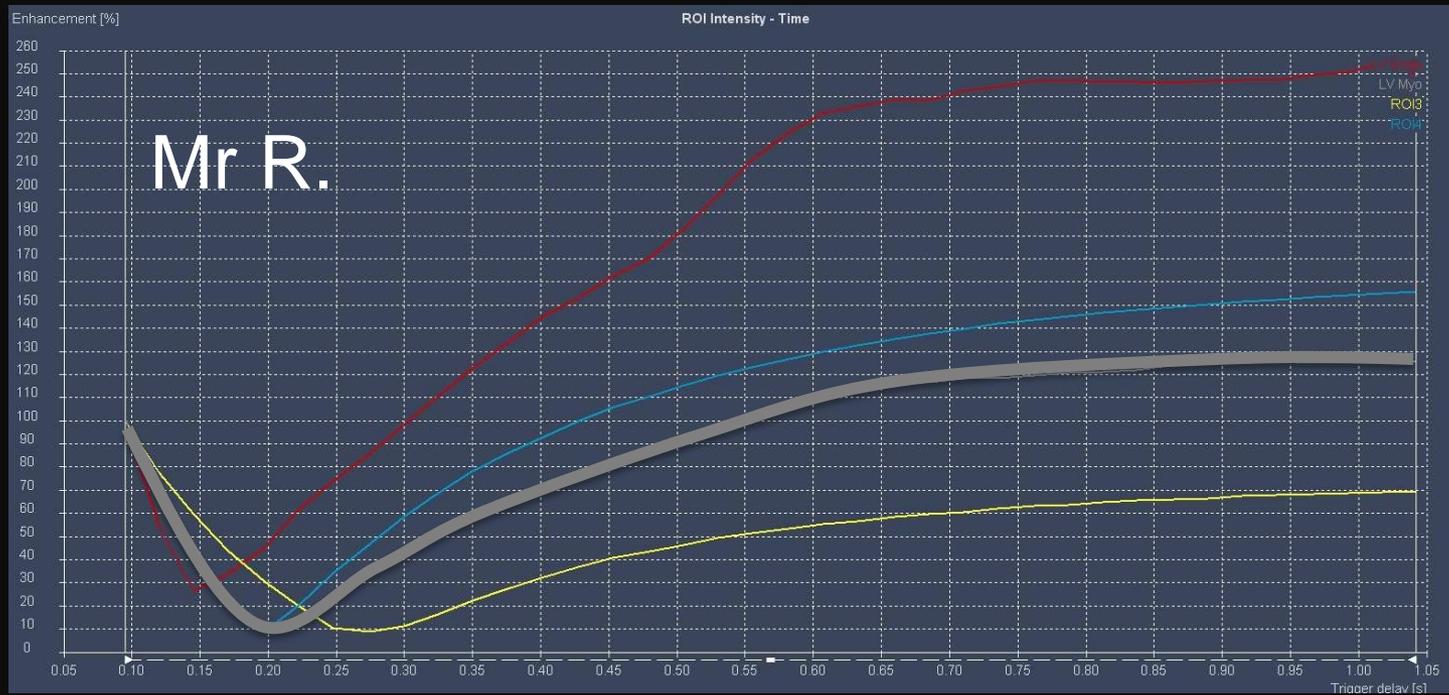
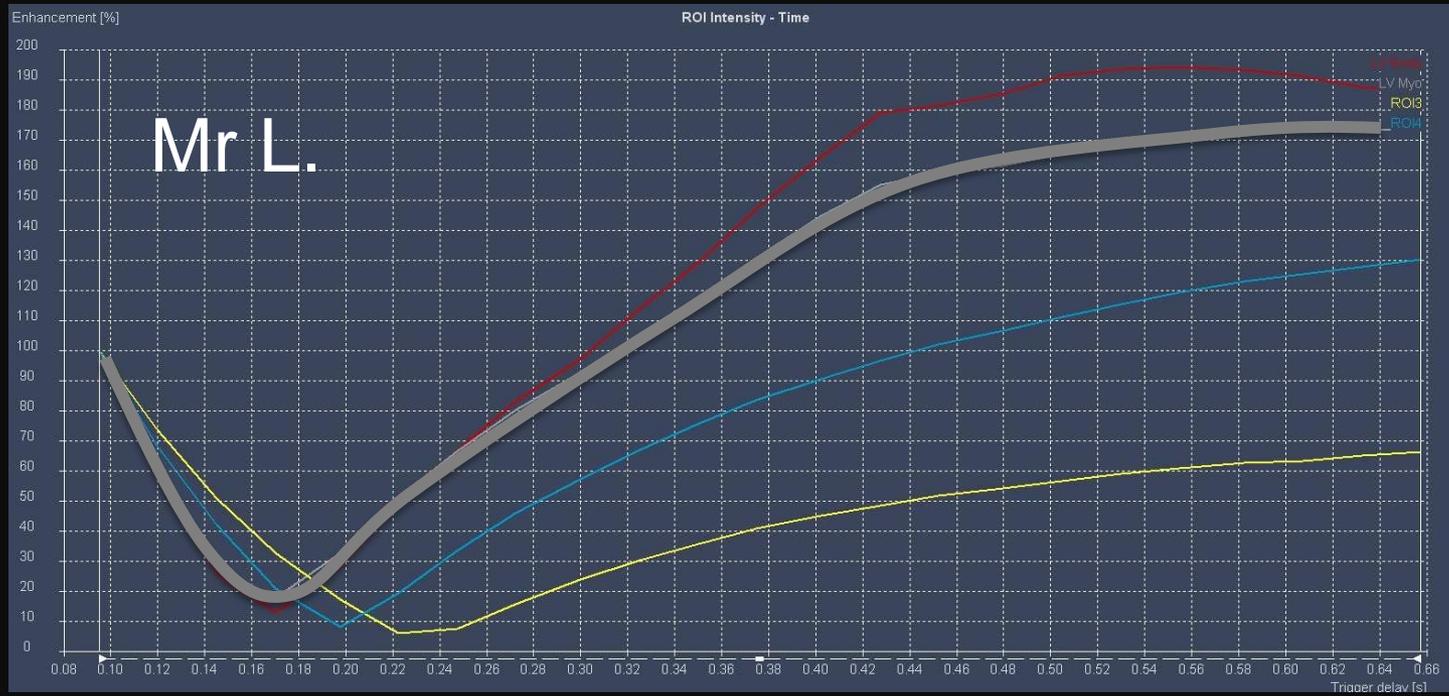
170ms

222ms

248ms

632ms





Conclusion

- Intérêt d'apprécier le niveau de pondération T1 en pratique clinique
- Le TI-scout (look locker) est une façon qualitative et simple d'apprécier la relaxation longitudinale



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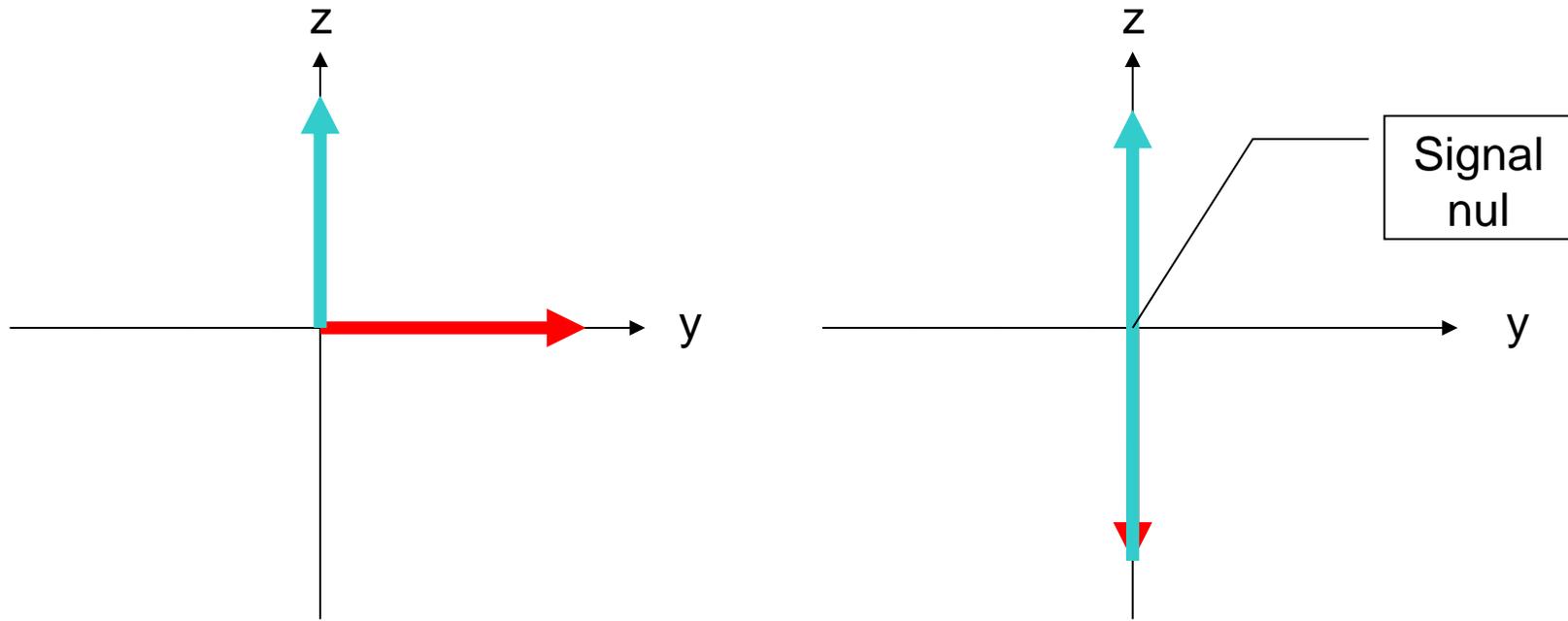
Service de Radiologie¹ et de Cardiologie² CHU d'ANGERS

Mapping T1

	T1 (ms)
Muscle squelettique	1000
Graisse	340
Myocarde sain	1000
Sang	1440

- *Radiology 2006 ; 238:1004-1012 ; n= 15*
Valeur du T1 en contraste spontané = 980 msec \pm 53, et après injection de gadolinium à 2 min = 344 \pm 35, 10 minutes = 470 \pm 26 ; 15 minutes = 494 \pm 23
- *J Cardiovasc Magn Reson 2003 ; 5:353–359 ; N=8*
T1 en contraste spontané des régions infarctées augmenté de 18 +/- 7% (SE, p <0.05), et après injection de produit de contraste T1 diminué de 27 +/- 4% (p < 0.05) par rapport au coeur sain
- *J Am Coll Cardiol, 2008 ; 52:1574-1580 ; n = 45*
Diminution du T1 15 minutes après injection de produit de contraste chez les patients avec fibrose myocardique histologique (383 \pm 17 ms vs. 564 \pm 23 ms, p < 0.0001), y compris dans les régions sans rehaussement tardif (429 \pm 22 ms vs. 564 \pm 23 ms, p <0.0001)

Séquence d'inversion récupération



En pratique utilisée pour éteindre le signal du myocarde sain
Améliore ainsi le rapport signal sur bruit

Il s'agit d'une séquence type écho de spin avec inversion du signal au départ

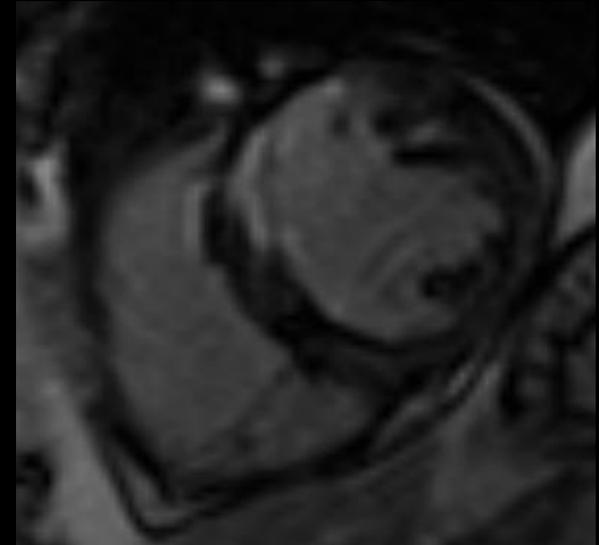
IDM antérieur phase hospitalière



CINE PA

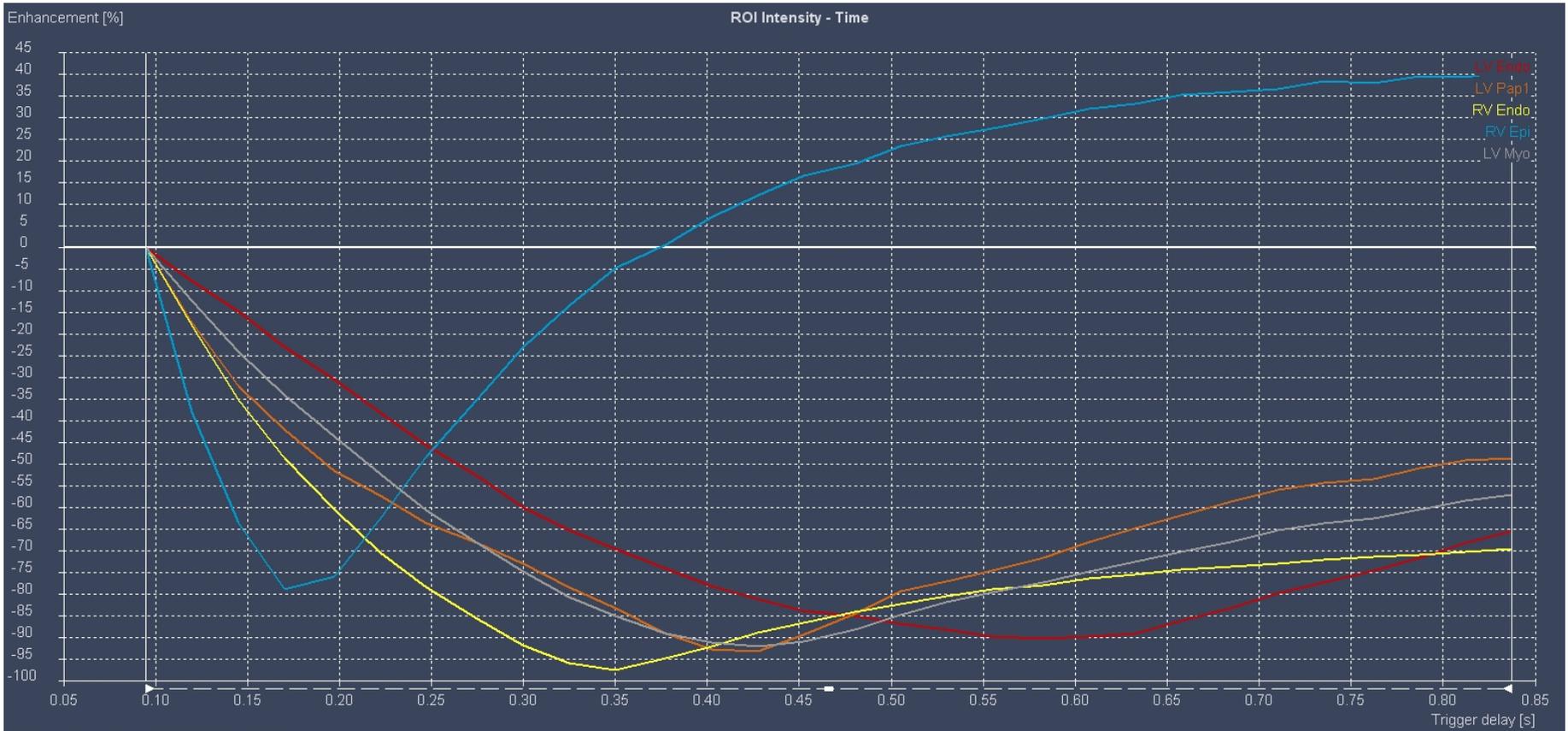


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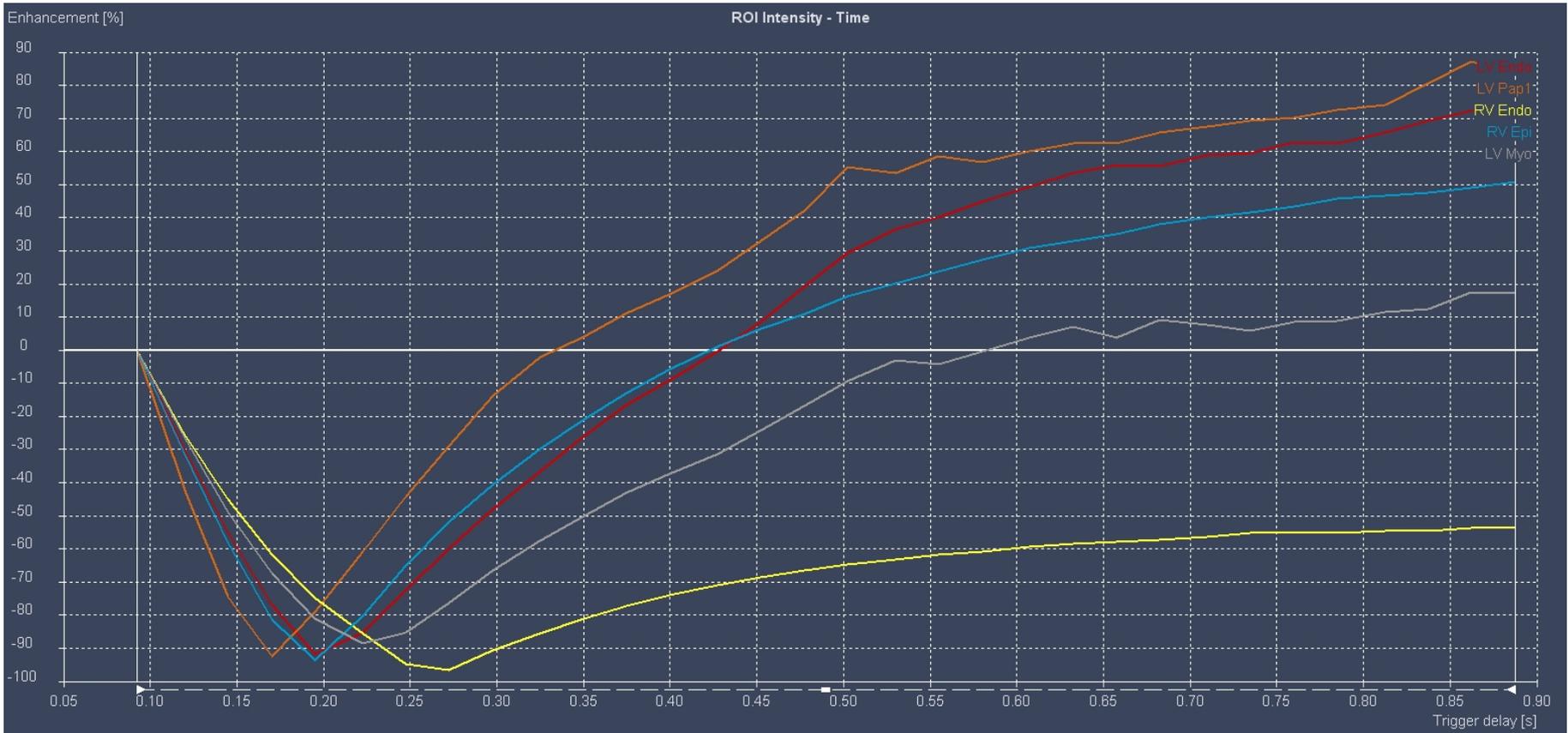


REHAUSSEMENT TARDIF

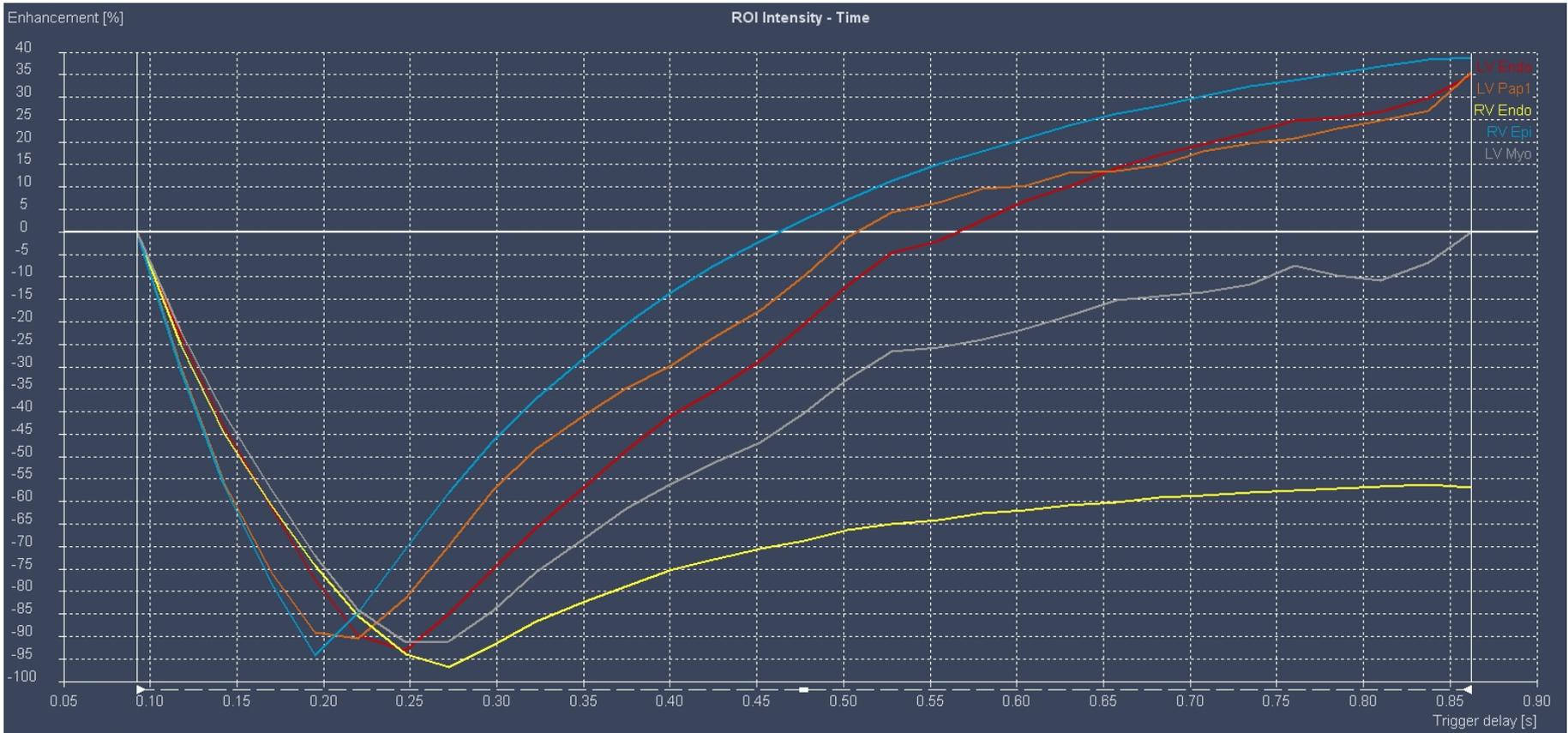
Avant Gado



5 minutes post-Gado



12 minutes post-Gado



Exemple 1: phénomène d'obstruction microvasculaire – « no-reflow »

- Examen réalisé en phase hospitalière d'un STEMI
- Hyposignal au sein de l'hypersignal de rehaussement tardif

