ROUTINE THROMBECTOMY:

Utile or Futile?

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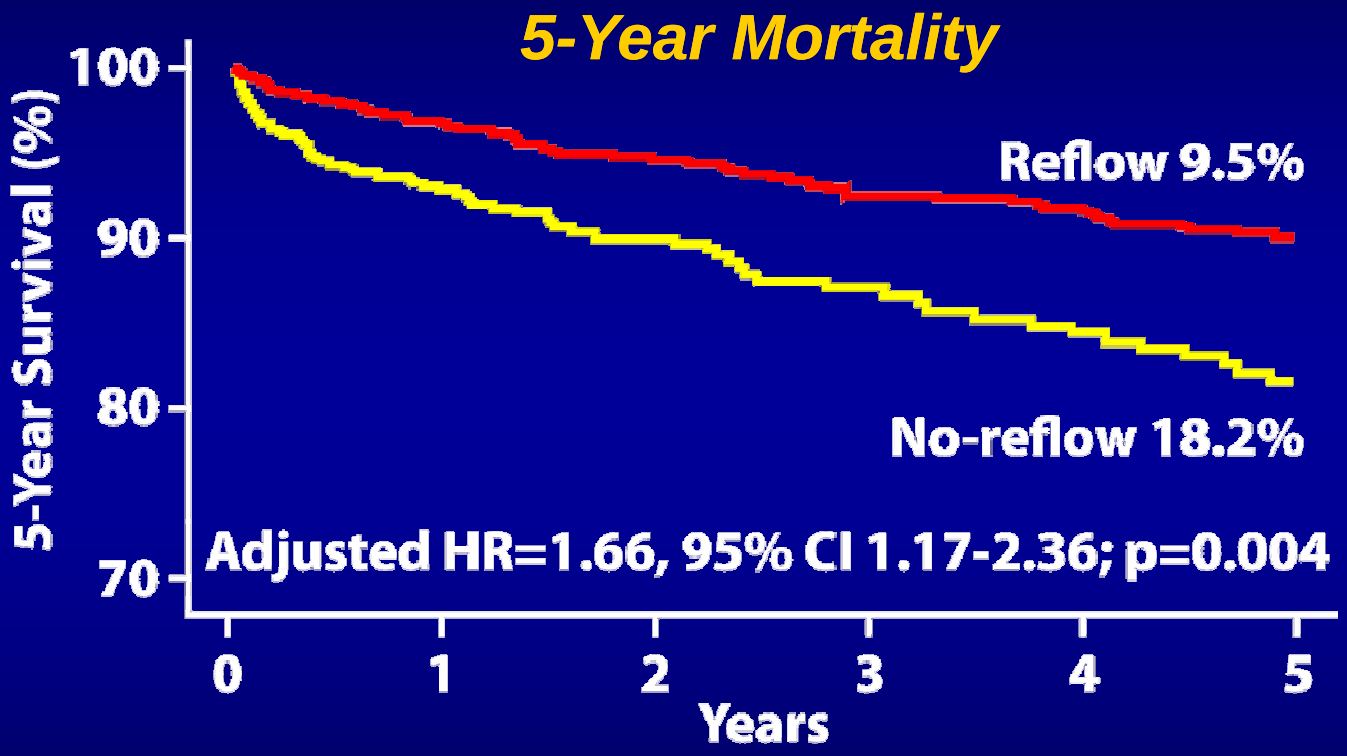
54-yo Female: Acute Inferior Wall STEMI

Distal Emboli, Slow Flow, No Reflow: ***15-20%***
Microvascular Dysfunction: ***30%***

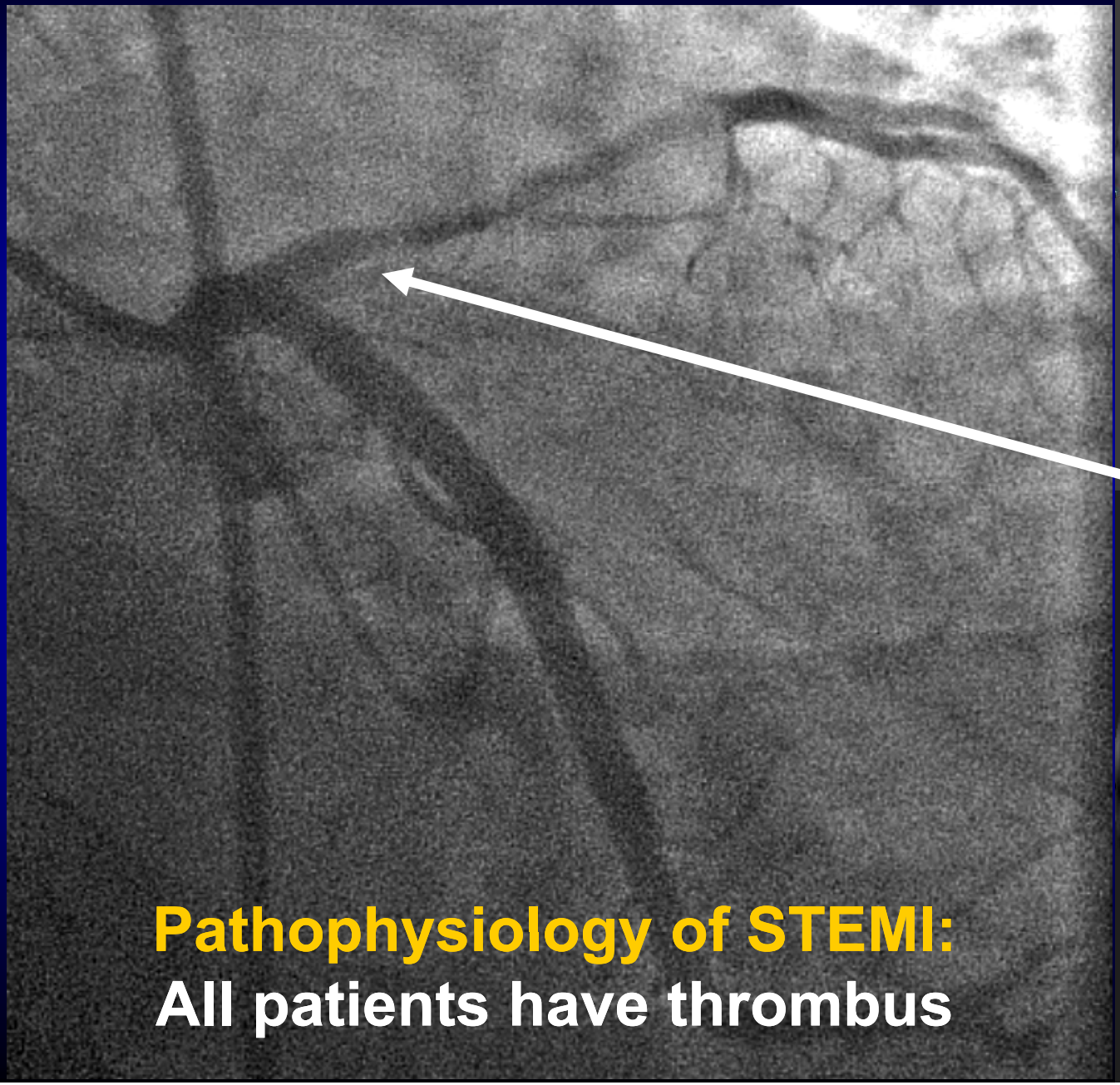
5-Year Prognostic Value of No-Reflow Phenomenon After PCI in Pts with AMI

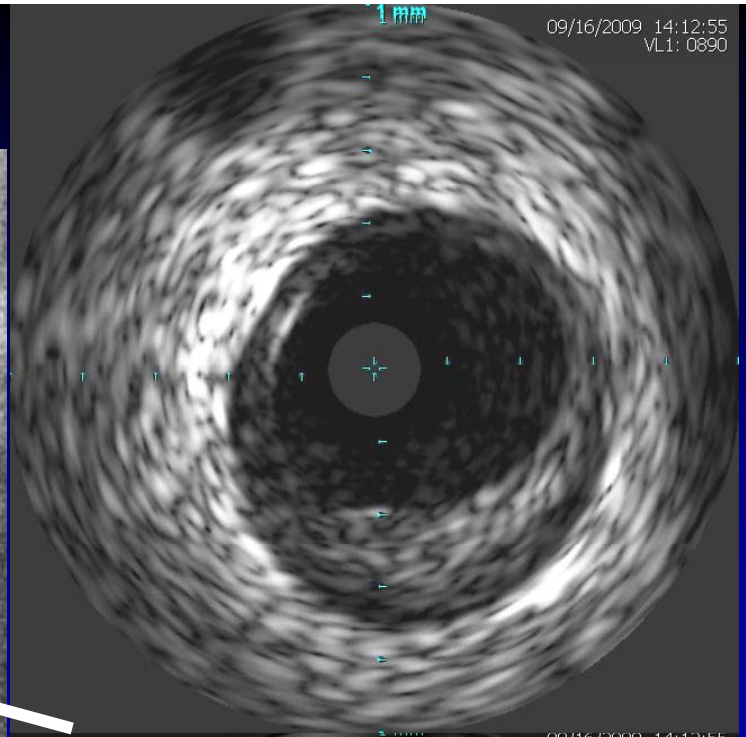
- 1406 pts with STEMI, underwent PCI and had scintigraphic infarct size at 7-14 days
- **Primary Endpoint:** 5-year mortality
- No reflow occurred in 29%
- **Conclusion:**
  - In STEMI pts, no-reflow predicts an increased mortality up to 5 yrs
  - The no-reflow phenomenon provides prognostic information independent of other relevant clinical factors, including infarct size

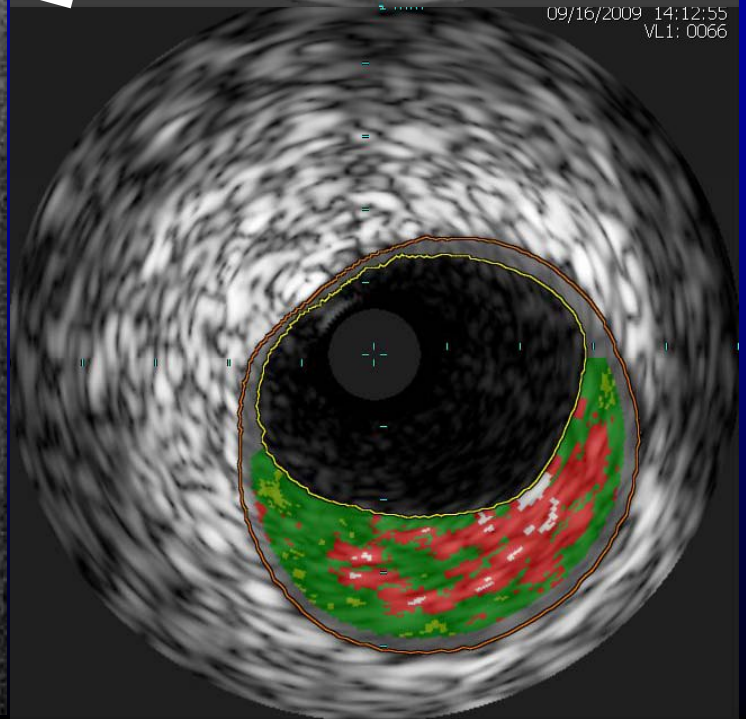


Ndrepepa et al. JACC 2010;55:2383

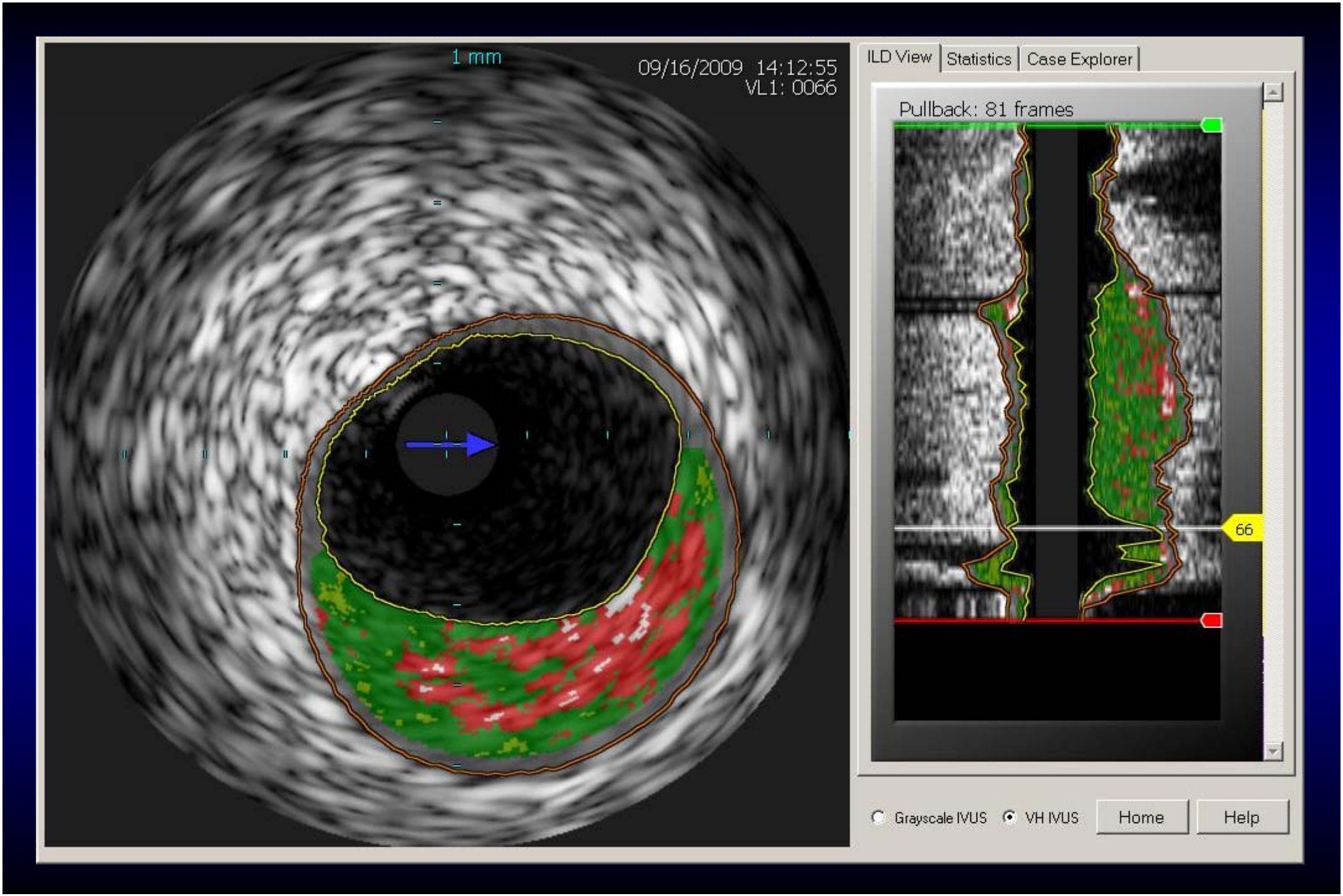
55-Year Male Anterior STEMI







Pathophysiology of STEMI:
All patients have thrombus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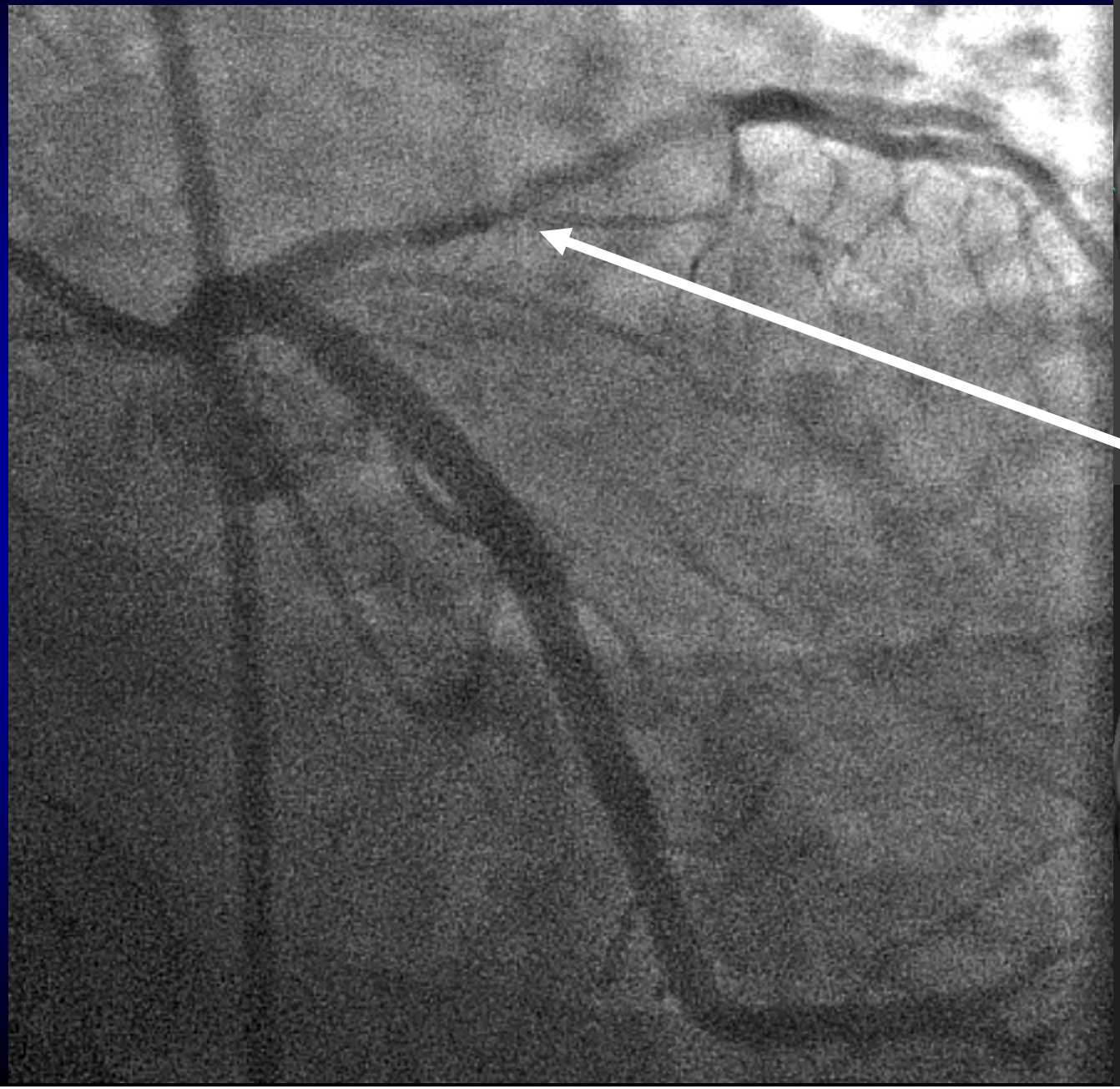
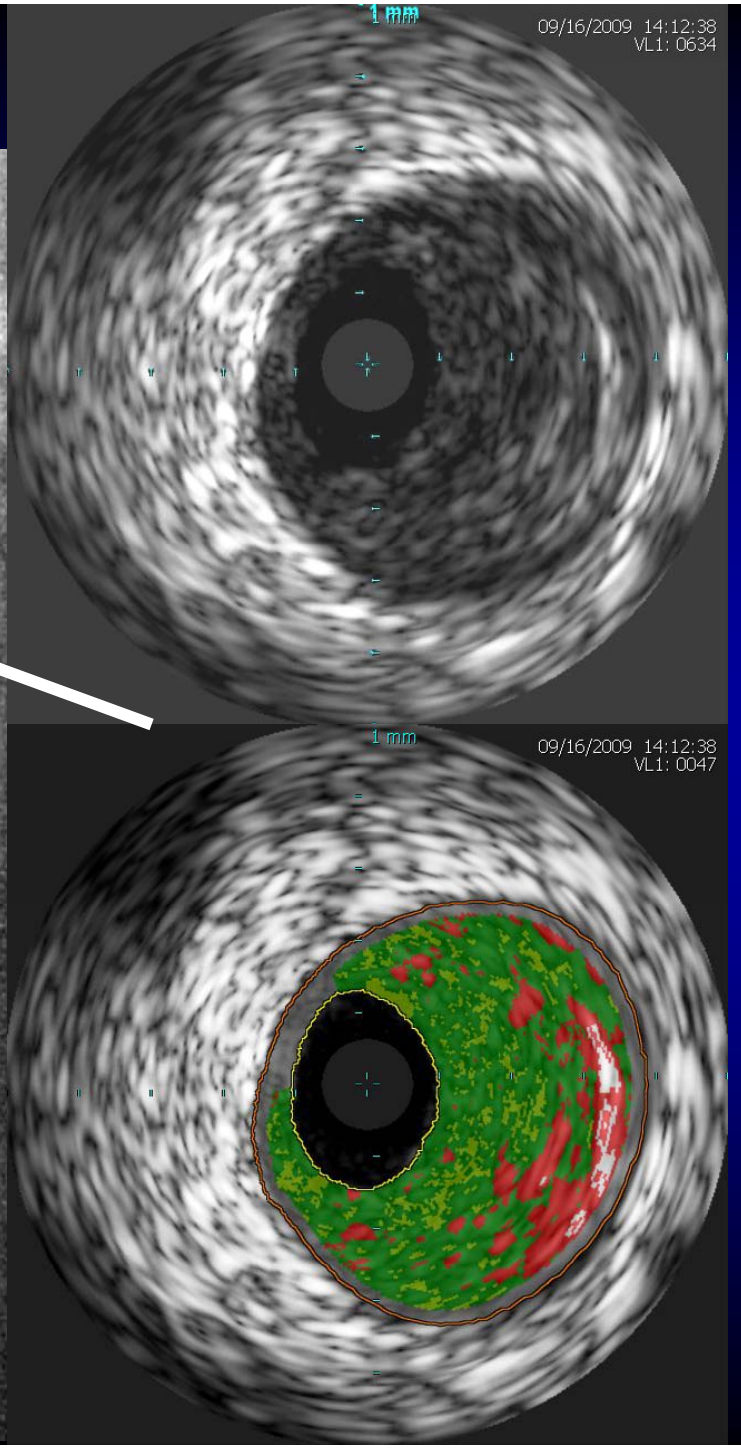
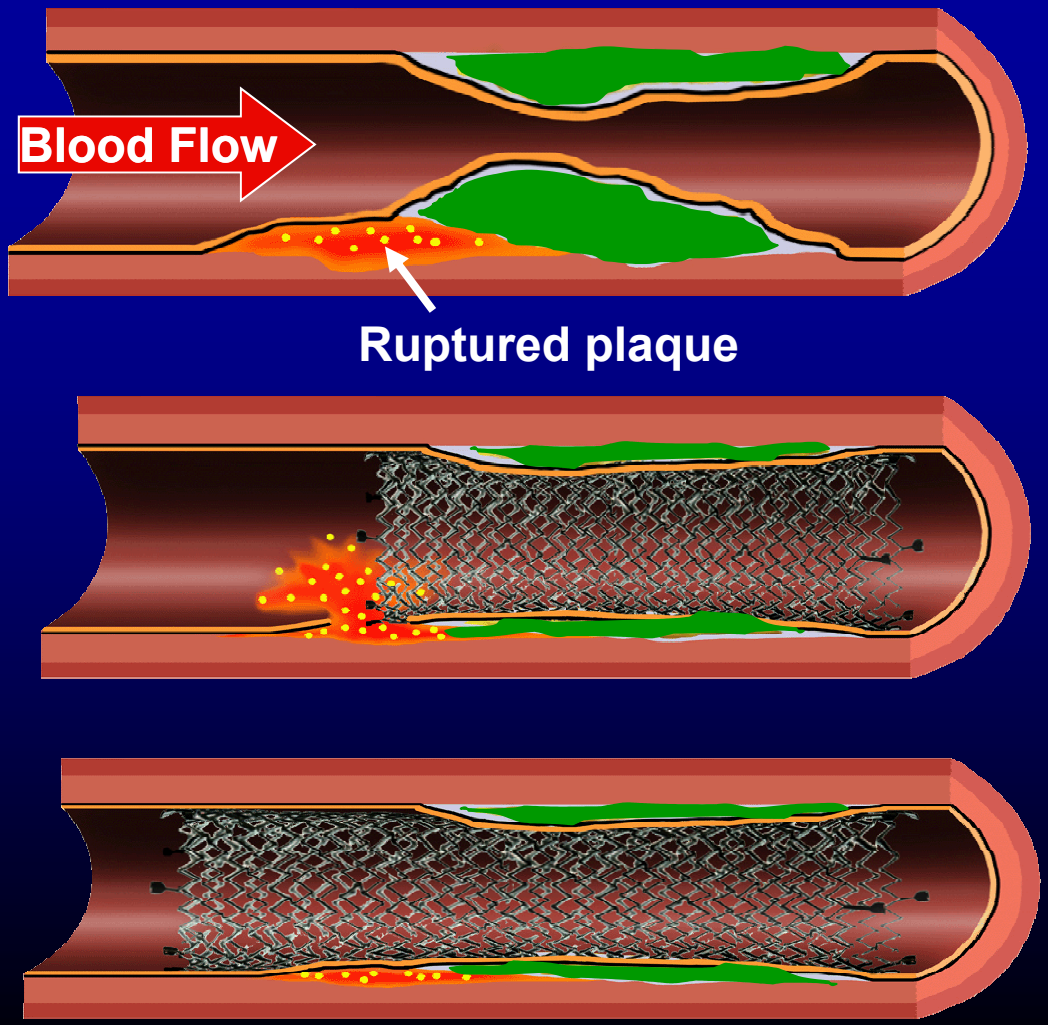
55-Year Male Anterior STEMI





Value of Virtual Histology in Management of the STEMI Patient



Angiography:

- Underestimates the proximal location of the TCFA and plaque rupture
- Underestimates the volume and length of associated thrombus

Therefore,

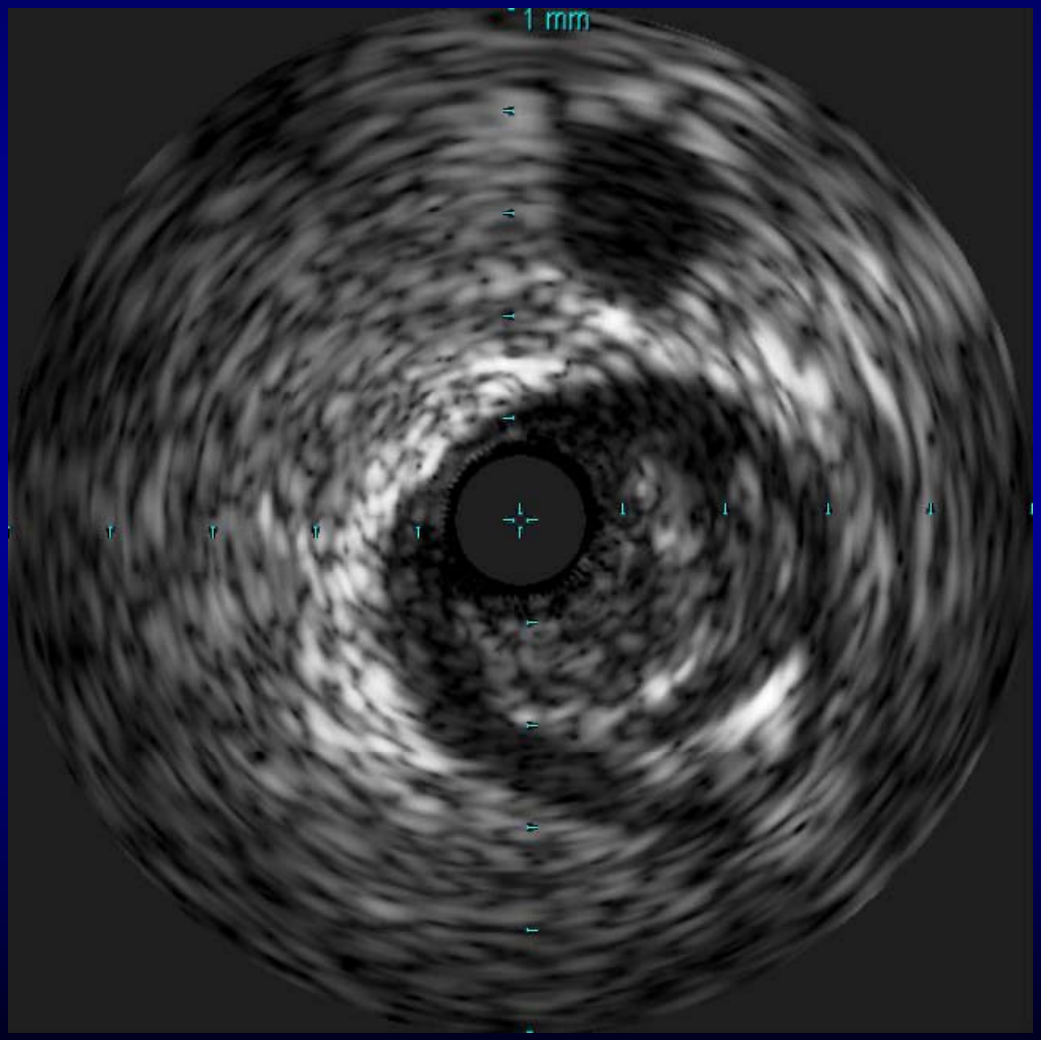
- Underutilize aspiration thrombectomy
- Underestimate stent length
- Cause of early complications

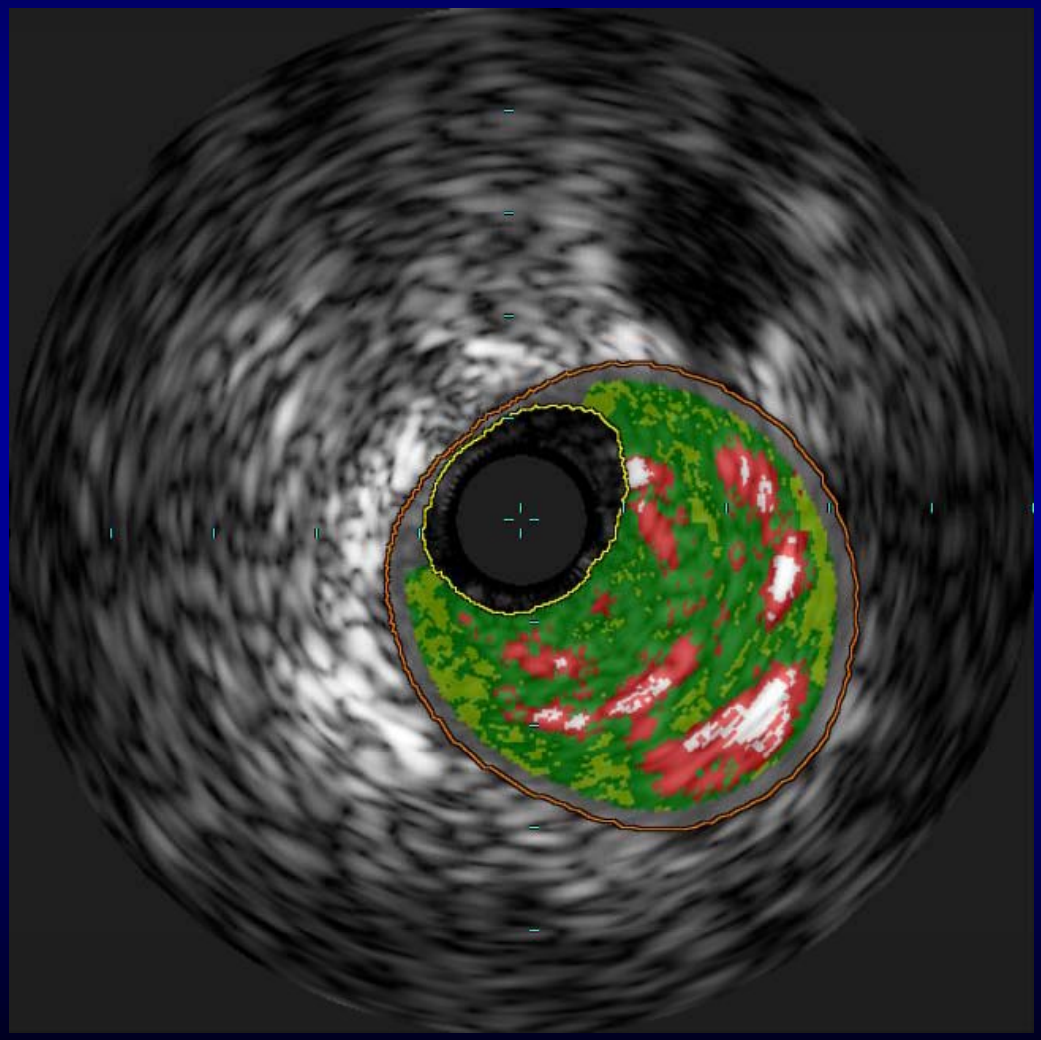
Courtesy Dr. Mark Wholey

Acute Inferior STEMI

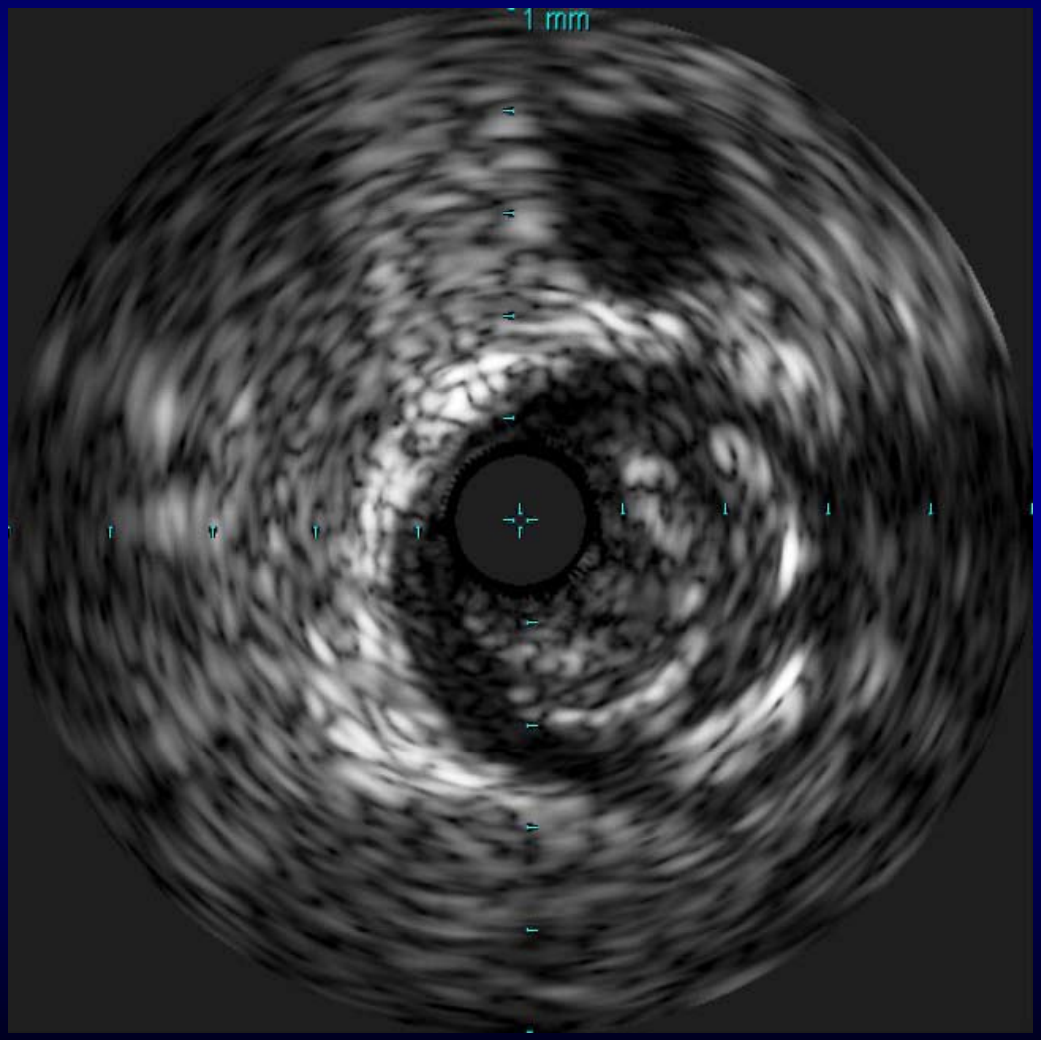
AT IVUS & VH Eval

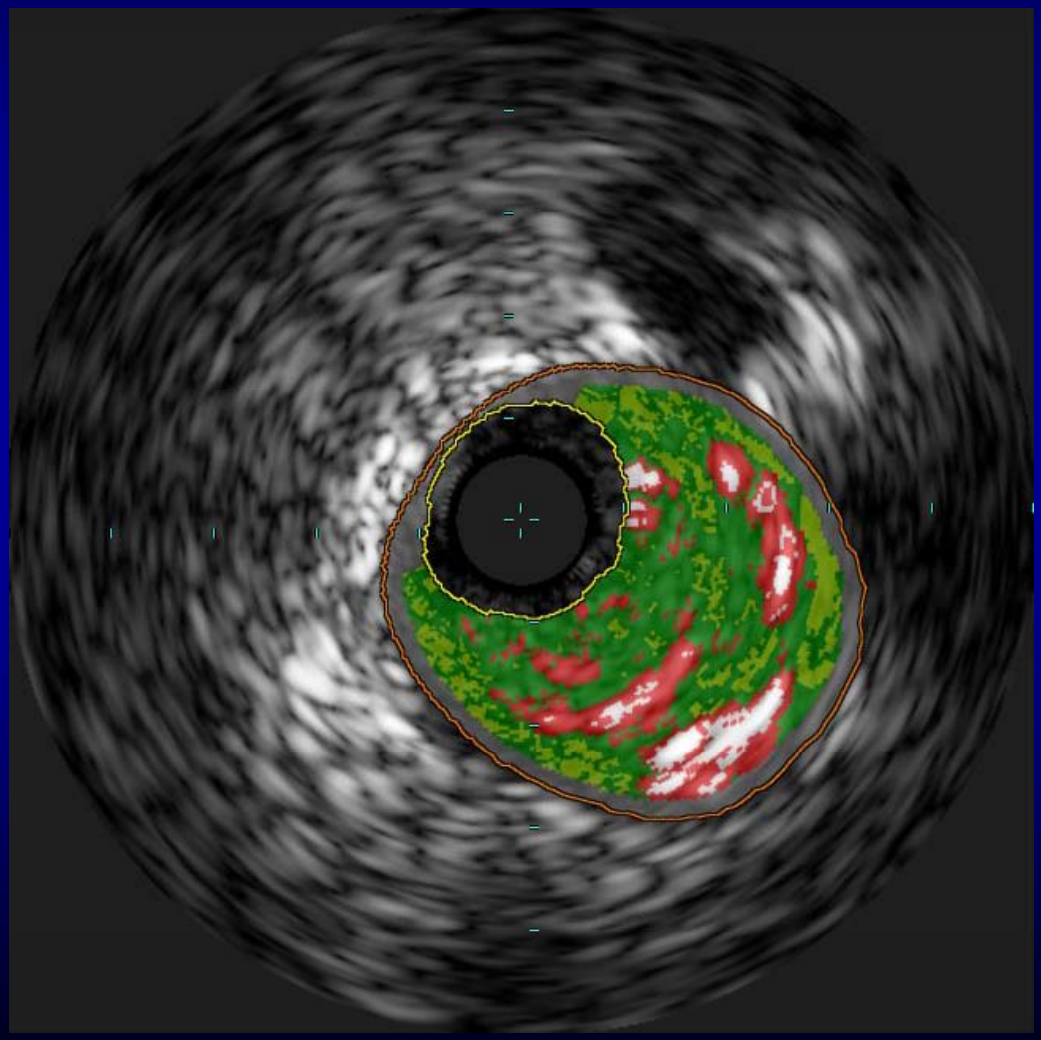
IVUS and VH Imaging of RCA Following AT





IVUS and VH Imaging of RCA Following AT





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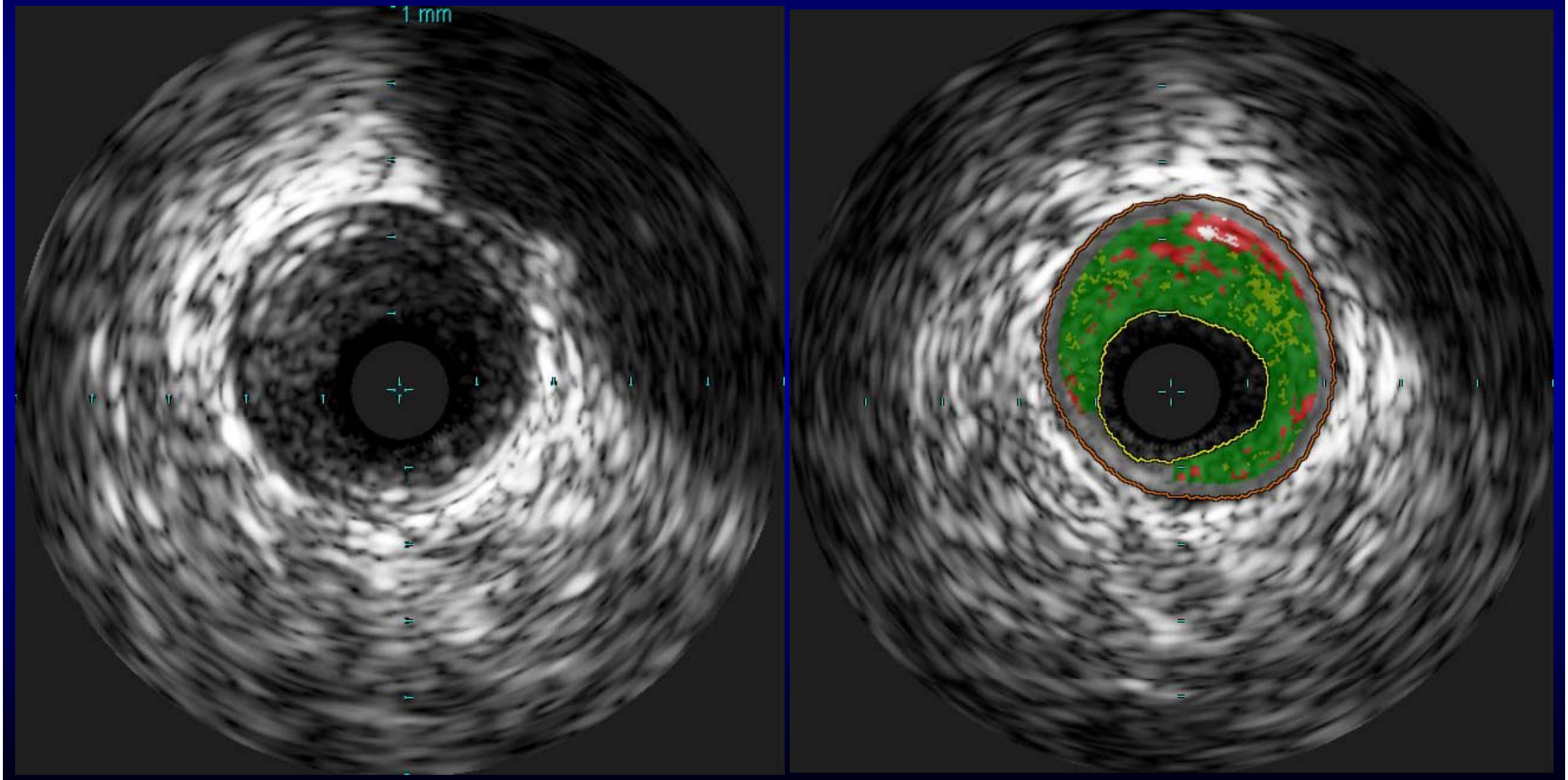


Selective Strategy for Thrombus Management in STEMI (Mehta Strategy)

Thrombus Grade	Mehta Classification
0 = No angio evidence	→ Direct stent ± PTCA
1 = Possible thrombus	→ Direct stent ± Pre PTCA
2 = Definite thrombus	→ Aspiration Thrombectomy
3 = Thrombus > ½ but < 2 VD	→ Aspiration Thrombectomy
4 = Thrombus ≥ 2 vessel diam	→ AngioJet
5 = Total occlusion	→ AngioJet

Mehta et al. J Invas Cardiol. 2010;22:26B

Catheter Aspiration in STEMI and Different Extent of Coronary Thrombus

191 STEMI pts had AT, followed by direct stenting

	Thrombus Grade 0-1 N = 46	Thrombus Grade 2-5 N = 135	p-value
Reference VD (mm)	3.2 ± 0.4	3.4 ± 0.4	0.004
Successful passage (%)	89	96	0.115
Aspirate obtained (%)	67	90	<0.001
Direct stenting (%)	80	70	0.185
Final TIMI 3 Flow (%)	89	92	0.574
Residual thrombus (%)	0.2 ± 0.8	0.1 ± 0.5	0.294
Distal emboli (%)	2	6	0.536
Early ST-seg resolution (%)	65	70	0.737

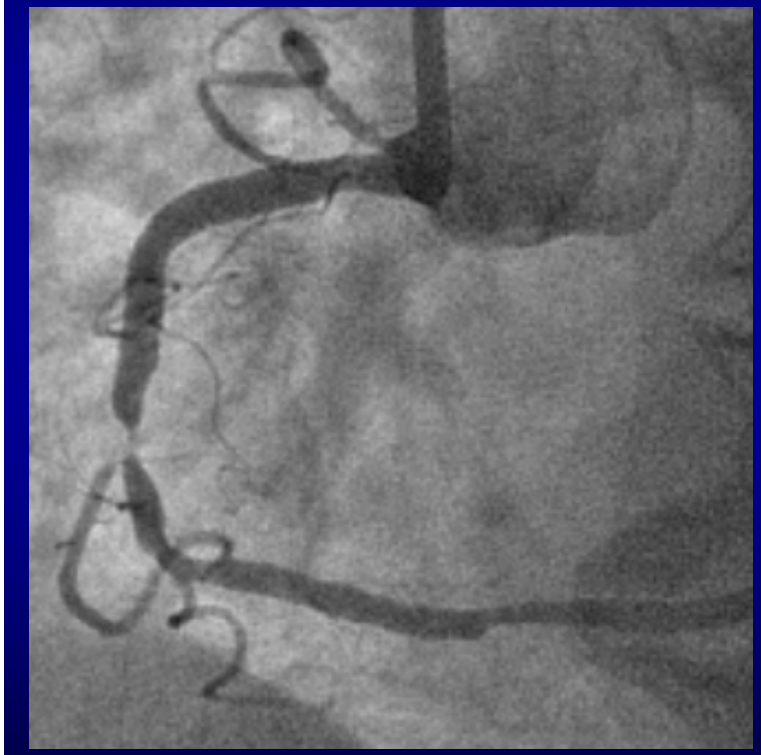
Conclusion: Visually observable aspirate obtained in most pts w/ or w/o angio signs of thrombus, extent of thrombus does not influence final result

I. Balevski et al. AJC 2011;107:681

Routine Thrombectomy: *Utile or Futile?*

- Thrombus is present in all STEMI patients
- Aspiration thrombectomy should be used routinely in all STEMI patients

64-year Male
Acute Inferior STEMI



Pre-AT

Post-AT

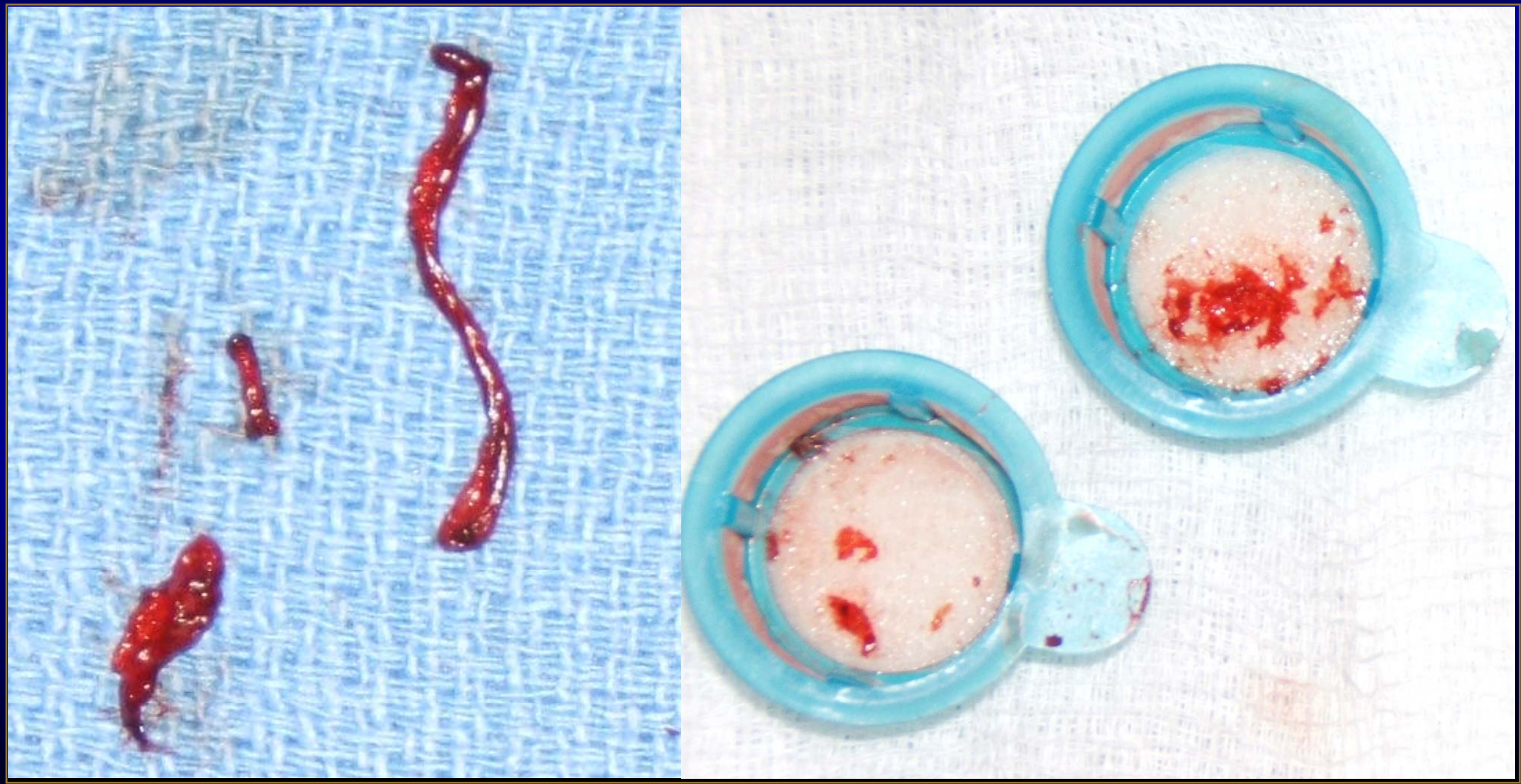
Post-DES

52-yr Male

Lateral Wall STEMI

Lossy Compression - not intended for diagnosis
60-yr
Male
Acute
Anterior
STEMI
8-30-05

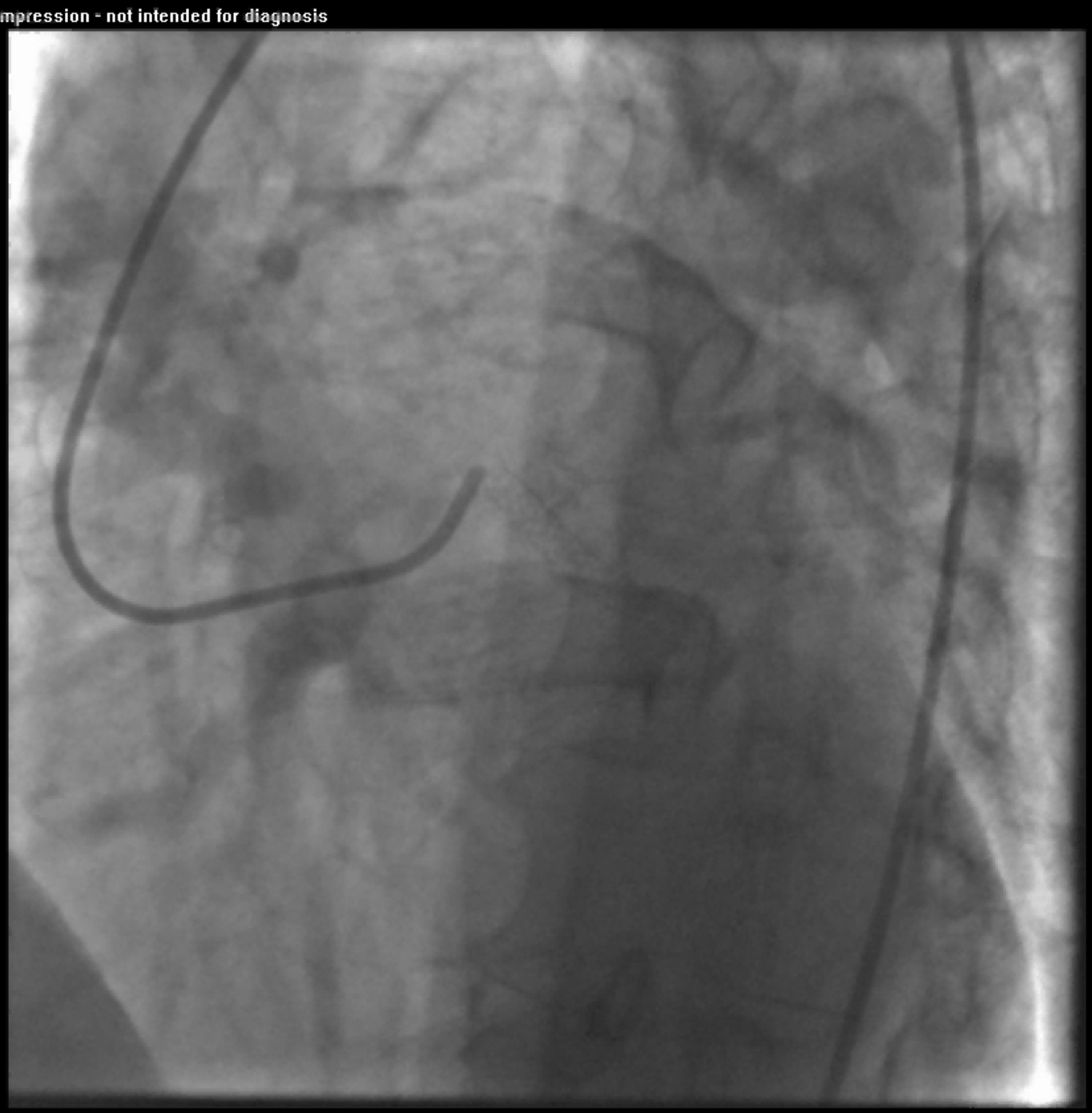
60-yr Male
Acute Anterior STEMI 8-30-05



60-yr
Male

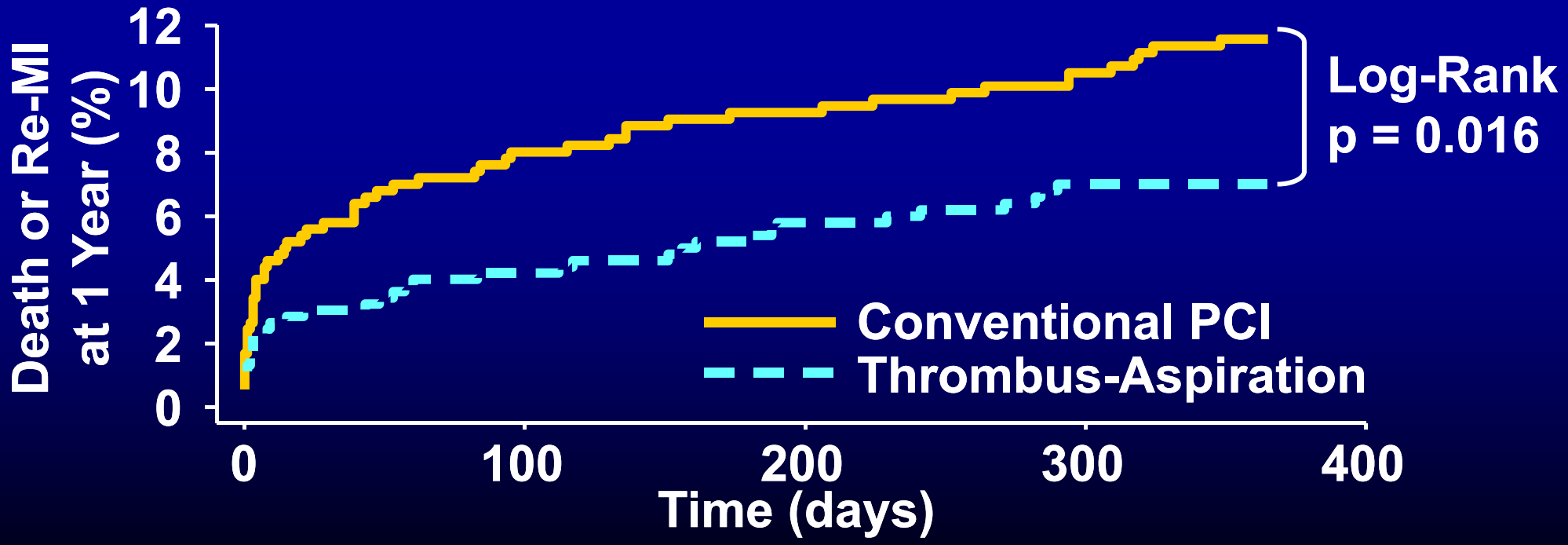
Acute
Anterior
STEMI

3-yr F/U
2-5-08



Thrombus Aspiration During Primary Percutaneous Intervention in AMI Study (TAPAS)

- 1071 STEMI pts, randomized (before angio) to AT with Export Catheter (533 pts) vs. Std 1º PCI (536 pts)
- **Primary Endpoint:** Myocardial Blush Grade (MBG)
- **MBG 0/1** for **TA** = 17%, for **Control** = 26.3%, p<0.001



T. Svilaas et al. NEJM 2008;358:557

TA During Primary PCI Improves Myocardial Reperfusion and Reduces Infarct Size: EXPIRA Trial

- 175 pts randomized to Export PCI vs. Std PCI
- **Primary Endpts:** MBG ≥ 2, 90-min ST-seg resolution, CE-MRI sub-study in 75 pts with ant. STEMI to assess MO and infarct size

Cardiac Magnetic Resonance Imaging: 3-month F/U

	Std PCI	EM PCI	P-value
Infarct Size (%)	11 ± 8.7	9 ± 4.5	0.001
Infarct Size, g	13 ± 12	11 ± 8.7	0.004

- **Conclusion:** Manual thrombectomy improves MBG, and STr in pts with visible thrombus. Lowers the rate of MVO and reduces infarct size at 3 months

Sardella et al. JACC 2009;53:309

Impact of Thrombectomy with EXPort Catheter in IRA During Primary PCI (EXPIRA Trial) on Cardiac Death

175 pts randomized, TIMI 0/1 flow, thrombus present

- thrombus score ≥ 3
- All pts received Abxiximab before therapy
- F/U 24 months, Primary endpoints: Death MACE

Adverse Clinical Events at 2 Years

	TA N=88	Std PCI N=87	p-value
MACE	4 (4.5%)	12 (13.6%)	0.038
Cardiac Death	0	6 (6.8%)	0.0001
Reinfarction	0	1 (1.1%)	0.999
TVR	4 (4.5%)	5 (5.7%)	0.651
Stent Thrombosis	0	0	

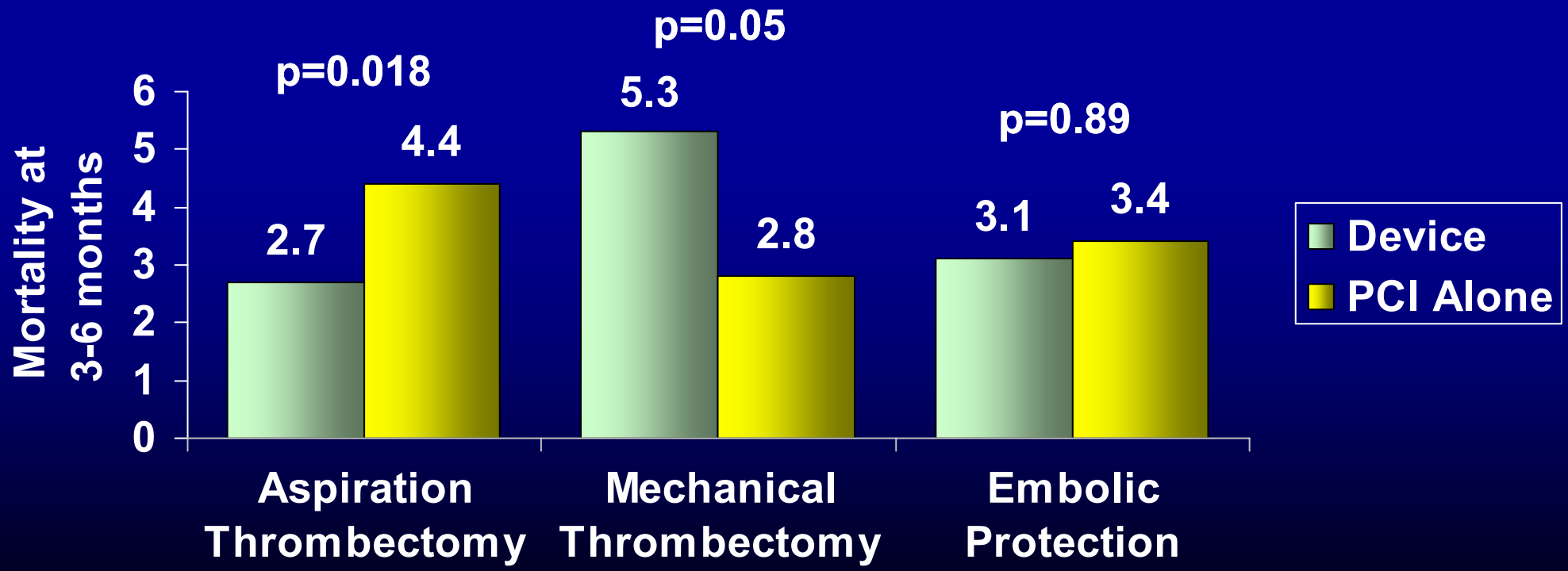
Independent predictors of death: *TA, age, symptom to balloon time*

G. Sardella et al. AJC 2010;106:624

Meta-Analysis of 13 Trials of Manual Thrombectomy:
5 Trials of Mechanical Thrombectomy (AngioJet & X-Sizer)

- 9 trials with distal protection (PercuSurge, FilterWire, Spider Rx, Angioguard)

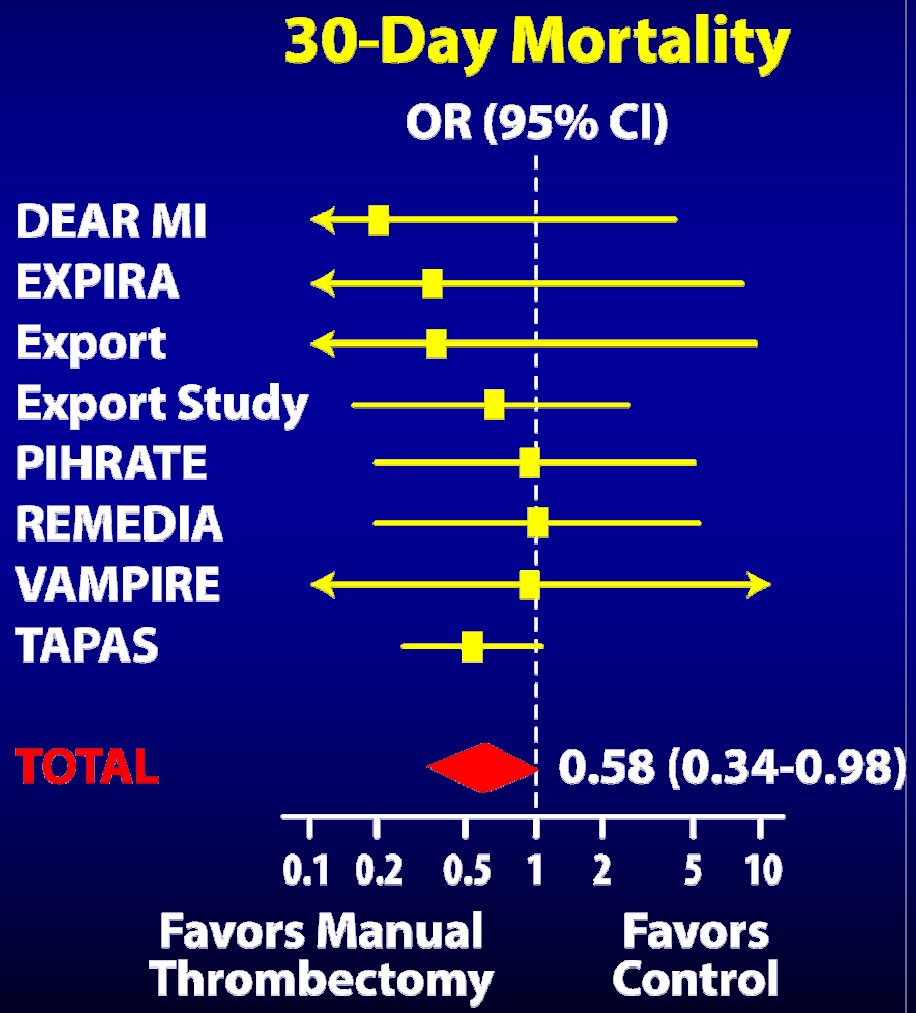
Mortality at 3-6 Months in Primary PCI Patients Comparing Adjunctive Devices for Treatment of Thrombus vs. Control



Baury et al. Eur Heart J. 2008;29:2989

Adjunctive Manual Thrombectomy Improves Myocardial Perfusion and Mortality in Pts Undergoing Primary PCI for STEMI: *A Meta-Analysis of 9 Randomized Trials (N=2417)*

	AT	Control	P-value
TIMI-3 Flow (%)	87	81	<0.0001
MBG 3 (%)	52	32	<0.0001
Distal Emboli (%)	7.9	19.5	<0.0001
30-Day Mortality (%)	1.7	3.1	0.04



De Luca et al. Eur Heart J 2008;29:3002

Routine Thrombectomy: *Utile or Futile?*

Summary of Meta-analyses

- **Use of Aspiration thrombectomy:**
  - **Improves**
    - **TIMI 3 flow post PCI**
    - **ST-segment resolution**
    - **MBG**
  - **Reduces the incidence of**
    - **Distal emboli**
    - **No-reflow (2 meta-analyses reporting)**
  - **Reduces mortality (3 of 4 meta-analyses reporting)**

Routine Thrombectomy: *Utile or Futile?*

Conclusions

- All STEMI patients have thrombus present
- Sequence of management:
  1. Cross with a wire
  2. Aspiration thrombectomy
  3. IVUS
  4. Direct stent
- Consider AngioJet only with very large thrombus

THANK YOU!

16th
April 27-29, 2011,
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TCTAP 2011
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