

5 6 7
JUN 2019

Votations autour du SCA

Je continue à thrombo-aspirer



STÉPHANE COOK
FRIBOURG, CH

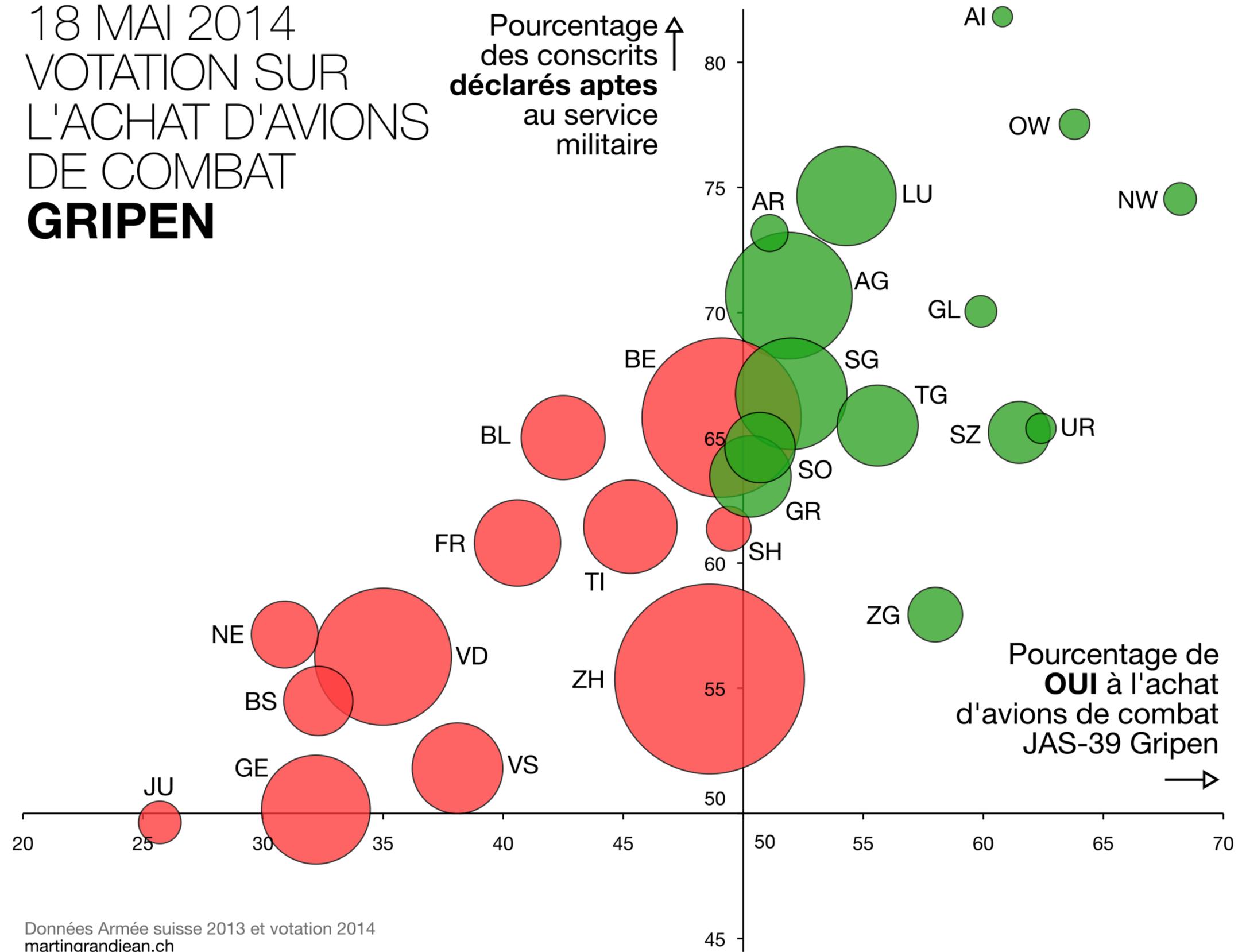


La thrombectomie en 8 points !

311 seances de votes
depuis 1848

226 sujets de votations
depuis que je peux voter

18 MAI 2014 VOTATION SUR L'ACHAT D'AVIONS DE COMBAT **GRIPEN**



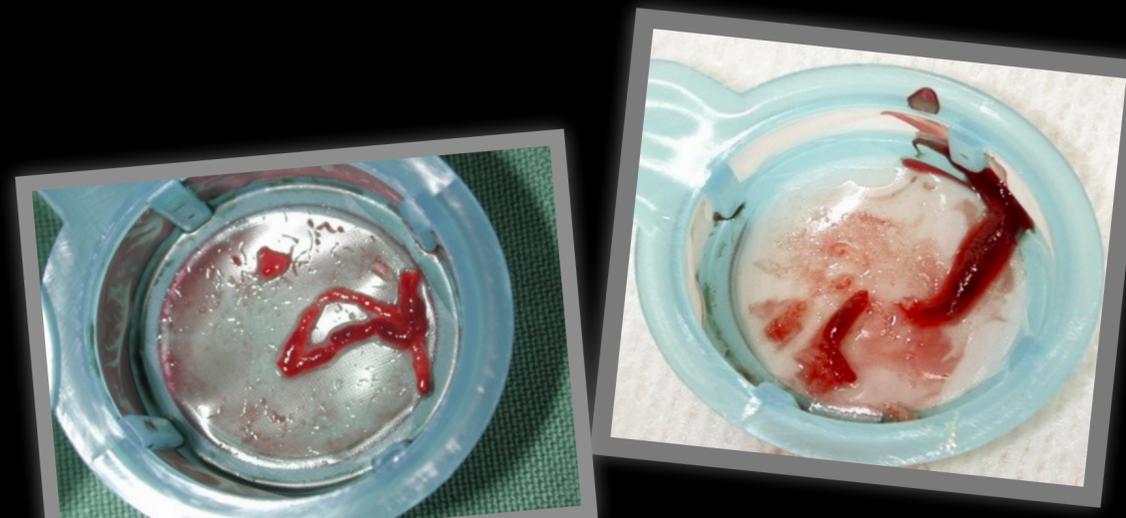
Données Armée suisse 2013 et votation 2014
martingrandjean.ch

- La perfusion myocardique après PCI primaire détermine le résultat clinique
- L'embolisation du matériel athérotrombotique joue un rôle crucial dans l'obstruction microvasculaire et l'altération de la perfusion myocardique

	Unstable angina	NSTEMI	STEMI
Angiographic thrombus	0%-1%	75%	>90%
Activated platelets	0%-5%	70%-80%	80%-90%
Acute coronary occlusion	0%-1%	10%-25%	>90%
Mortality	1%-2%	3%-8%	6%-15%

Adapted from Antman EM. In: Braunwald E, ed. *Heart Disease: A Textbook in Cardiovascular Medicine*, 5th ed. Philadelphia,

- Une grosse charge thrombotique double la mortalité à 1 an (TOTAL)
- Des essais antérieurs ont montré la faisabilité de l'aspiration de thrombus au cours de PCI primaire



Point #1

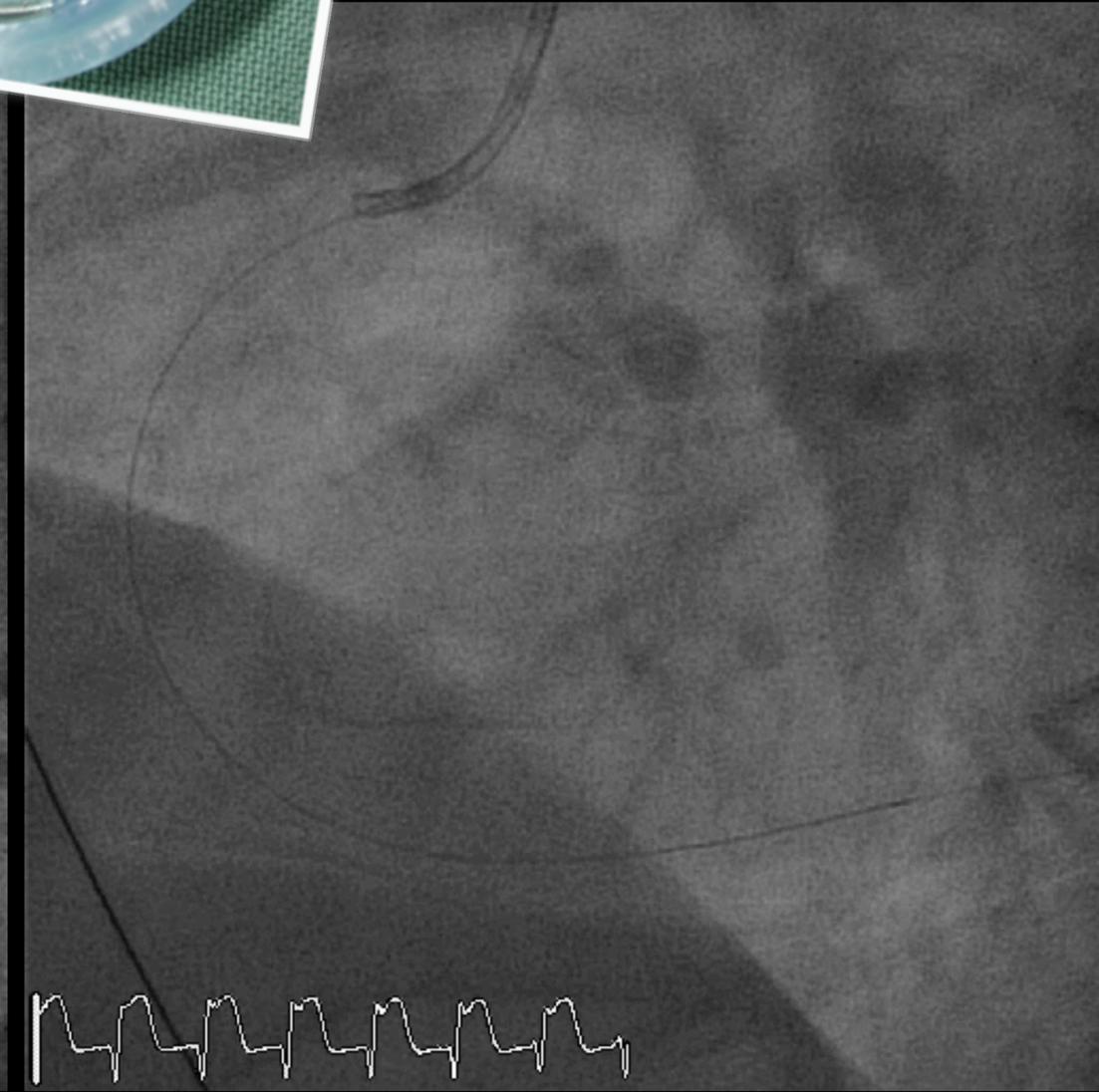
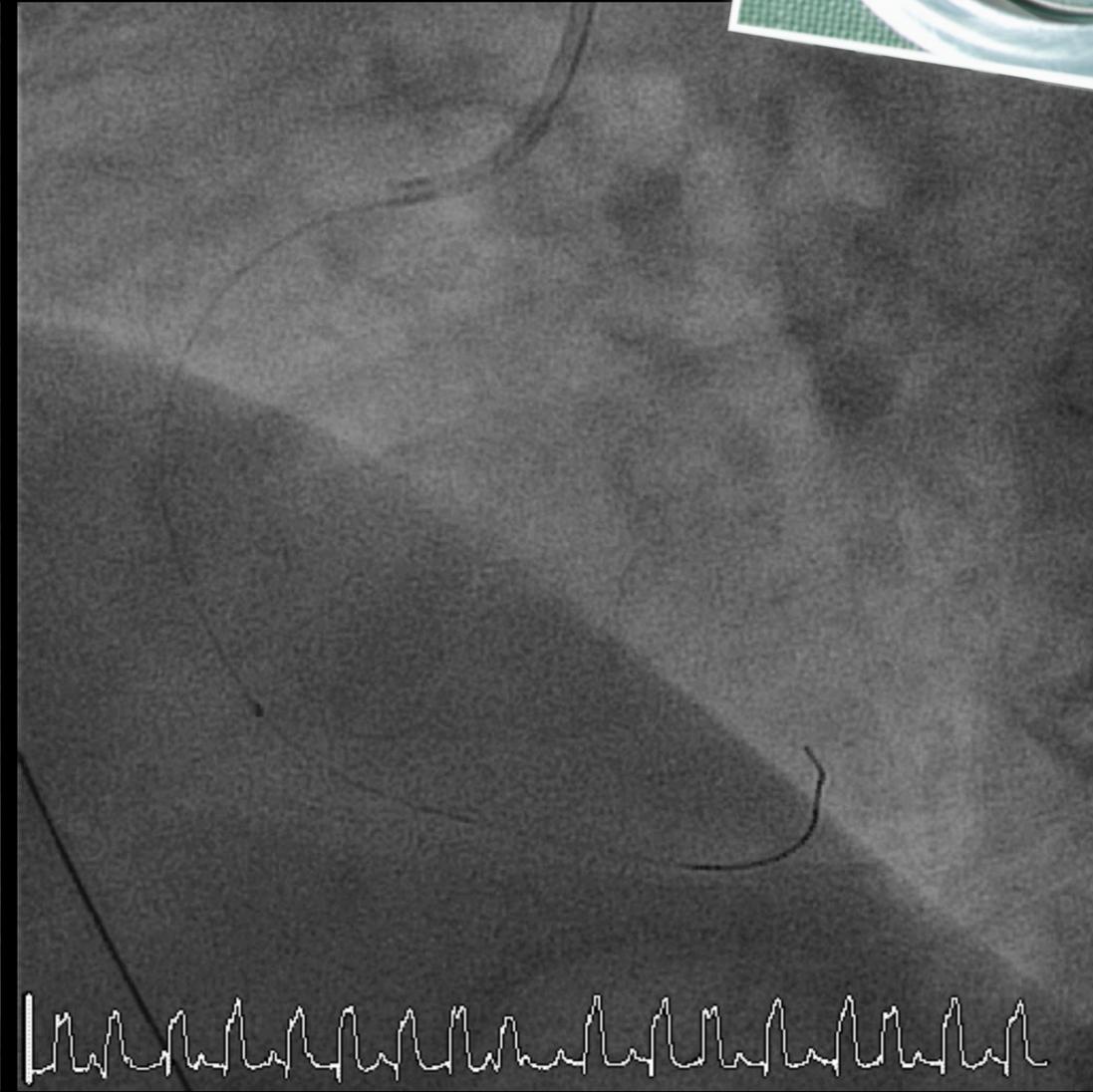
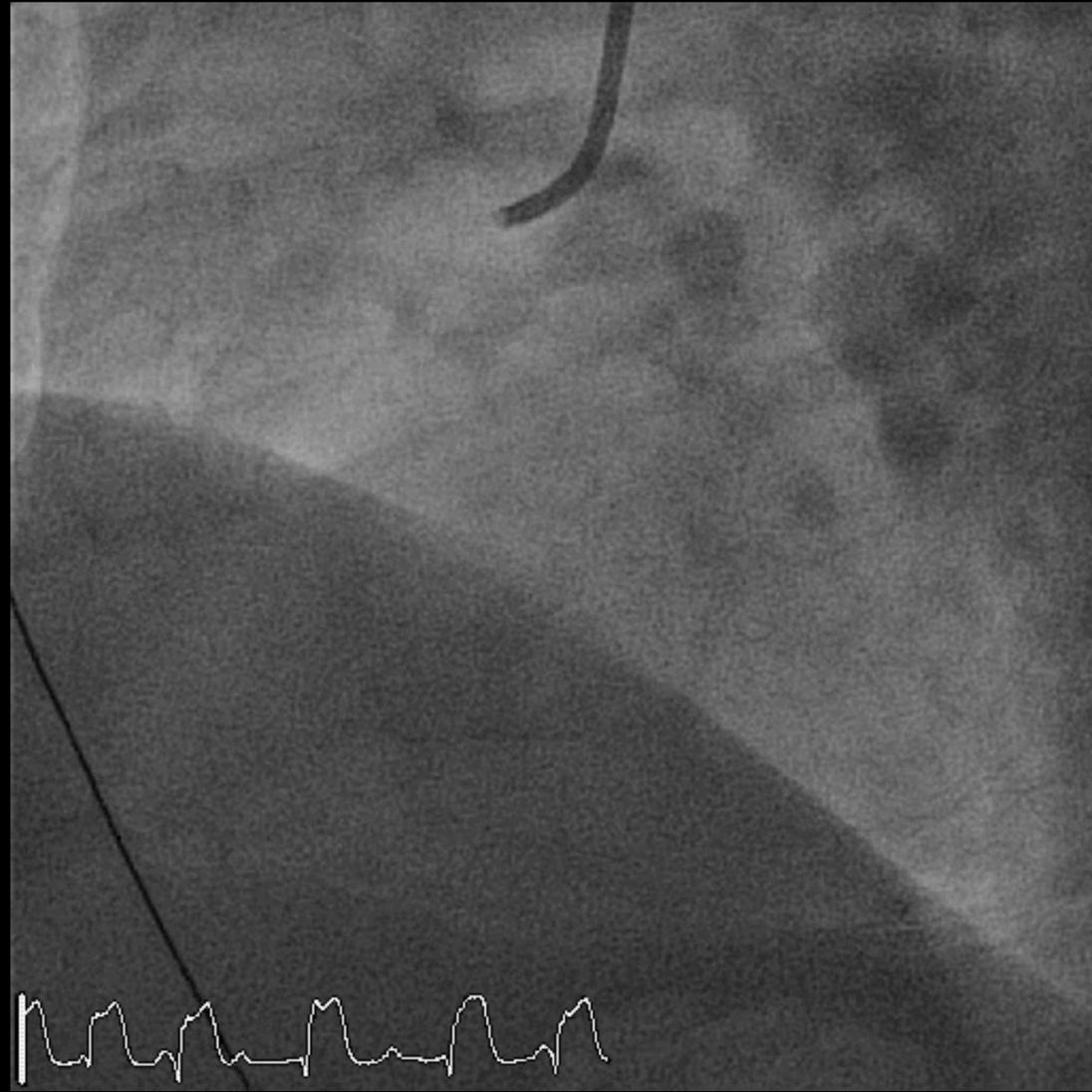
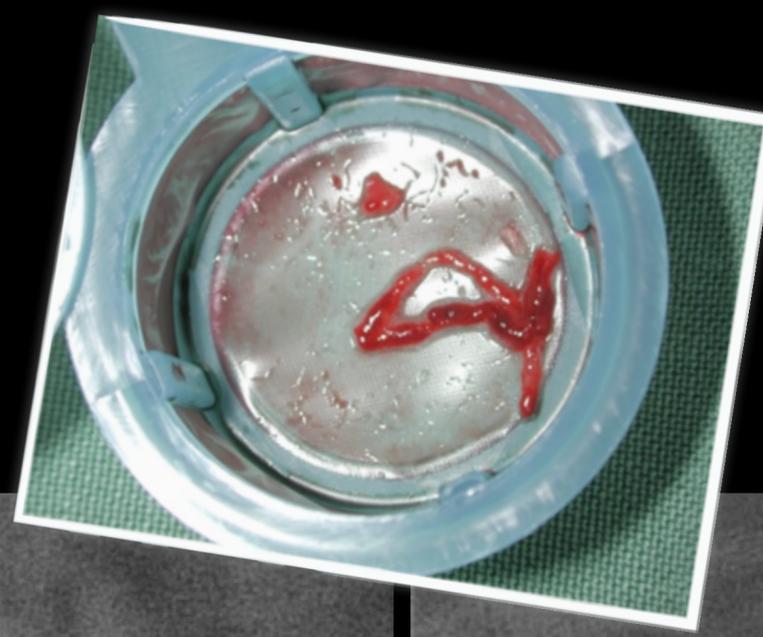
ASPIRER C'EST PAS SORCIER

et c'est pas cher ..

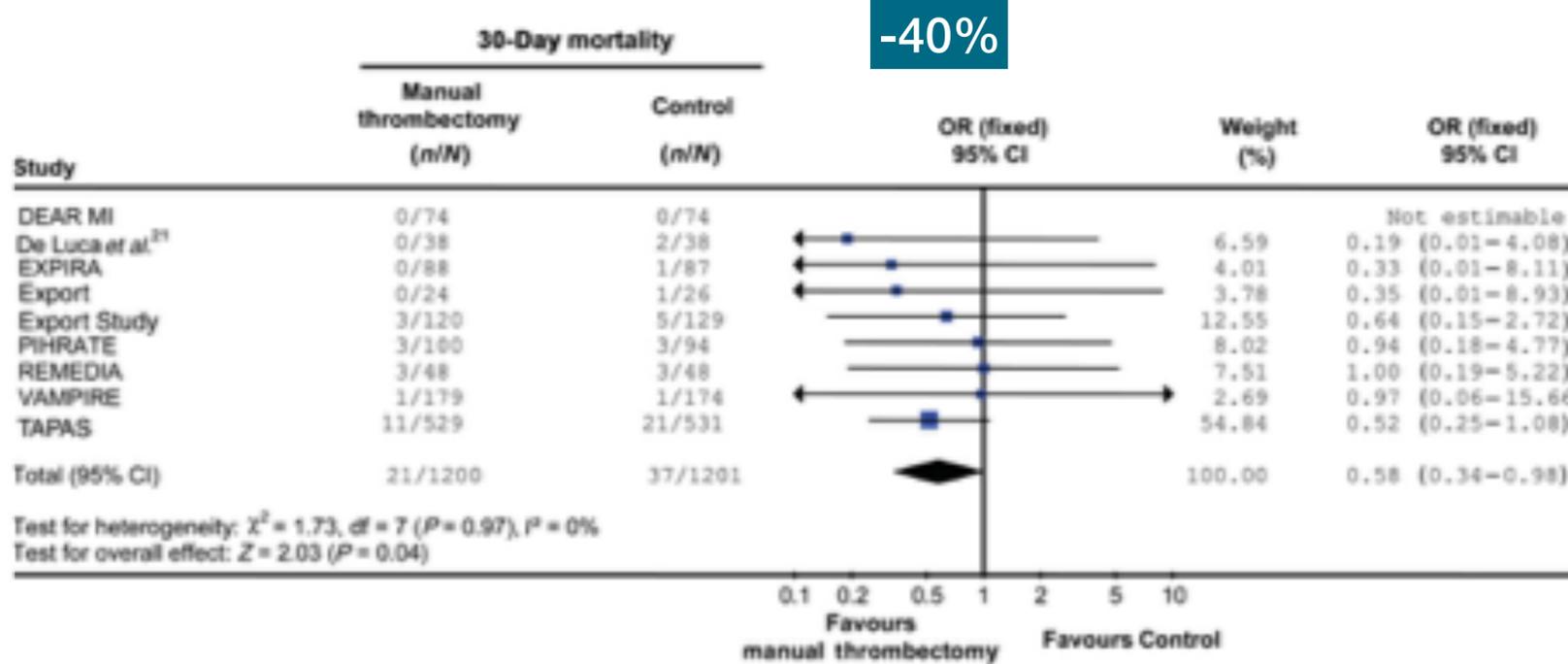
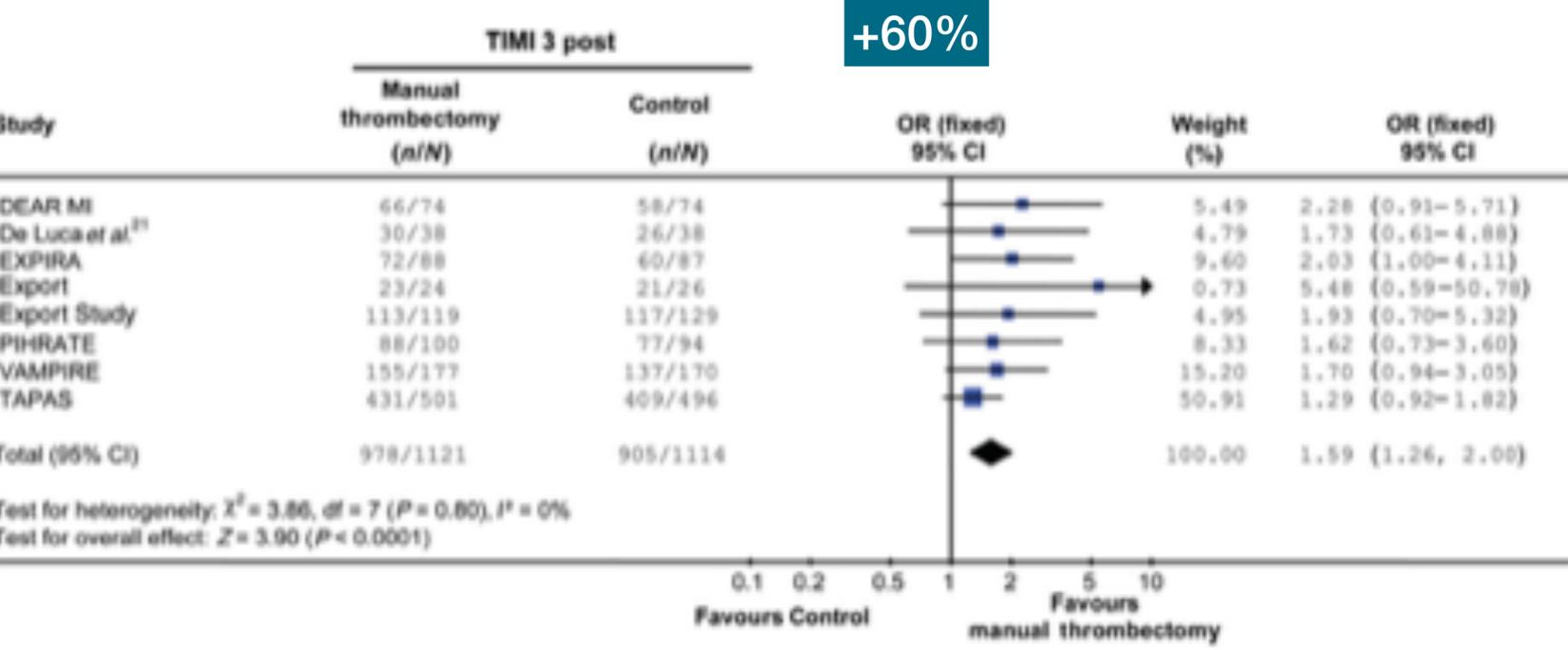
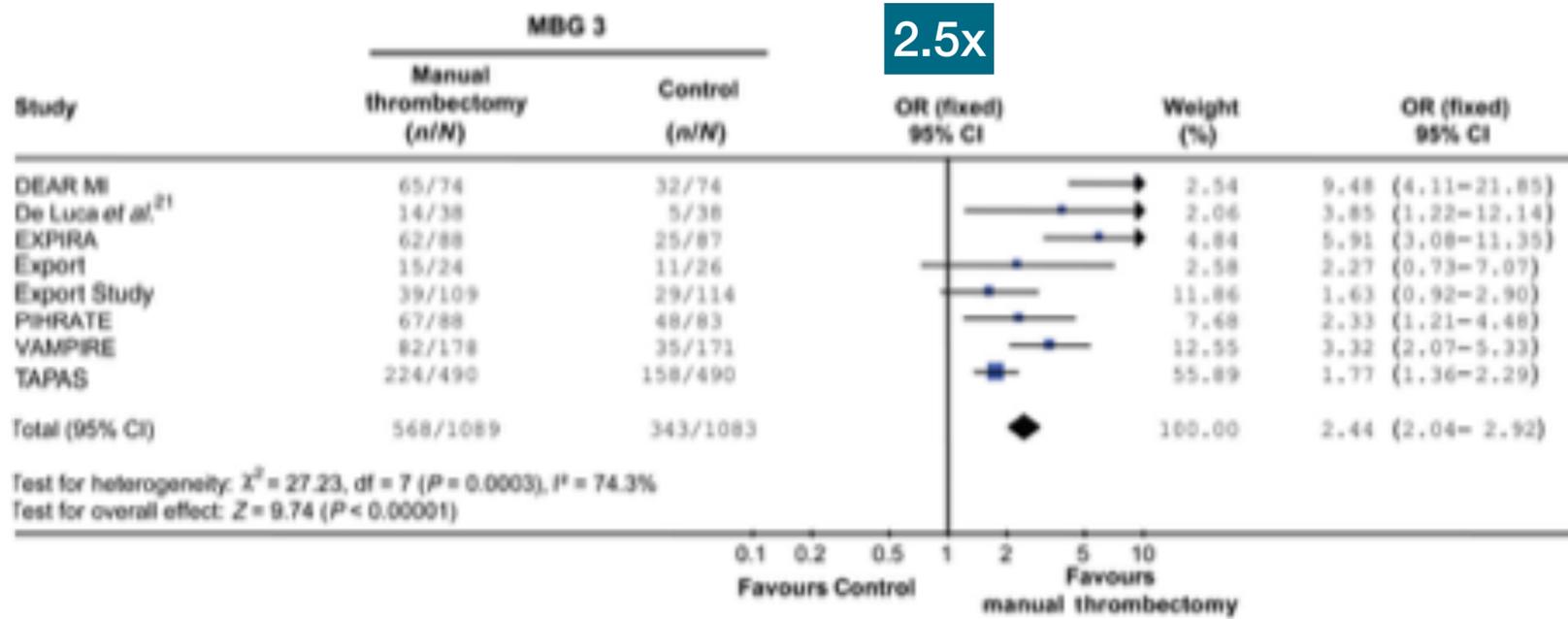
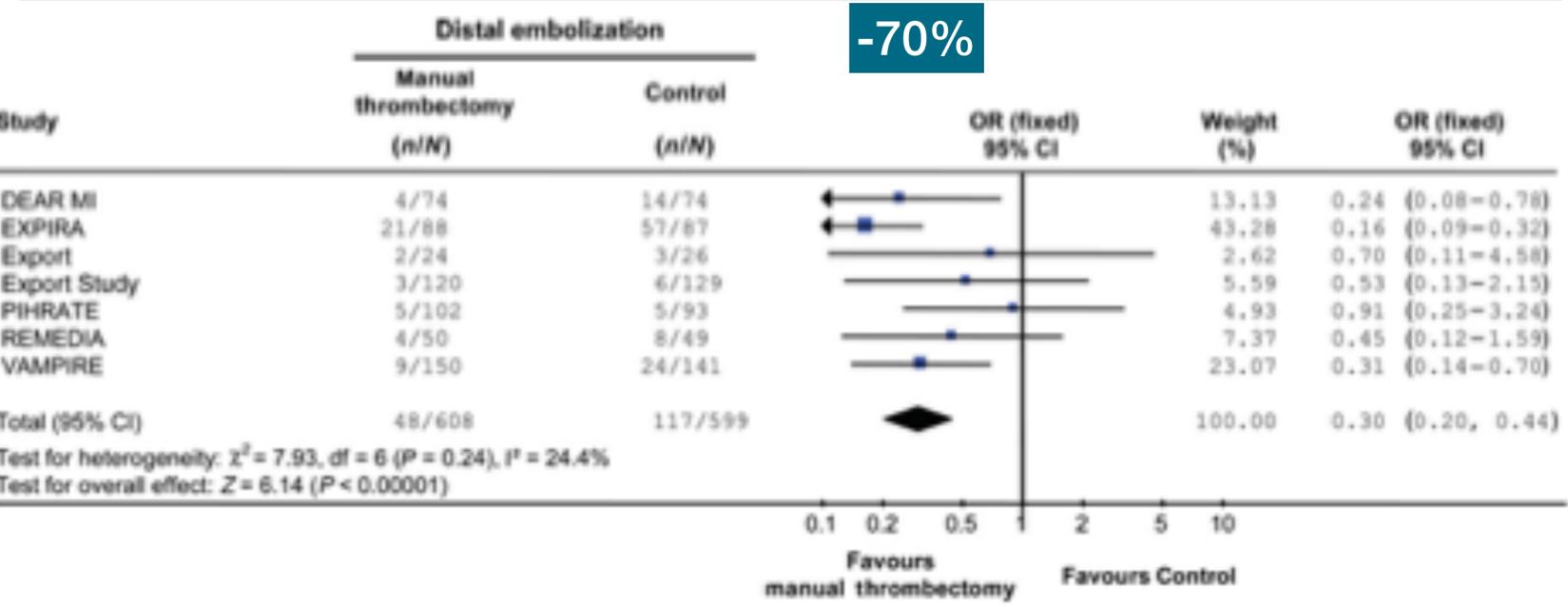


PARIS RHONE

Point #2 - ça marche !



Thrombectomie d'aspiration = 3x moins d'embolisation, 2x plus de flux coronarien normal et 40% en moins de mortalité à 30 jours



De Luca et al., European Heart Journal (2008) 29, 3002-3010

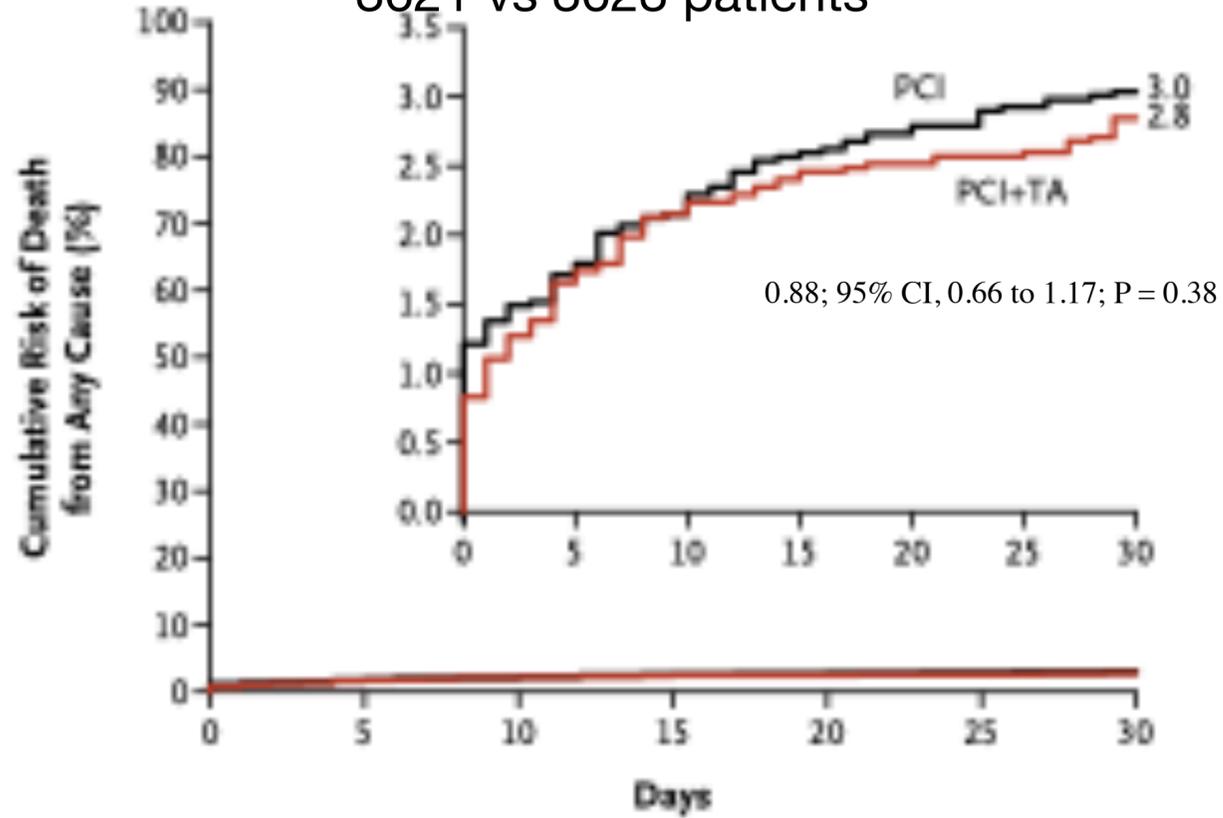
Ca marche pas toujours !



5 6 7
JUN 2019

Thrombus Aspiration in ST-Elevation Myocardial Infarction in Scandinavia (TASTE) trial

2014, SCAAR,
Export, Eliminate, OXT, or Pronto
3621 vs 3623 patients

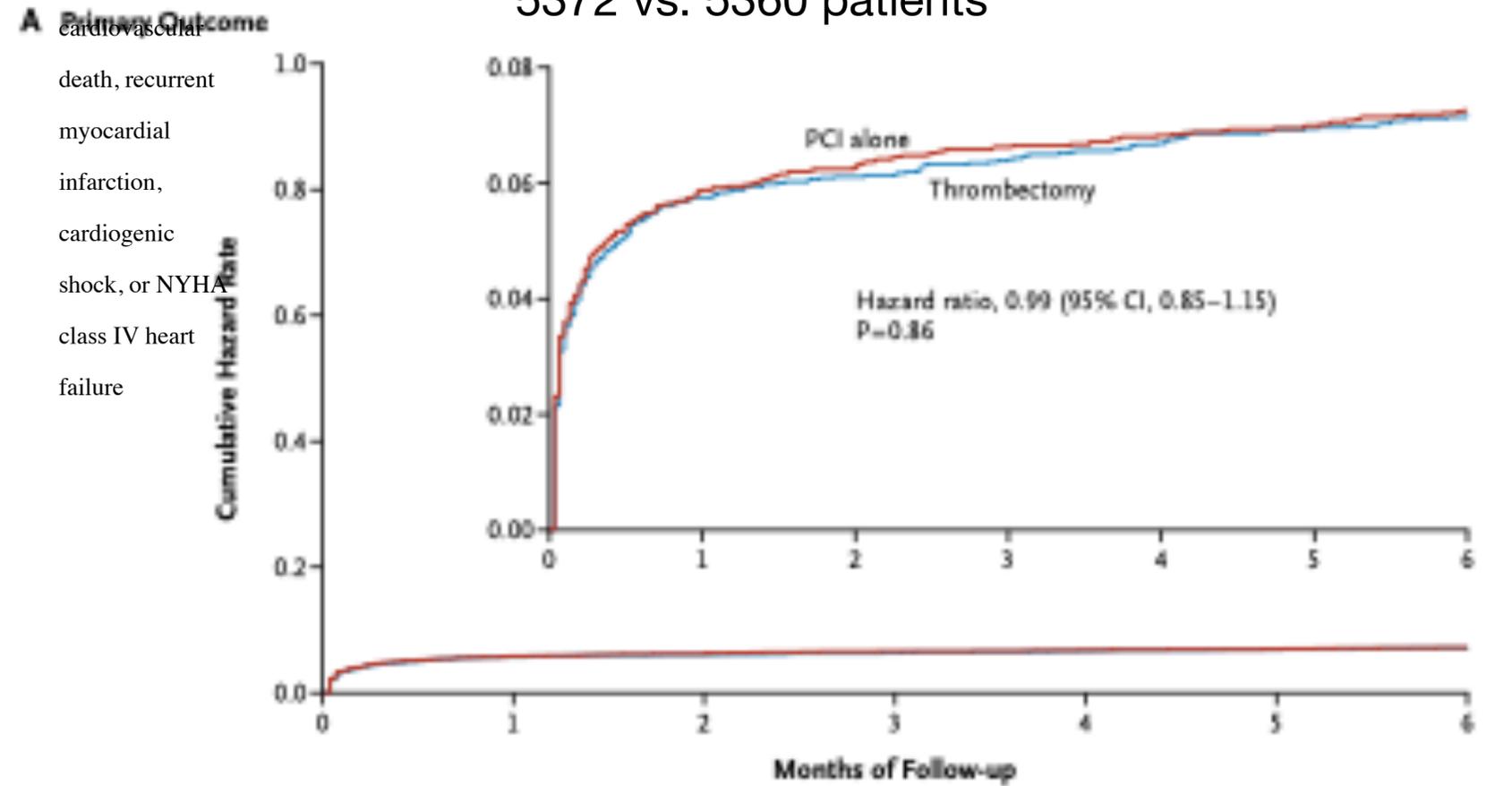


No. at Risk	0	5	10	15	20	25	30
PCI+TA	3621	3568	3540	3532	3526	3524	3519
PCI	3623	3567	3545	3530	3523	3517	3513

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Trial of Routine Aspiration Thrombectomy with PCI versus PCI Alone in Patients with STEMI (TOTAL)

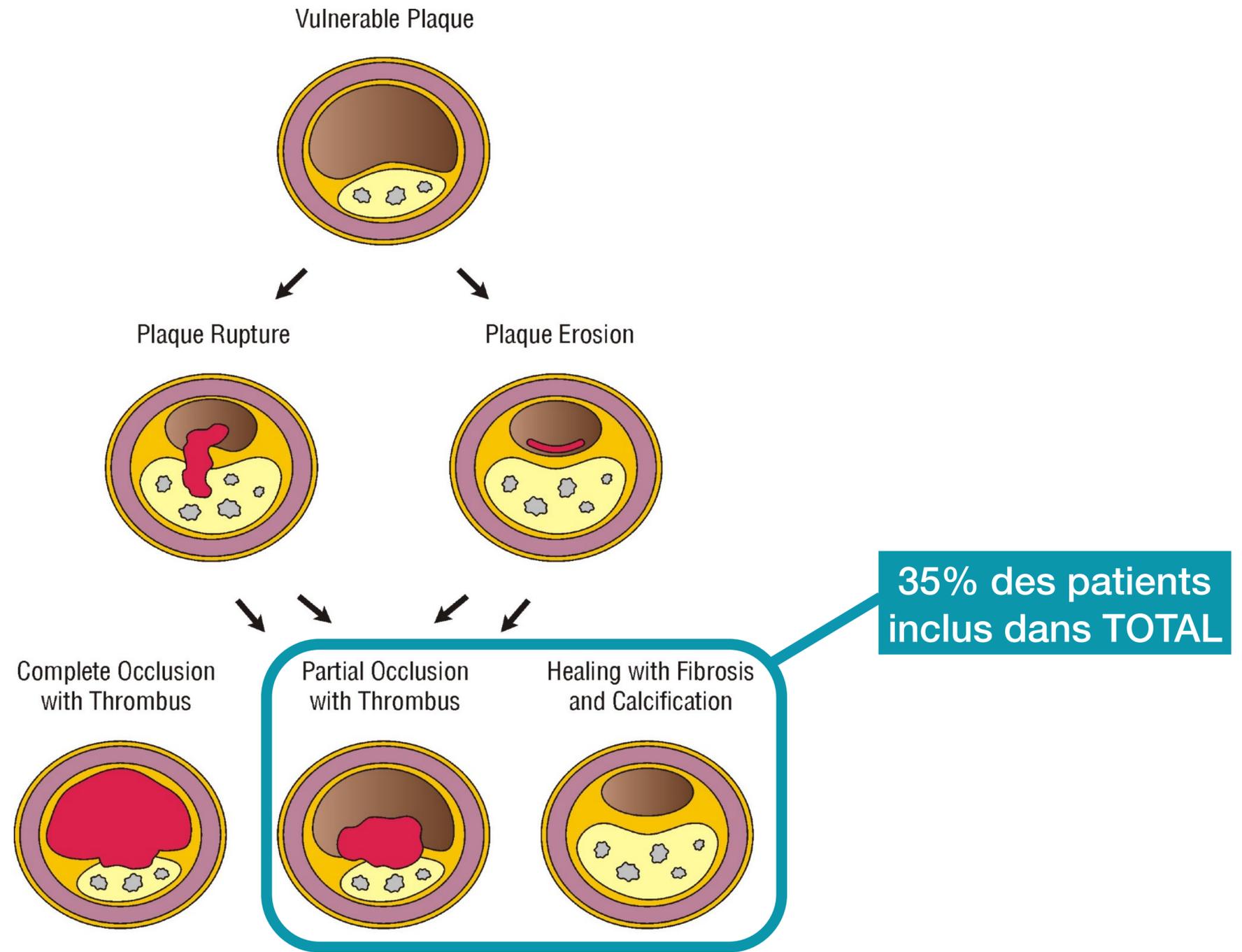
2015, Canada, EU, Chine, Australie
Export 6/7F (XT, AP, and ADVANCE)
5372 vs. 5360 patients



No. at Risk	0	1	2	3	4	5	6
Thrombectomy	5033	4734	4696	4678	4662	4647	4628
PCI alone	5030	4727	4688	4666	4653	4642	4618

Jolly SS et al, NEJM, 2015

SCA - Pas tous les mêmes



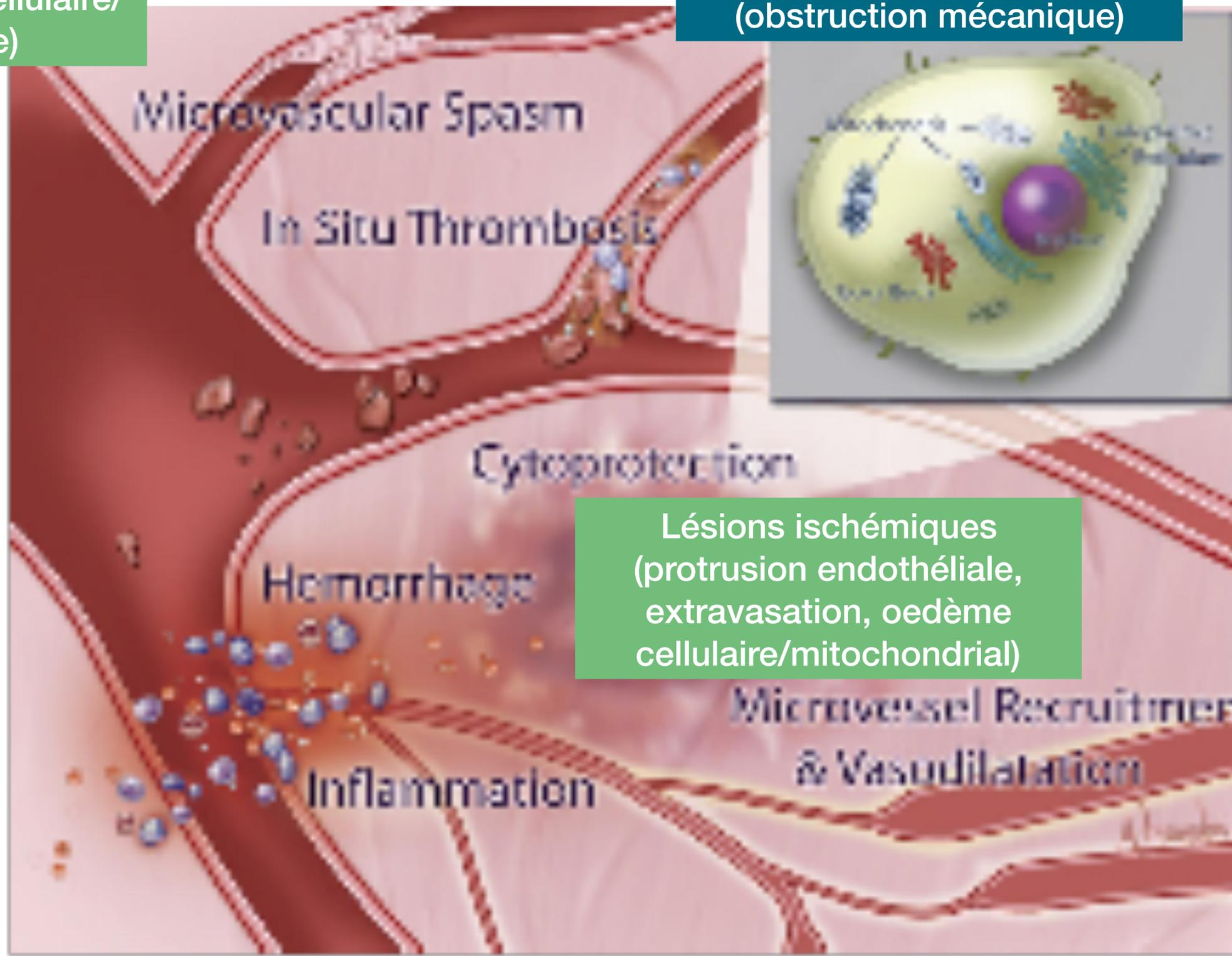
Thrombectomie

Ballon

Quid des obstructions micro vasculaires - plusieurs mécanismes

Lésions de reperfusion
(Spasmes, rupture cellulaire/
mitochondriale)

Embolisation distale
(obstruction mécanique)

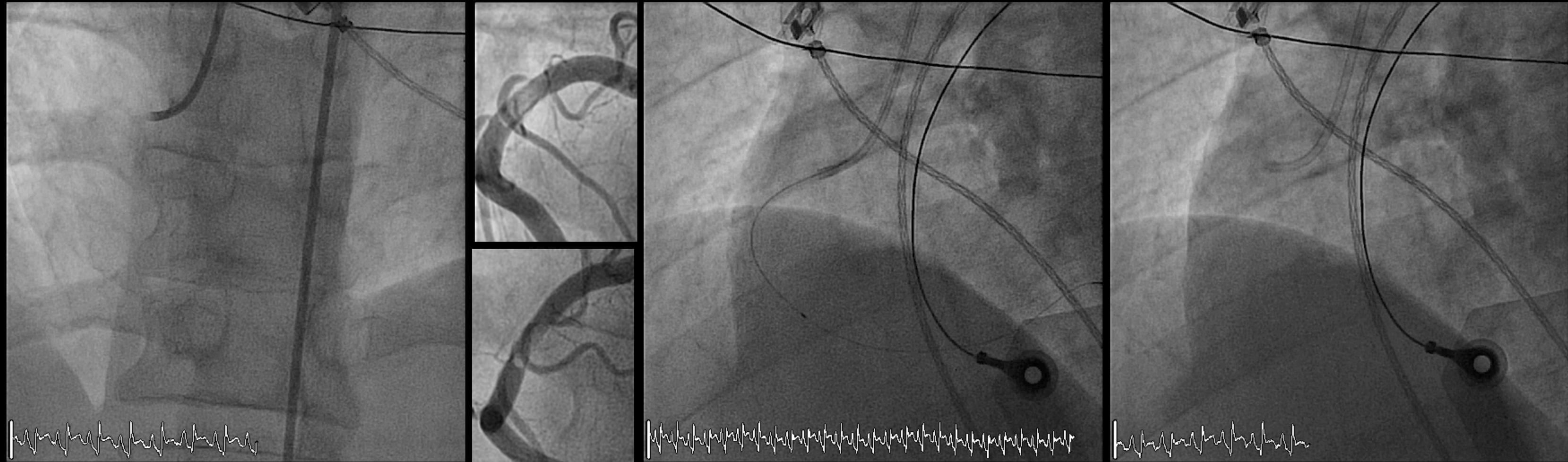


Lésions ischémiques
(protrusion endothéliale,
extravasation, oedème
cellulaire/mitochondrial)

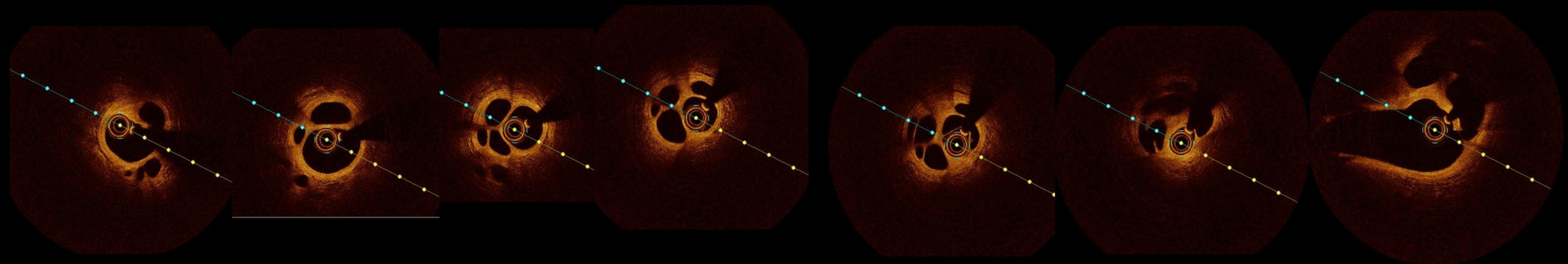
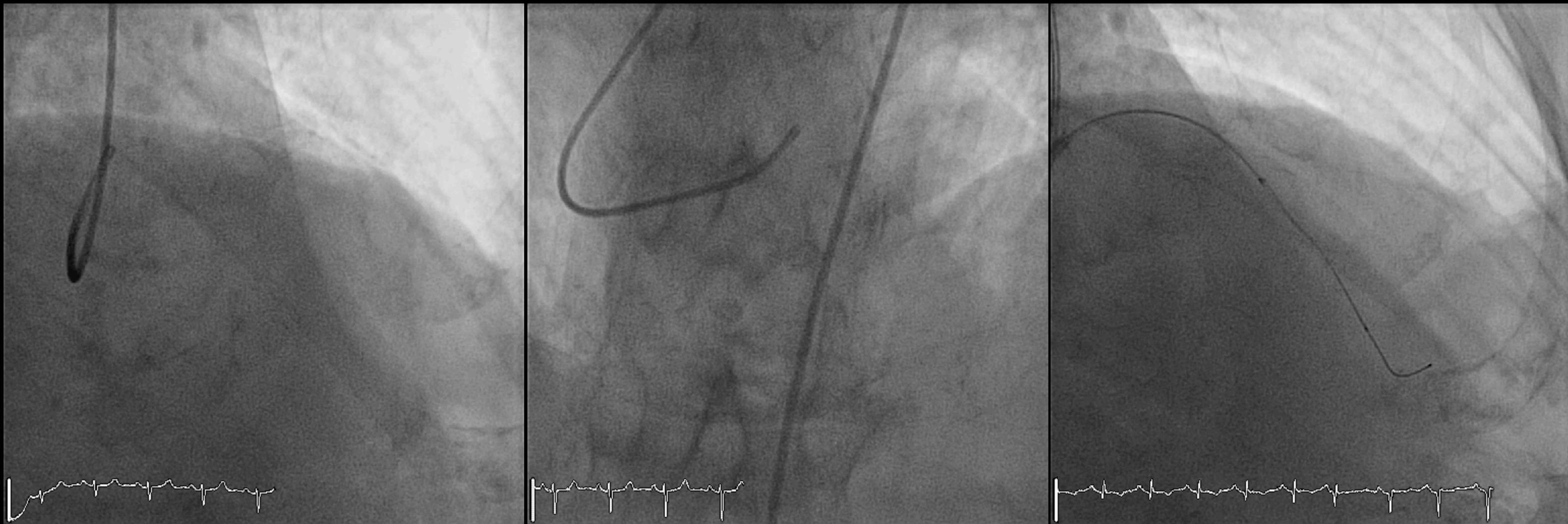
(MPTP) mitochondrial permeability transition pore

Jaffe et al, J Am Coll Cardiol Intv 2010;3:695-704

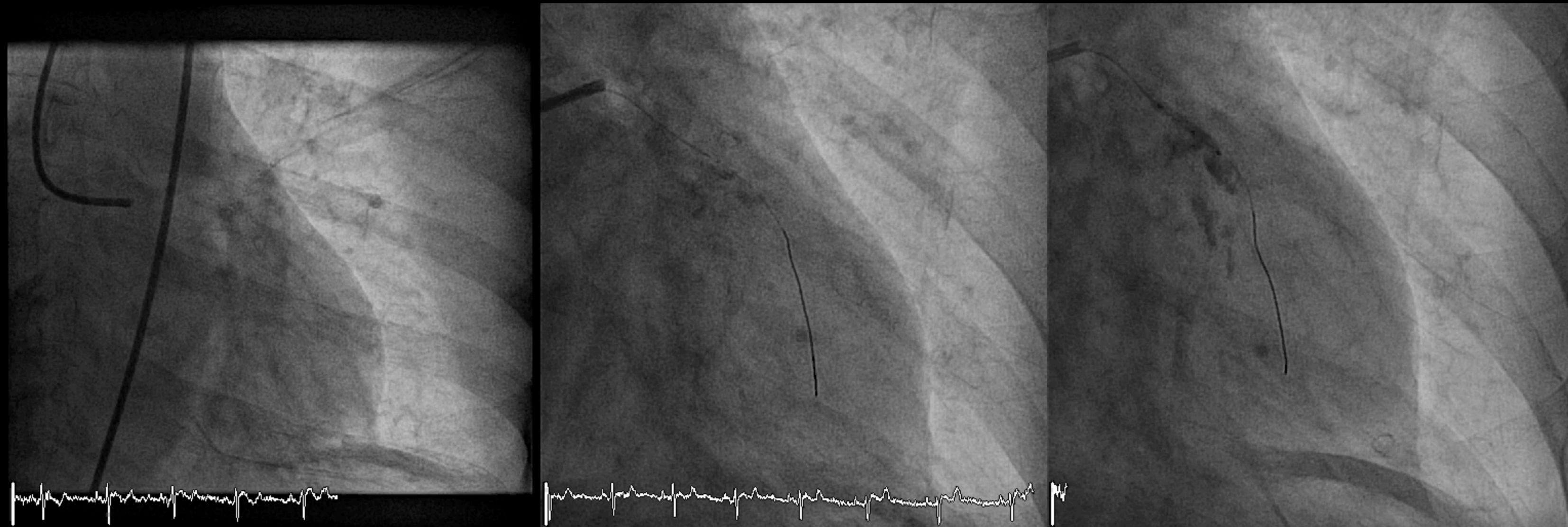
● Les thrombi sont très adhérents

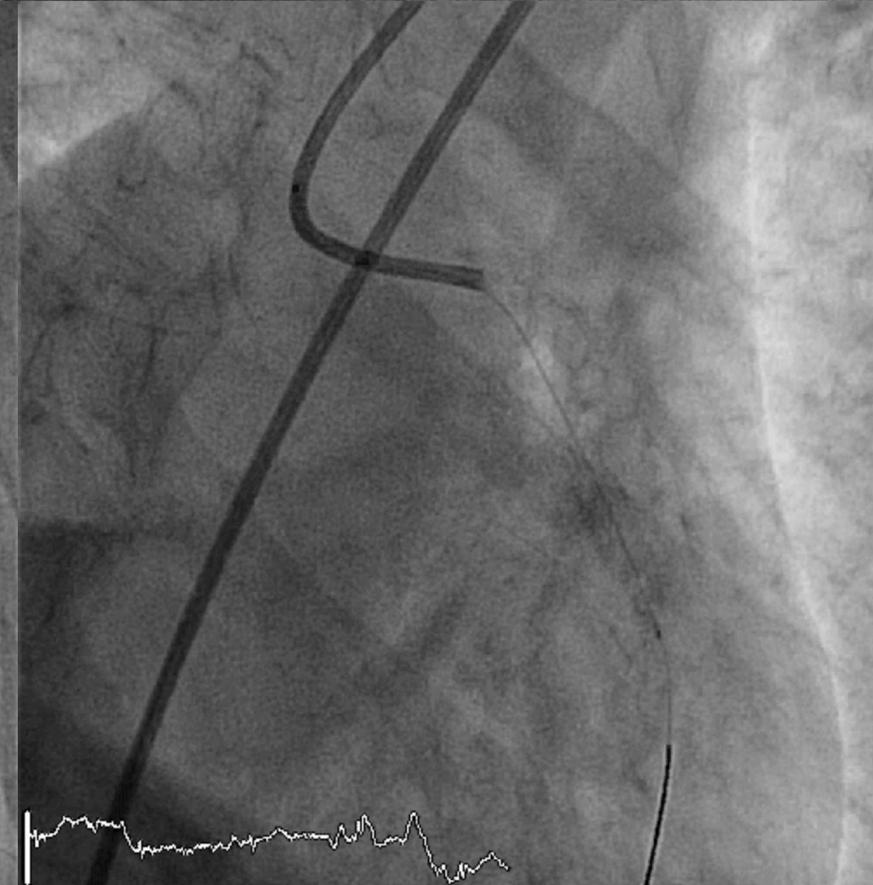
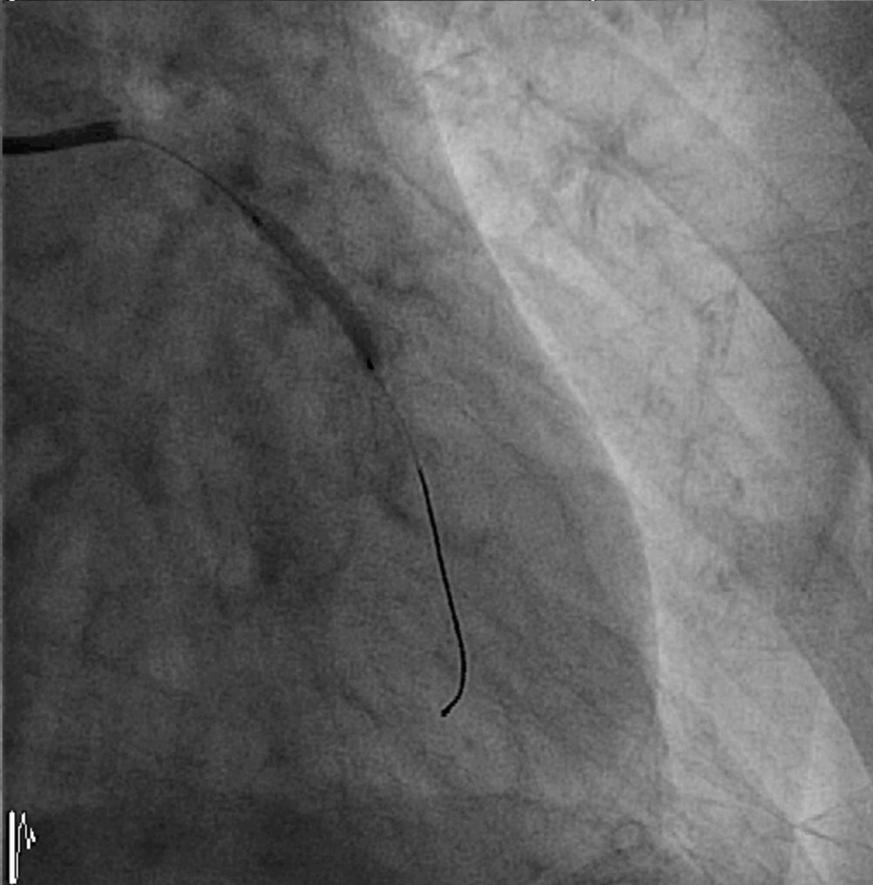
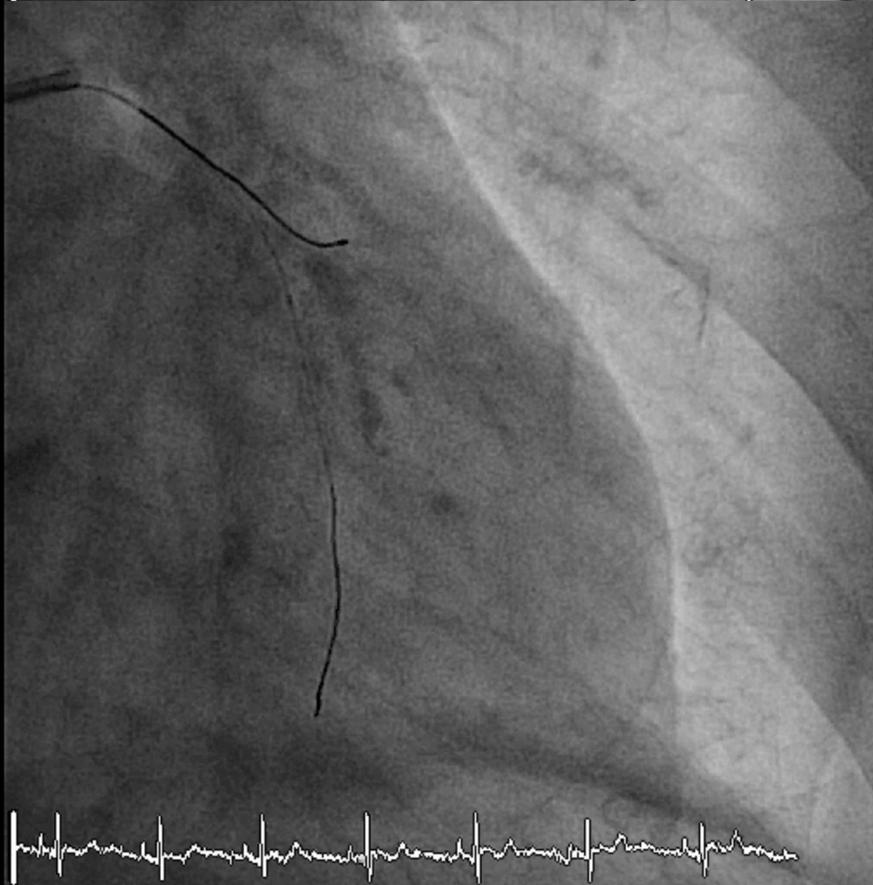
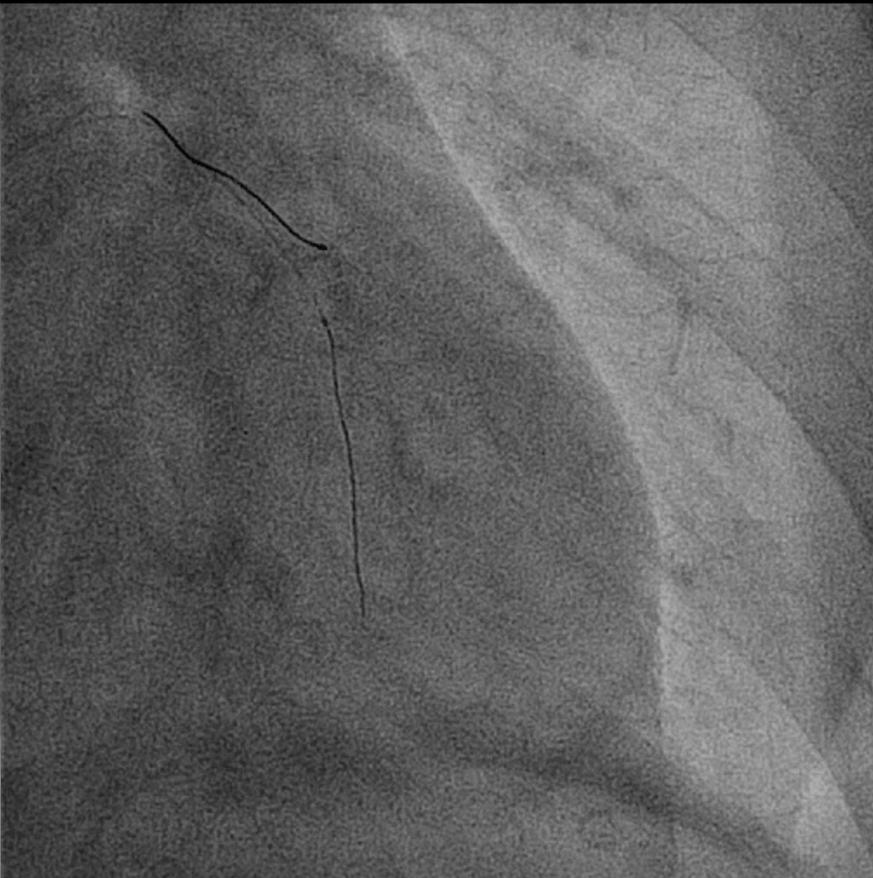
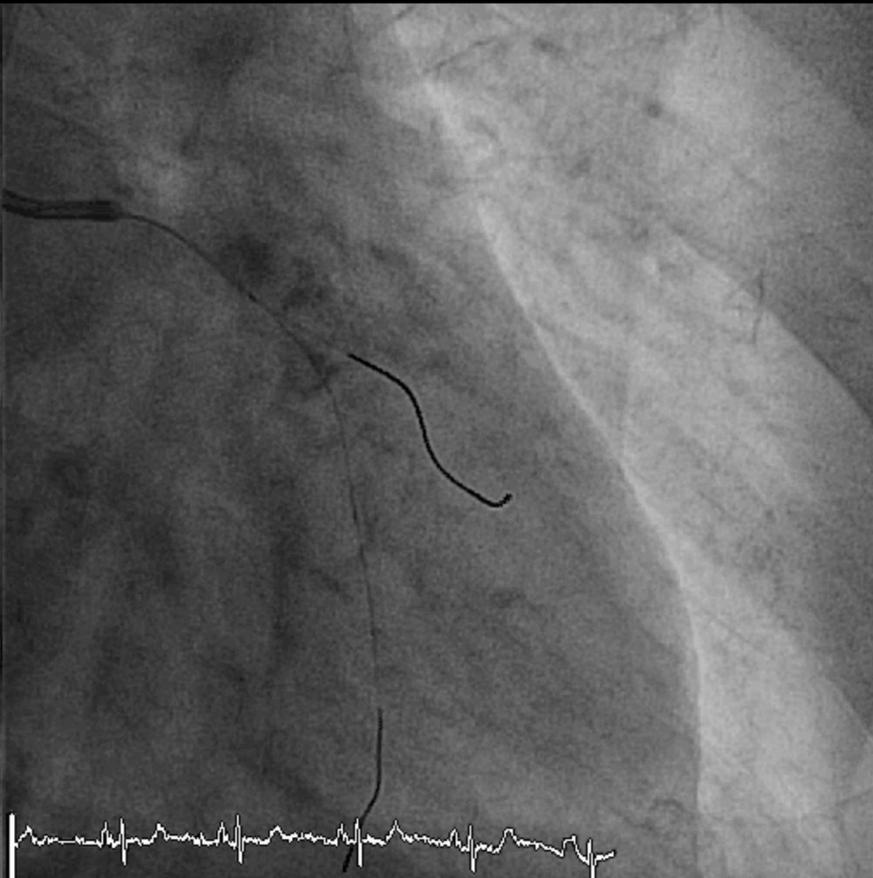
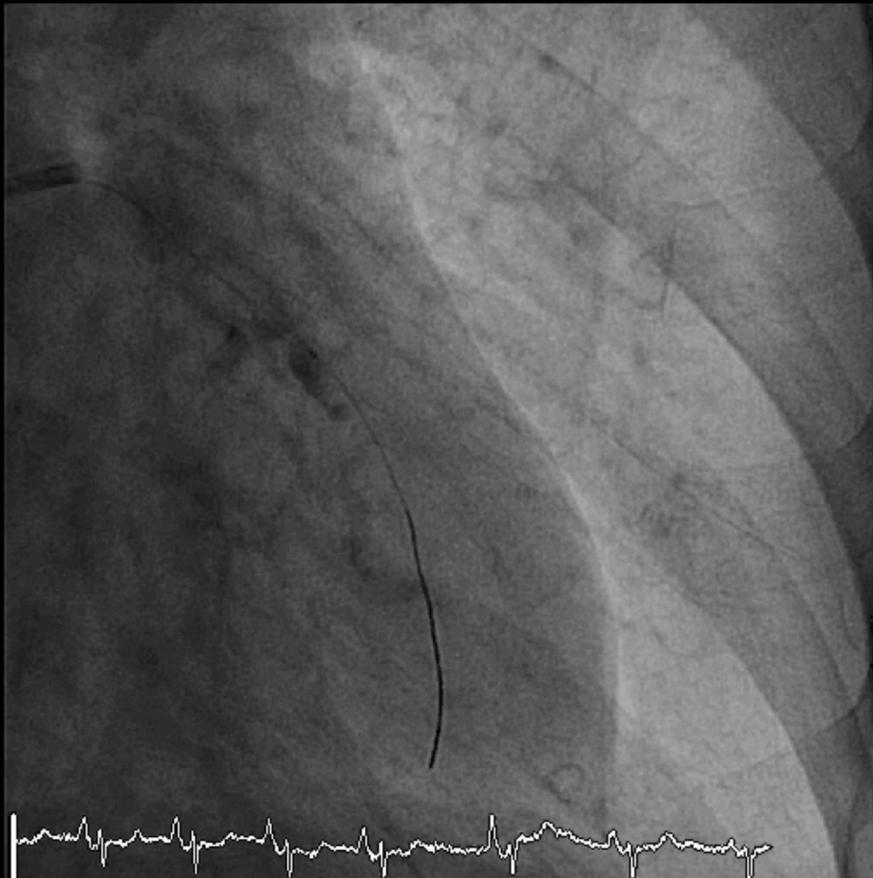


● Surtout les vieux ...



de temps en temps, le cath de thromboaspiration ne
passe pas et y'a une raison





Point #3 - Pas de thrombus, pas de besoin d'aspirer

TOTAL

(8983 avec thrombus vs. 1073 sans -!)

TABLE 2 Thrombus Aspiration Versus PCI Alone for High and Low Thrombus Subgroups

	Thrombus Aspiration*	PCI Alone*	HR (95% CI)	p Value	Interaction p Value
Primary outcome at 30 days					
High thrombus burden	263 (5.8)	272 (6.1)	0.95 (0.80-1.12)	0.54	0.24
Low thrombus burden	22 (4.4)	18 (3.2)	1.39 (0.75-2.60)	0.30	
Stroke at 30 days					
High thrombus burden	31 (0.7)	16 (0.4)	1.90 (1.04-3.48)	0.03	0.99
Low thrombus burden	2 (0.4)	0 (0.0)	Not estimable	0.13	
All-cause death at 30 days					
High thrombus burden	111 (2.5)	136 (3.1)	0.80 (0.62-1.03)	0.08	0.37
Low thrombus burden	8 (1.6)	7 (1.2)	1.29 (0.47-3.57)	0.62	
CV death at 30 days					
High thrombus burden	107 (2.4)	134 (3.0)	0.78 (0.61-1.01)	0.06	0.24
Low thrombus burden	8 (1.6)	6 (1.1)	1.51 (0.52-4.36)	0.44	
MI at 30 days					
High thrombus burden	69 (1.5)	58 (1.3)	1.17 (0.82-1.66)	0.39	0.40
Low thrombus burden	5 (1.0)	8 (1.4)	0.71 (0.23-2.16)	0.54	
Class IV heart failure at 30 days					
High thrombus burden	78 (1.7)	71 (1.6)	1.08 (0.78-1.49)	0.65	0.34
Low thrombus burden	7 (1.4)	4 (0.7)	1.99 (0.58-6.81)	0.26	
Cardiogenic shock at 30 days					
High thrombus burden	84 (1.9)	94 (2.1)	0.88 (0.65-1.18)	0.38	0.32
Low thrombus burden	6 (1.2)	4 (0.7)	1.70 (0.48-6.04)	0.41	
Definite stent thrombosis at 30 days					
High thrombus burden	46 (1.0)	53 (1.2)	0.85 (0.57-1.26)	0.42	0.64
Low thrombus burden	6 (1.2)	6 (1.1)	1.13 (0.36-3.51)	0.83	
Target vessel revascularization at 30 days					
High thrombus burden	113 (2.5)	113 (2.6)	0.98 (0.75-1.27)	0.88	0.89
Low thrombus burden	14 (2.8)	17 (3.0)	0.93 (0.46-1.89)	0.84	
Primary outcome at 1 yr					
High thrombus burden	364 (8.1)	366 (8.3)	0.97 (0.84-1.13)	0.72	0.41
Low thrombus burden	30 (6.0)	28 (5.0)	1.22 (0.73-2.05)	0.44	
All-cause death at 1 yr					
High thrombus burden	197 (4.4)	209 (4.7)	0.92 (0.76-1.12)	0.42	0.46
Low thrombus burden	16 (3.2)	15 (2.7)	1.21 (0.60-2.46)	0.59	
CV death at 1 yr					
High thrombus burden	165 (3.7)	183 (4.1)	0.88 (0.72-1.09)	0.25	0.17
Low thrombus burden	13 (2.6)	9 (1.6)	1.64 (0.70-3.84)	0.25	
MI at 1 yr					
High thrombus burden	114 (2.6)	103 (2.4)	1.08 (0.83-1.41)	0.55	0.53
Low thrombus burden	11 (2.2)	15 (2.7)	0.83 (0.38-1.81)	0.64	
Class IV heart failure at 1 yr					
High thrombus burden	98 (2.2)	92 (2.1)	1.04 (0.78-1.39)	0.77	0.22
Low thrombus burden	8 (1.6)	4 (0.7)	2.28 (0.69-7.57)	0.17	
Cardiogenic shock at 1 yr					
High thrombus burden	89 (2.0)	100 (2.3)	0.87 (0.66-1.16)	0.35	0.48
Low thrombus burden	6 (1.2)	5 (0.9)	1.36 (0.41-4.47)	0.61	
Definite stent thrombosis at 1 yr					
High thrombus burden	59 (1.3)	65 (1.5)	0.89 (0.62-1.26)	0.51	0.94
Low thrombus burden	6 (1.2)	8 (1.4)	0.85 (0.29-2.45)	0.76	
Target vessel revascularization at 1 yr					
High thrombus burden	247 (5.6)	222 (5.2)	1.09 (0.91-1.30)	0.36	0.49
Low thrombus burden	27 (5.5)	34 (6.1)	0.90 (0.54-1.49)	0.68	

Values are n (%), unless otherwise indicated. *Percent from Kaplan-Meier Estimates.
CV = cardiovascular; other abbreviations as in Table 1.

TABLE 2 Thrombus Aspiration Versus PCI Alone for High and Low Thrombus Subgroups

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Primary outcome at 30 days					
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Low thrombus burden	22 (4.4)	18 (3.2)	1.39 (0.75-2.60)	0.30	
All-cause death at 30 days					
High thrombus burden	111 (2.5)	136 (3.1)	0.80 (0.62-1.03)	0.08	0.37
Low thrombus burden	8 (1.6)	7 (1.2)	1.29 (0.47-3.57)	0.62	
CV death at 30 days					
High thrombus burden	107 (2.4)	134 (3.0)	0.78 (0.61-1.01)	0.06	0.24
Low thrombus burden	8 (1.6)	6 (1.1)	1.51 (0.52-4.36)	0.44	

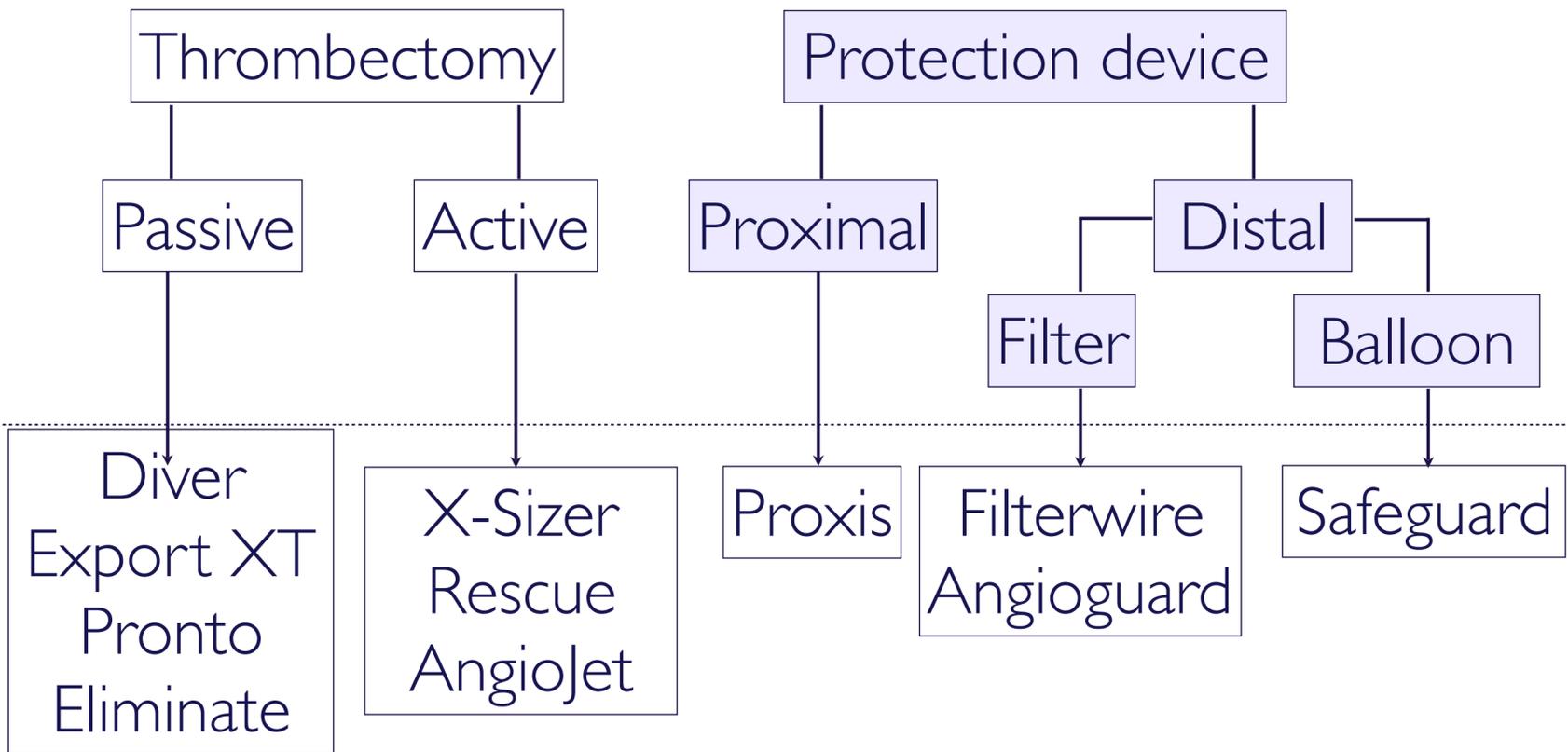
cardiovascular death, recurrent myocardial infarction, cardiogenic shock, or NYHA class IV heart failure

Jolly S, et al. J Am Coll Cardiol 2018;72:1589-96

Point #4 - Plusieurs systèmes ..



Embololic protection device in STEMI



Inclus dans des études		
	Export	13506
	Pronto	2563
	Eliminate	2559
Quid de différences ?	Diver CE	508
	NiPro	355
	Rescue	215
	Thrombuster II	186

Point #5 - Risque d'AVC .. ?

Trial of Routine Aspiration Thrombectomy with PCI versus PCI Alone in Patients with STEMI (TOTAL)

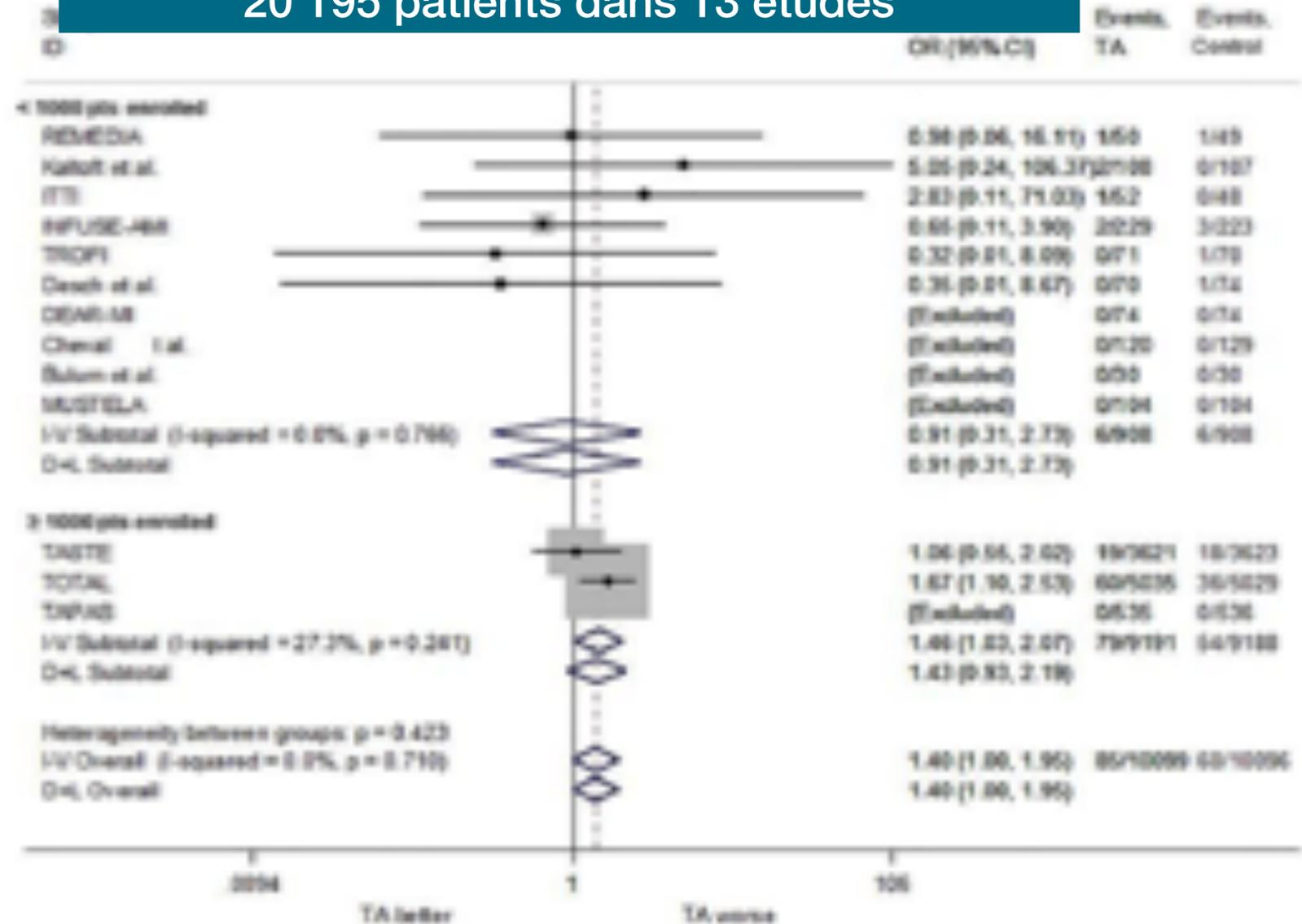
Table 3. Primary and Secondary Outcomes.

Outcome	Thrombectomy (N=5033) no. (%)	PCI Alone (N=5030) no. (%)	Hazard Ratio (95% CI)*	P Value
Primary outcome within 180 days: cardiovascular death, recurrent myocardial infarction, cardiogenic shock, or NYHA class IV heart failure	347 (6.9)	351 (7.0)	0.99 (0.85–1.15)	0.86
Cardiovascular death within 180 days	157 (3.1)	174 (3.5)	0.90 (0.73–1.12)	0.34
Recurrent myocardial infarction within 180 days	99 (2.0)	92 (1.8)	1.07 (0.81–1.43)	0.62
Cardiogenic shock within 180 days	92 (1.8)	100 (2.0)	0.92 (0.69–1.22)	0.56
NYHA class IV heart failure within 180 days	98 (1.9)	90 (1.8)	1.09 (0.82–1.45)	0.57
Cardiovascular death, recurrent myocardial infarction, cardiogenic shock, NYHA class IV heart failure, stent thrombosis, or target-vessel revascularization within 180 days	497 (9.9)	494 (9.8)	1.00 (0.89–1.14)	0.95
Stent thrombosis within 180 days	77 (1.5)	87 (1.7)	0.88 (0.65–1.20)	0.42
Definite stent thrombosis within 180 days	64 (1.3)	68 (1.4)	0.94 (0.67–1.32)	0.72
Target-vessel revascularization within 180 days	225 (4.5)	218 (4.3)	1.03 (0.85–1.24)	0.77
Major bleeding within 180 days	79 (1.6)	77 (1.5)	1.02 (0.75–1.40)	0.89
Key safety outcome: stroke within 30 days	33 (0.7)	16 (0.3)	2.06 (1.13–3.75)	0.02
Net-benefit outcome within 180 days: cardiovascular death, recurrent myocardial infarction, cardiogenic shock, NYHA class IV heart failure, or stroke	377 (7.5)	364 (7.2)	1.04 (0.90–1.20)	0.64

* Hazard ratios are for the thrombectomy group as compared with the PCI-alone group. NYHA denotes New York Heart Association.

Jolly SS et al, NEJM, 2015

Meta-Analyse 2018 20'195 patients dans 13 études



Taglieri et al., Acute Cardiovasc Care, 2018

⚠ Risque d'AVC plus est uniquement déterminée par l'étude TOTAL
 ⚠ L'association est faible car la limite inférieure de l'IC
 ⚠ En prenant les deux études les plus importantes [TASTE (n = 7244) et TOTAL (n = 10 732)], l'hétérogénéité conduit à une différence non significative

Thrombus Aspiration in ST-Elevation Myocardial Infarction in Scandinavia (TASTE) trial

	Thrombus Aspiration (N = 3621)	PCI Only (N = 3623)	Point Estimate (95% CI)	P Value
30 days				
All-cause death — no./total no. (%)	103/3621 (2.8)	110/3623 (3.0)	Hazard ratio, 0.94 (0.72–1.22)	0.63
Rehospitalization due to reinfarction — no. (%)	19 (0.5)	31 (0.9)	Hazard ratio, 0.61 (0.34–1.07)	0.09
Stent thrombosis — no. (%)†	9 (0.2)	19 (0.5)	Hazard ratio, 0.47 (0.20–1.02)	0.06
Target-vessel revascularization — no./total no. (%)	63/3498 (1.8)‡	76/3499 (2.2)‡	Hazard ratio, 0.83 (0.59–1.15)	0.27
Target-lesion revascularization — no./total no. (%)	43/3498 (1.2)‡	57/3499 (1.6)‡	Hazard ratio, 0.75 (0.51–1.12)	0.16
Index hospitalization				
Stroke or neurologic complication — no. (%)	19 (0.5)	18 (0.5)	Odds ratio, 1.06 (0.55–2.02)	0.87

Fröbert O et al, NEJM, 2014

Freund et al. Late-Presenting

Variable	Overall (n = 144)	Thrombus aspiration (n = 70)	Standard PCI only (n = 74)	p	Odds ratio (95% confidence interval)
Stroke	1/110 (1)	0/60 (0)	1/50 (2)	0.46	NA

TAPAS, TASTE & TOTAL

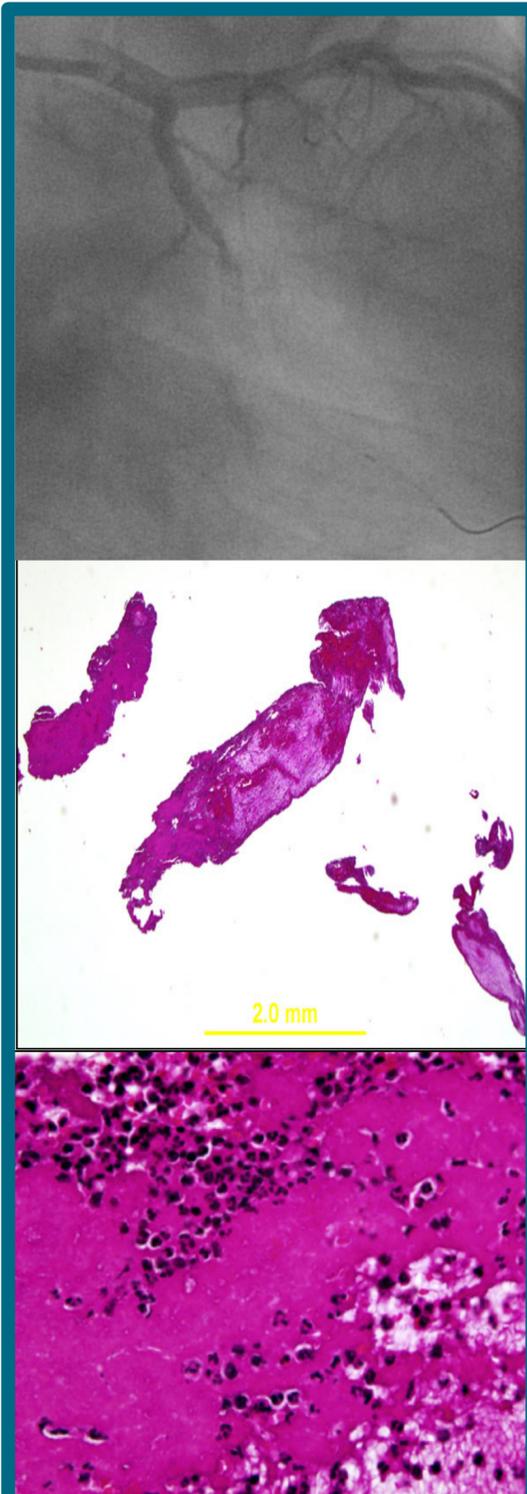
Outcome	Thrombus Aspiration N= 9155	PCI Alone N= 9151	HR	95% CI	P value
Primary Outcome					
Cardiovascular death at 30 days	221 (2.4)	262 (2.9)	0.84	0.70-1.01	0.06
Key Safety Outcome					
Stroke or TIA at 30 days*	66/8518 (0.8)	46/8476 (0.5)	1.43	0.98-2.1	0.06
Other Outcomes at 30 days					
All Cause death	232 (2.5)	273 (3.0)	0.85	0.71-1.01	0.06
Myocardial infarction	96 (1.0)	104 (1.1)	0.92	0.70-1.21	0.55
Congestive heart failure**	141/8653 (1.6)	128/8648 (1.5)	1.10	0.87-1.40	0.44
Target vessel revascularization	215 (2.3)	239 (2.6)	0.90	0.74-1.08	0.24
Cardiovascular death, MI, cardiogenic shock, congestive heart failure, stent thrombosis or target vessel revascularization**	604/8653 (7.0)	654/8648 (7.6)	0.92	0.82-1.03	0.14
Outcomes at 1 year					
Cardiovascular death	343 (3.7)	380 (4.2)	0.90	0.78-1.04	0.15
All cause death	426 (4.7)	464 (5.1)	0.91	0.80-1.04	0.18
Myocardial infarction	233 (2.5)	239 (2.6)	0.97	0.81-1.16	0.73
Congestive heart failure**	268/8653 (3.1)	258/8648 (3.0)	1.04	0.87-1.23	0.68
Target vessel revascularisation	495 (5.4)	504 (5.5)	0.97	0.86-1.10	0.68
Stroke or TIA*	128/8055 (1.6)	103/7990 (1.3)	1.24	0.95-1.61	0.11

*Data only available from TASTE and TOTAL trials and OR reported not HR.

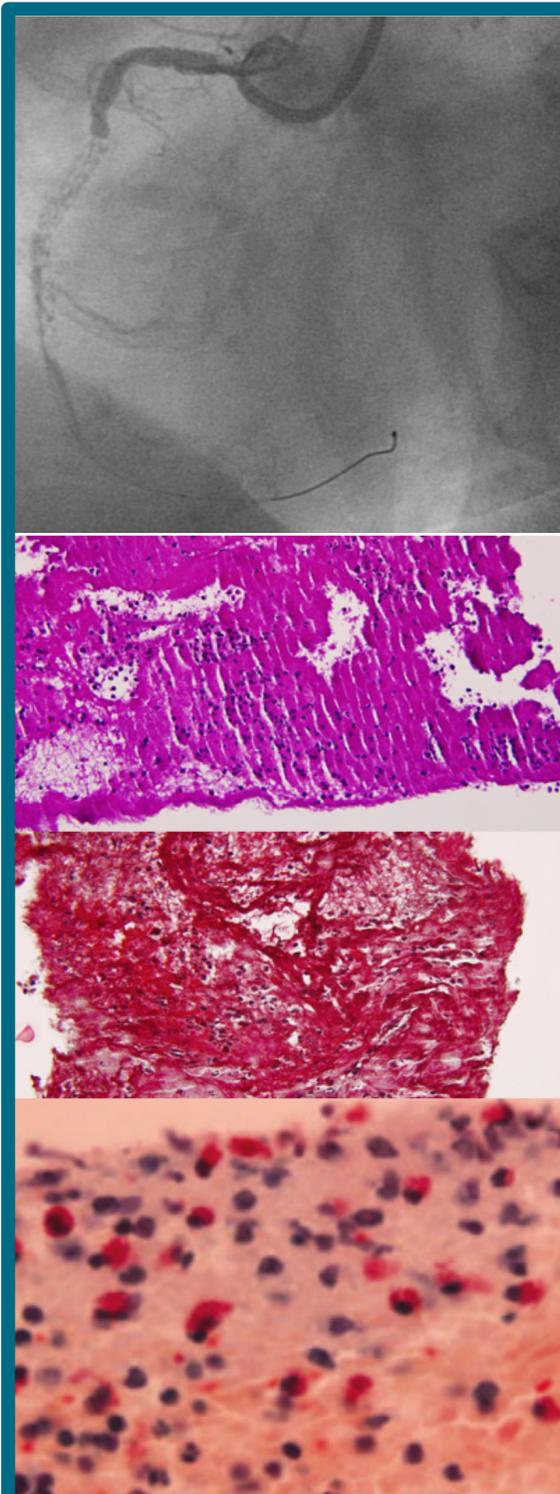
** Data only available from TASTE and TOTAL trials

Jolly, Circulation 2016

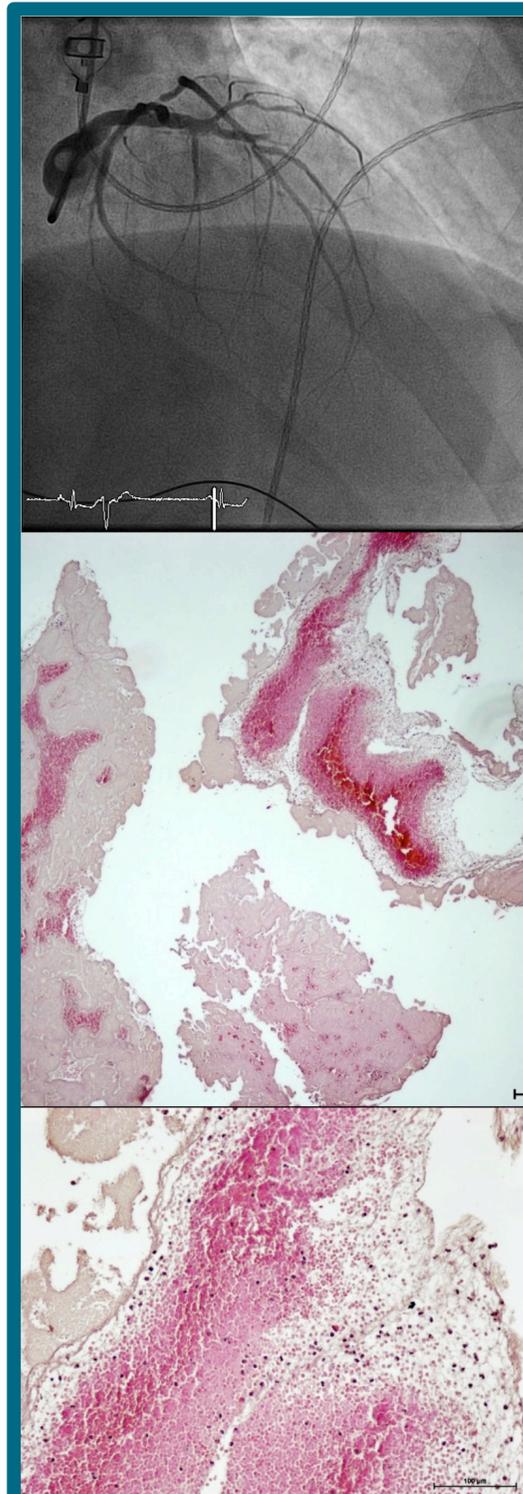
Point #6 - et on apprend des tas de trucs



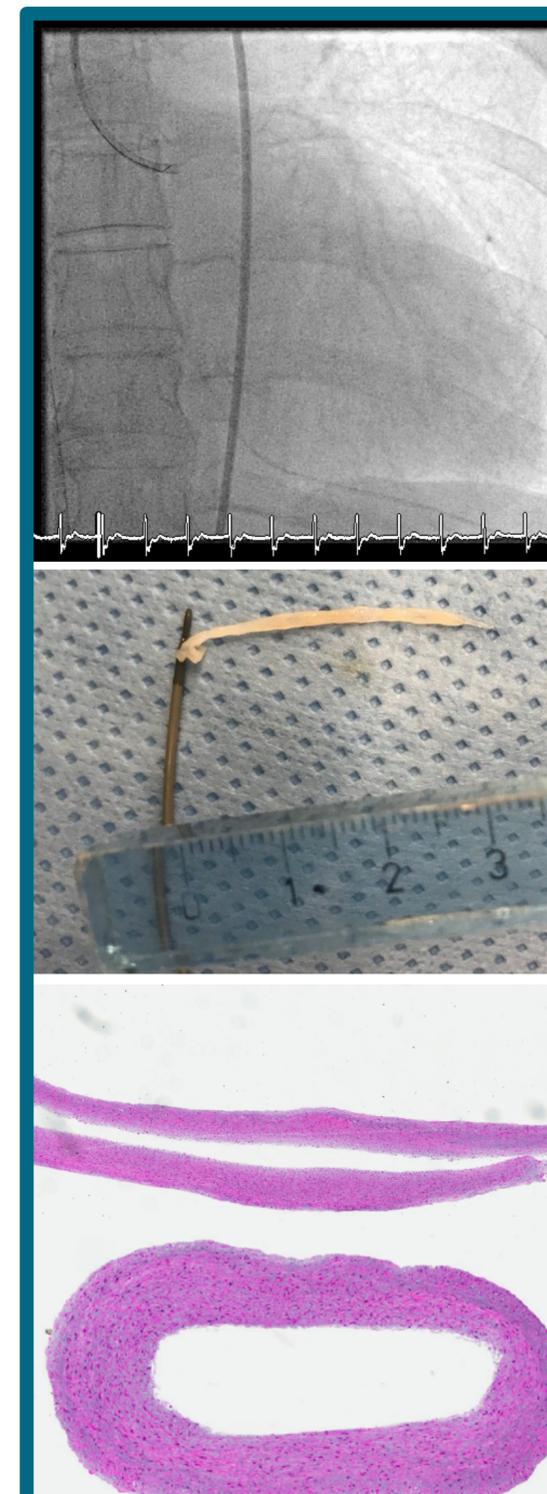
Taxus =
Neutrophiles



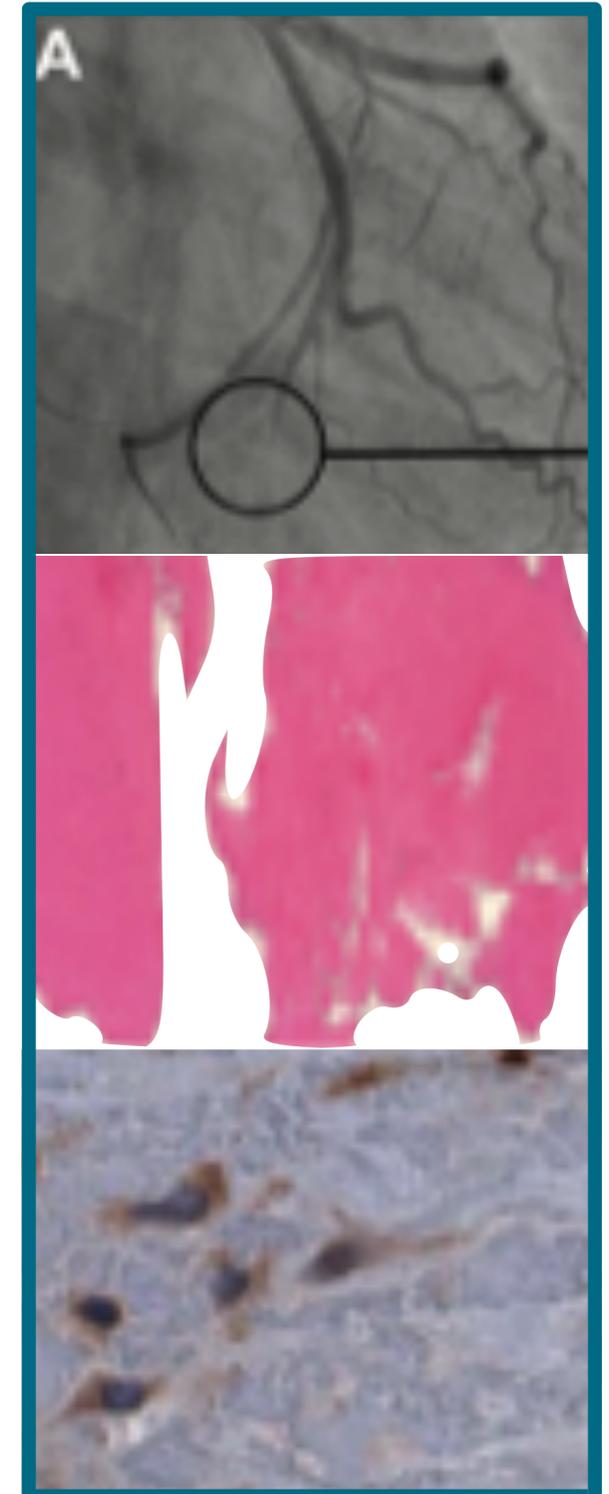
Cypher =
Eosinophiles



Absorb =
Degradation

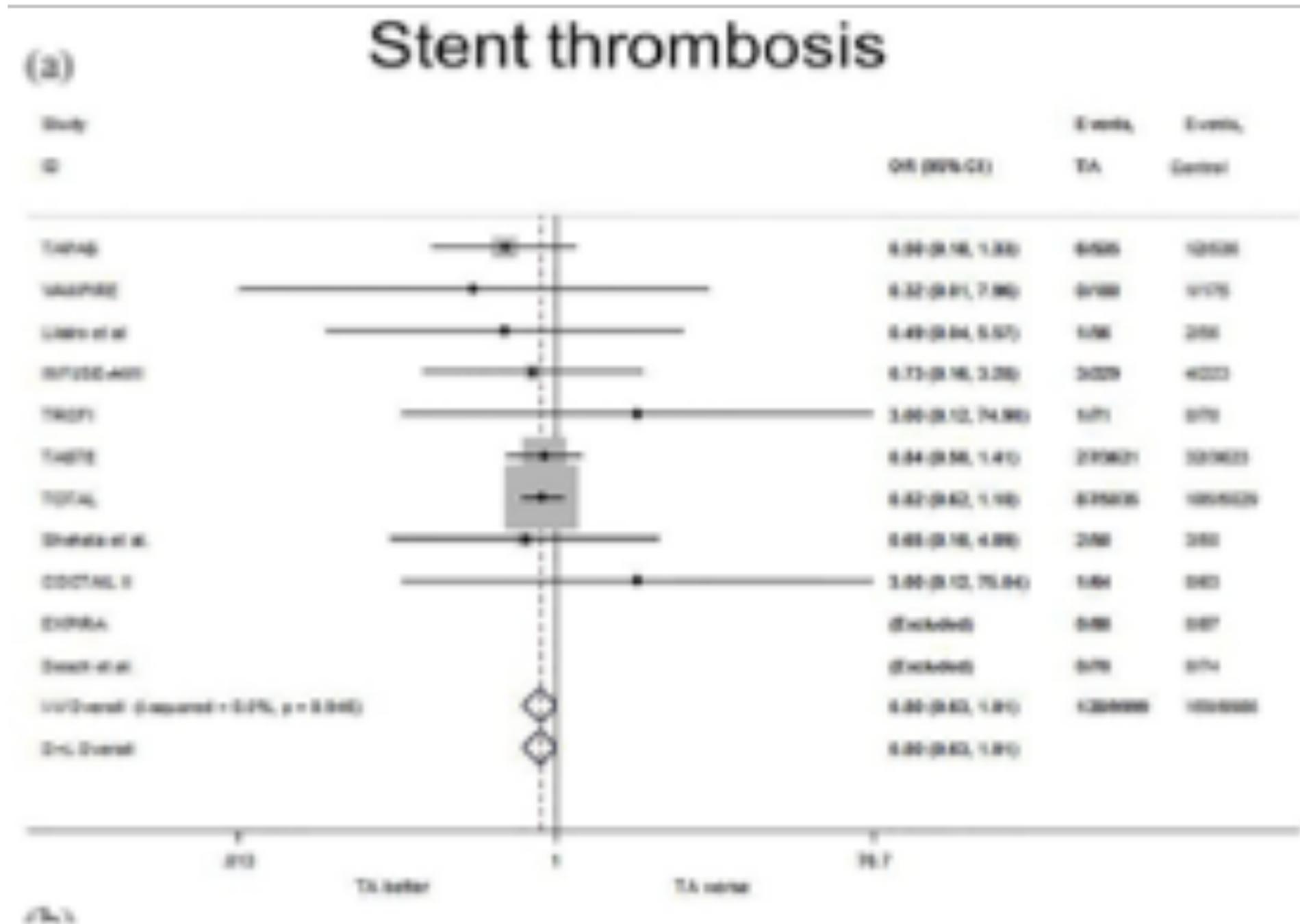


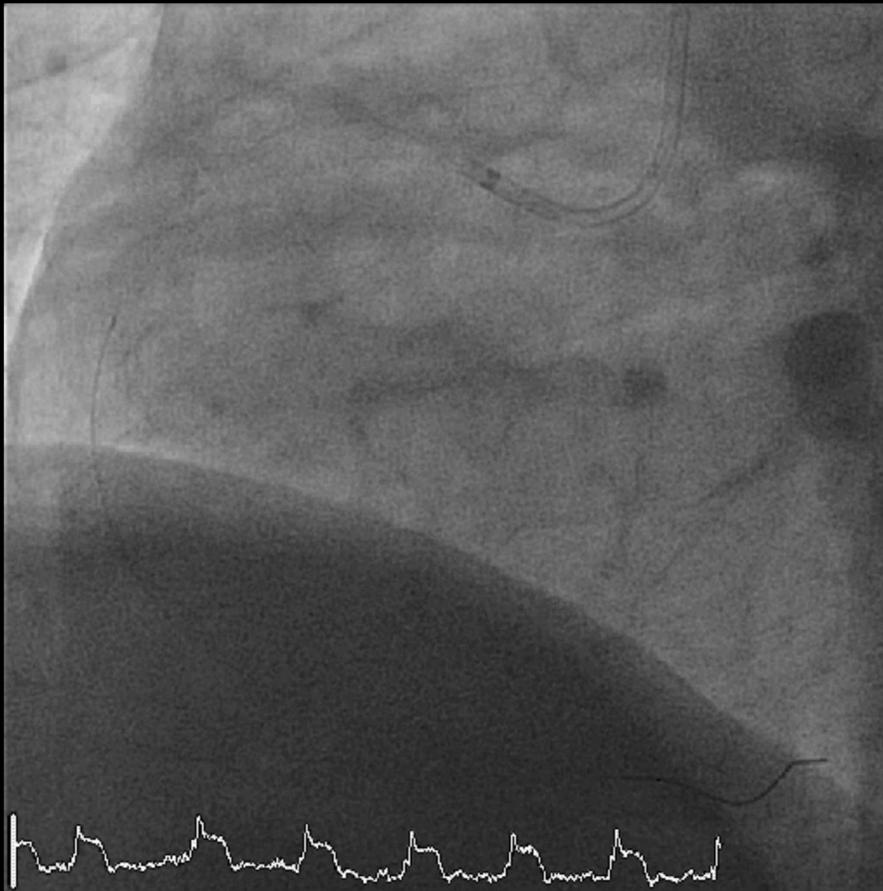
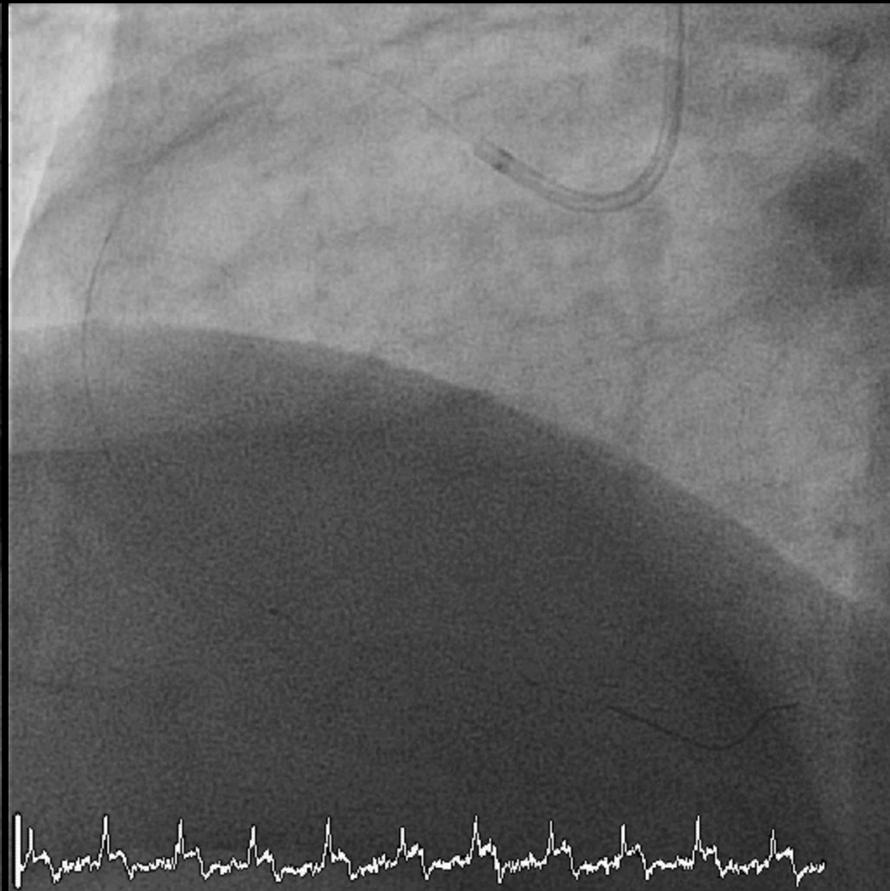
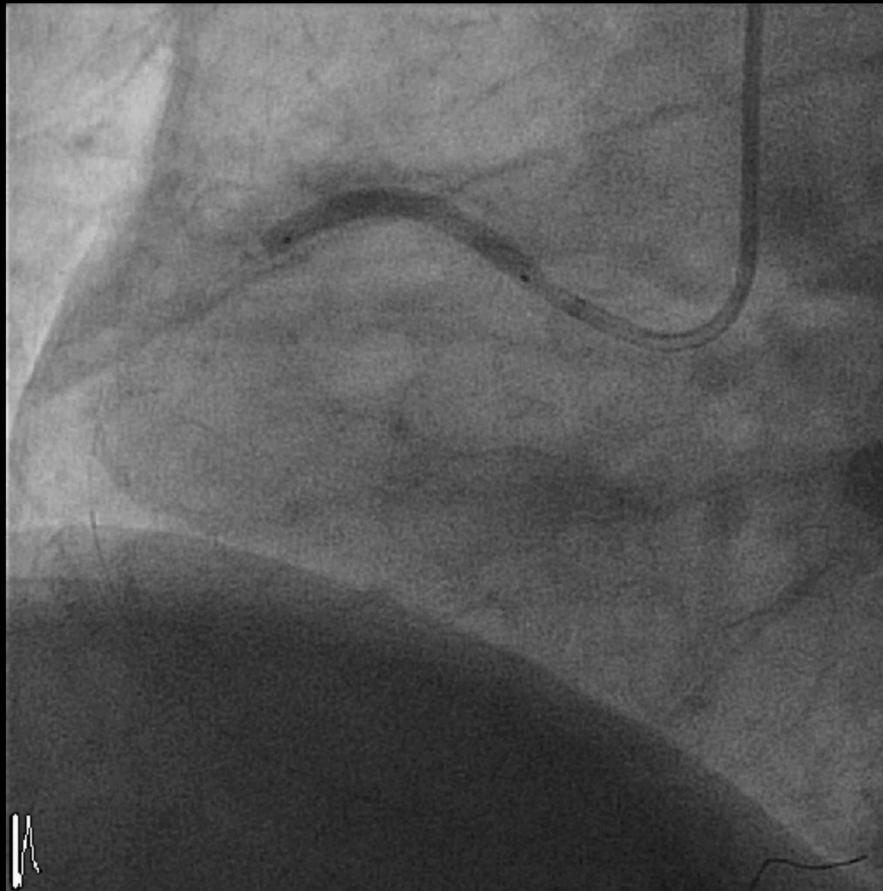
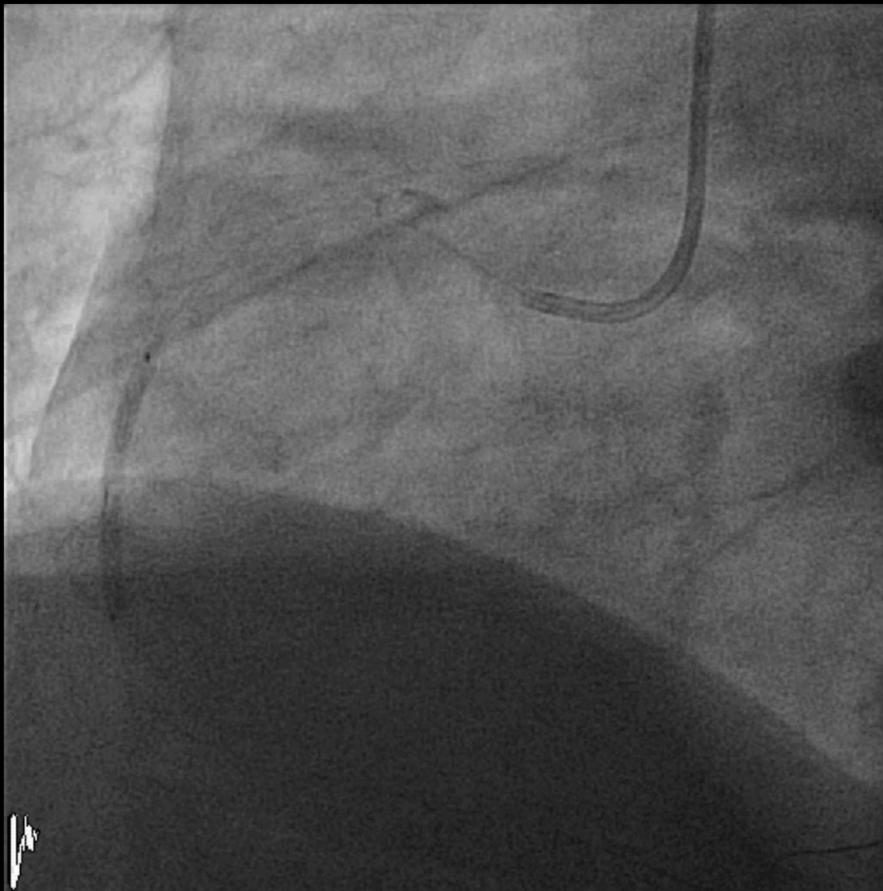
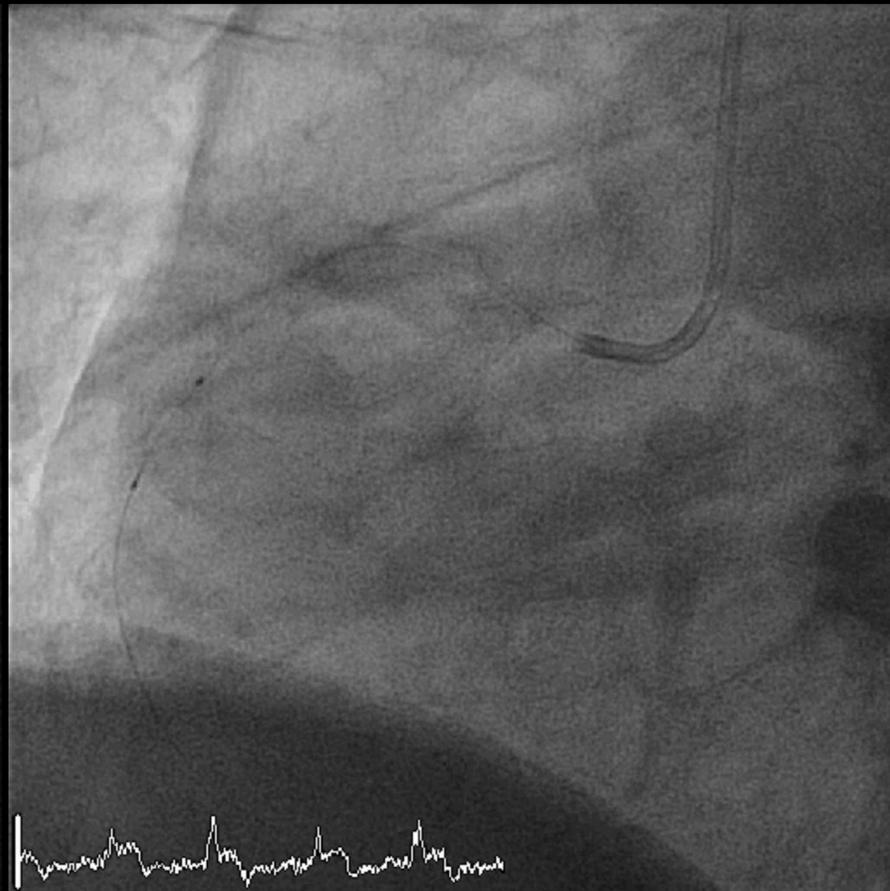
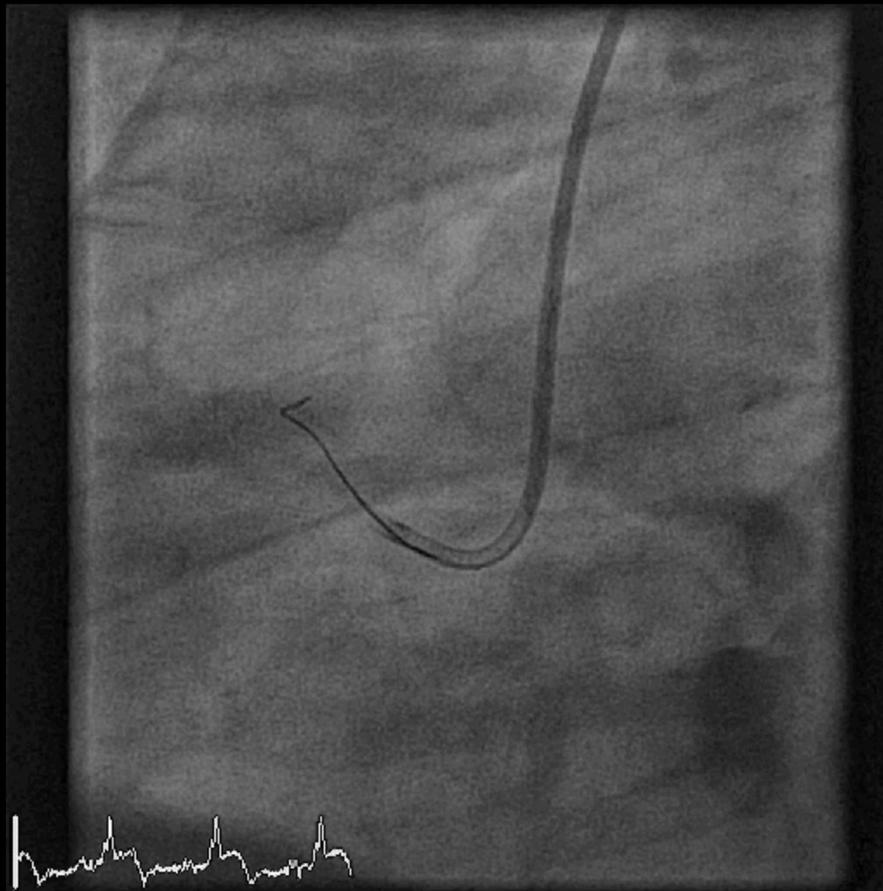
Peeling Radial



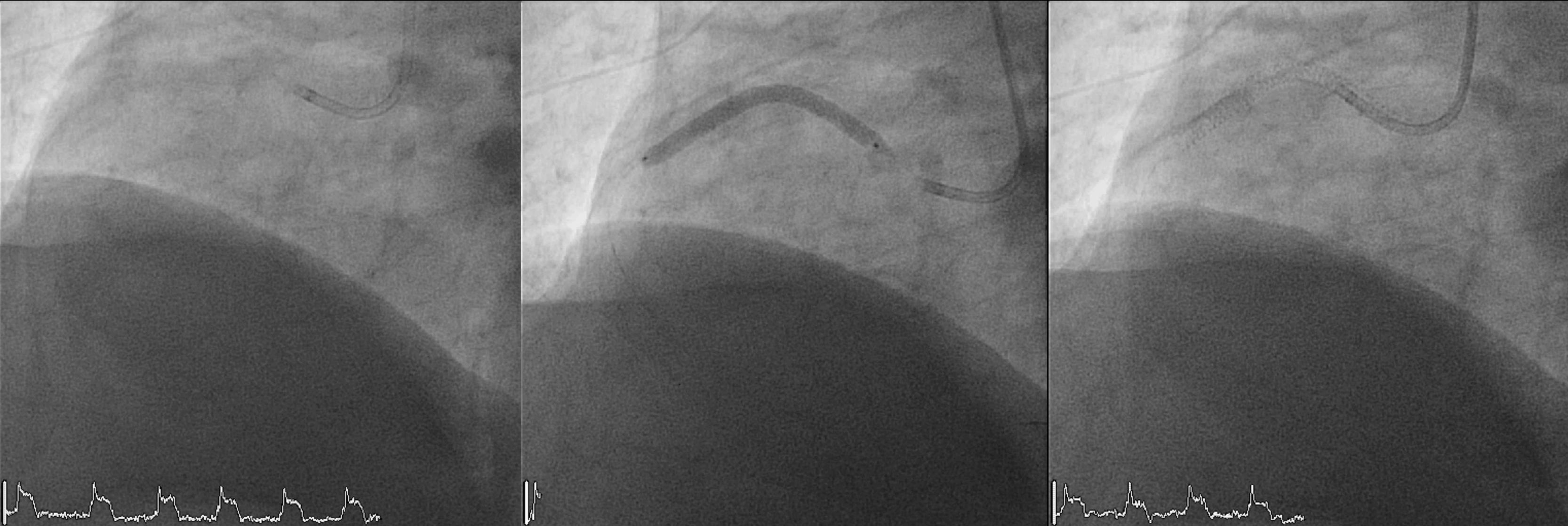
Embolisation
placenta

Point #7 - ça diminue le risque de thrombose





Point #8 - on peut injecter des trucs



Catheter d'aspiration ... et de perfusion (ReoPro, adénosine, nitro, contraste, etc.)

Niccoli G, et al. ReOPEN trial, JACC Cardiovasc Interv 2013;6:580 – 589.

Niccoli G, et al., J Am Coll Cardiol 2014;63:1454 – 1455.

Bref, je continue à thromboaspirer parce que



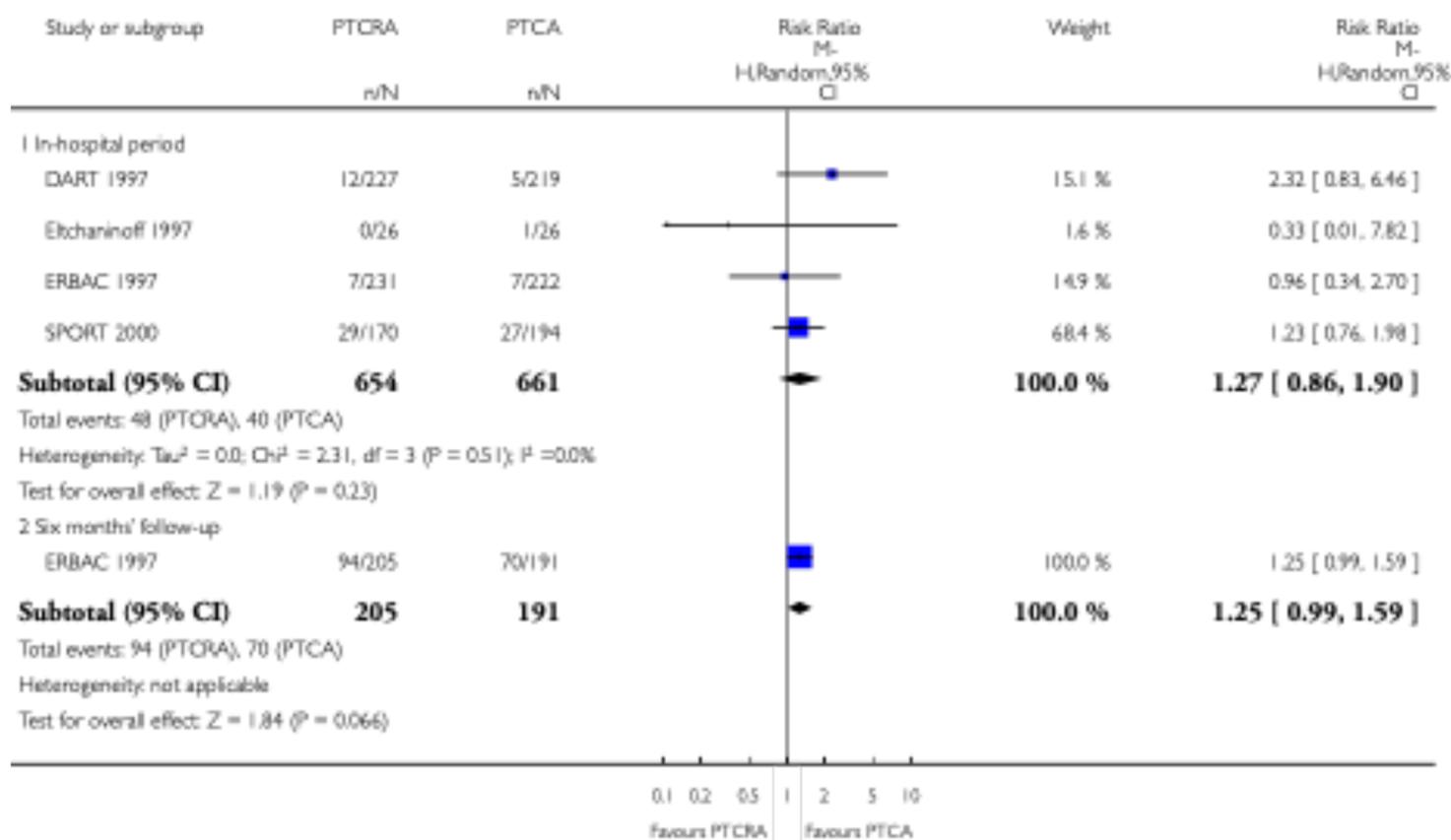
- ça fonctionne bien en cas de lésion thrombotique
- plus y'a de thrombus, plus y'a d'intérêt
- c'est essentiel dans 15% des cas
- j'aime bien analyser les thrombus (j'apprend souvent qqch)
- je peux utiliser le catheter de thrombectomie pour faire des injections distales (contraste, drogues)
- le risque d'AVC est minime (étude TOTAL) et je crois que cela dépend de la technique (et de l'opérateur)

Conflit d'intérêt

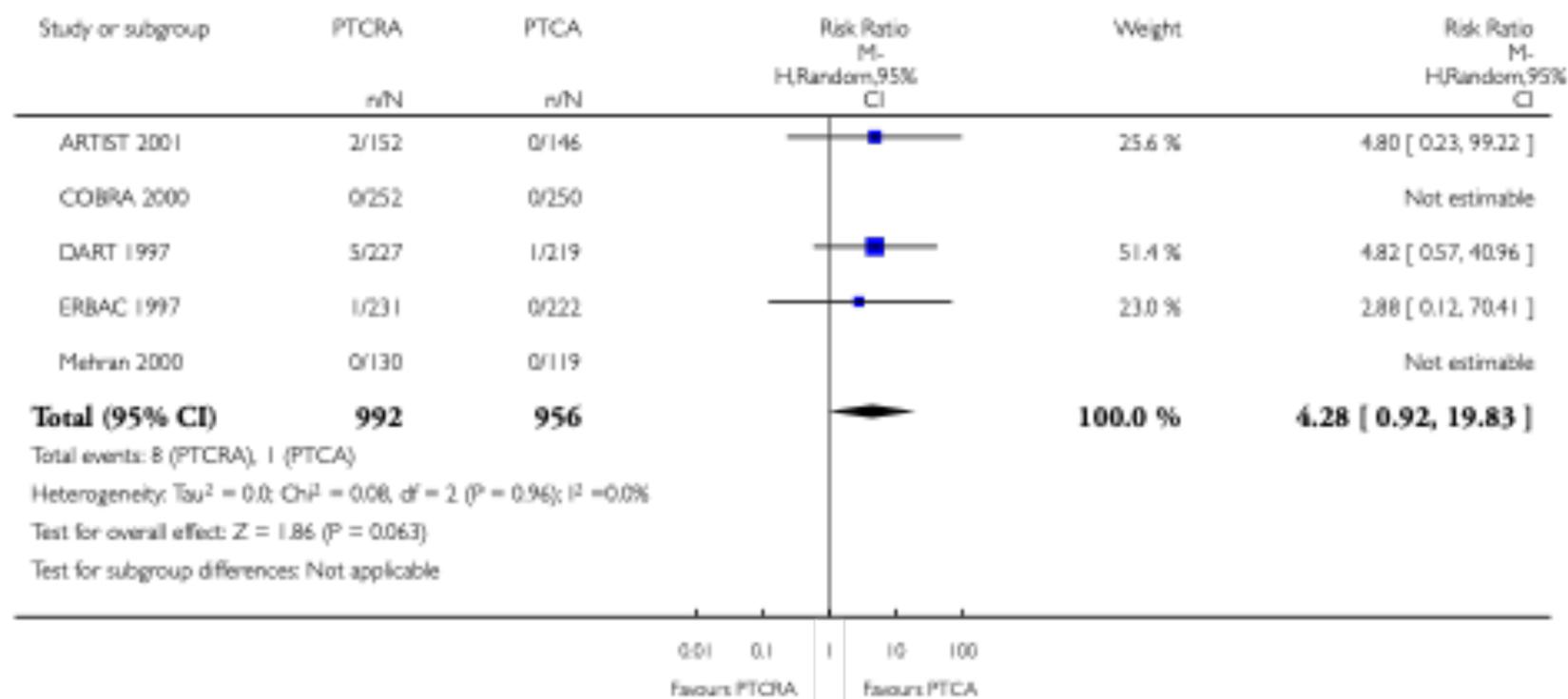
Pour des raisons personnelles:

- * j'utilise le rotablator quand je le juge nécessaire
- * je continue à traiter les sténoses serrées des patients ayant une maladie coronarienne « chronique »

Outcome: 1 MACE as a composite event



Outcome: 1 Perforation



Outcome: 5 Transient vessel occlusion

