EUROPEAN HEART HOUSE

Anti-Thrombotic Therapy – Update 2017

Thursday 23 February – Saturday 25 February, 2017

Thrombectomy

how? For whom?

Marco Zimarino, MD, PhD

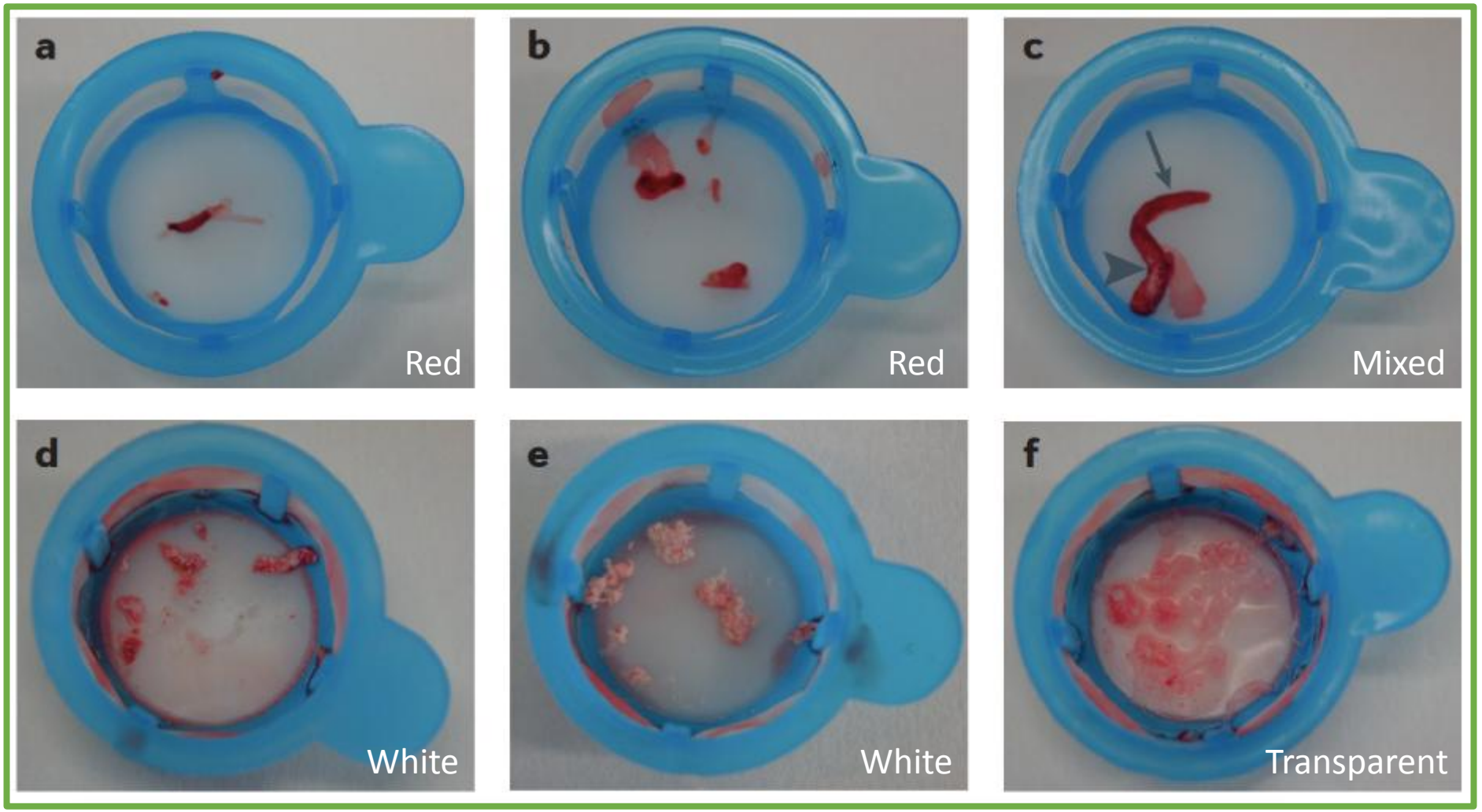
Institute of Cardiology - University G. d'Annunzio, Chieti (Italy)

Why Manual Thrombectomy? Pros

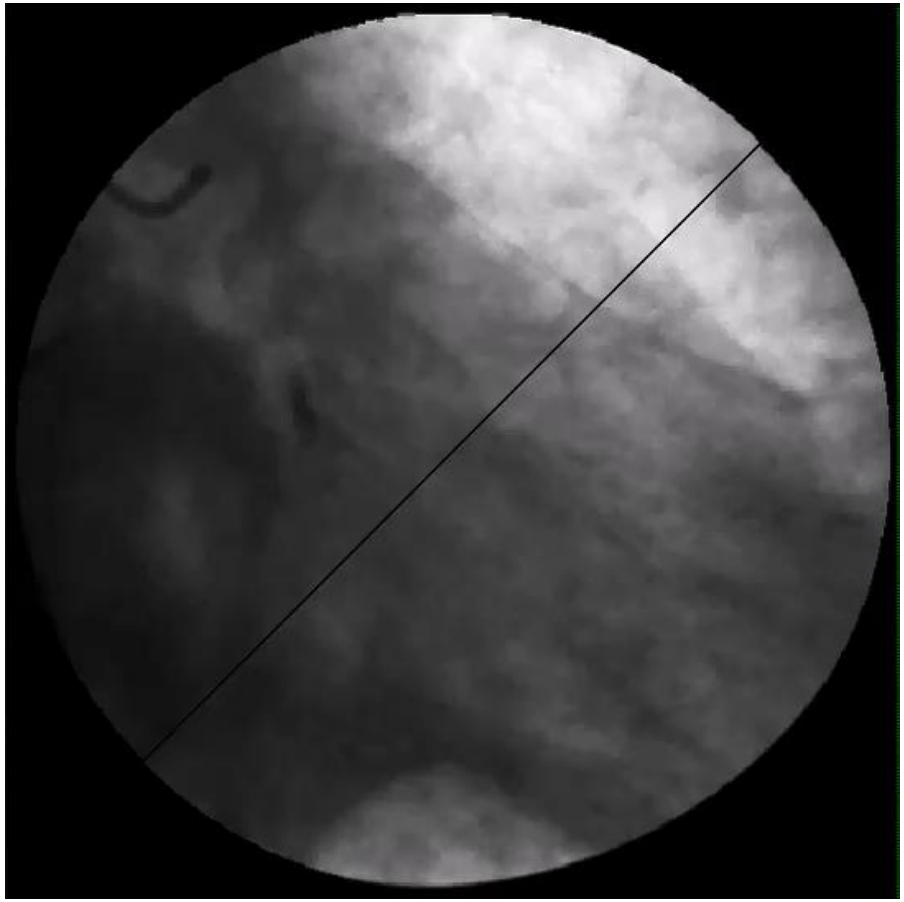
① Extraction of thrombotic material, acute reduction in thrombus load

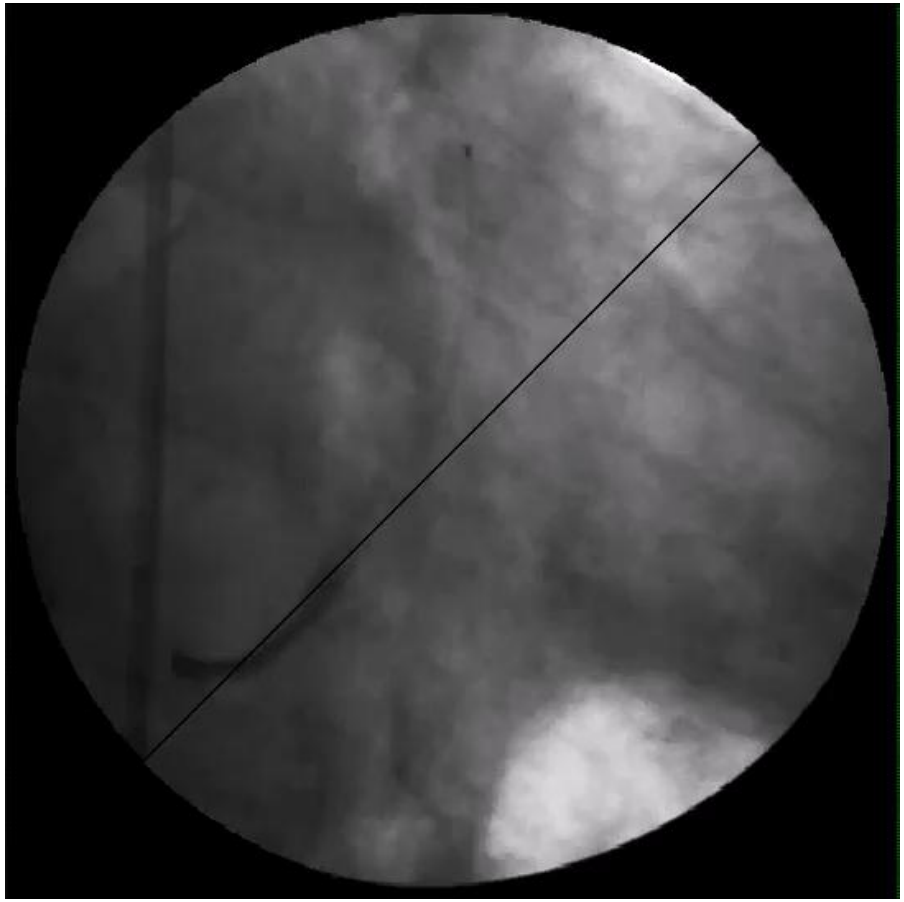
② Superior visualization of residual stenosis, facilitating direct stenting

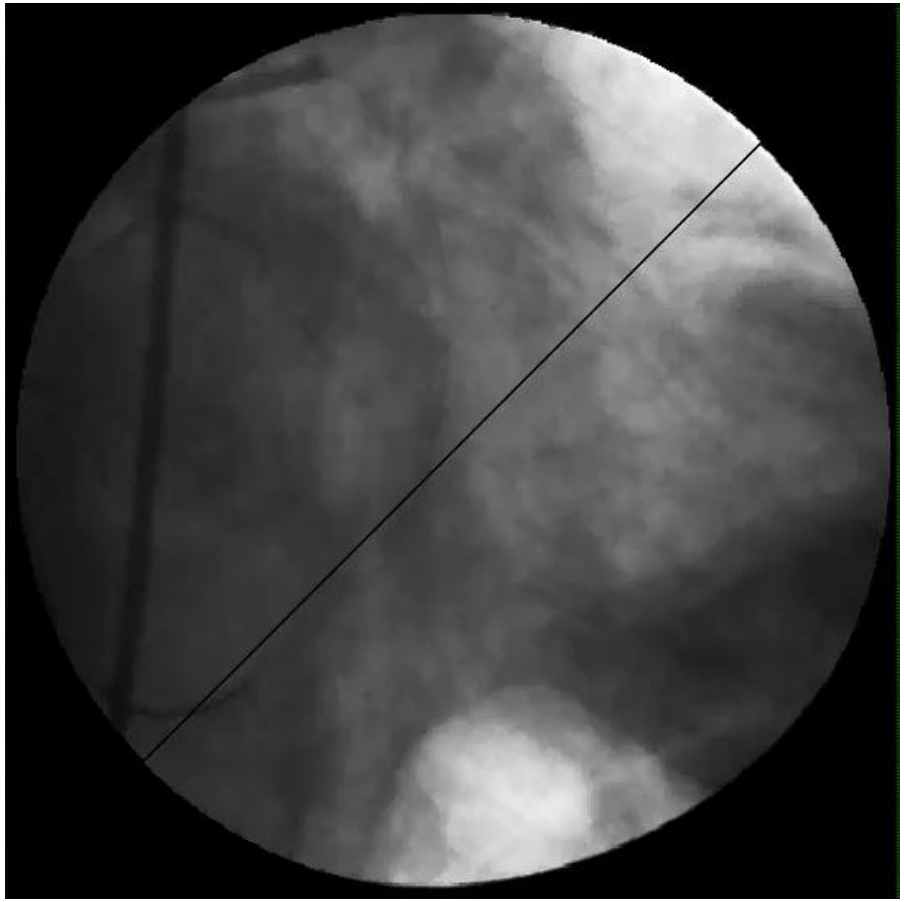
And I'm Always Happy to See These Things Out of My Patient Rather Than Downstream!

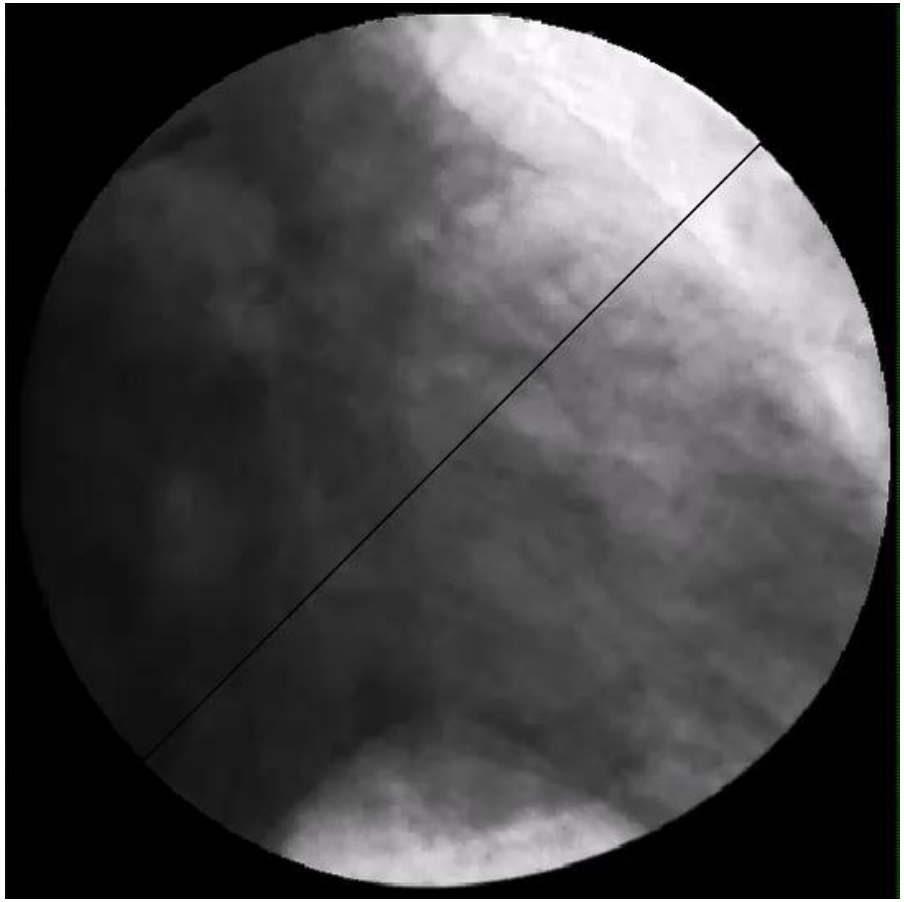


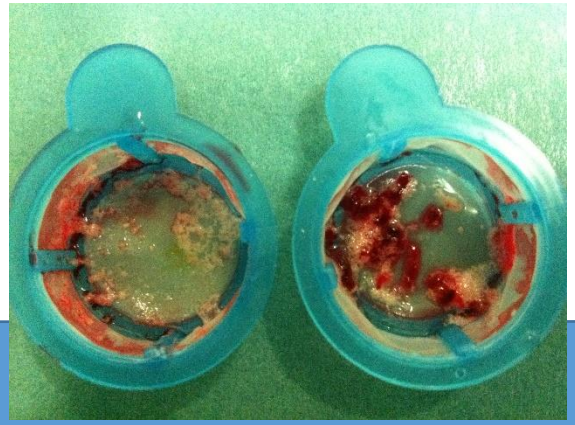
Mahmoud KD, et al. Nat Rev Cardiol 2016;13:418-28











Major Thrombectomy Trials (2008-2015)

	TAPAS (2008)	TASTE (2013)	TOTAL (2015)
Reperfusion	↑	NR	↑
30-day stroke	NR	=	↑
1-year death	↓	=	=
1-year re-MI	=	=	=
1-year ST	=	=	=
1-year TVR	=	=	=
1-year HF	NR	NR	=
Operator dependency	Yes	Uncertain	NR

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Manual Thrombectomy: STEMI Guidelines

United States

STEMI – The usefulness of selective and bailout aspiration thrombectomy in patients undergoing primary PCI is not well established

IIb C

STEMI – Routine aspiration thrombectomy before primary PCI is not useful

III A

Europe

STEMI - Thrombus aspiration may be considered in selected patients

IIb A

Levine GN, et al. J Am Coll Cardiol. 2016;67:1235-50

Windecker et al. Eur Heart J. 2014;35:2541-619

30-Day Outcomes of Thrombus Aspiration

Patient-level meta-analysis of 18,306 patients from TAPAS, TASTE and TOTAL

Outcome	TA N=9155	PCI alone N=9151	HR	95% CI	P value
CV death	2.4%	2.9%	0.84	0.70-1.01	**0.06**
Stroke/TIA*	0.8%	0.5%	1.43	0.98-2.1	**0.06**
Death	2.5%	3.0%	0.85	0.71-1.01	**0.06**
MI	1.0%	1.1%	0.92	0.70-1.21	0.55
CHF**	1.6%	1.5%	1.10	0.87-1.40	0.44
TVR	2.3%	2.6%	0.90	0.74-1.08	0.24
MACE**	7.0%	7.6%	0.92	0.82-1.03	0.14

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

1-Year Outcomes of Thrombus Aspiration

Patient-level meta-analysis of 18,306 patients from TAPAS, TASTE and TOTAL

Outcome	TA N=9155	PCI alone N=9151	HR	95% CI	P value
CV death	3.7%	4.2%	0.90	0.78-1.04	0.15
Stroke/TIA*	1.6%	1.3%	1.24	0.95-1.61	0.11
Death	4.7%	5.1%	0.91	0.80-1.04	0.18
MI	2.5%	2.6%	0.97	0.81-1.16	0.73
CHF**	3.1%	3.0%	1.04	0.87-1.23	0.68
TVR	5.4%	5.5%	0.97	0.86-1.10	0.68

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

30-Day Outcomes by TIMI Thrombus Grade

Patient-level meta-analysis of 18,306 patients from TAPAS, TASTE and TOTAL

Outcome	TA N=9155	PCI alone N=9151	HR	95% CI	P value	P_{int}
CV death						
TG ≥3	2.5%	3.1%	0.80	0.65-0.98	**0.03**	0.32
TG <3	2.2%	2.2%	1.00	0.68-1.47	0.99	
TG ≥4	2.7%	3.2%	0.82	0.66-1.02	0.08	0.67
TG <4	2.0%	2.3%	0.89	0.65-1.22	0.48	
Stroke/TIA*						
TG ≥3	0.9%	0.5%	1.56	1.02-2.42	**0.04**	0.34
TG <3	0.5%	0.5%	0.99	0.43-2.26	0.98	
TG ≥4	1.0%	0.6%	1.87	1.18-3.02	**0.009**	**0.04**
TG <4	0.4%	0.5%	0.80	0.40-1.57	0.51	

*Stroke or TIA outcomes have odds ratio reported instead of hazard ratio

Why NOT Manual Thrombectomy? Cons

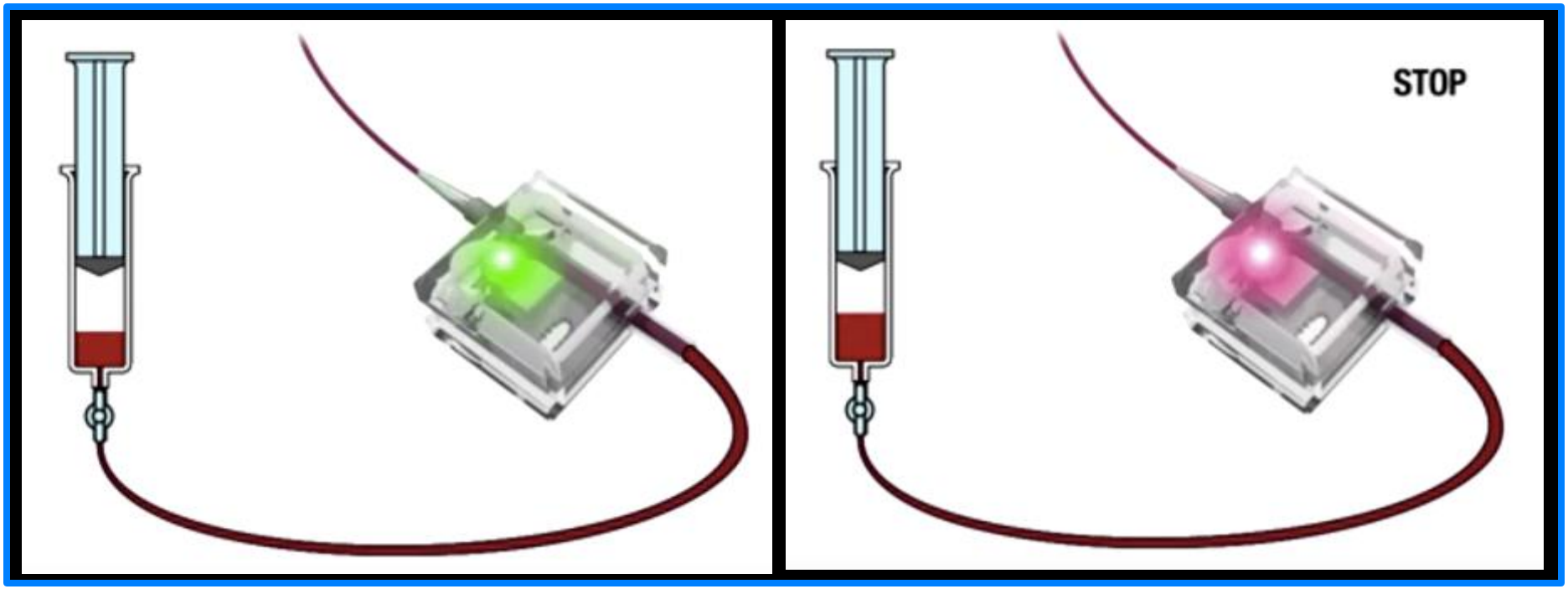
① Thrombus embolization downstream due to wire crossing (prior to aspiration)

② Limited ability to deal with large organized thrombi

③ Embolization of thrombus to other vascular territories during removal of the aspiration catheter

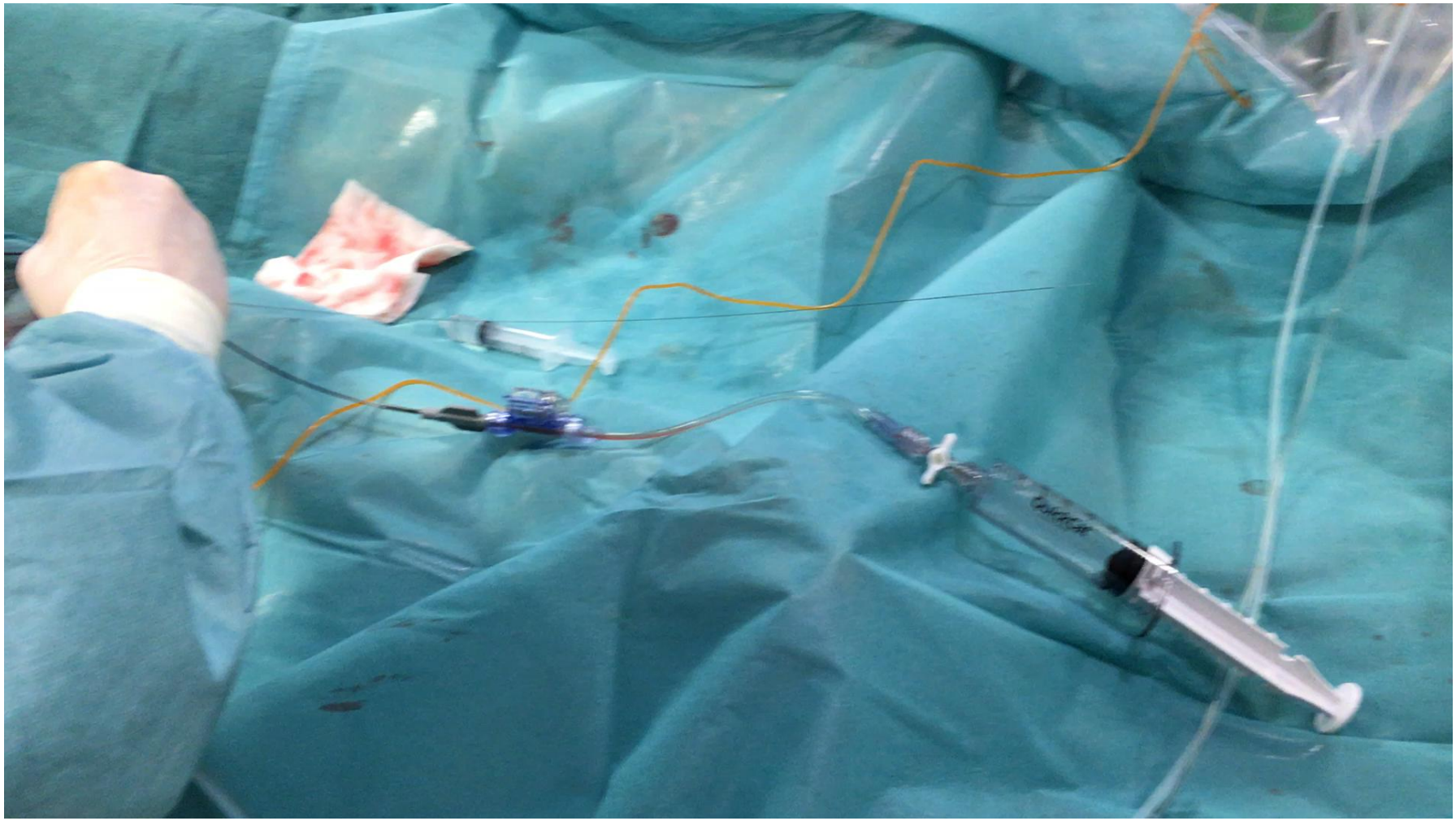
Can We Improve the Outcomes of Manual Thrombectomy?

Clot detector of catheter advancement without vacuum

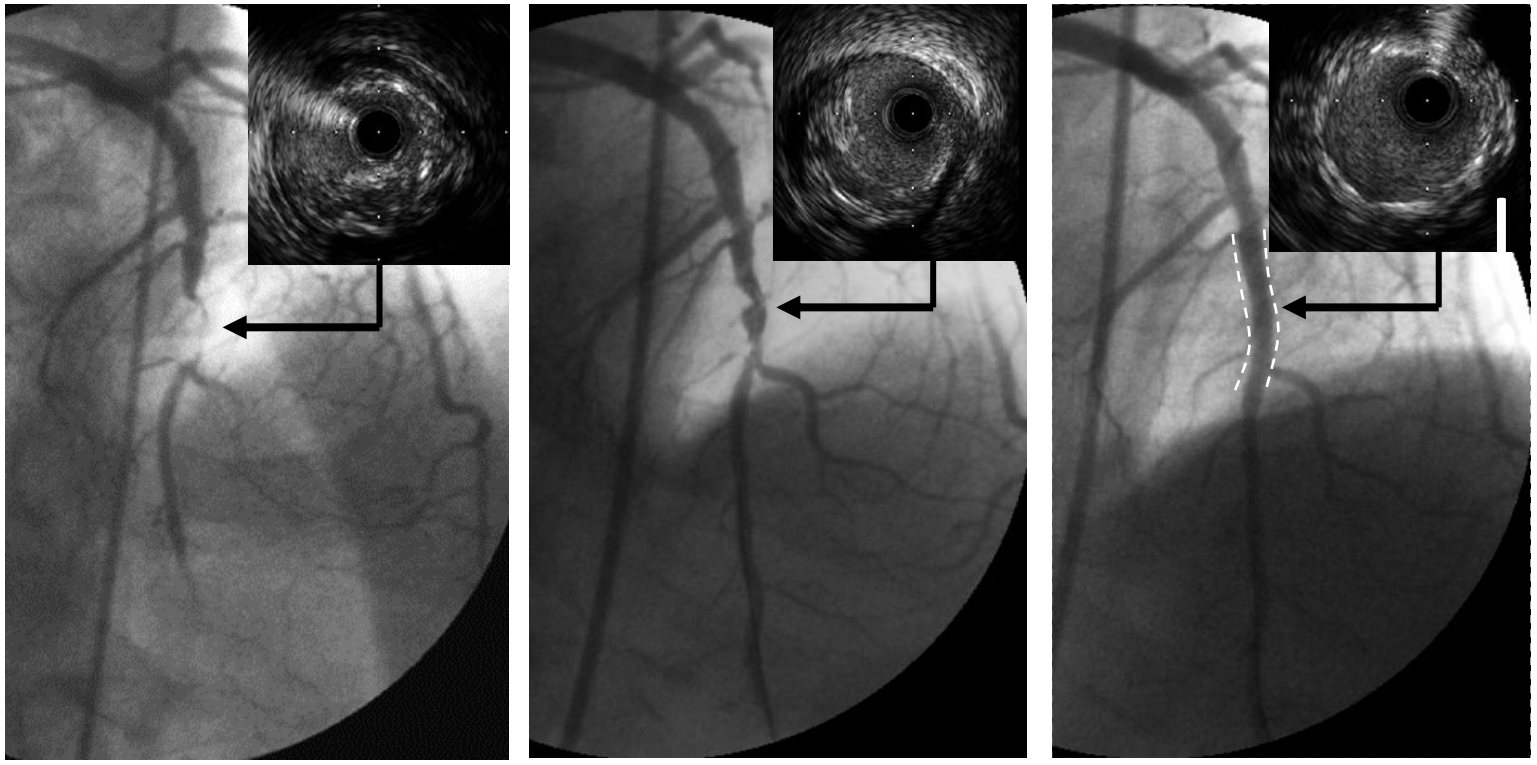


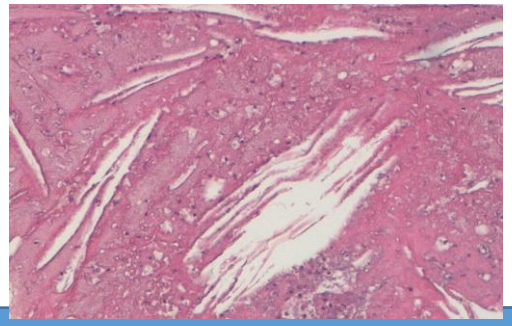
Advance safely

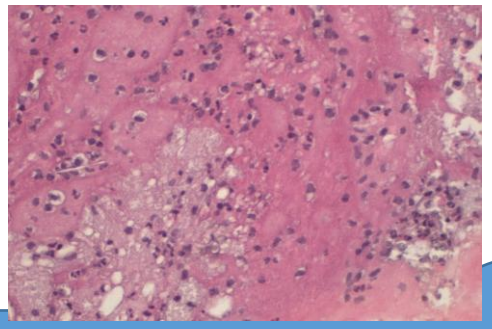
Stop when no active suction



TA for atherothrombotic burden reduction in NSTE-ACS

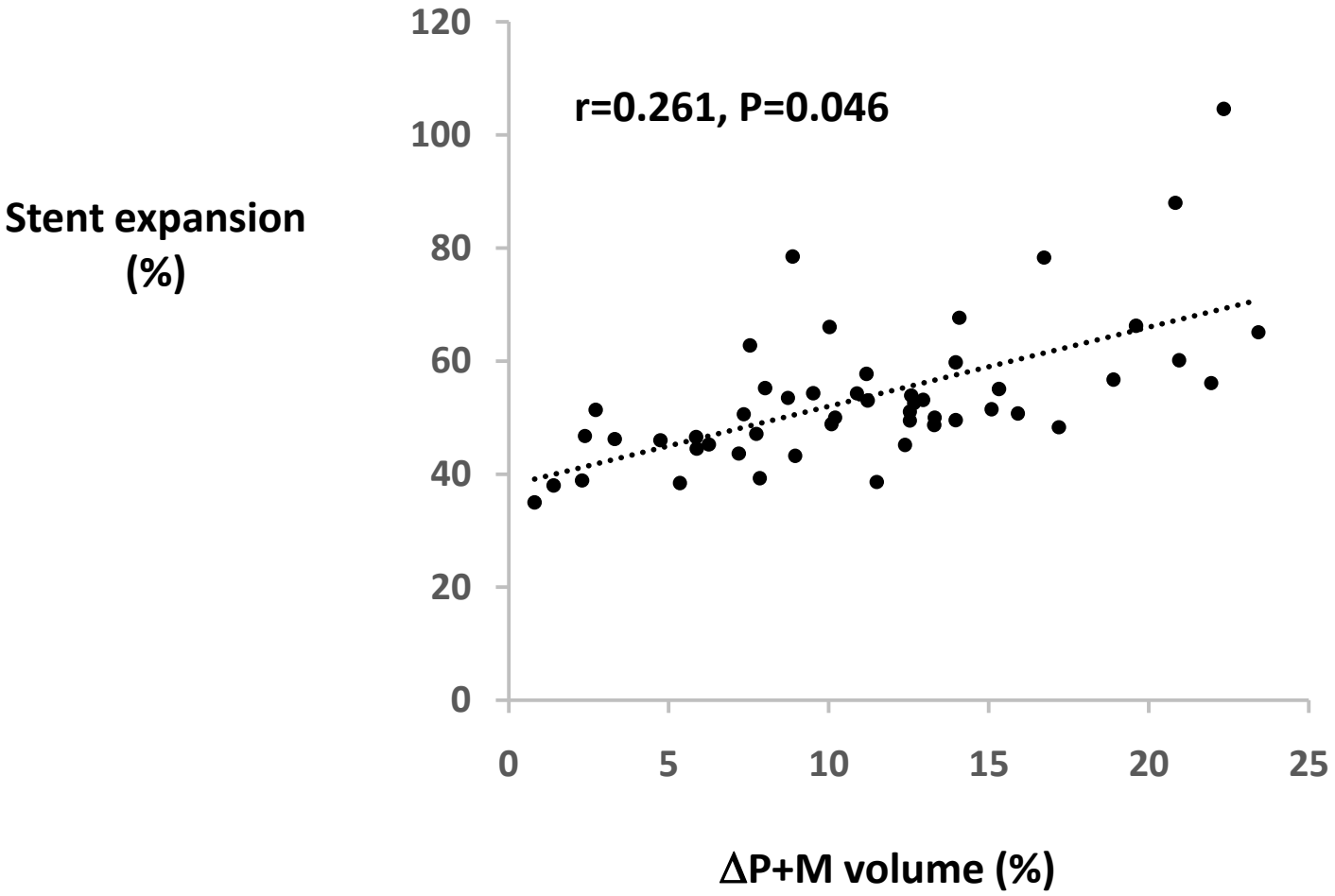






Zimarino M on behalf of REMNANT investigators, Catheter Cardiovasc Interv 2017; 88: 716-25

Plaque reduction and Stent expansion



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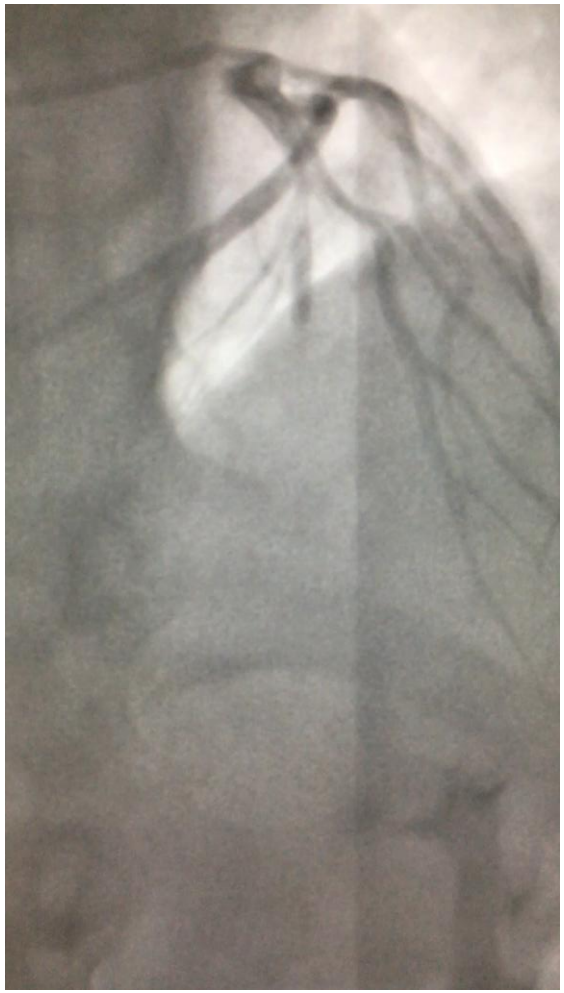


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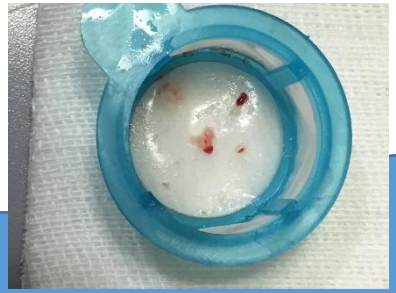

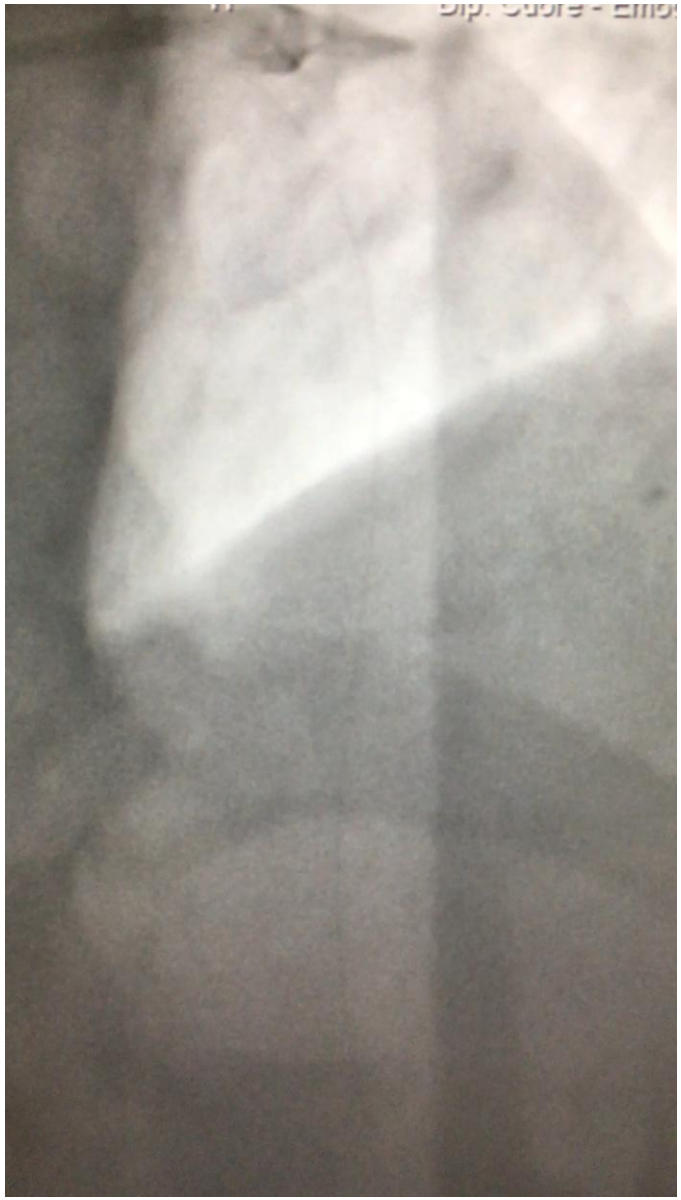
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Feasibility Considerations On Future Trials of Mechanical Thrombectomy (If Any)

- ✓ It is conceivable that improved forms of thrombus aspiration that mitigate stroke risk could reduce CV mortality in patients with high thrombus burden.
- ✓ The effects observed in the pooled analysis of TAPAS, TASTE and TOTAL in the high thrombus burden subgroup should be considered exploratory given that the subgroup interactions were not statistically significant and that there was no adjustment for multiple testing.
- ✓ These findings could serve as a basis for much larger trials with new devices that reduce the risk of systemic embolization. Such trials would need to enroll 26,000 patients with a high thrombus burden to be powered for a 20% reduction in CV mortality based on the event rates observed in this data-set.

Closing Remarks

① Based on the available data, we can reasonably conclude that the routine use of TA in all patients with STEMI cannot be recommended.

② However, arguing against bailout use of TA in case of large thrombus burden or to improve an initially poor result would be difficult.

③ Avenues of further research or exploration of current trial data include the role of operator performance, identification of specific subgroups that might derive benefit from selective TA, the use of new devices or adds-on for TA catheters, and the synergy with PCI techniques such as direct and deferred stenting.

④ In the era of low mortality for primary PCI in STEMI, outcomes data should focus on sensitive outcome measure, such as left ventricular ejection fraction and new-onset heart failure over an extended follow-up.