XVIII SOLACI Congress & SOCIME Annual Meeting

SOLACI' 2012 In partnership with TCT

México DF, 8-10 August, 2012

Efficacy of intracoronary IIb/IIIa inhibitor during primary PCI. Standard use or bailout only?

Costantino R. Costantini, M.D., Ph.D., F.A.C.C.
Hospital Cardiológico Costantini
Foundaction Francisco Costantini
Curitiba - Brazil

Room Molino del Rey, August 9th, 2012,16h15 at 17h05 pmc

2012 -- Potential conflicts of interest

Speaker's name: Costantino R Costantini, M.D., Ph.D., F.A.A.C.

Acute Myocardial Infarction

❖ MACRUZ et al	ARQ. BRAS. CARD	1970
❖ FAVALORO et al.	AM J CARDIOL	1972
❖ GALEANO et al.	ARQ. BRAS. CARD	1973
❖ RENTROP et al.	CLINIC. CARD	1978
❖ MEYER et al.	CIRCULATION	1982
❖ HARTZLER et al.	AM J CARDIOL	1983

My Mentor --- 1982

Geoffrey Hartzler
† 65 Year Old
(Last April)

Arquivo pessoal: C. Costantini

Acute Myocardial Infarction
PTCA Direct Approach

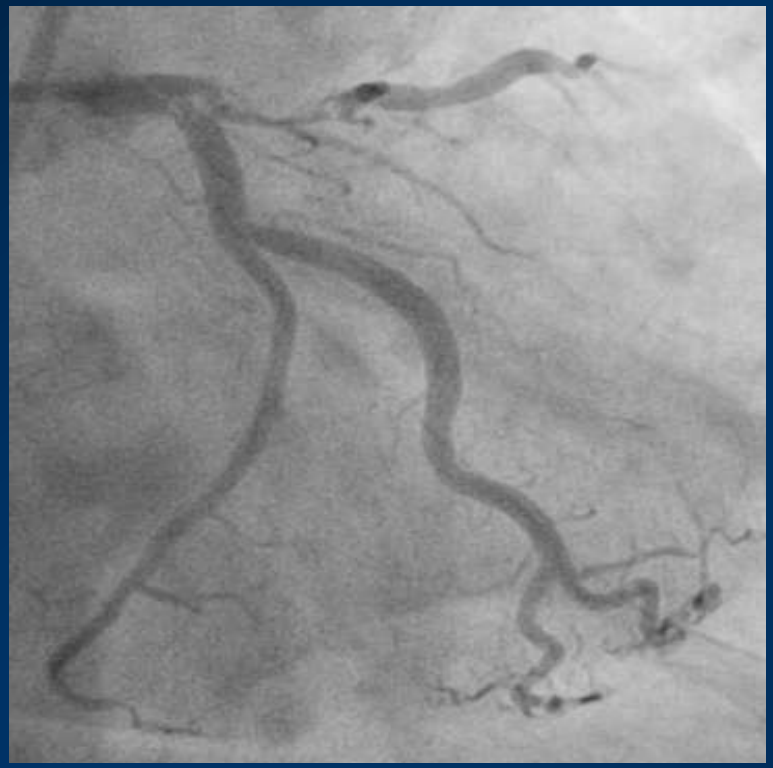
Why ?????

G. Hartzler 1982

- HIGH RATE OF SUCCESS
- LOW HOSPITAL MORTALITY / MORBIDITY
- LOW LATE MORTALITY
- IMPROVES VENTRICULAR FUNCTION
- HIGH RATE OF ASYMPTOMATIC PATIENTS
- FEW CONTRA INDICATIONS

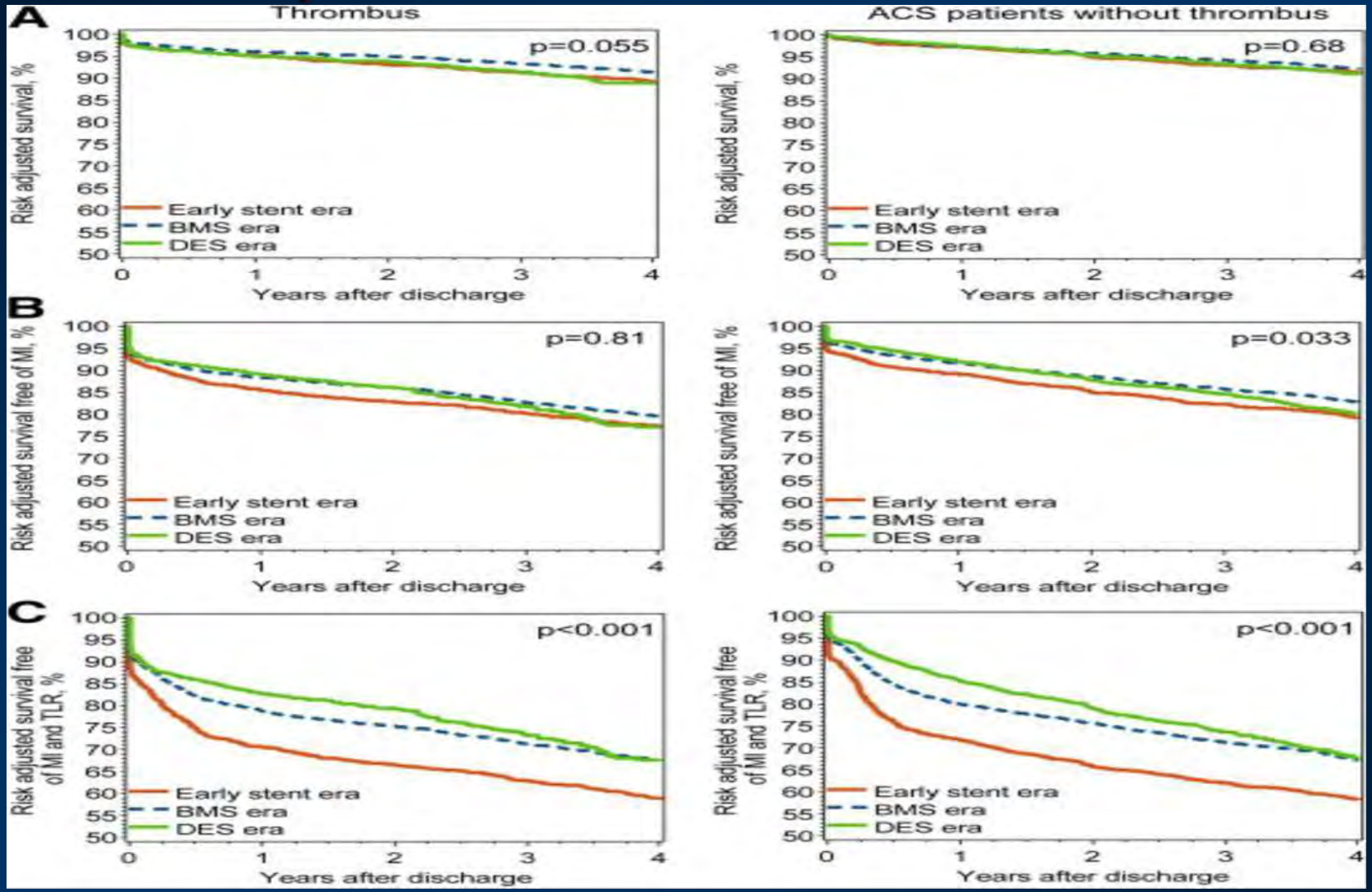
!!!!!!! Thrombus !!!!!!!
This is the Problem !!!!!! (1982 Hartzer)

2012 STILL is THE PROBLEM !!!!



Images Hospital Costantini 2011

5,000 Patients With Thrombus
7,671 ACS Without Thrombus



Holmes, J Am Coll Cardiol Intv. 2010;3(9):937-946

Acute Myocardial Infarction

Reperfusion Objectives

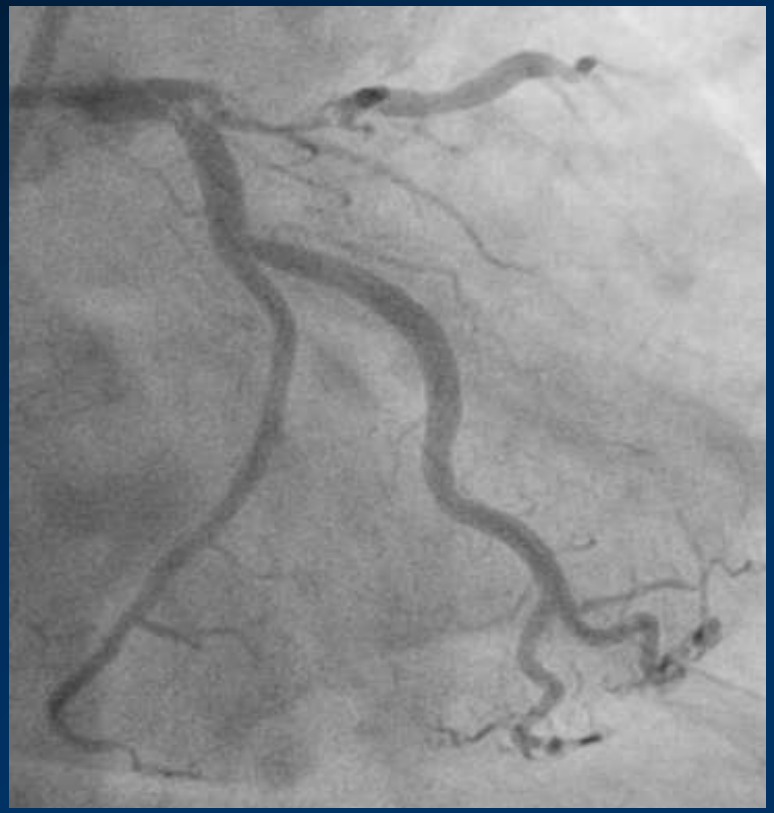
FAST
TIME IS MUSCLE

EFFECTIVE
TIMI FLOW III / BLUSH III

RECURRENT ISCHEMIA
ELIMINATE THE CULPRIT LESION

Functional Recovery
▼
Life Quality
▼
Early Social Reinsertion

AMI (!!! Thrombus !!!)
What to do ???



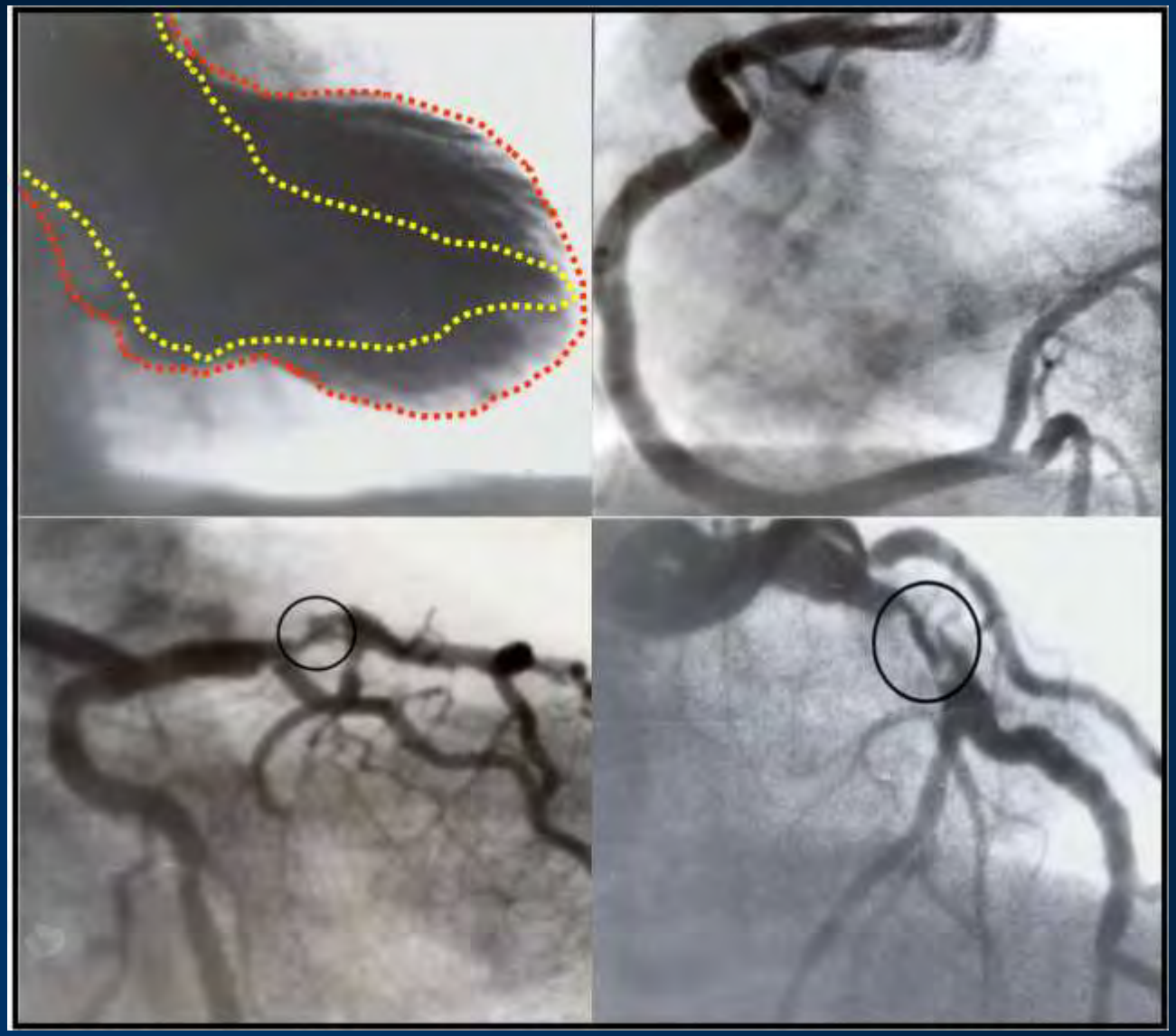
Medical Approach
?

Mechanical Approach
??

Or Both
???

Images Hospital Costantini 2011

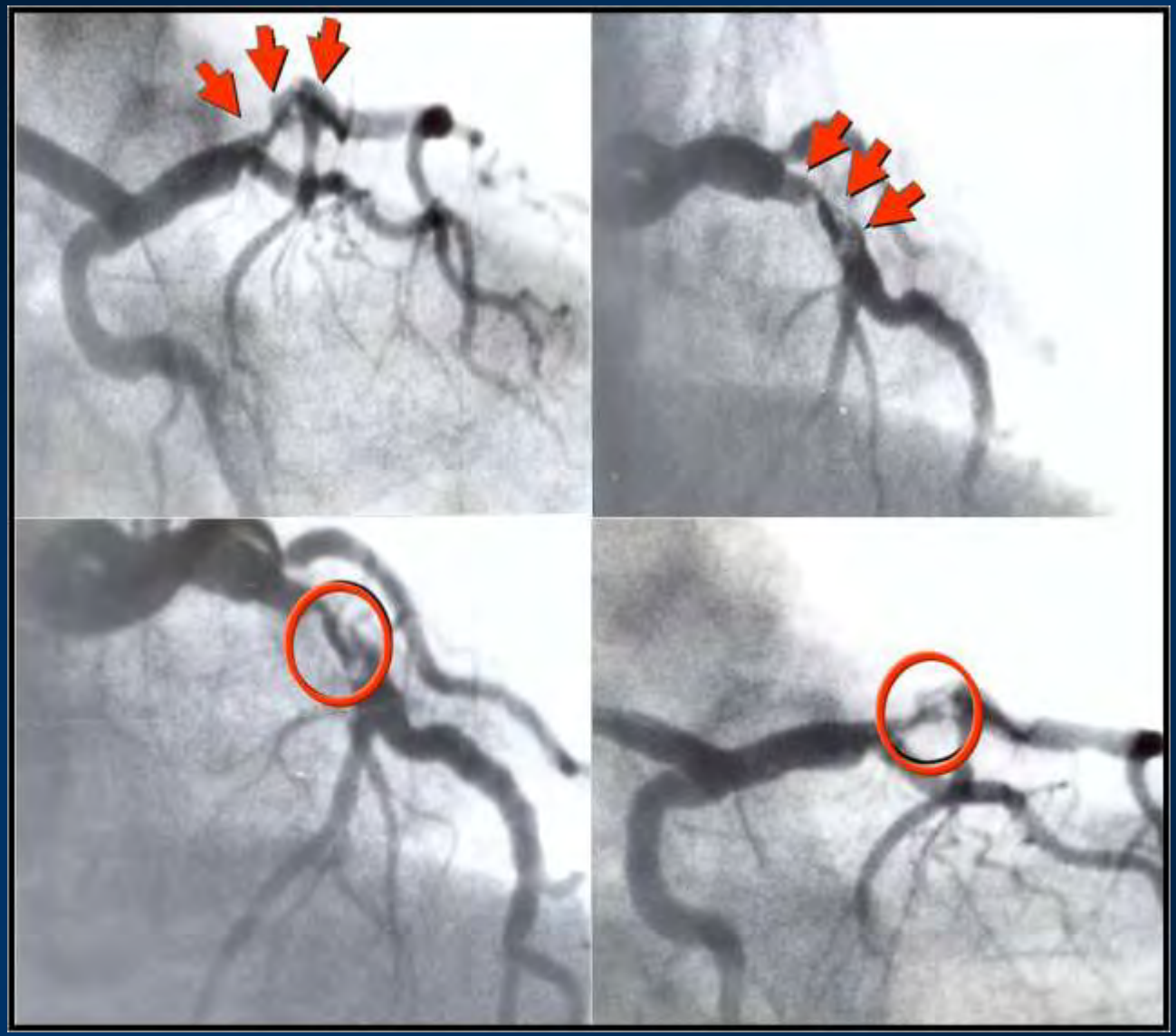
ACS -- 1994



OMM ♂ - 73 Yrs
43115 - 05Oct94

ACS -- LAD angiograph with Thrombus

1994



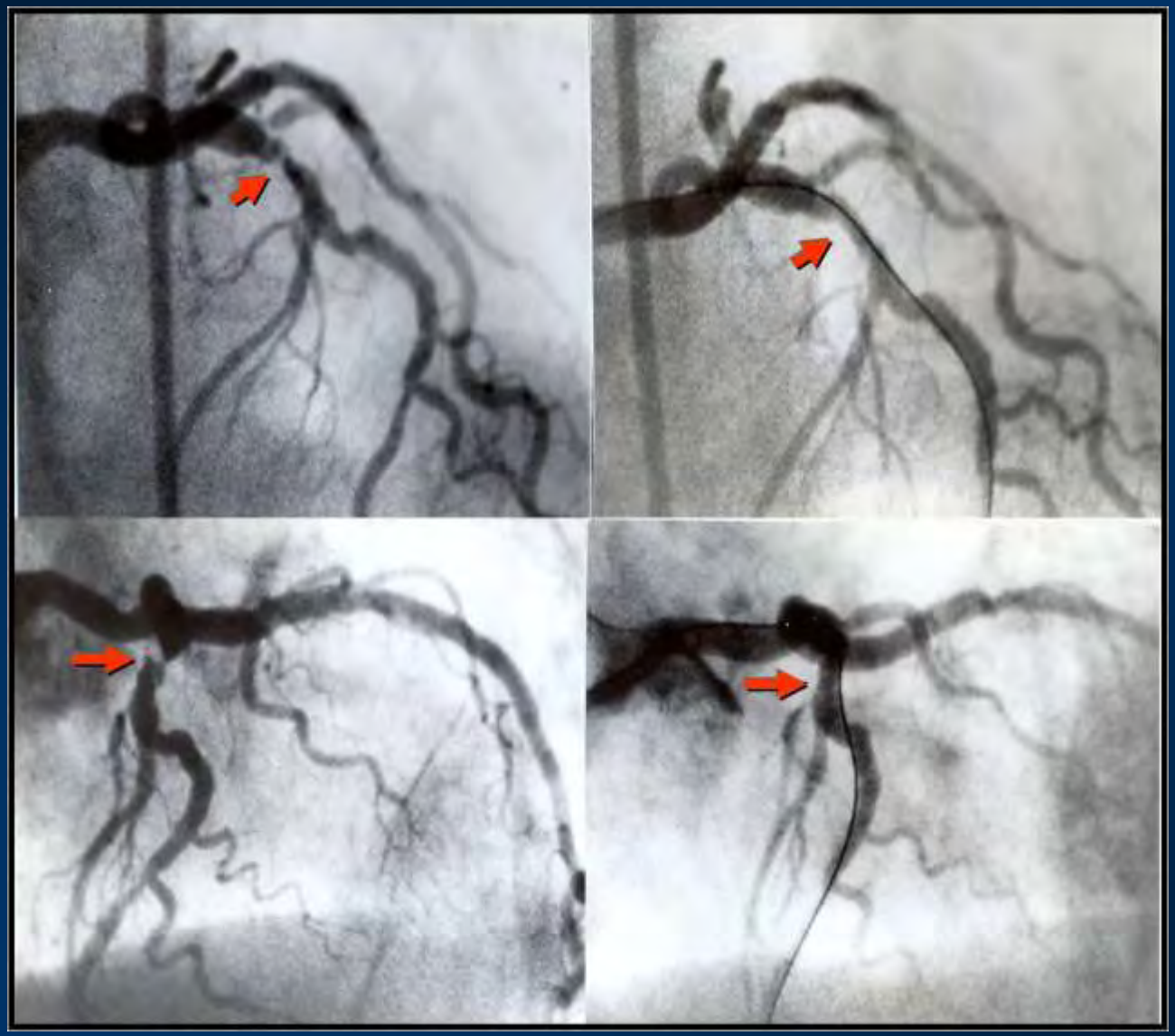
OMM ♂ - 73 Yrs
43115 - 05Oct94

HOSPITAL CARDIOLÓGICO COSTANTINI

ffc

ACS -- LAD angiograph after 5 days Heparin

1994



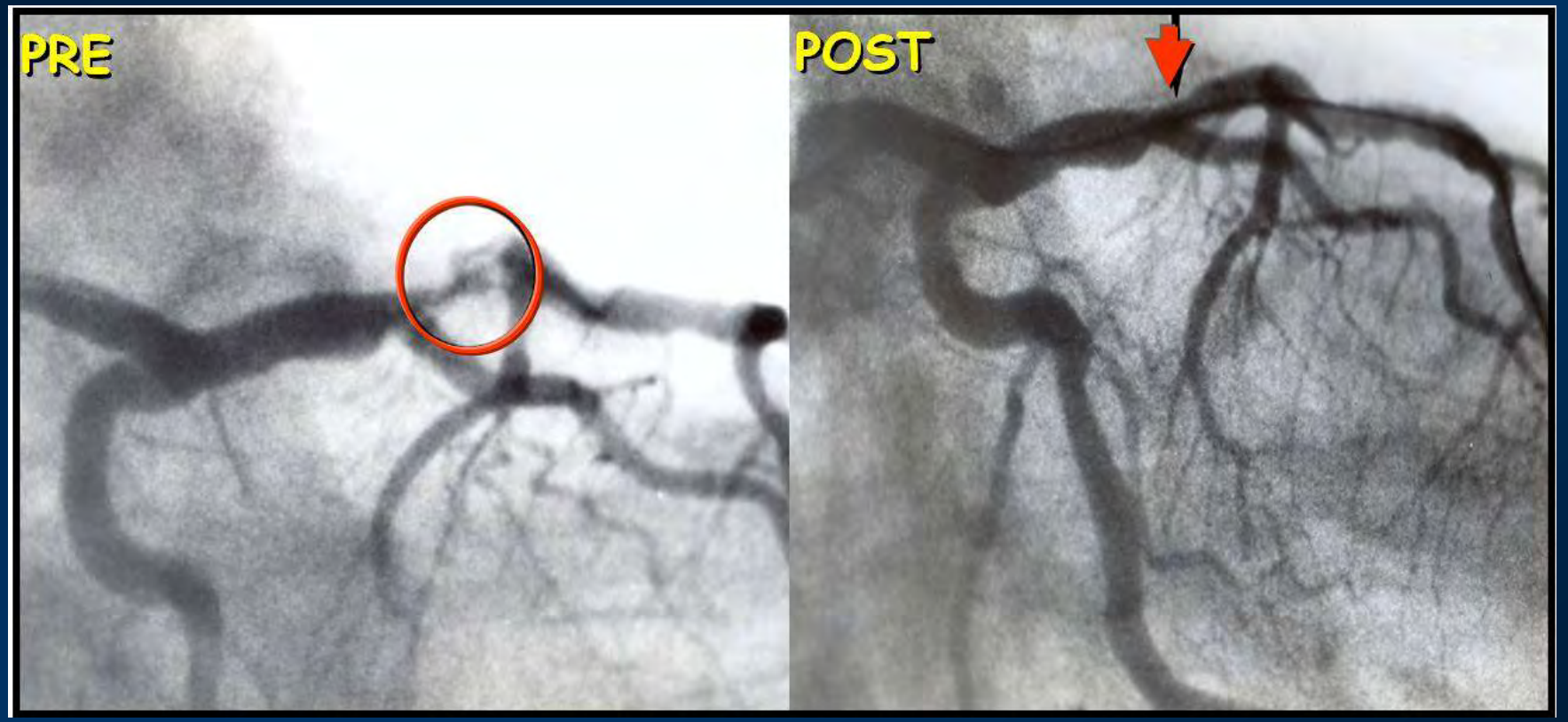
OMM ♂ - 73 Yrs
43164 - 10Oct94

HOSPITAL CARDIOLÓGICO COSTANTINI

ffc

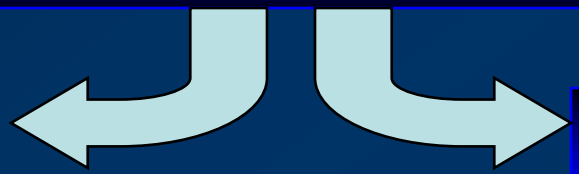
ACS -- LAD angiogram post ANGIOPLASTY

1994



AMI

PRIMARY PCI LIMITATIONS



RECURRENT ISCHEMIA (10 - 15%)

ACUTE OCCLUSION (5 - 10%)

REOCCLUSION AFTER 6 MO TIMI FLOW I (10 - 15%)

DISSECTION (20 – 25 %) REESTENOSIS (35 - 40%)

Circulation. 2000; 102: 2945-51.

The Stent PAMI Pilot Study

Palmaz-Schatz implanted in 236 consecutive pts with STEMI

Mean Follow-Up Duration of 7.4 ± 2.6 Months

	In-Hospital	Post D/C	Cumulative
Death	2 (0.8%)	4 (1.7%)	6 (2.5%)
Reinfarction	4 (1.7%)	5 (2.1%)	9 (3.8%)
TVR	10 (4.2%)	26 (11.1%)	35 (14.8%)
- PCI	5 (2.1%)	20 (8.5%)	24 (10.2%)
- CABG	6 (2.5%)	10 (4.3%)	16 (6.8%)
Death, MI, or TVR	13 (5.5%)	30 (12.8%)	41 (17.4%)

Stone GW et al. JACC 1998;31:23–30.
Stone GW et al. Circulation. 1999;99:1548-1554.

The Stent PAMI Pilot Study

Palmaz-Schatz implanted in 236 consecutive pts with STEMI

FU angio in 176 pts (77.0%) at 7.8 ± 3.2 mos

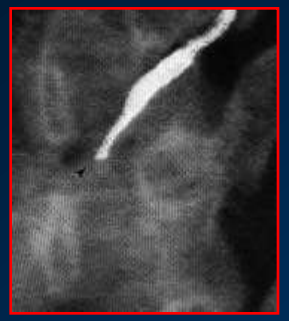
Late loss = 0.88 ± 0.92

Binary angiographic restenosis = 27.5%

Reocclusion = 6.4%

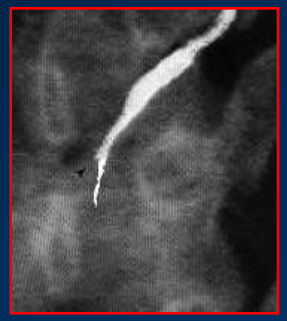
Stone GW et al. JACC 1998;31:23–30.
Stone GW et al. Circulation. 1999;99:1548-1554.

TIMI Myocardial Perfusion (TMP) Grades



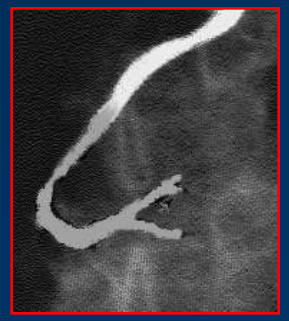
TMP Grade 3

Normal ground-glass appearance of blush. Dye mildly persistent at end of washout.



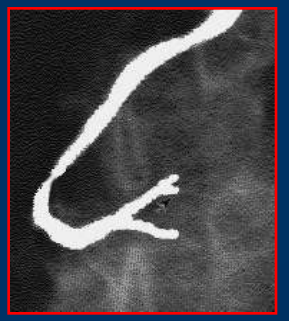
TMP Grade 2

Dye strongly persistent at end of washout. Gone by next injection.



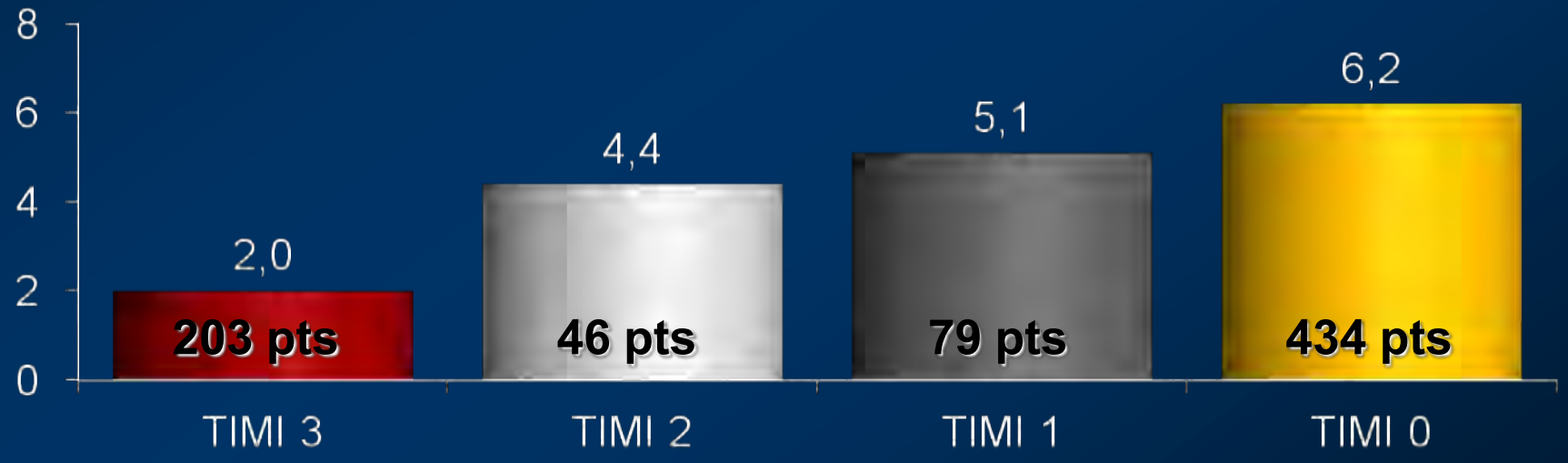
TMP Grade 1

Stain present. Blush persists on next injection.



TMP Grade 0

No or minimal blush.



Adapted from Gibson CM, et al. Circulation. 2000;101:125-130.

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Efficacy of intracoronary IIb/IIIa inhibitor during primary PCI. Standard use or bailout only?

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Room Molino del Rey, August 9th, 2012,16h15 at 17h05 pmc

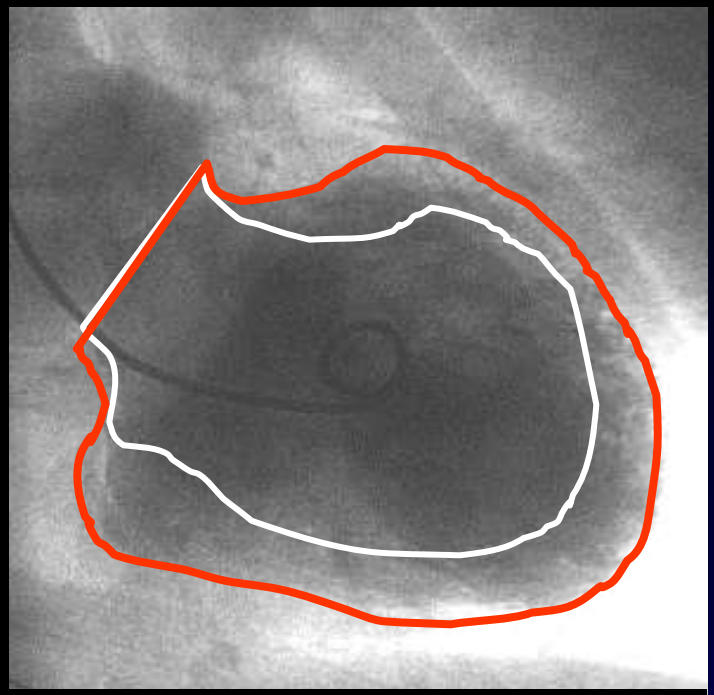
IIb - IIIa

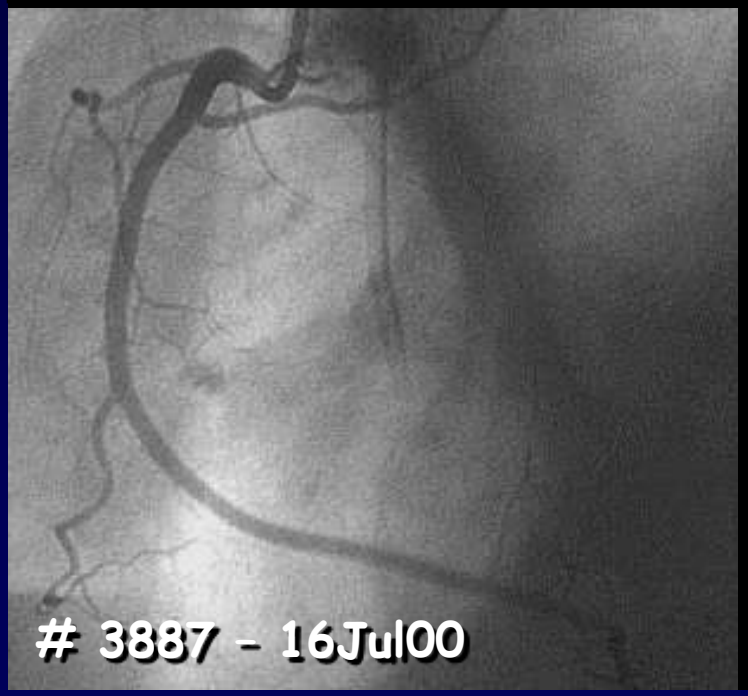
The Use of Agents that Block the Platelet Receptor IIb / IIIa is the Most Important Pharmacological Therapeutic Advancement as Adjunt PCI , since the Discovery of Action of Aspirin.

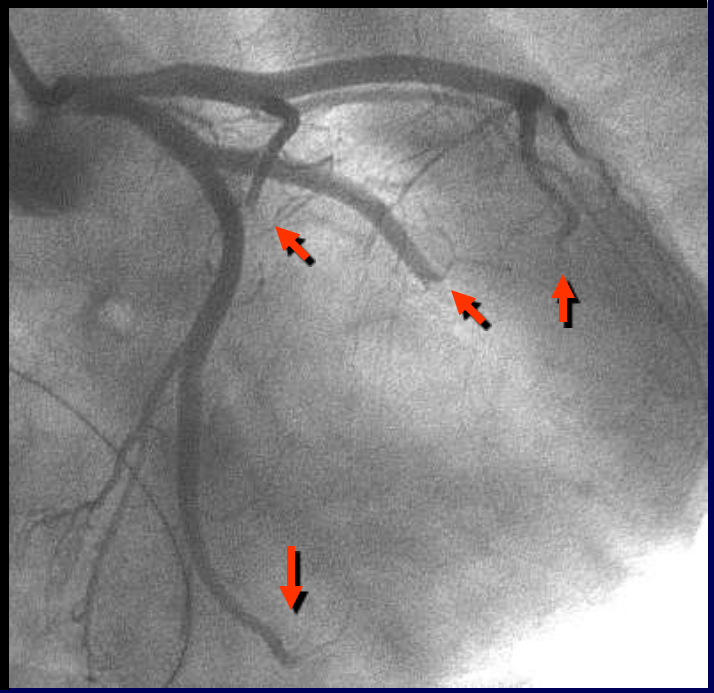
HOLMES. NEJM. 1997 MAYO CLINIC

L.K. 52 Yrs ♀
W/O RISK FACTORS
HORMÔN USE
AMI 3 HOURS
KKIV

DIAGNOSTIC	9:30
HOSP. ADMISSION	10:10
CATH LAB	10:20
1º INFLATION	10:35
END	11:40







L.K. 52 Yrs ♀
AMI 3 HOURS
KKIV

BALOON 2.0mm

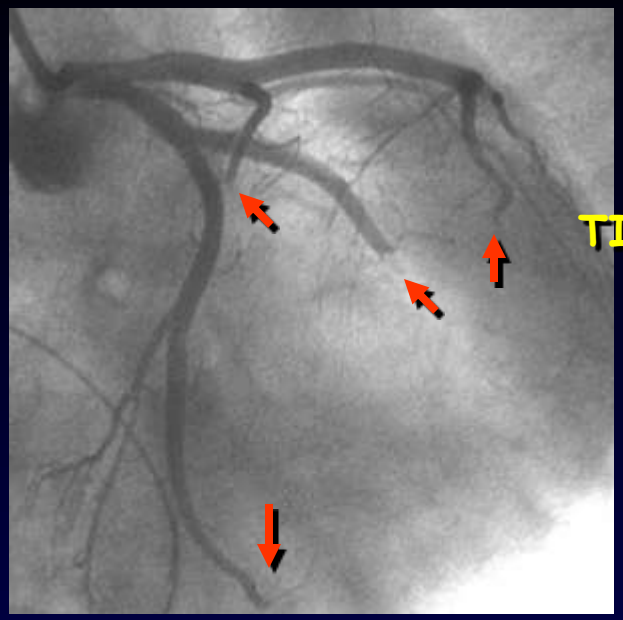
HEPARIN &
TIROFIBAM
INTRA
CORONARY

DOPAMINE
DOBUTAMINE

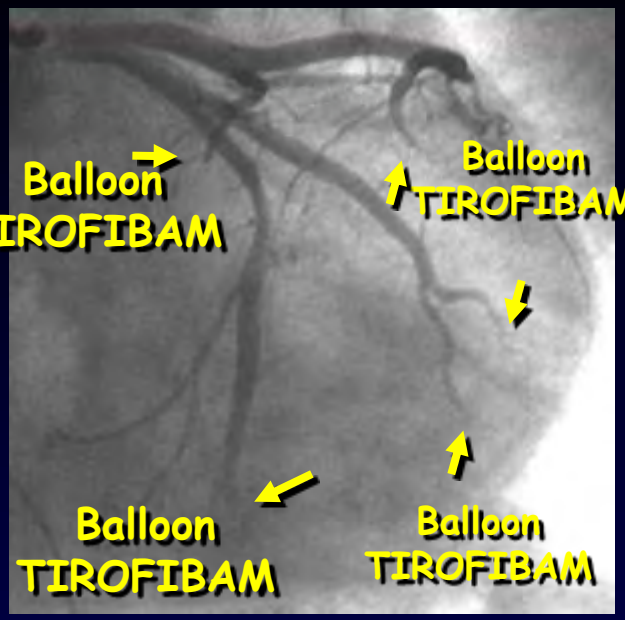
IABP

PLATELETS
1.190.000

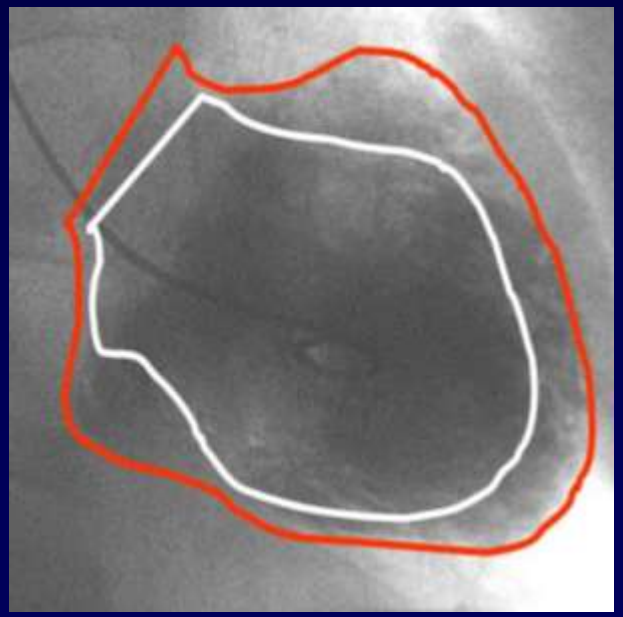
PRE

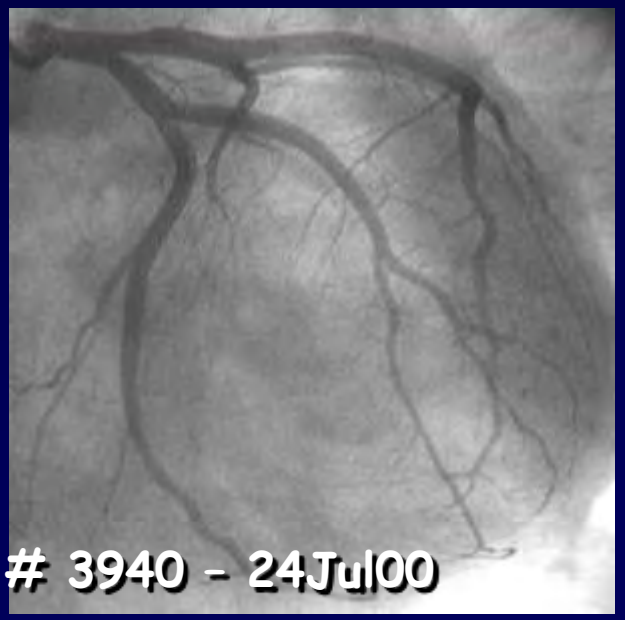


POST



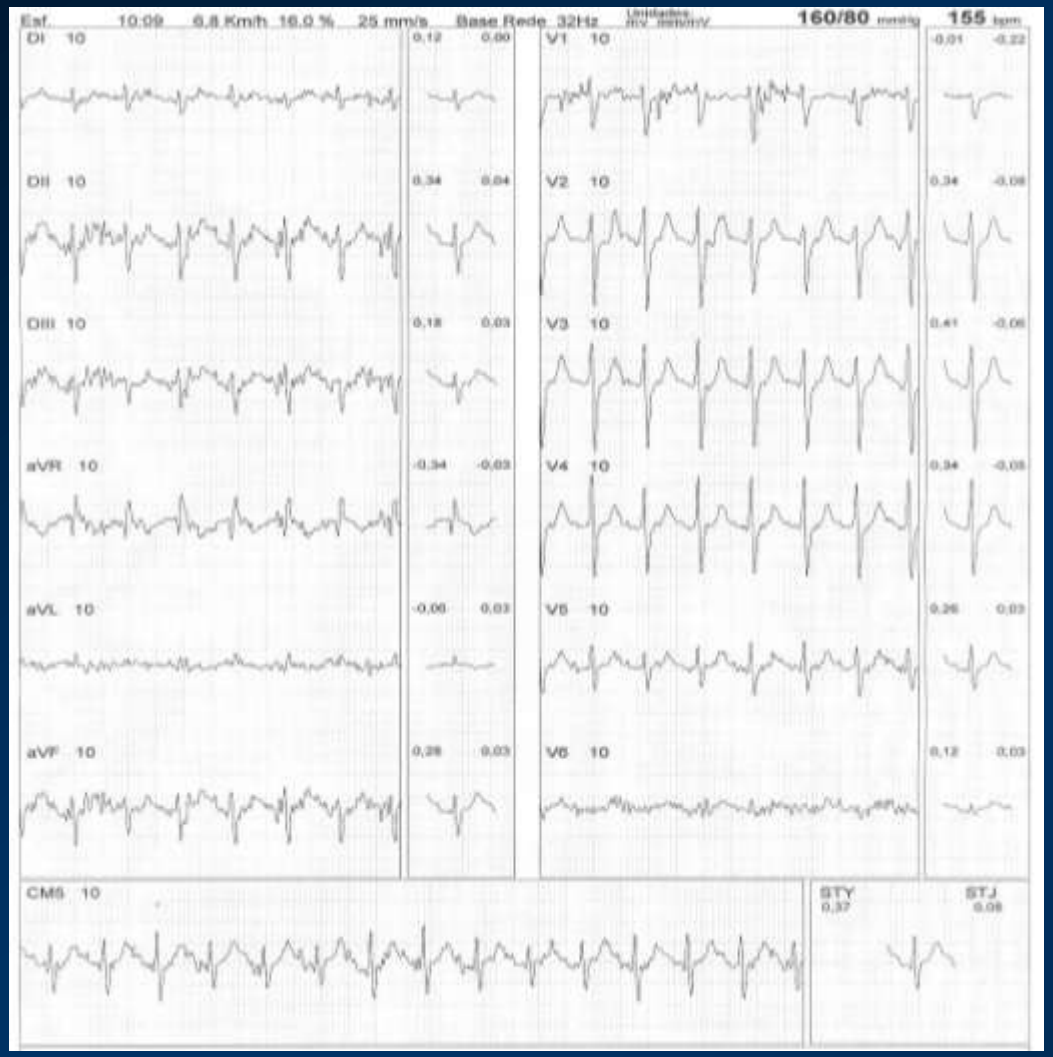
After 8 days





HOSPITAL CARDIOLÓGICO COSTANTINI

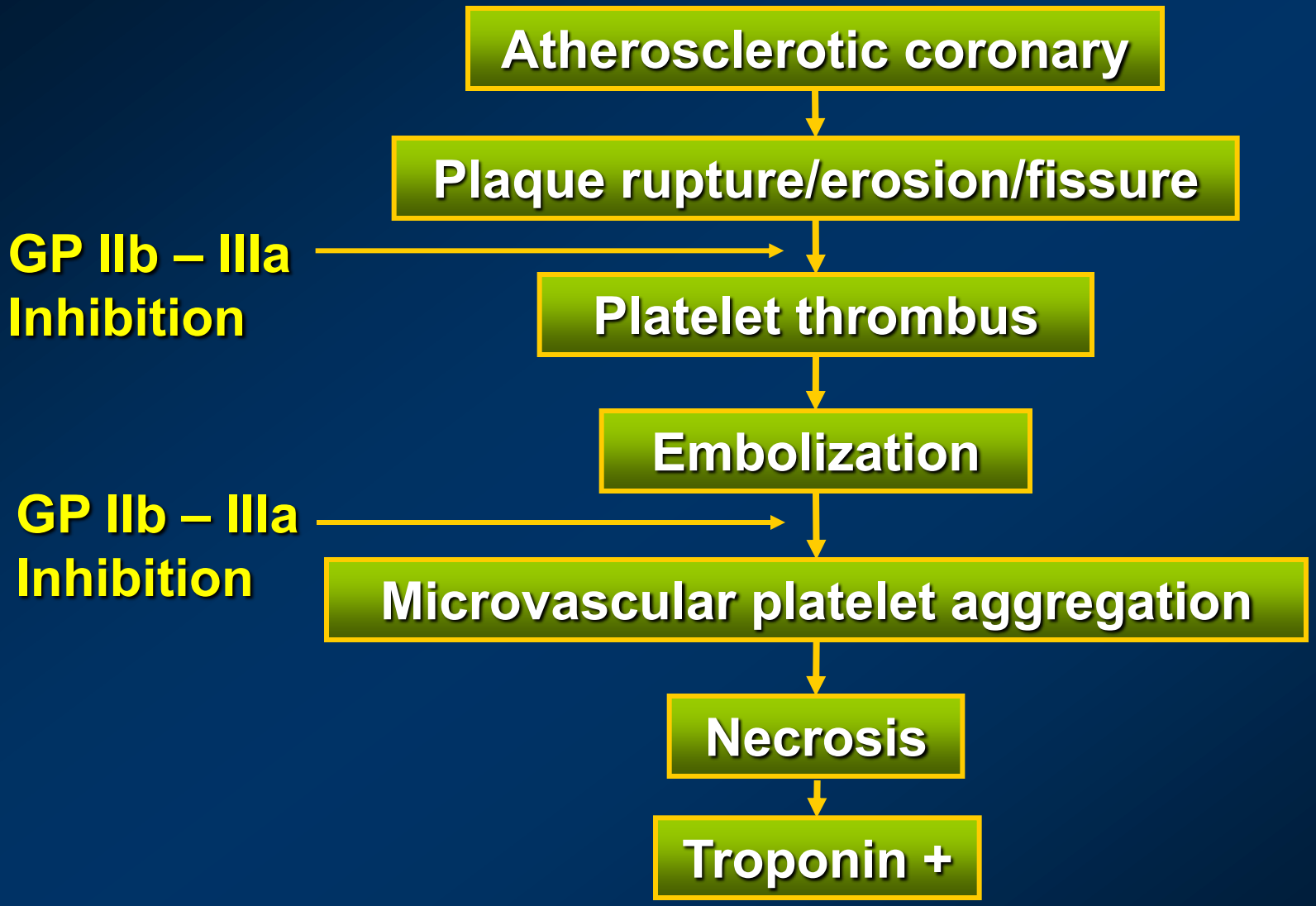
Follow up @ 10 Years Post Tirofiban IC



Normal Treadmill Test (11 Mets)

Trans Thoracic Echo
Ejection Fraction
41%
(15Sep2010)

ACS Possible Link Between Platelets and Troponin and Benefit of GP IIb – IIIa Inhibition



Topol EJ. 1997

2001

Comparação dos inibidores das glicoproteínas IIb-IIIa na angina instável em angioplastia coronária: Tirofiban versus abciximab

José Luis LAZARTE*, Sergio Gustavo TARBINE*, Rubens Zenobio DARWICH*, Daniel Anibal ZANUTTINI*, Marcelo Freitas SANTOS*, Marco FRANCHETTI**, Lauro RUBINI**, Mario MARANHÃO**, Marcio MARANHÃO**, Marcio SCORSIN***, Gilson YARED**, Marco BARBOSA**, Costantino Costantini ORTIZ*, Olavo GARCIA**, Costantino Roberto COSTANTINI****

Bolus Intracoronario em Todos os Pacientes

Medicação

O uso do inibidor da glicoproteína IIb-IIIa começou imediatamente durante o procedimento antes da revascularização coronária .

Tirofiban : usou-se 10 ug/k/ em bolus e infusão contínua de 0.15 ug/k/min. durante 36 horas .

Abciximab : de 0.25 mg/k em bolus, seguida de infusão de 0.125 ug/k/min durante 12 horas.

Todos receberam antes do procedimento ac. acetil salicílico 200 mg/d, clopidogrel 300 mg, mantendo com 75mg/d. ou ticlopidina 500 mg/d., durante 30 dias.

Costantini et al; Rev Bras Cardiol Invas 2001; 9 (4):12-17

Different IIb/IIIa Drugs Comparative Analysis In Patients with Unstable Angina Undergoing PCI

Tirofiban vs. Abciximab (Intracoronary Bolus)

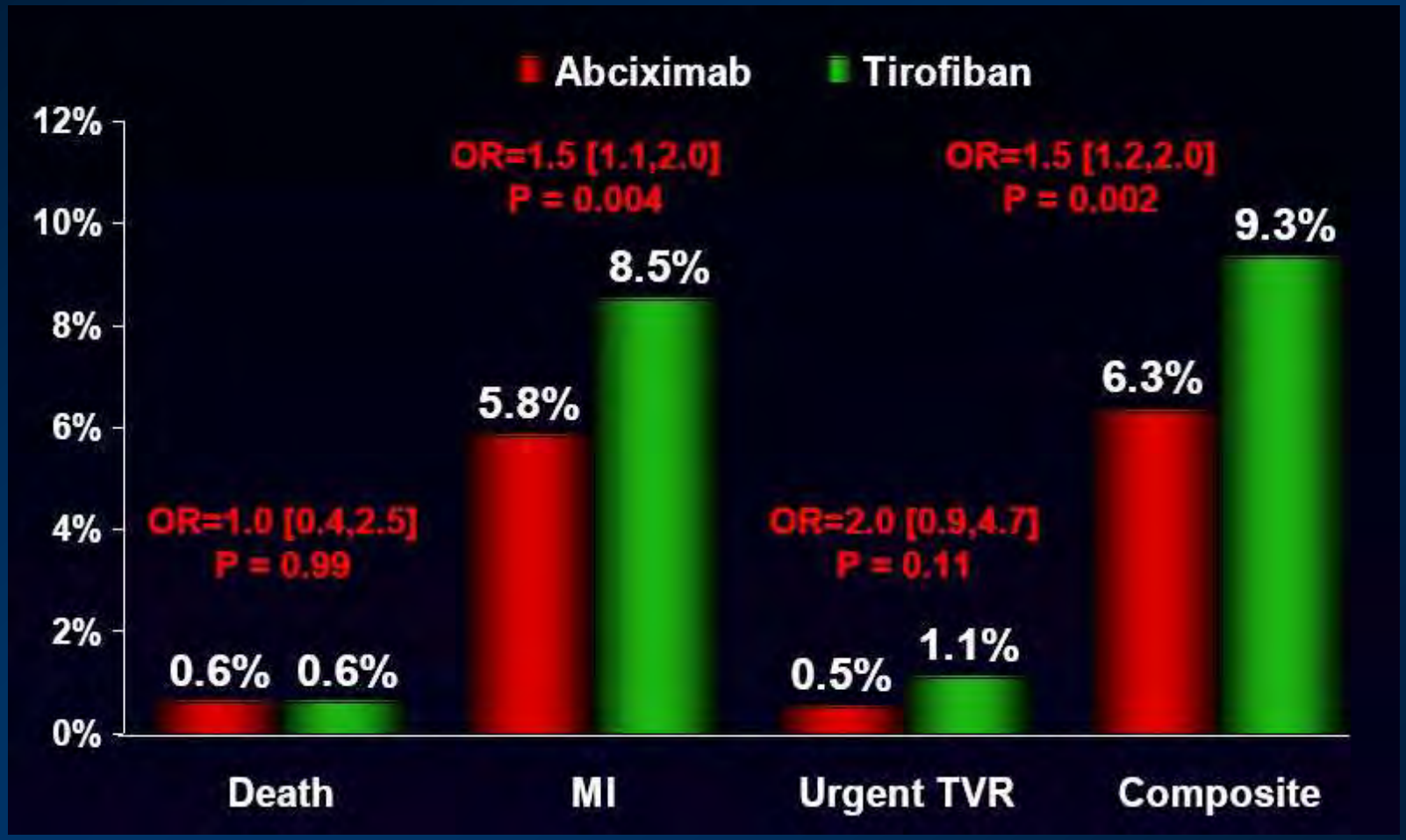
Costantini et al 2001

	*Tirofiban N=72 (IC)	*Abciximab N=198 (IC)	*p*
Intra Hospitalar Events (%)			
Acute Occlusion	(2,7)	(2,5)	0,984
AMI	(0,0)	(0,5)	1,000
Death	(1,4)	(0,5)	0,462
MACE	(4,1)	(3,5)	NS
Minor Bleeding	(5,5)	(1,5)	-

Costantini et al; Rev Bras Cardiol Invas 2001; 9 (4):12-17

TARGET Trial: 30 Day Events - ACS

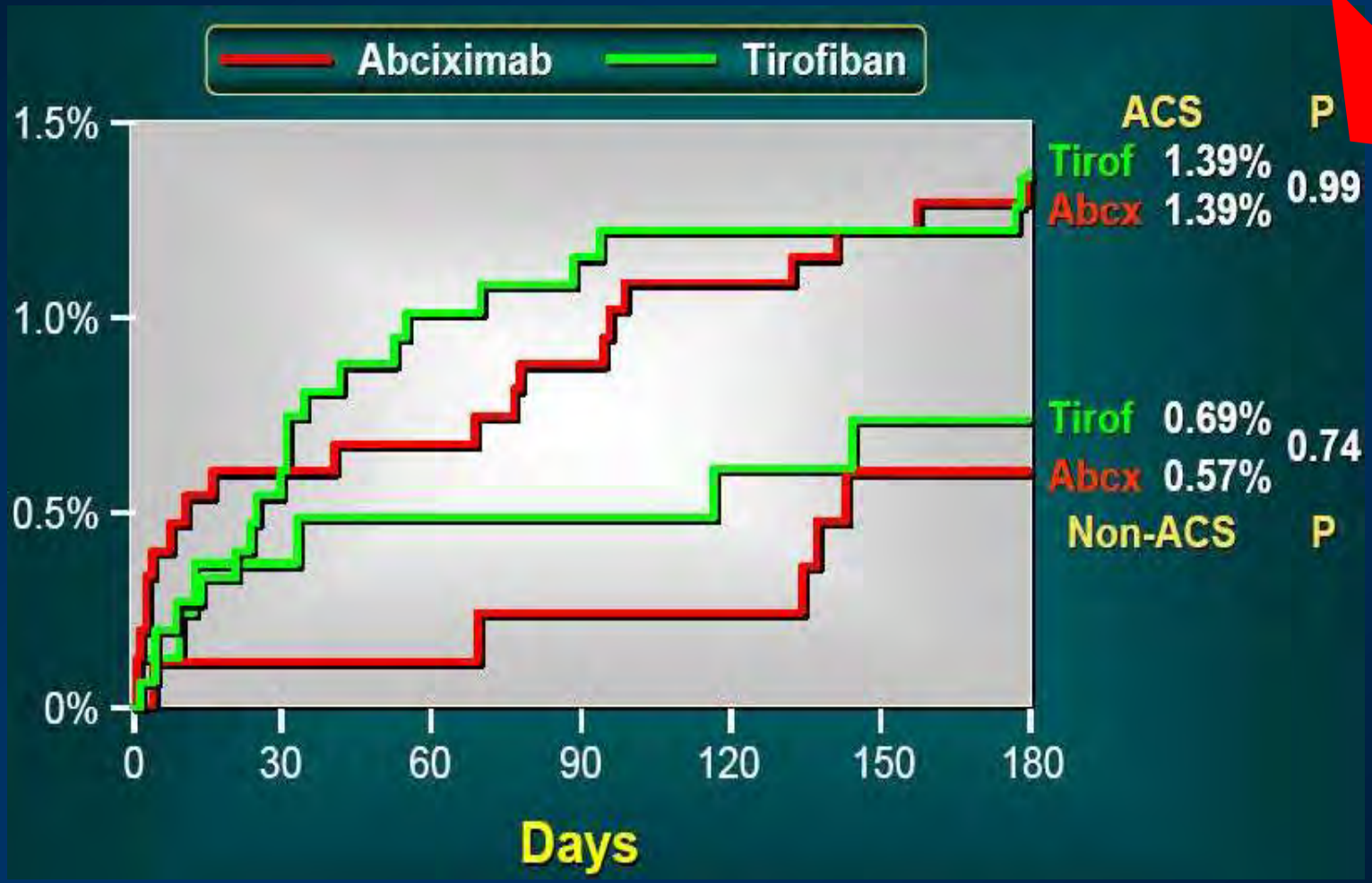
Abciximab vs. Tirofiban



Stone, Moliterno, Bertrand, et al. Circ 2002;105:2347

TARGET Trial: 6 months Death

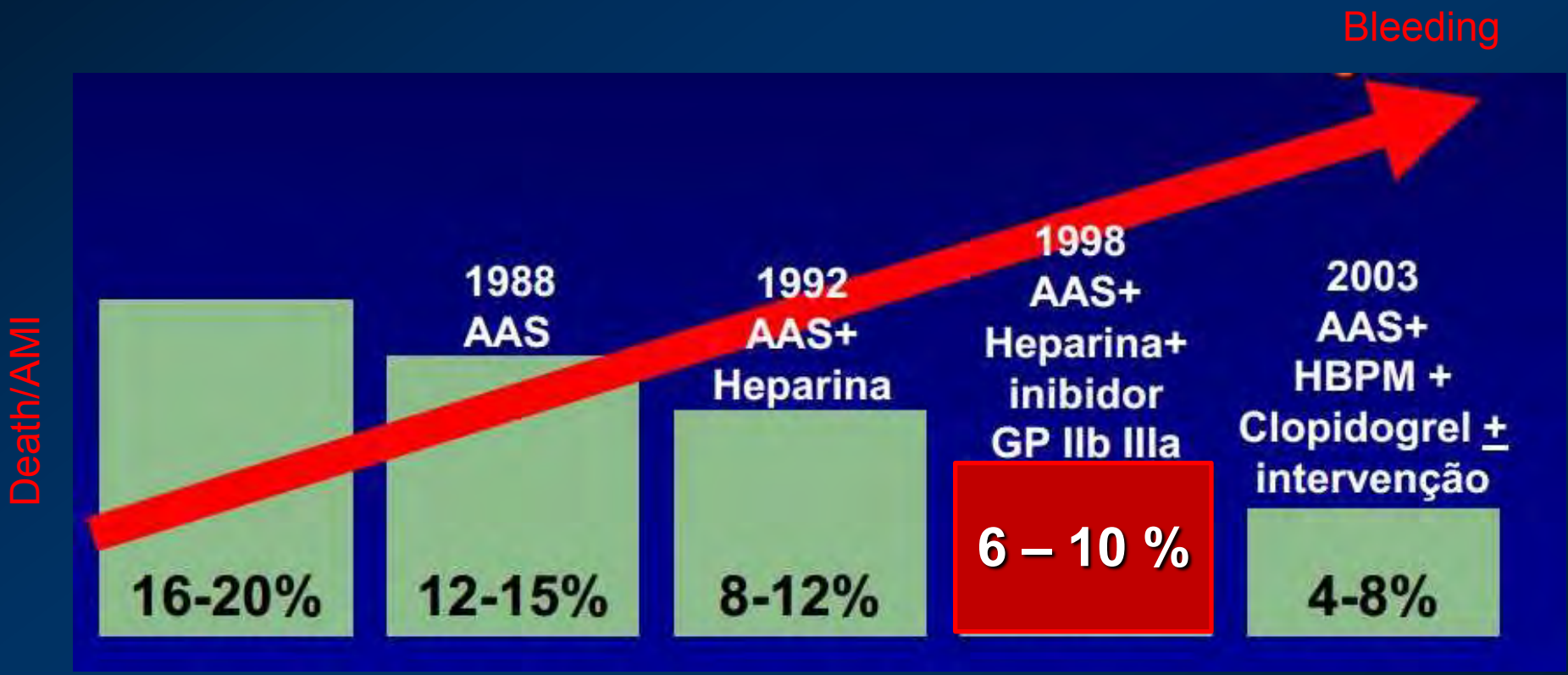
Abciximab vs. Tirofiban



Oral presentaion Stone, TCT 2002

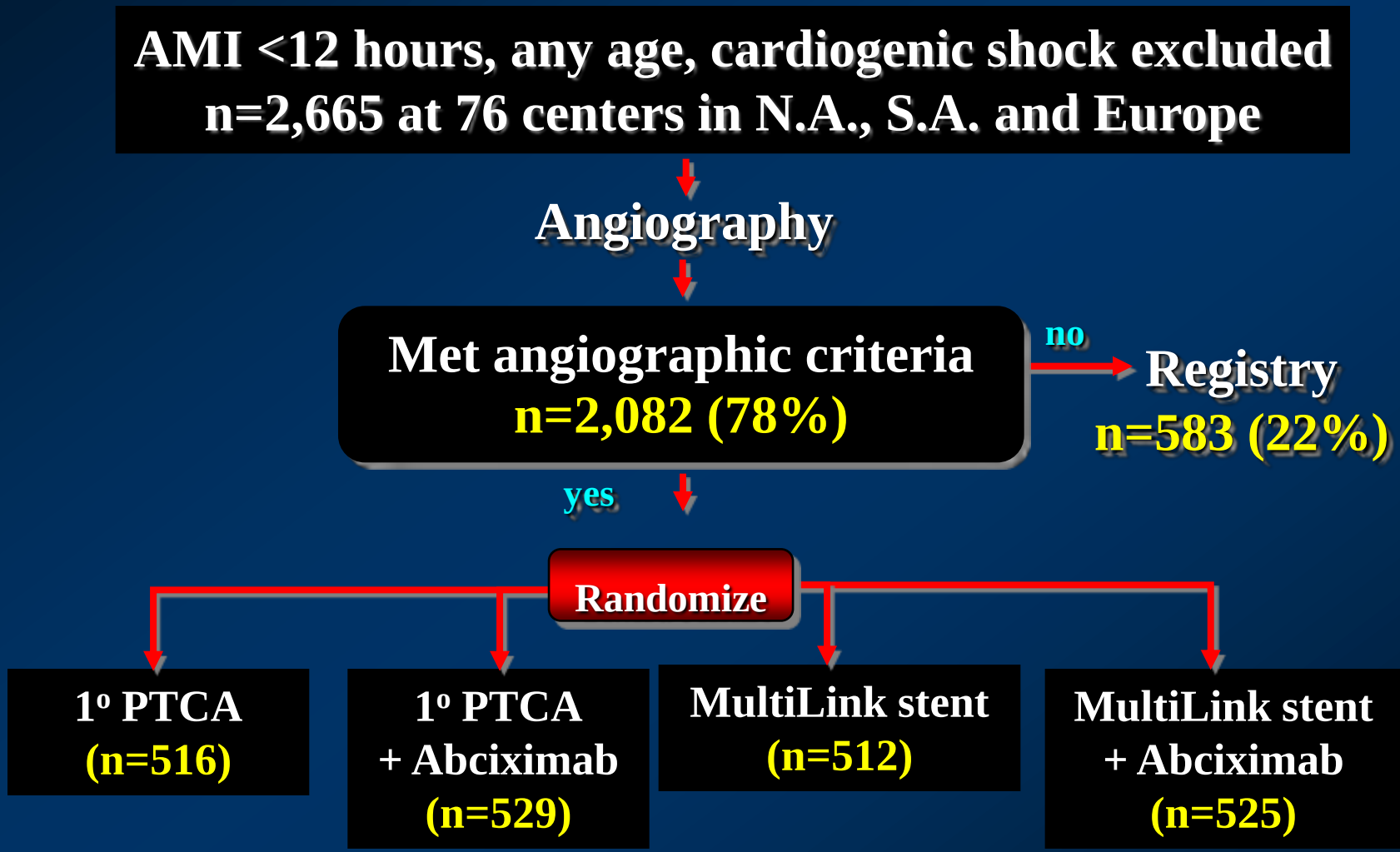
Anti Thrombotic Drugs Risk Benefit in AMI/UA in the last decade:

Improved efficacy, however increased bleeding



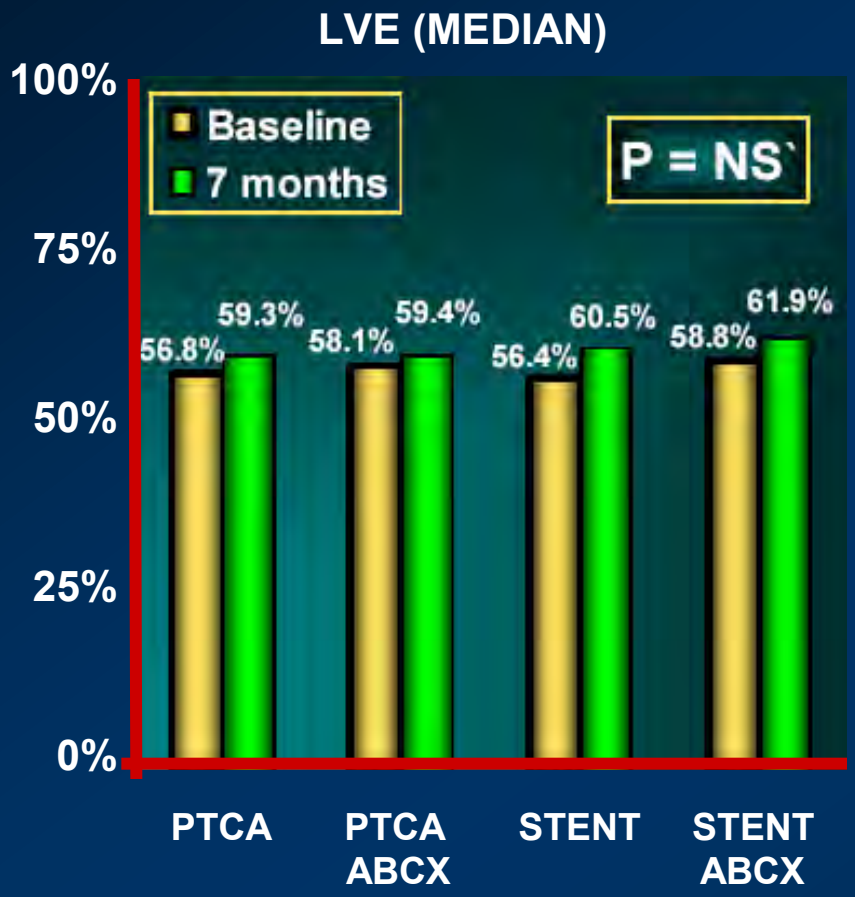
RIDKER, P. et al. Are both aspirin and heparin jus tified as adjuncts to thrombolytic therapy for acute myocardial infarction? The Lancet, 341: 1574-1577, 1993.

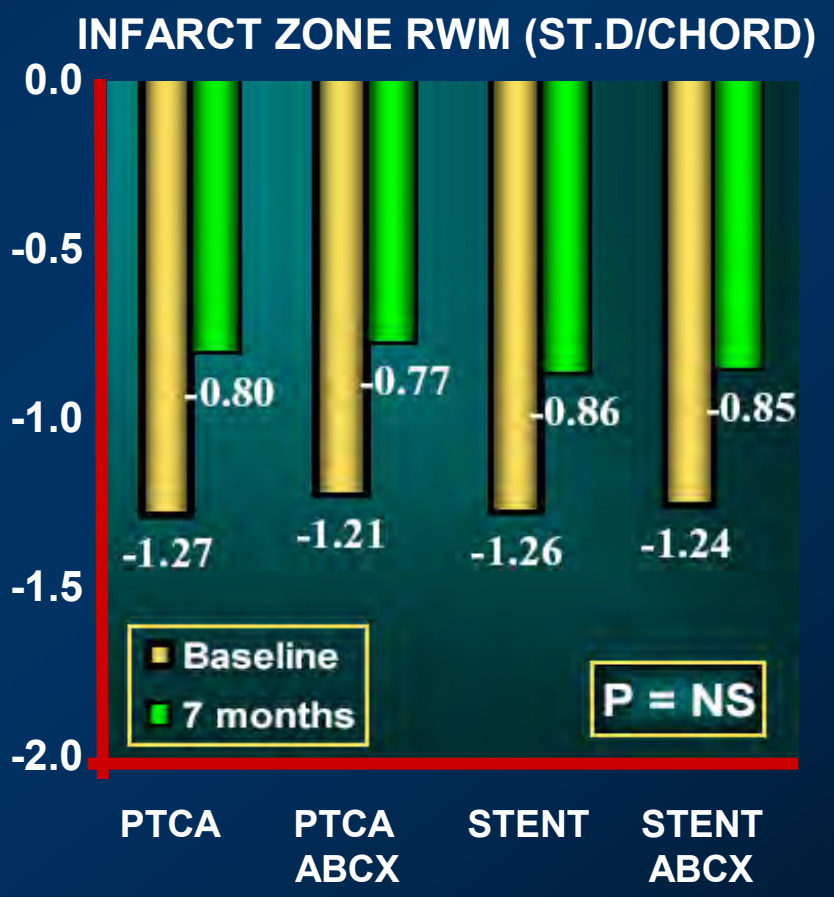
Study Design



Stone et al.Circulation 2000; 102: II-664

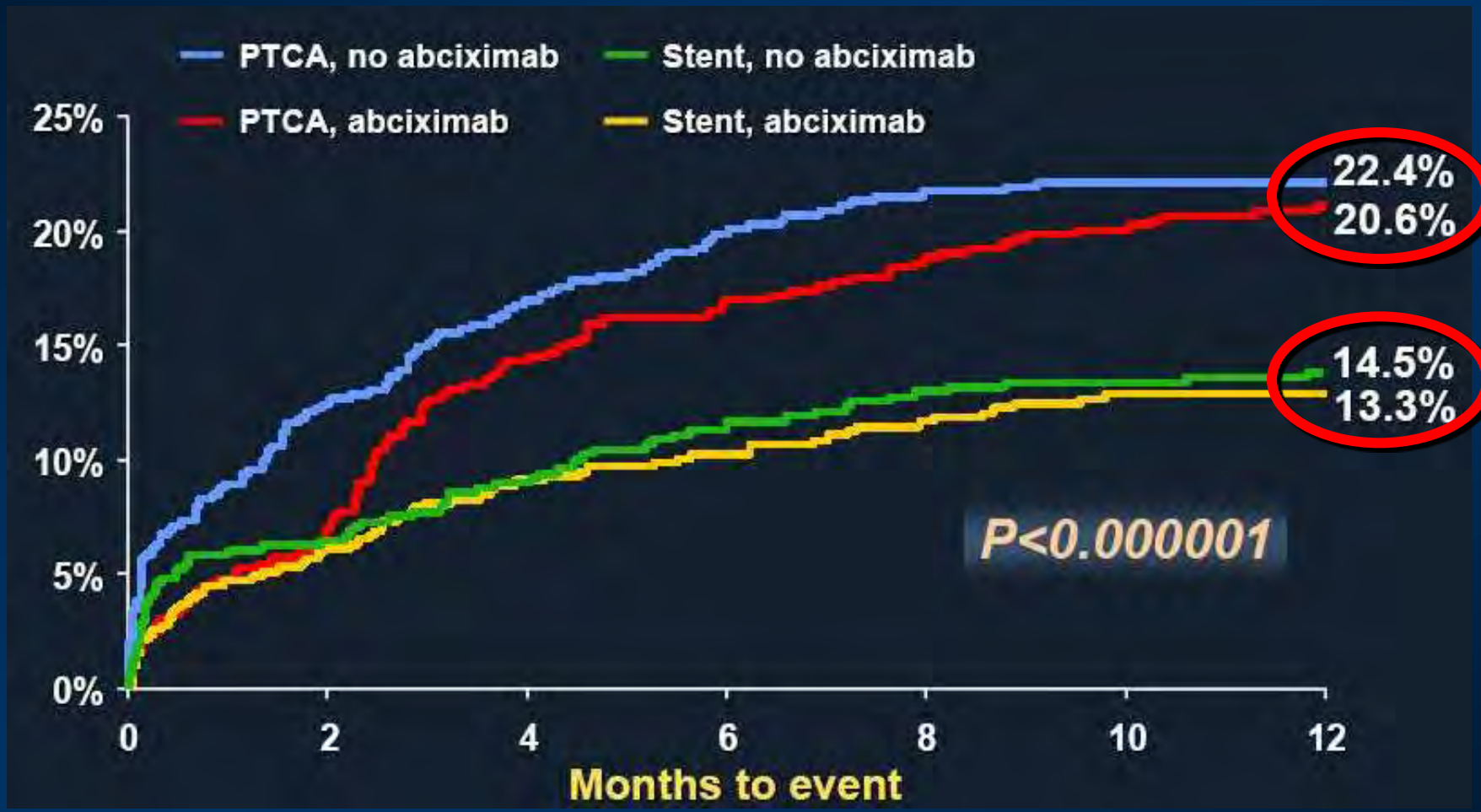
CADILLAC: Myocardial Recovery





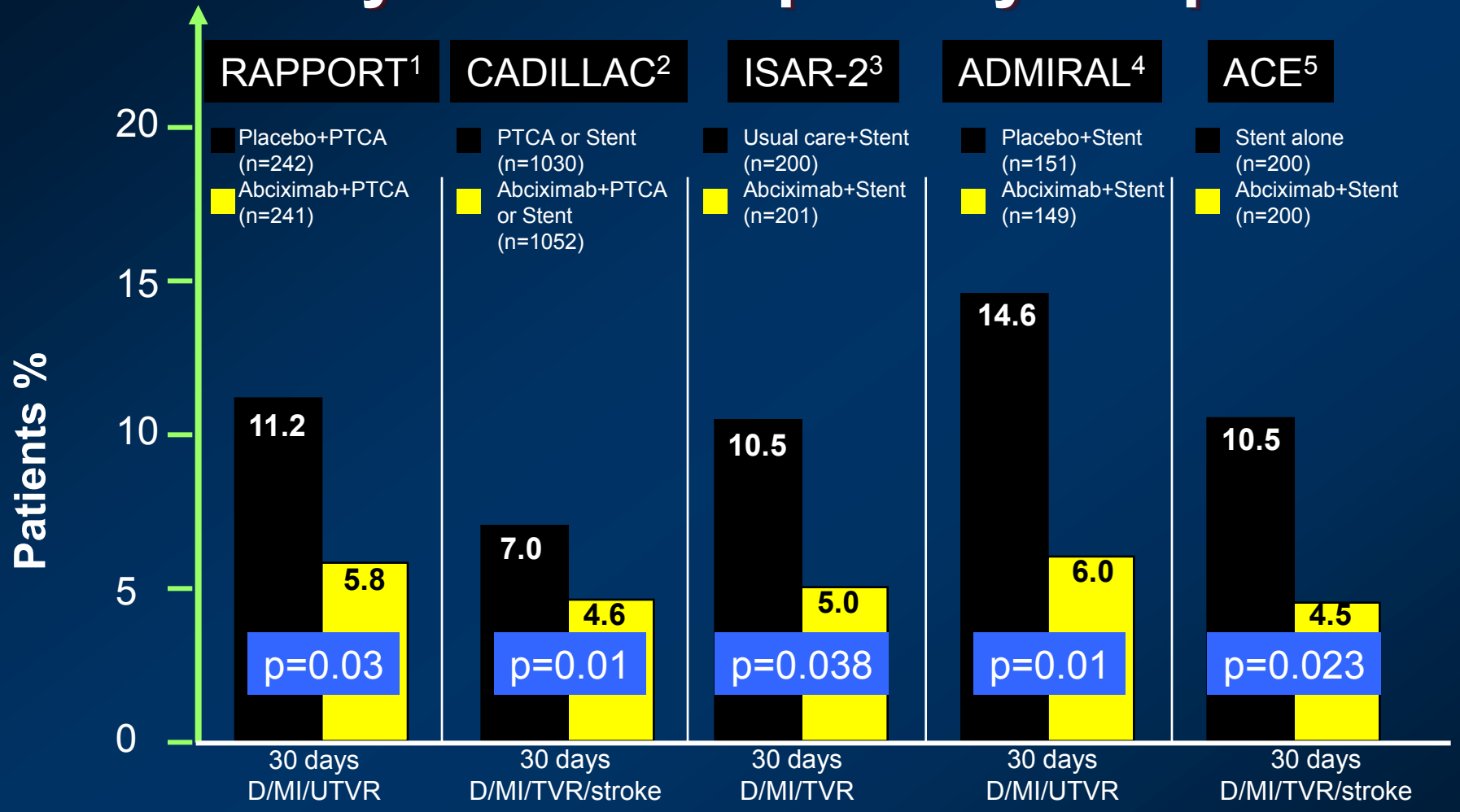
Stone GW et al. NEJM 2002;346:957–66

CADILLAC (n=2,082): 12 Month MACE



Stone GW et al. NEJM 2002;346:957–66

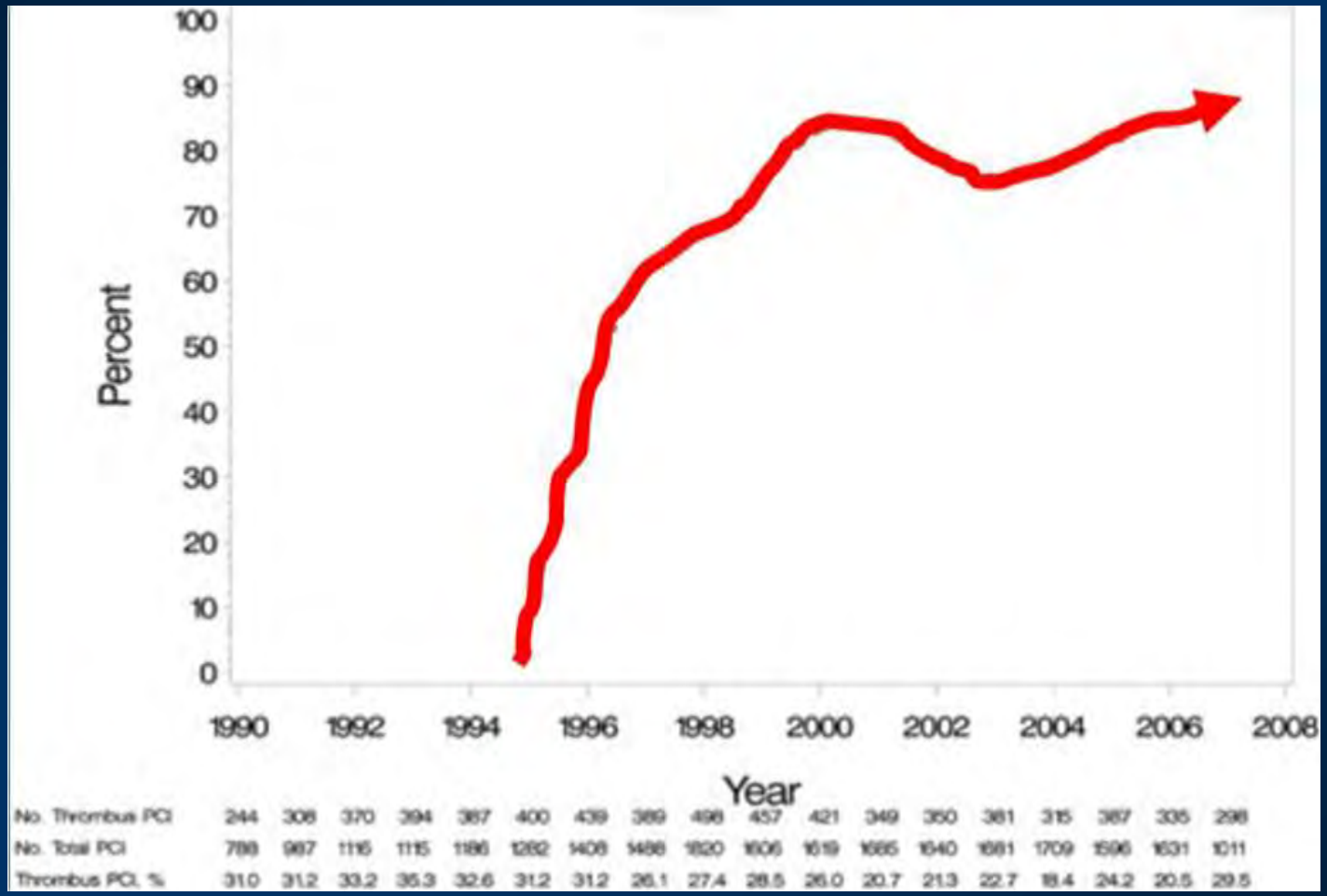
ReoPro® in Primary PCI Trials:
30-Day results for primary Endpoint



Adapted from

1. Brener SJ, et al. *Circulation* 1998;**98**:734–741. 2. Tcheng JE, et al. *Circulation* 2003;**108**:1316–1323
3. Neumann F-J, et al. *J Am Coll Cardiol* 2000;**35**:915–921. 4. Montalescot G, et al. *N Engl J Med* 2001;**344**:1895–1903
5. Antoniucci D, et al. *J Am Coll Cardiol* 2003;**42**:1879–1885

Temporal Trends in the Use of Glycoprotein IIb/IIIa Inhibitors



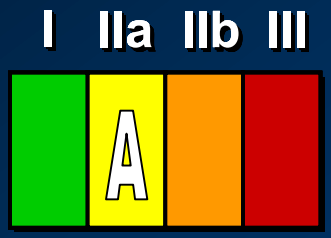
Adapeted Costantino Costantini Solaci 2012; Holmes, J Am Coll Cardiol Intv. 2010;3(9):937-946

Use of Glycoprotein IIb/IIIa Receptor Antagonists in STEMI

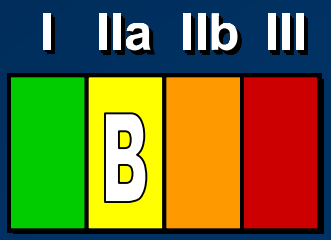
BRAVE-3, ON - TIME 2, HORIZONS-AMI, META-ANALYSES GURM & De LUCA, MULTISTRATEGY, FINESSE

Modified Recommendation

It is reasonable to start treatment with glycoprotein IIb/IIIa receptor antagonists at the time of primary PCI (with or without stenting) in selected patients with STEMI:



abciximab



?

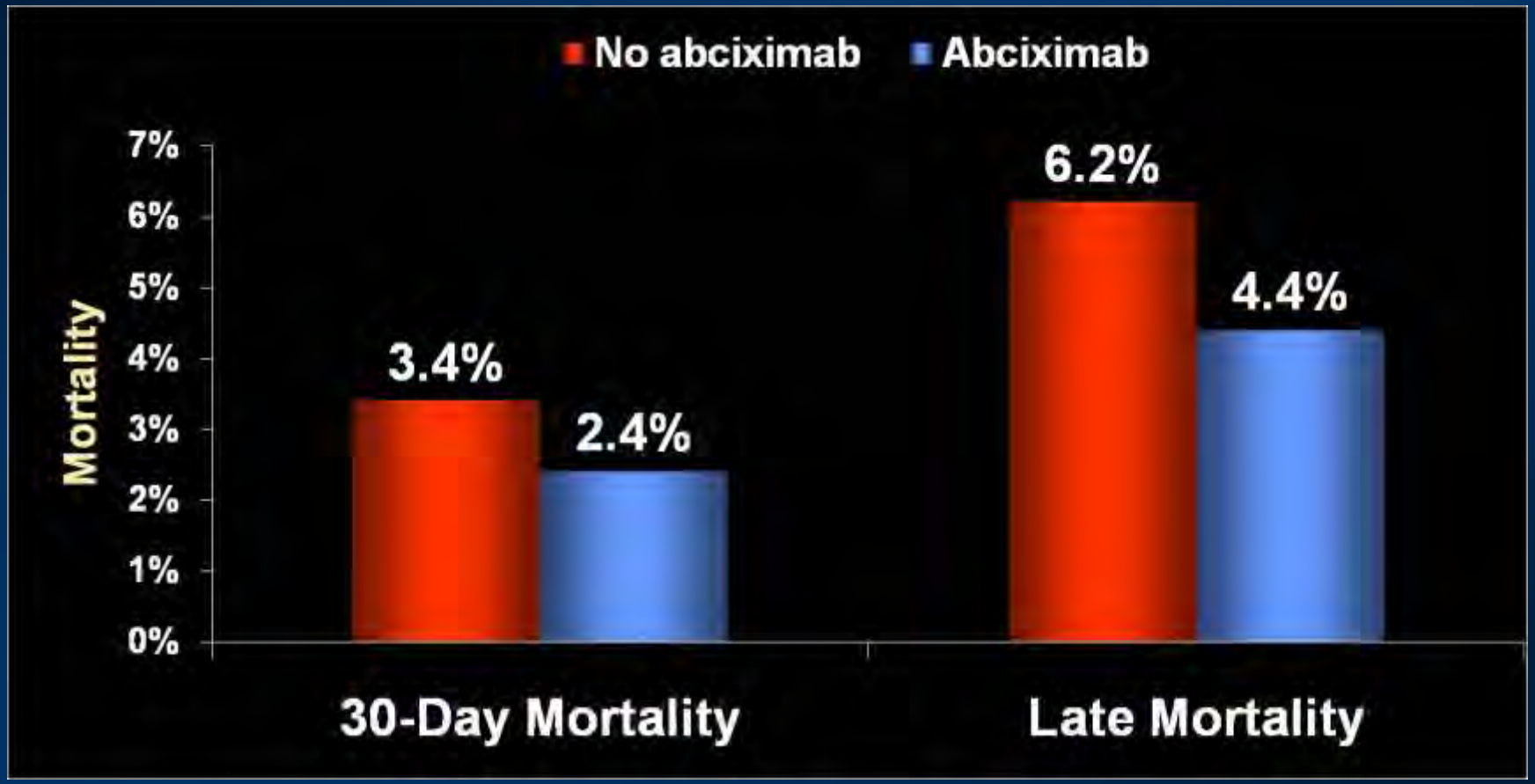
tirofiban and eptifibatide

Given the results of the studies cited above, the writing group concluded that in the setting of dual-antiplatelet therapy with UFH or bivalirudin as the anticoagulant, current evidence indicates that adjunctive use of a GP IIb/IIIa antagonist can be useful at the time of primary PCI but cannot be recommended as routine therapy. These agents might provide more benefit in selective use, for example, for the patient with a large thrombus burden or for patients who have not received adequate thienopyridine loading.

JACC Vol.54, No, 23, 2009; 2205-41., ACC/AHA 2009 Joint STEMI/PCI Guidelines Focused Update

Abciximab in Primary PCI Meta-analysis

8 RCTs – 3,949 pts with AMI w/i 12º undergoing primary (7) or rescue (1) PCI rand to abciximab vs. placebo or control



De Luca G et al. JAMA 2005;293:1759–1765

Tirofiban as adjunctive therapy for acute coronary syndromes and percutaneous coronary intervention: a meta-analysis of randomized trials

Methods and results

We searched for randomized trials comparing tirofiban vs. placebo or any active control. Odds ratios (OR) were computed from individual studies and pooled with random-effect methods. Thirty-one studies were identified involving 20 006 patients (12 874 comparing tirofiban vs. heparin plus placebo or bivalirudin alone, and 7132 vs. abciximab). When compared with placebo, tirofiban was associated at 30 days with a significant reduction in mortality [OR = 0.68 (0.54–0.86); $P = 0.001$] and death or myocardial infarction (MI) [OR = 0.69 (0.58–0.81); $P < 0.001$]. The treatment benefit persisted at follow-up but came at an increased risk of minor bleedings [OR = 1.42 (1.13, 1.79), $P = 0.002$] or thrombocytopenia. When compared with abciximab, mortality at 30 days did not differ [OR = 0.90 (0.53, 1.54); $P = 0.70$], but in the overall group tirofiban trended to increase the composite of death or MI [OR = 1.18 (0.96, 1.45); $P = 0.11$]. No such trend persisted at medium-term follow-up or when appraising studies testing tirofiban at 25 μg/kg bolus regimen.

Conclusion

Tirofiban administration reduces mortality, the composite of death or MI and increases minor bleedings when compared with placebo. An early ischaemic hazard disfavouring tirofiban was noted when compared with abciximab in studies based on 10 but not 25 μg/kg tirofiban bolus regimen.

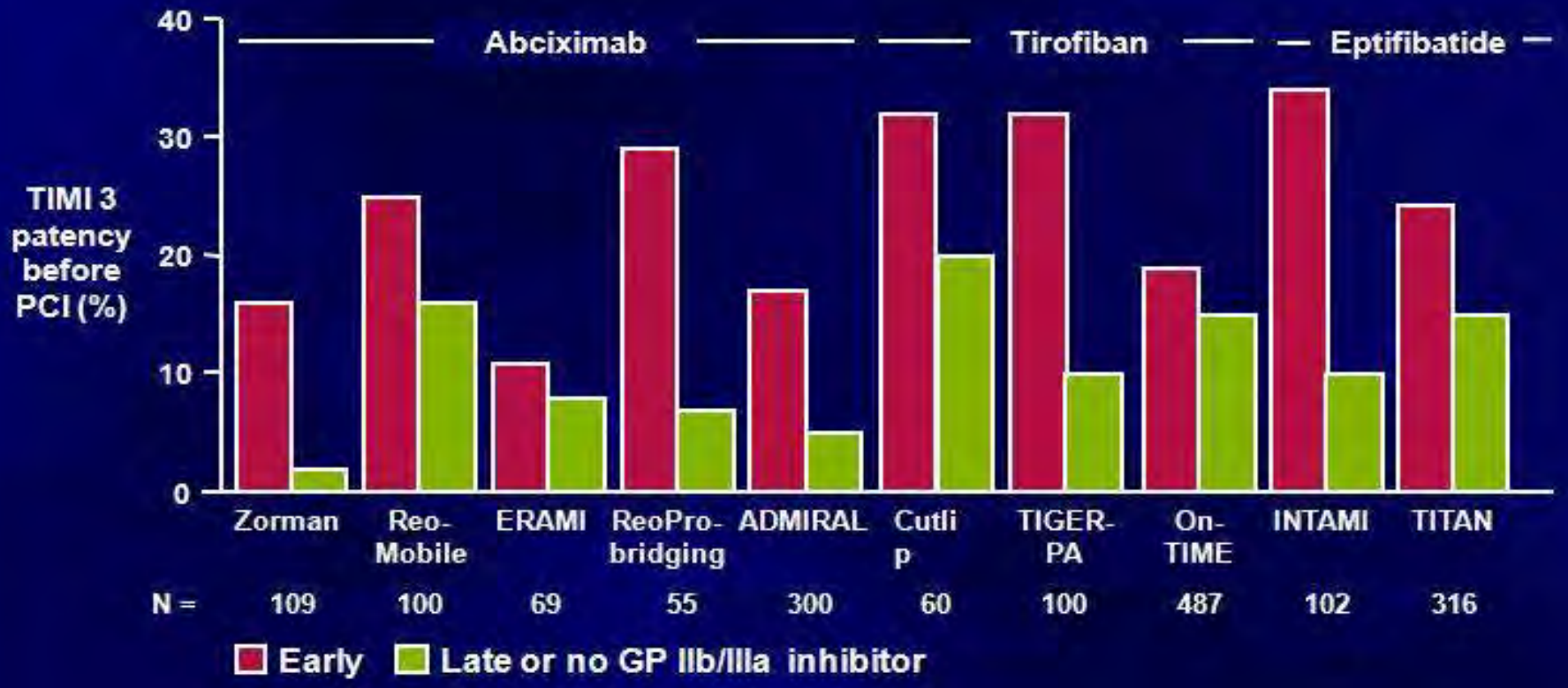
European Heart Journal (2010) 31, 35–49

Abciximab vs. Tirofiban (MultiStrategy Trial)

3 Year Outcomes All-Cause Death

Am Heart J. 2012 Jan;163(1):104-11.

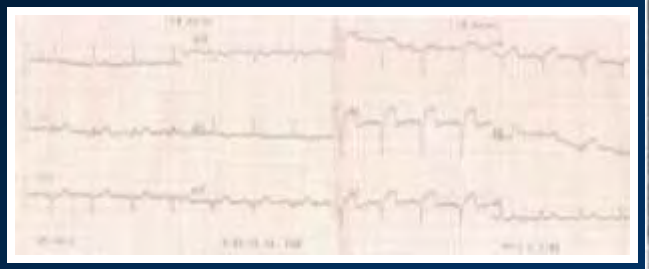
TIMI 3 patency before PCI in trials of early vs late/no GP IIb/IIIa inhibitors in STEMI



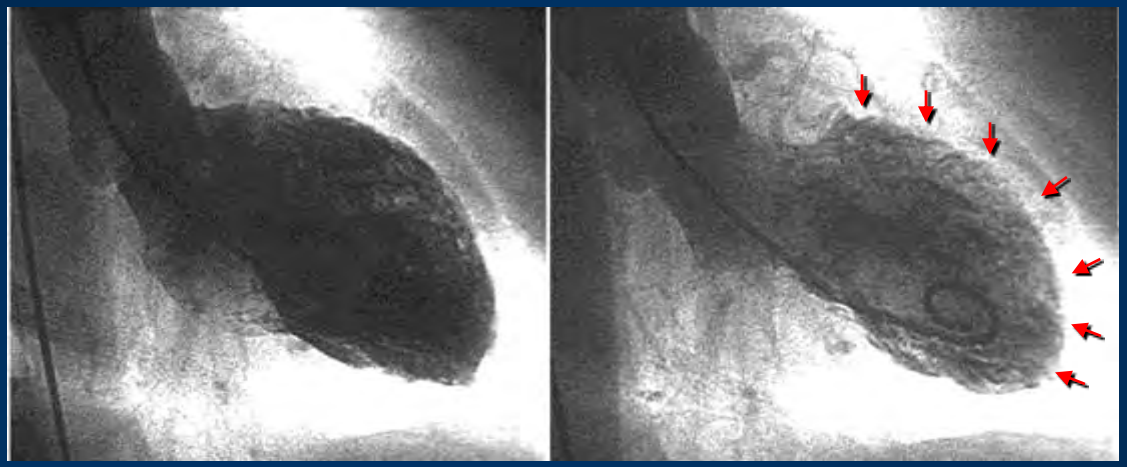
Zeymer U et al. *Eur Heart J*. 2005;26:1971-7.
www.timi.org

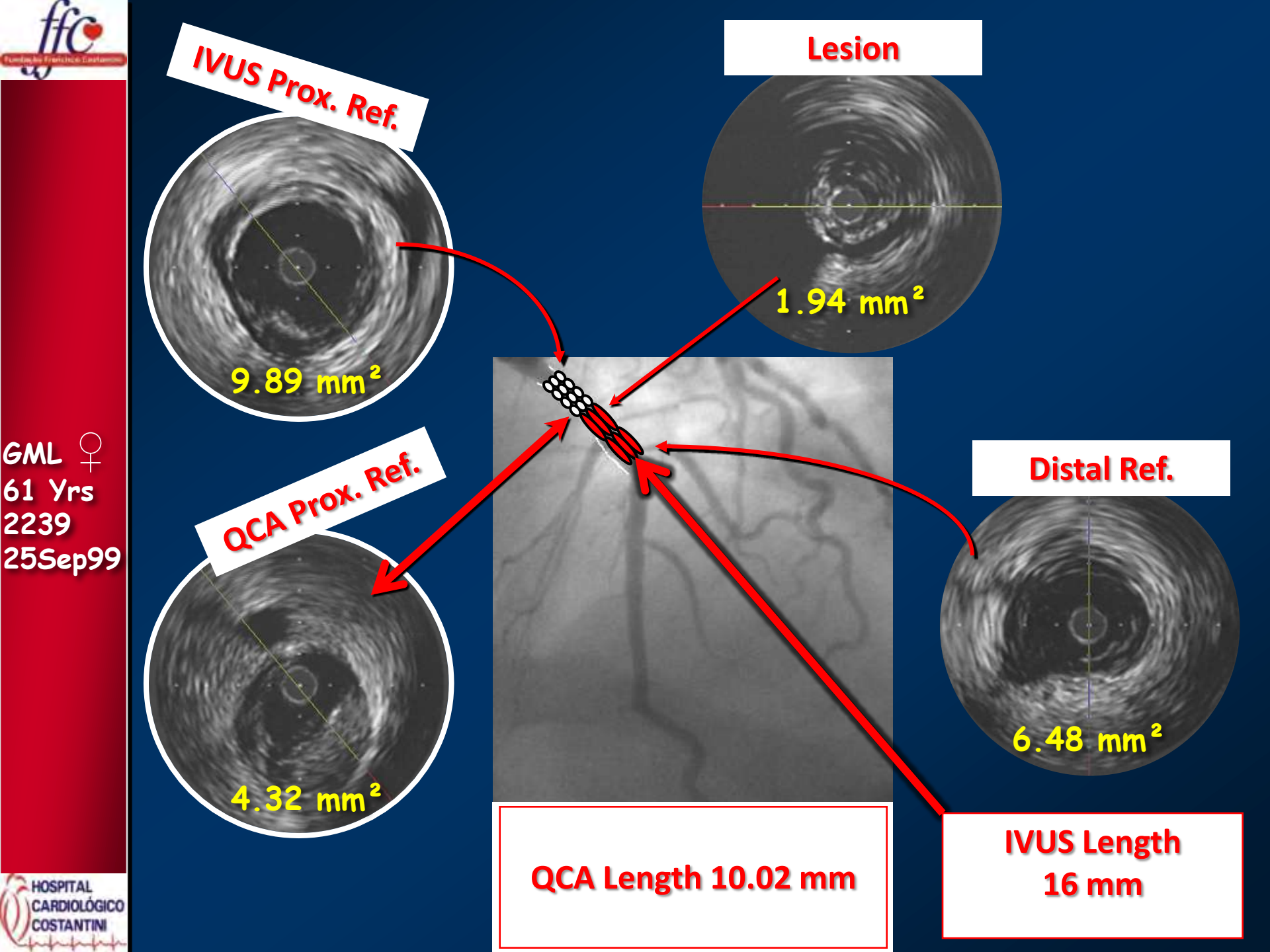
IAM & ABXICIMAB (1999)

LVEF= 42 %

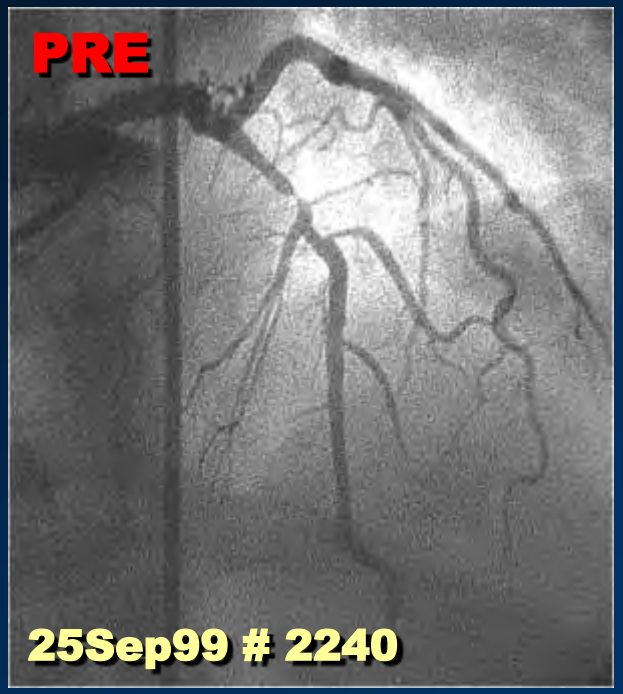


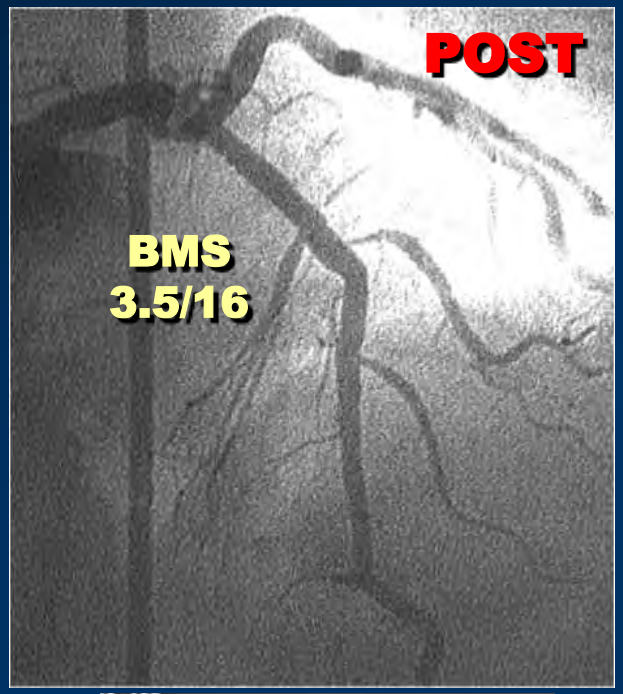
Anterior STEMI , 195'. Onset

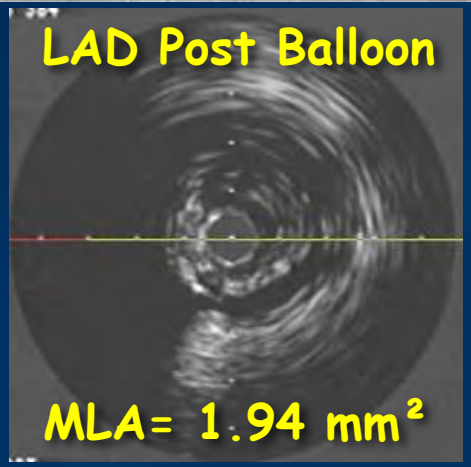


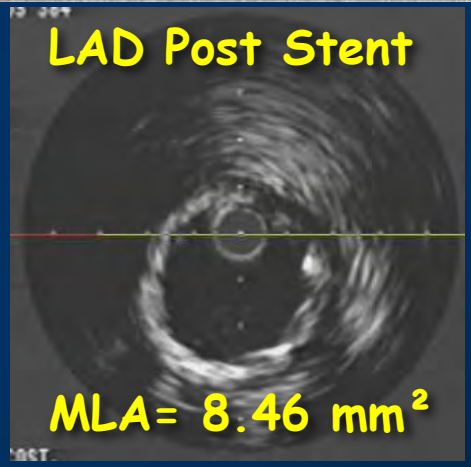

IVUS Prox. Ref.
9.89 mm²
Lesion
1.94 mm²
QCA Prox. Ref.
4.32 mm²
Distal Ref.
6.48 mm²
QCA Length 10.02 mm
IVUS Length
16 mm
GML ♀
61 Yrs
2239
25Sep99
HOSPITAL
CARDIOLÓGICO
COSTANTINI

Year 1999 Angiography
Pre & Post PCI in STEMI

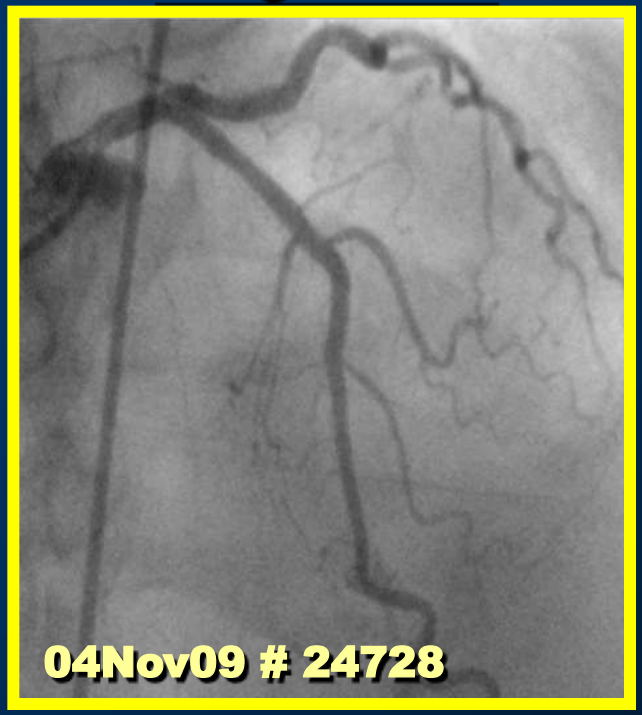








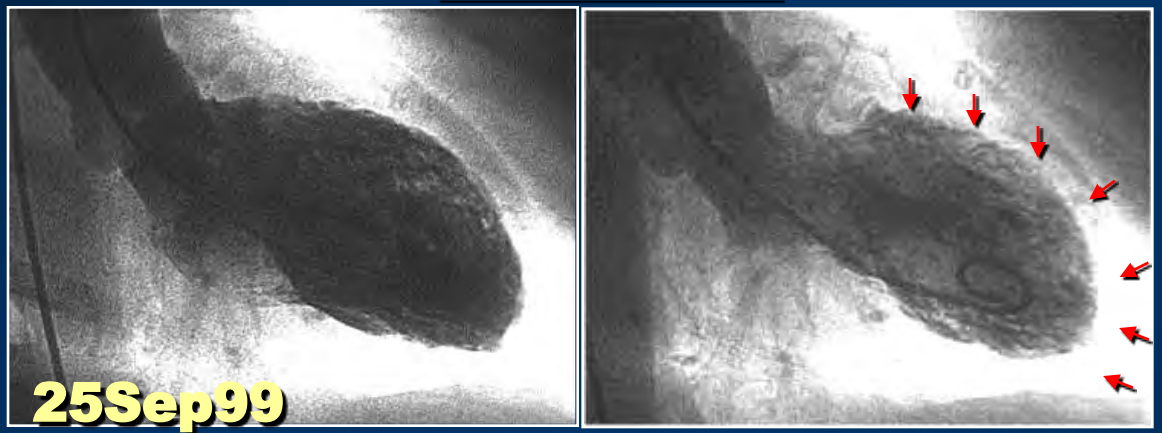
Year 2009
FU @ 10 Yrs



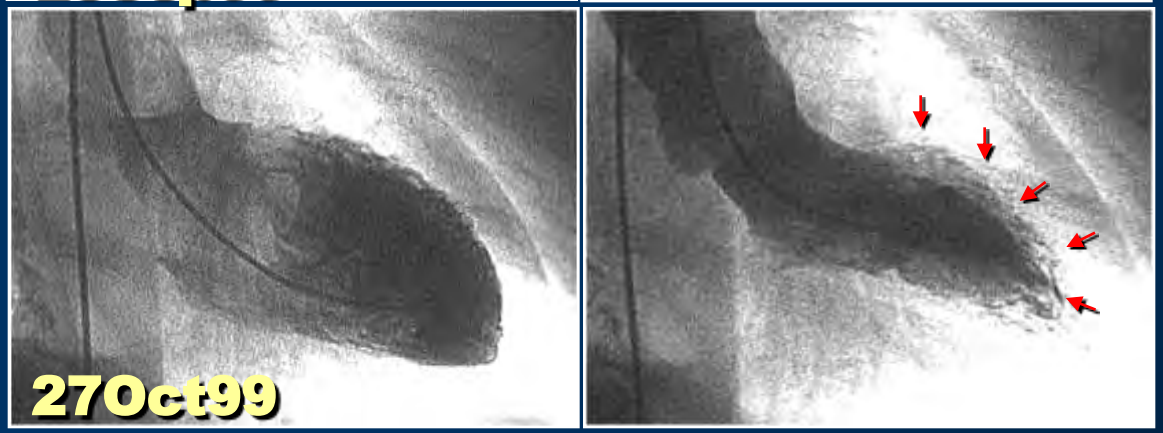
LVEF= 42 %

Anterior AMI
1999 > 3 hs

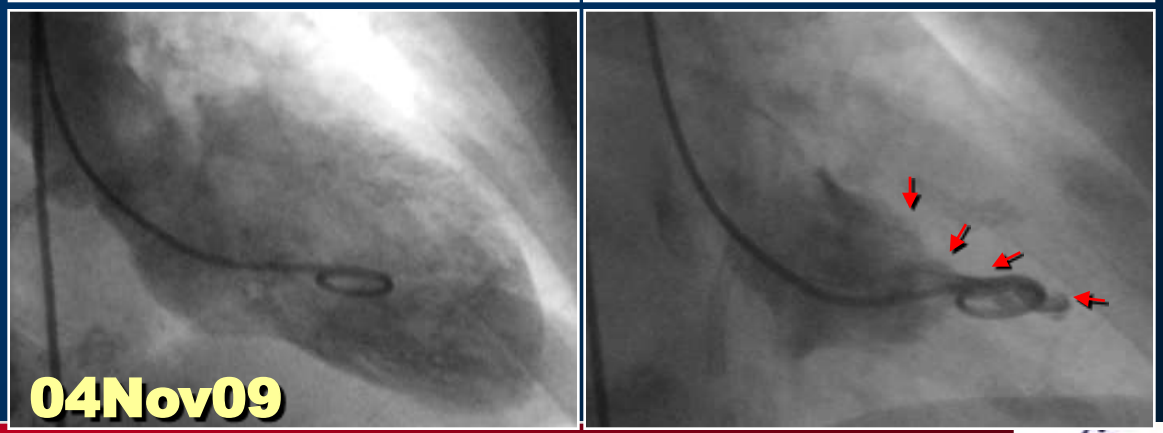
GML ♀
71 Yrs



FU @ 32 Days
After PTCA With
BMS



FU @ 10 Yrs
After PTCA With
BMS



LVEF= 76 %

HOSPITAL CARDIOLÓGICO COSTANTINI

ffc

IIb/IIIa in STEMI 1998 - 2012
HCC Use vs. No Use

	*IIbIIIa Used N=409 (51%)	*IIbIIIa NoUsed N=389 (49%)	*p*
Intra Hospitalar Events (%)	**92 % IC**		
TIMI 3 Flow	**(94,7)**	**(94,4)**	**0,7123**
Death	**(5,6)**	**(6,42)**	**0,6258**
REMI	**(0,51)**	**(1,7)**	**0,1103**
REPCI	**(1,02)**	**(2,2)**	**0,1875**
CABG or repeat PCI	**(0,24)**	**(0,51)**	**0,5309**
Transfusion	**(6,1)**	**(7,45)**	**0,4476**

***HCC MI: Intra Hospitalar Events**

Efficacy of intracoronary IIb/IIIa inhibitor during primary PCI.

Standard use or bailout only?

2011 ACC/AHA PCI Guidelines
GP IIb/IIIa Inhibitor Therapy*

Additional Recommendations	COR	LOE
Administration of *intracoronary* (versus IV) abciximab administration in patients undergoing primary PCI with abciximab	**IIb**	**B**
Routine precatheterization laboratory (e.g., ambulance or emergency room) administration of GP IIb/IIIa inhibitors as part of a upstream strategy for patients with STEMI undergoing PCI	**III – No Benefit**	**B**

*Recommendations apply for abciximab, double-bolus eptifibatide, or high-bolus dose tirofiban

2011 ACCF/AHA/SCAI Guideline for PCI and Coronary Revascularization

Meta Analysis of IC Versus IV Abciximab

administration of peer reviewed studies 997 STEMI

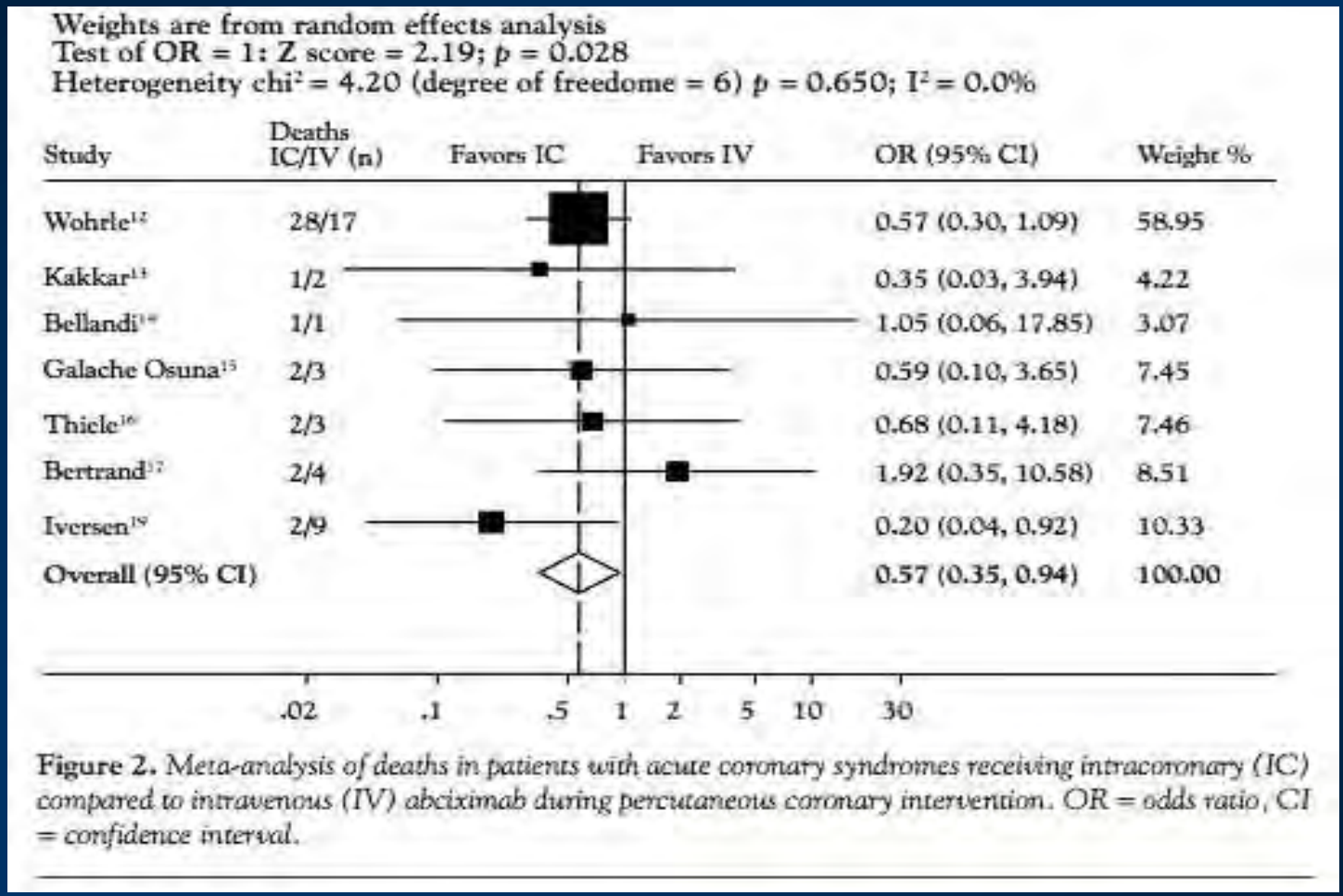


Figure 2. *Meta-analysis of deaths in patients with acute coronary syndromes receiving intracoronary (IC) compared to intravenous (IV) abciximab during percutaneous coronary intervention. OR = odds ratio, CI = confidence interval.*

Hansen et al. Journal of Invasive Cardiology Vol 22; 6. June 2010. 278-282.

Meta-analysis of IV vs IC Bolus Abciximab (+ 12º Infusion) During Primary PCI in STEMI

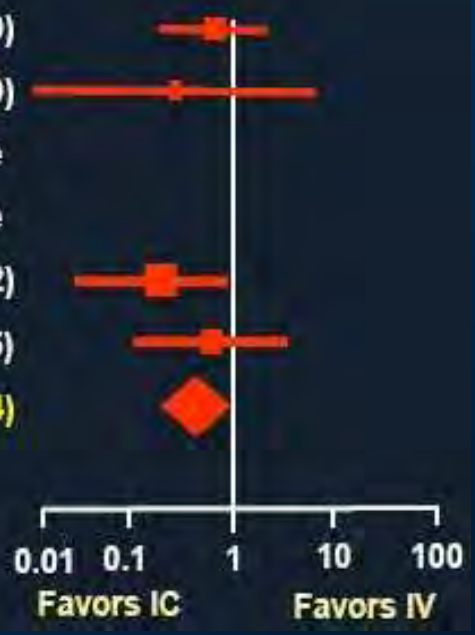
6 RCTs, 1246 total pts randomized

30-Day Mortality

Study or Subgroup	Intracoronary abciximab Events	N	Intravenous abciximab Events	N	Weight	Odds Ratio M-H, Fixed 95% CI
CICERO 2010	5	271	7	263	33.7%	0.69 (0.22, 2.19)
Crystal AMI 2010	0	25	1	23	7.4%	0.29 (0.01, 7.59)
Dominguez-Rodriguez 2009	0	25	0	25		Not estimable
EASY-MI 2010	0	53	0	52		Not estimable
Iversen 2011	2	185	9	170	44.8%	0.20 (0.04, 0.92)
Thiele 2008	2	77	3	77	14.1%	0.66 (0.11, 4.05)
Total (95% CI)		636		610	100.0%	0.43 (0.20, 0.94)
Total events	9	1.4%	20	3.3%		

Heterogeneity: $Chi^2=1.88$, df=3 (P=0.60); $I^2=0\%$

Test for overall effect: Z=2.11 (P=0.03)



Navarese EP et al. Platelets 2011:On-line

Meta-analysis of data 1,198 STEMI pts in 5 randomized trials that compared intracoronary and IV Abciximab

30-Day Follow Up

30-day Follow-up	Intracoronary (n = 611)	IV (n = 597)	*P* Value
Death or Reinfarction	2.9%	5.5%	0.03
Death	1.5%	3.4%	0.04
TVR	2.6%	4.8%	0.045

Conclusion: In a meta-analysis of small, single-center trials, intracoronary vs. IV abciximab was associated with improved short-term survival.

Piccolo R, et al. Heart. 2012: Epub ahead of print.

Comparasion of Abciximab vs. Eptifibatide During PCI in STEMI (from the HORIZONS-AMI Trial)

1,710 primary PCI pts in the heparin plus glycoprotein Iib/IIIa inhibitor arm compared according to GPI choice

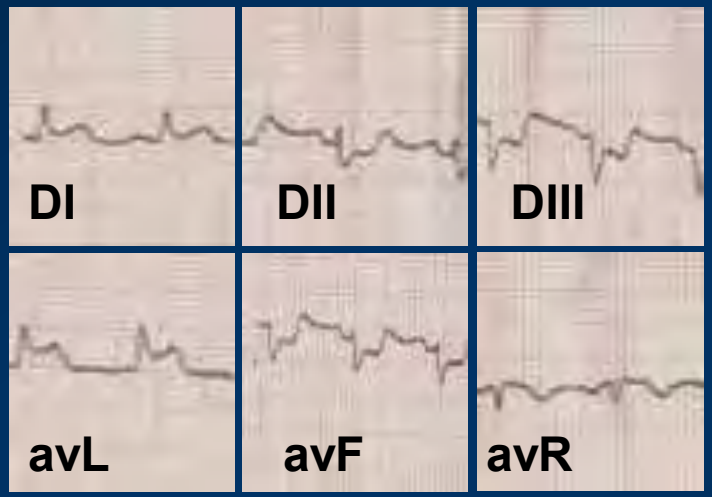
3-Year Outcomes

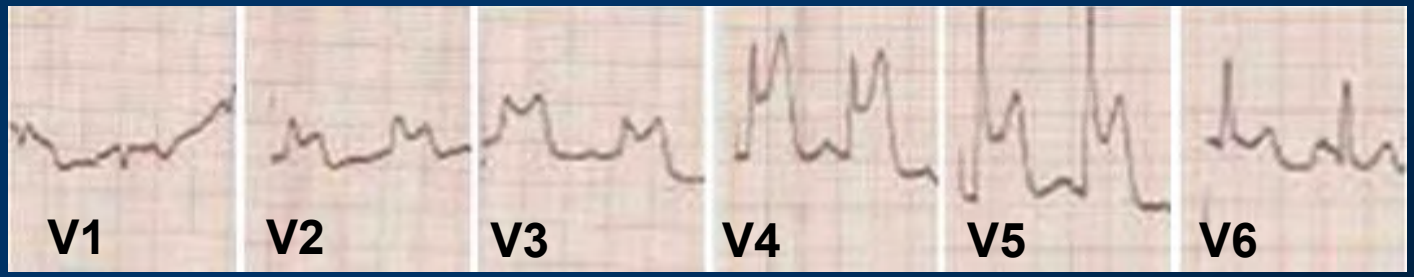
3-Year Outcomes	Abciximab (n = 907)	Eptifibatide (n = 803)	*P* Value
MACE	21.3%	22.8%	0.47
Major Bleeding (Non-CABG)	10.9%	10.2%	0.68
NACE	27.3%	28.4%	0.64

Implications: In pts with STEMI, use of either abciximab or eptifibatide during primary PCI results in comparable bleeding risks and clinical efficacy at 3 years.

Singh HS, et al. Am J Cardiol. 2012: Epub ahead of

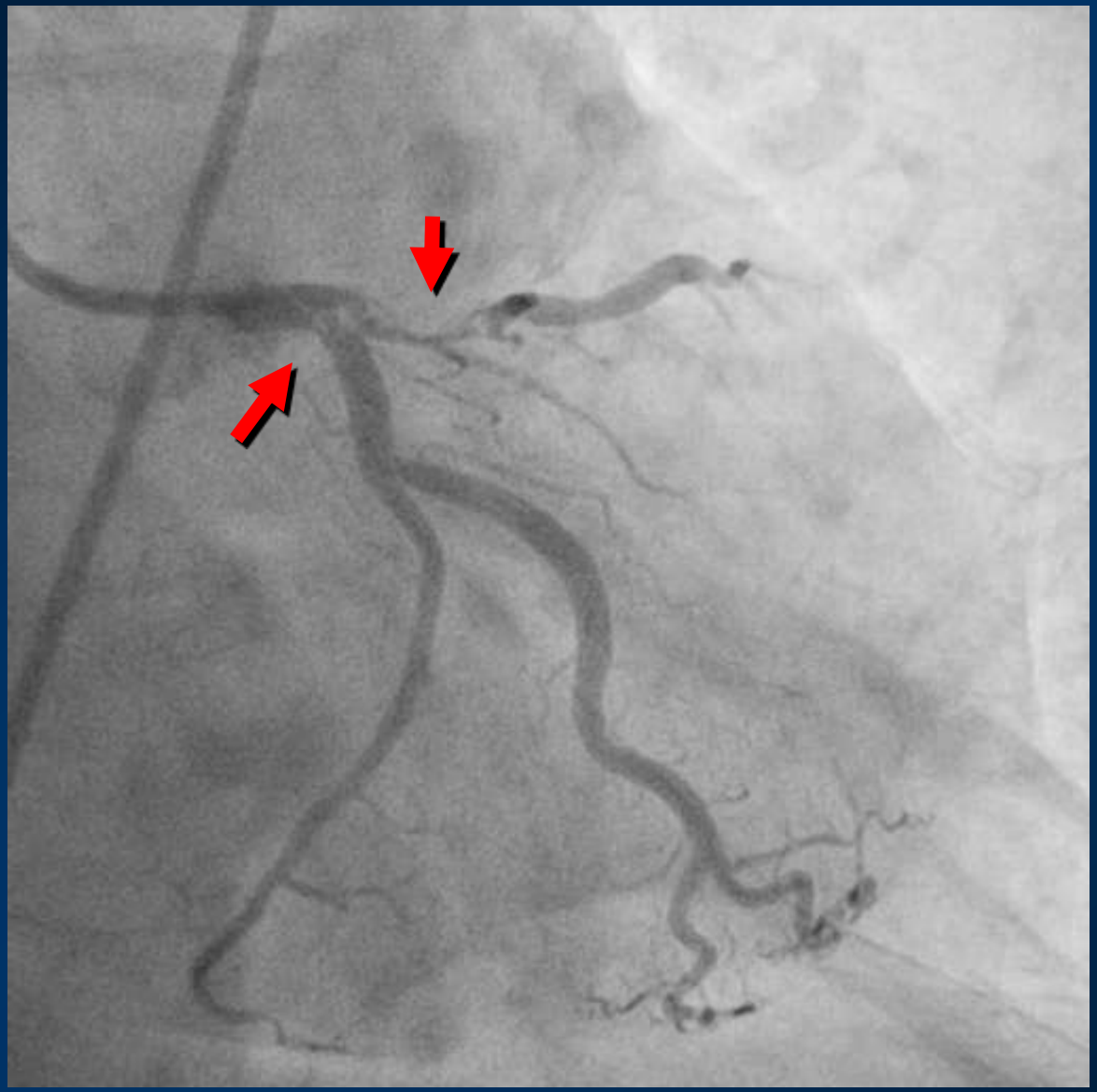
ECG Ambulance,
Anterior Wall AMI 40 min on set



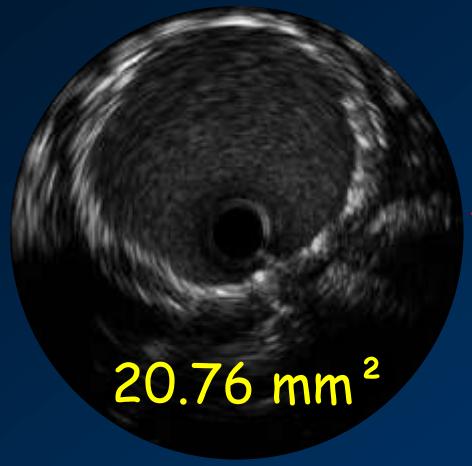


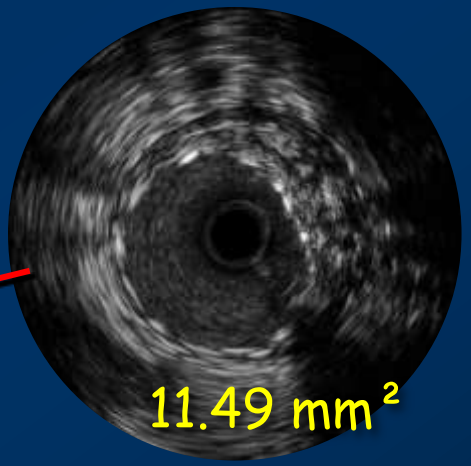
(CARDIAC SURGEON in the FAMILY)

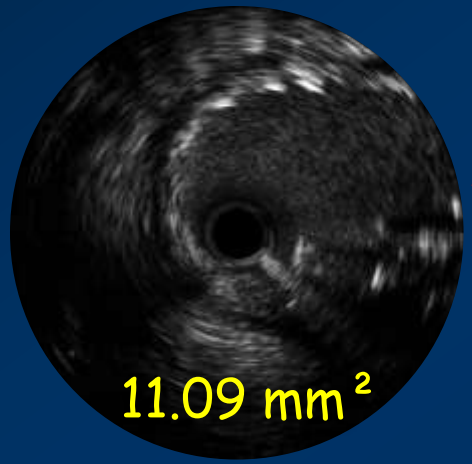
LM > LAD / LCx

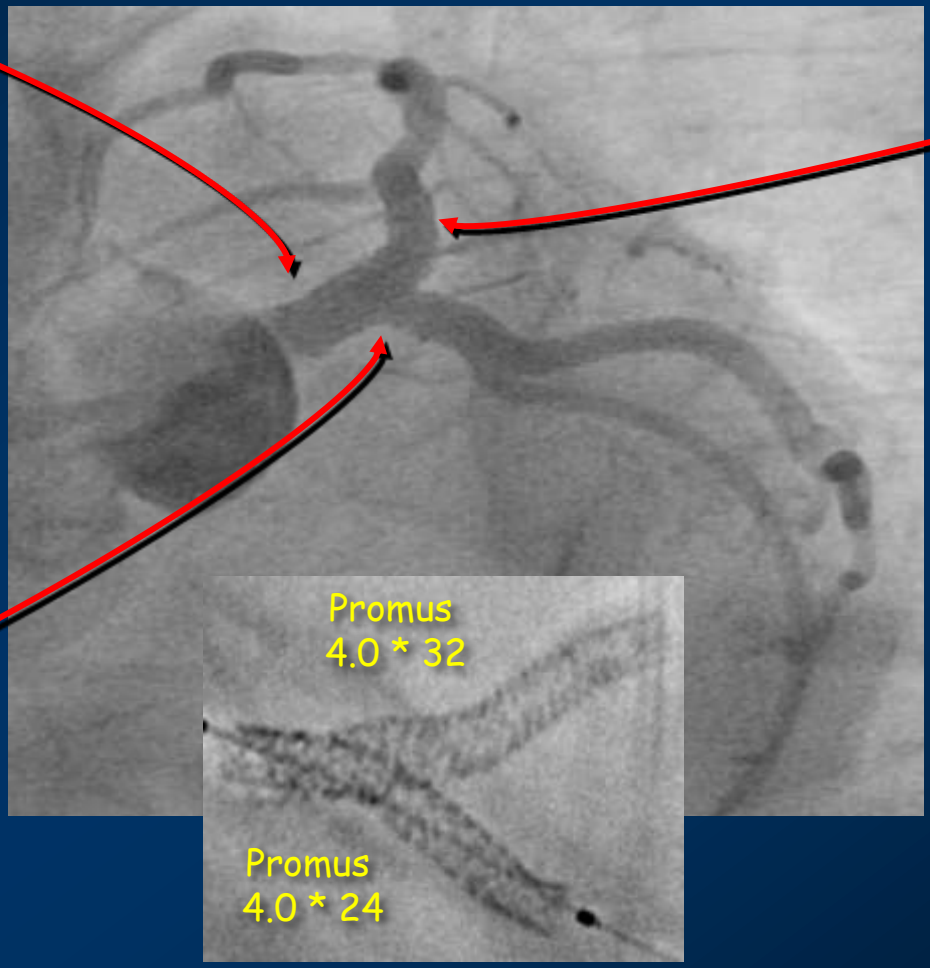


Final Result

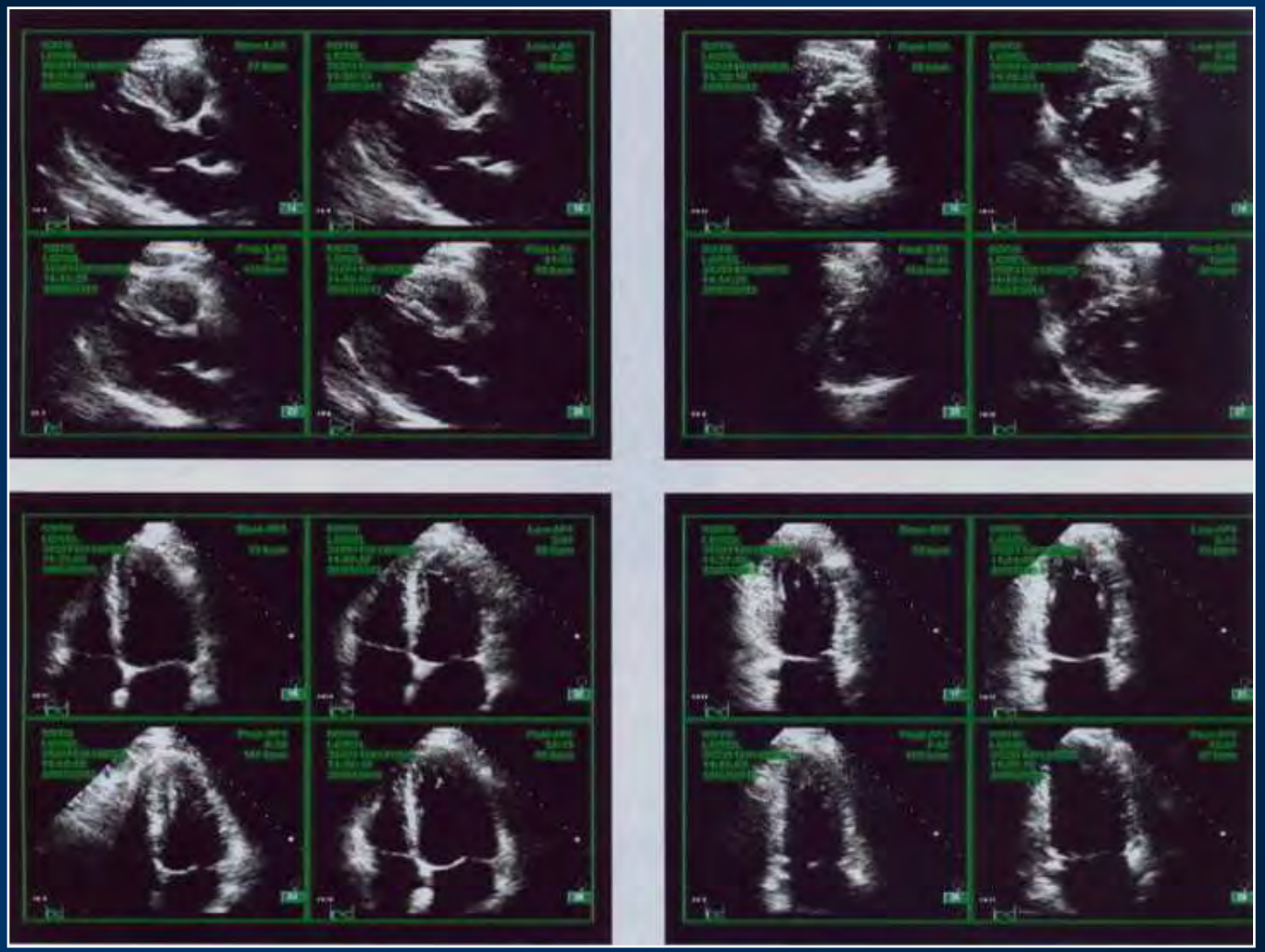




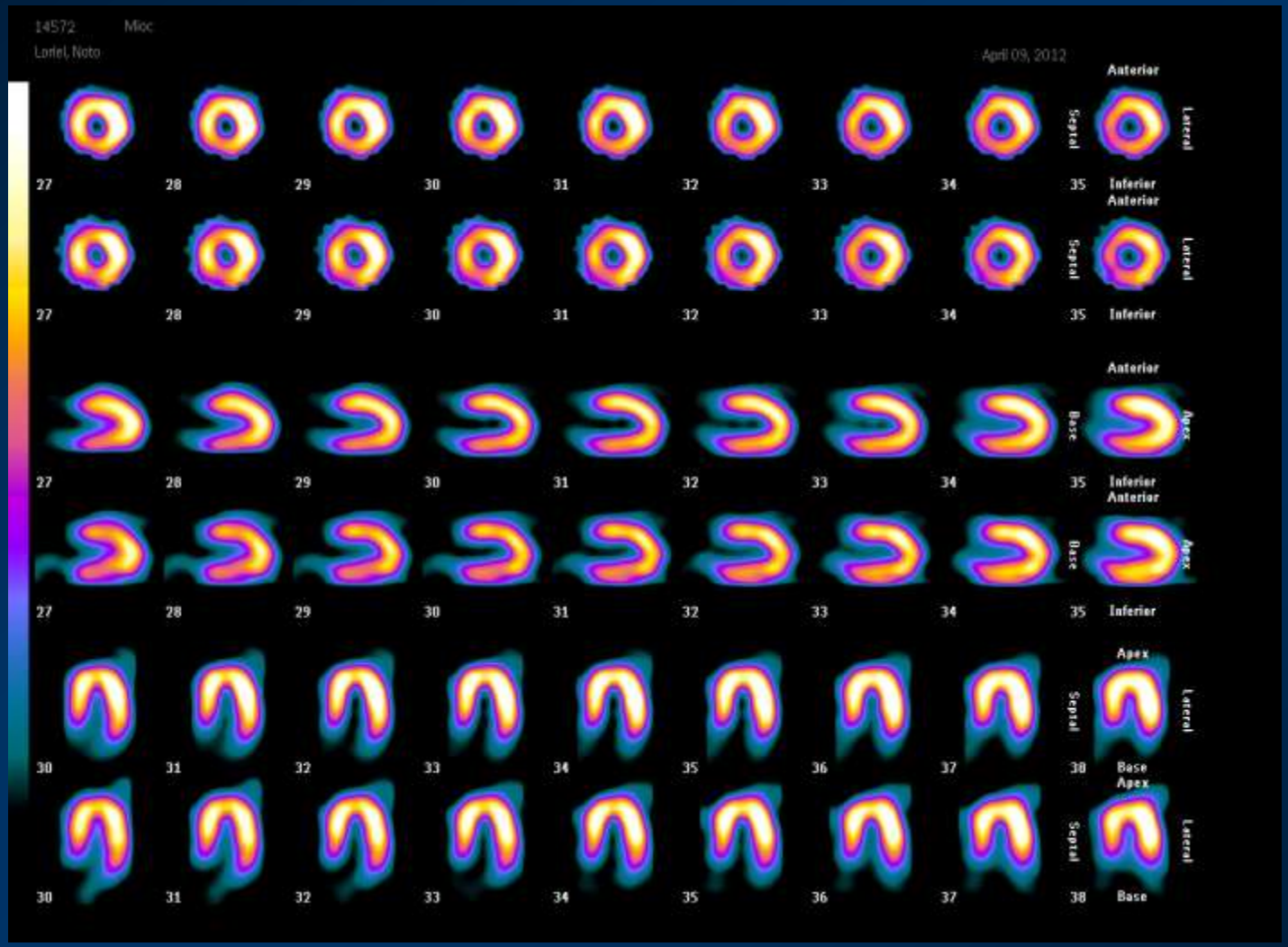




Dobutamine Echo Stress; Normal
After 3 months

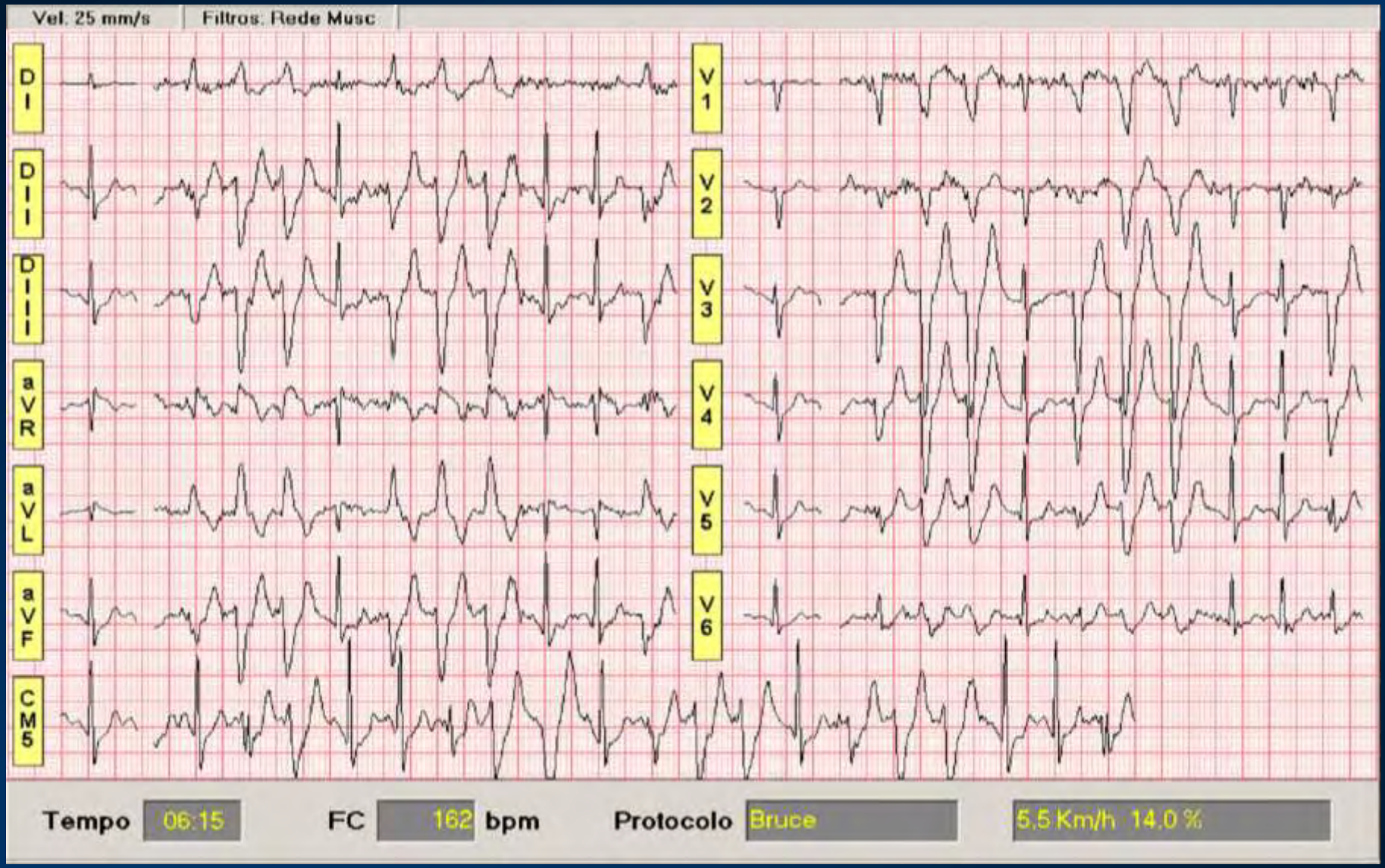


Thallium Spect; Normal
After 3 months



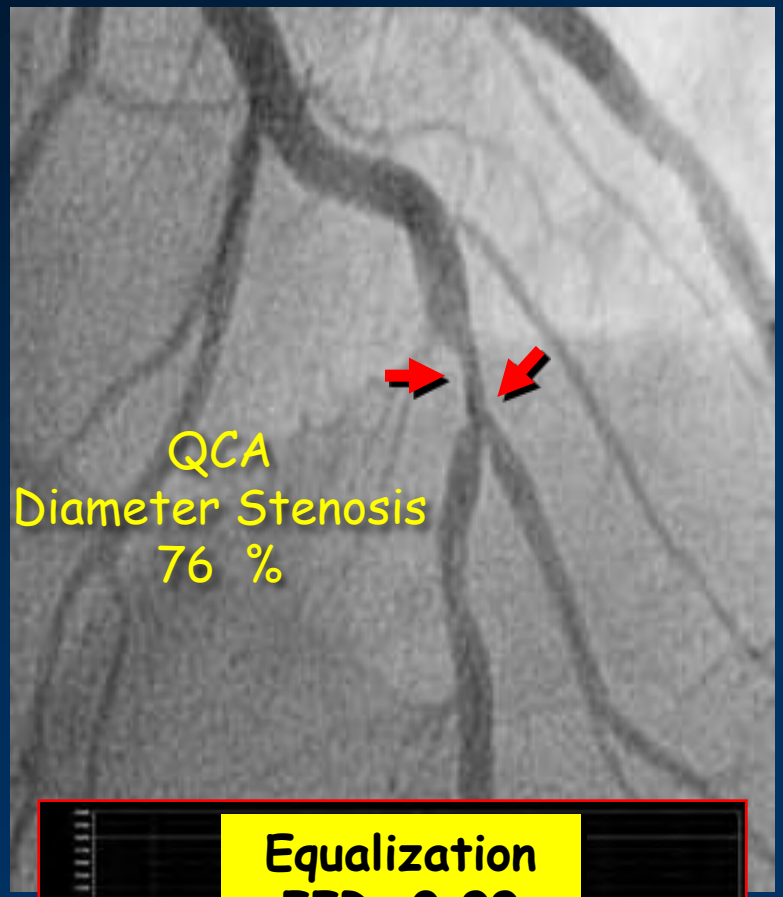
LN ♂ - 65 Yrs
09/04/2012

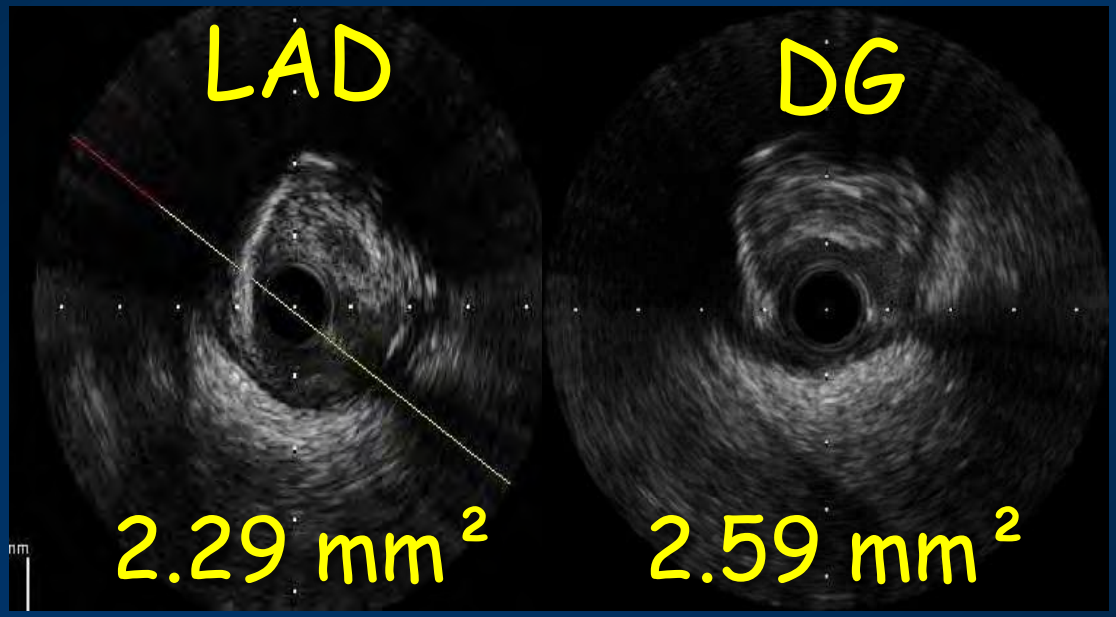
TMT After 3 months

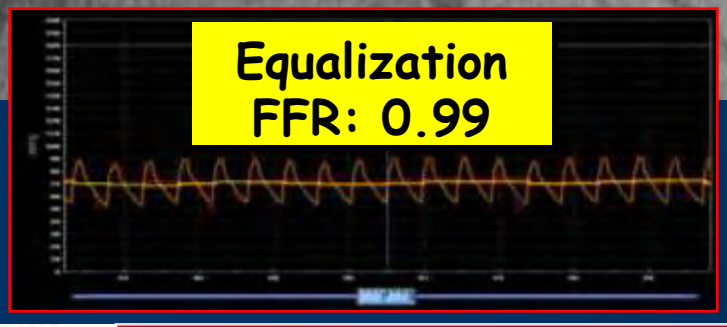


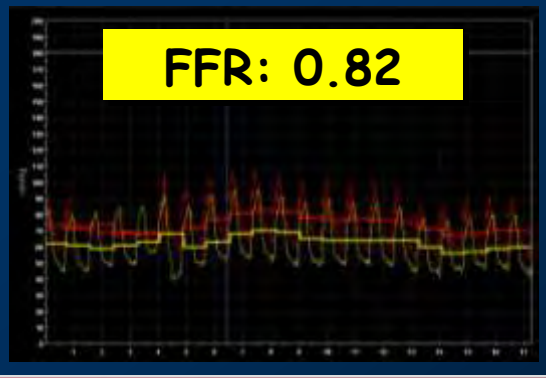
FFR Vs. IVUS Vs. ???

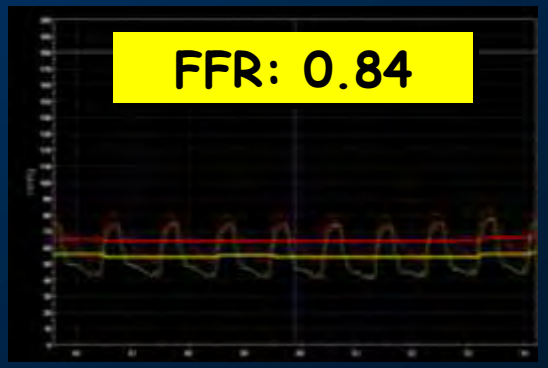
Continuous Intravenous Infusion 180 µg/kg/min





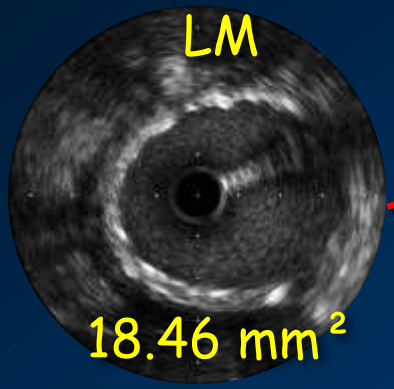


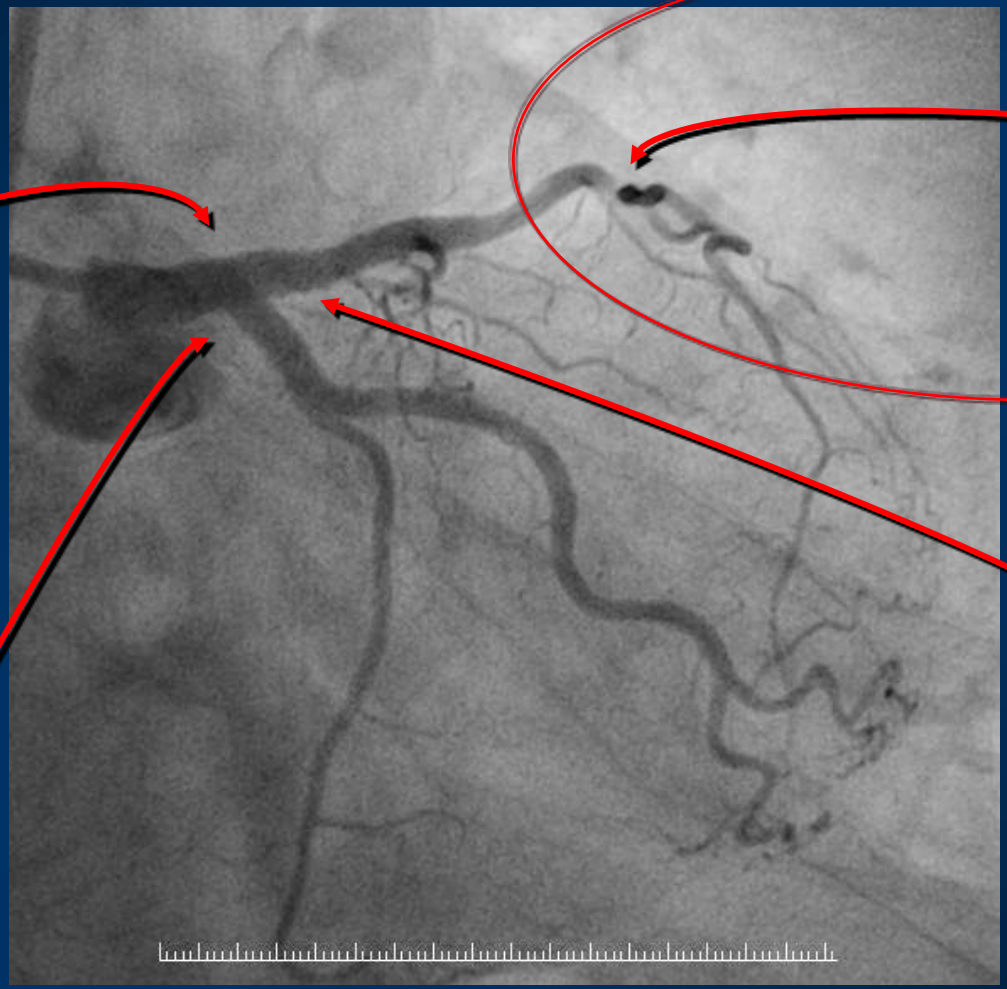


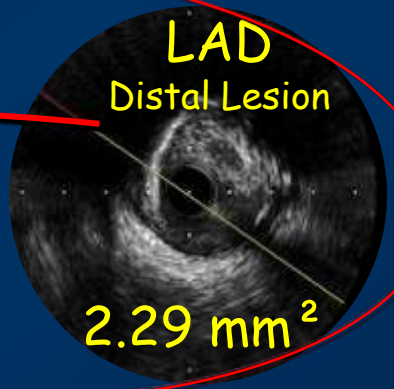


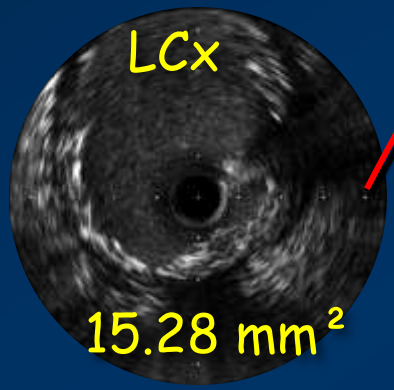
Follow up @ 7 months

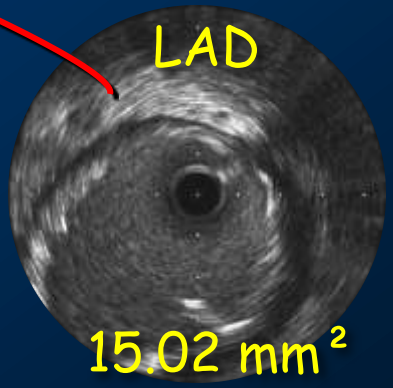
ANGIO and IVUS Evaluation



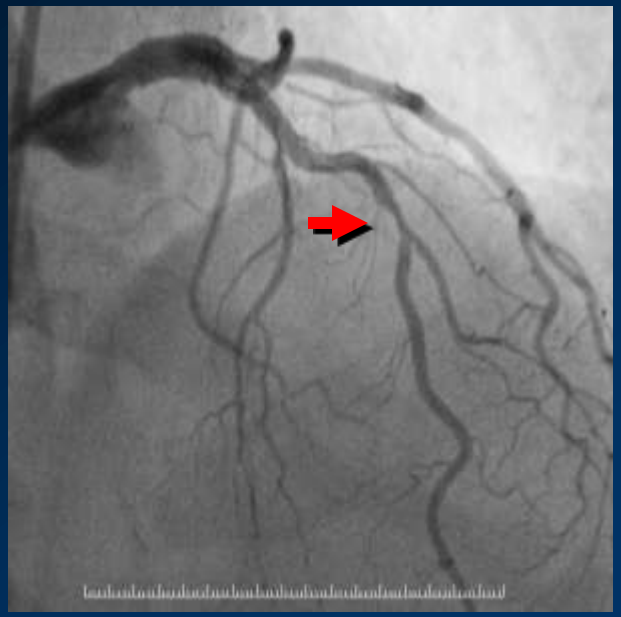


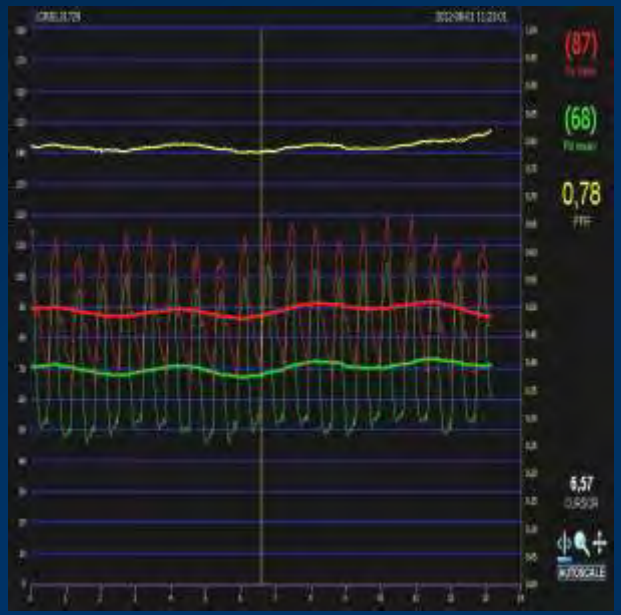


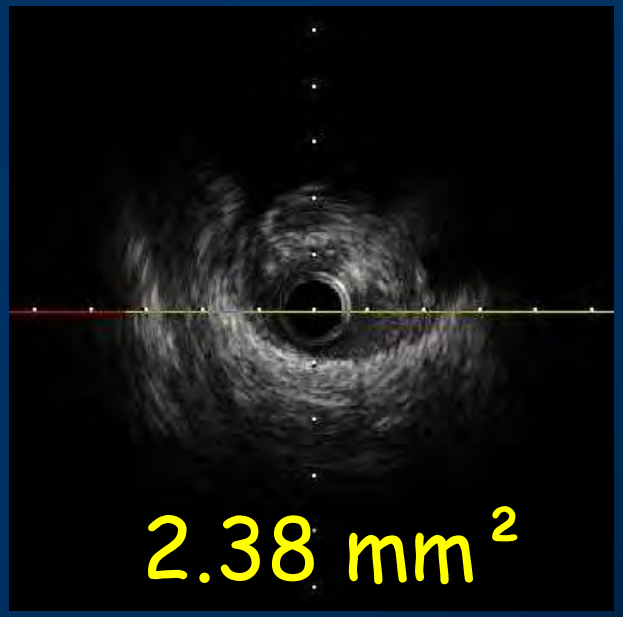




Second Evaluation FFR 0.78

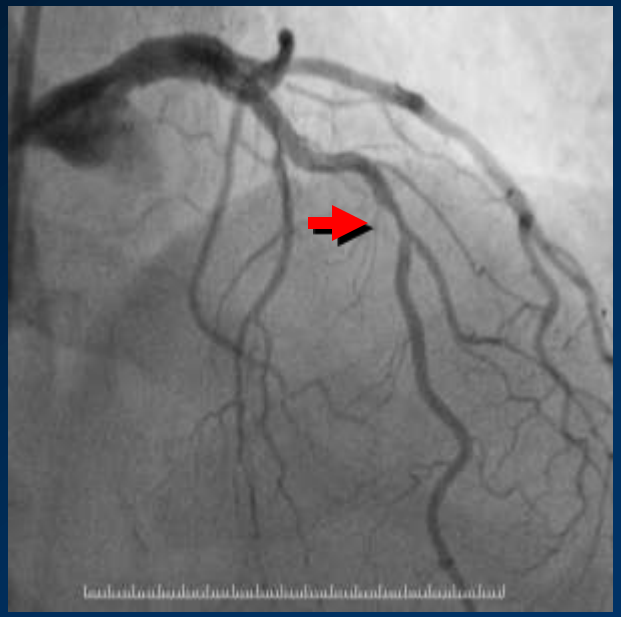


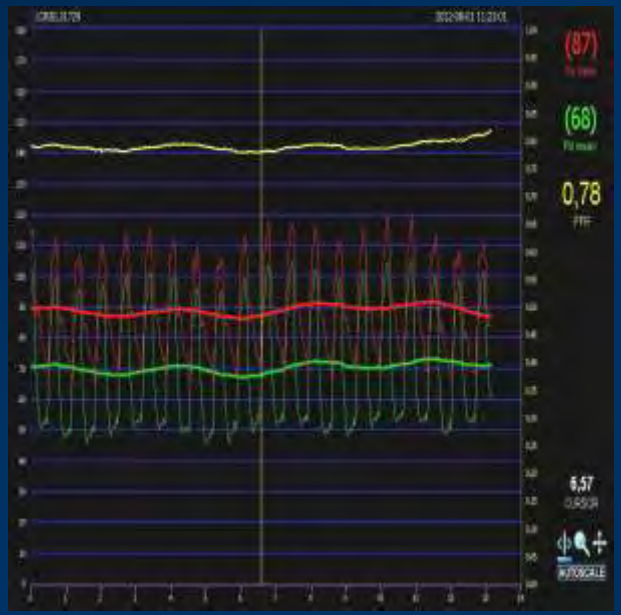


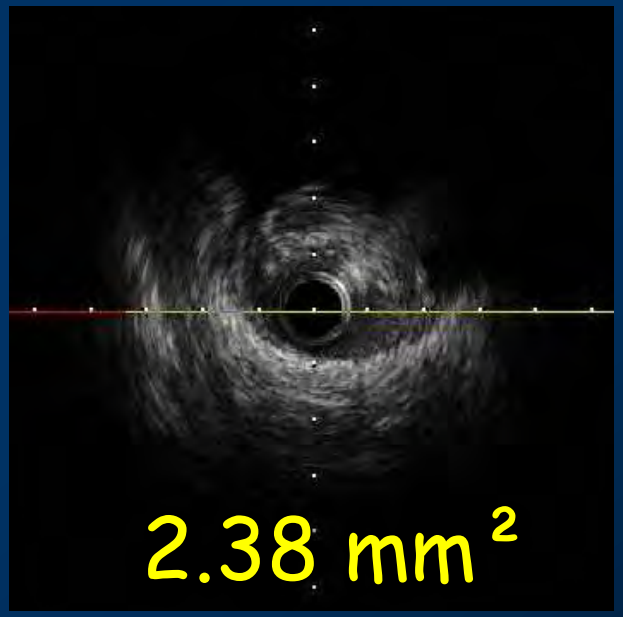


FFR was measured with a coronary pressure guidewire (Radi Medical Systems) at maximal hyperemia induced by intravenous adenosine, which was administered at a rate of 140 µg per kilogram of body weight per minute through IV.

Second Evaluation FFR 0.78

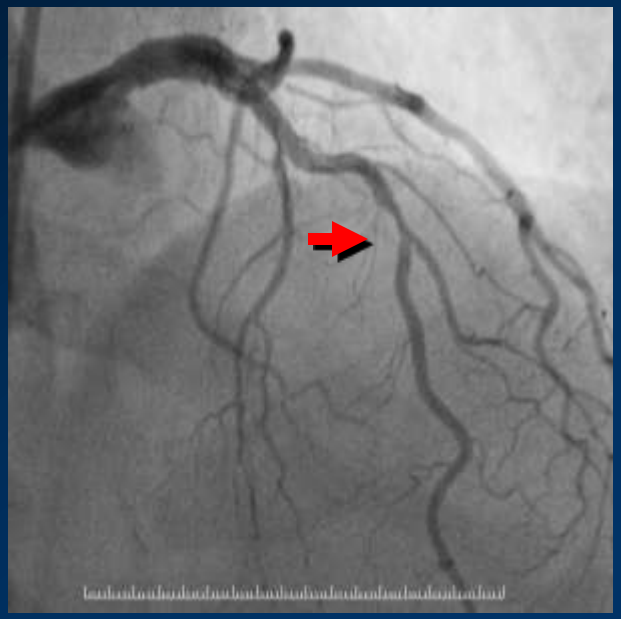


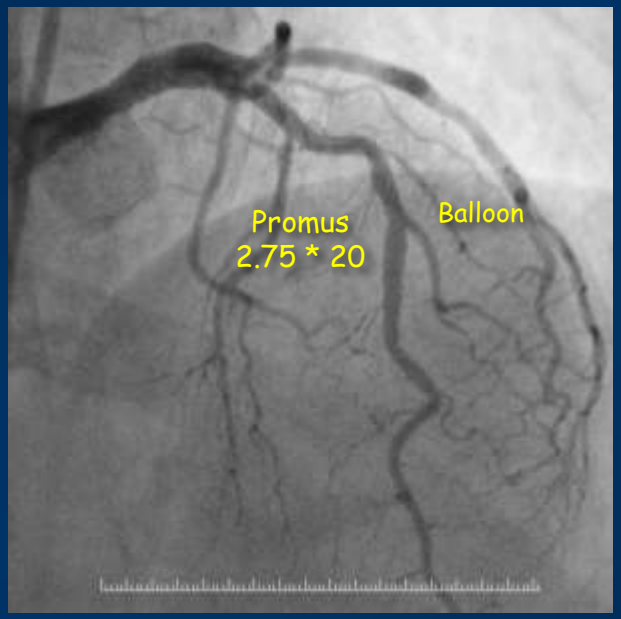


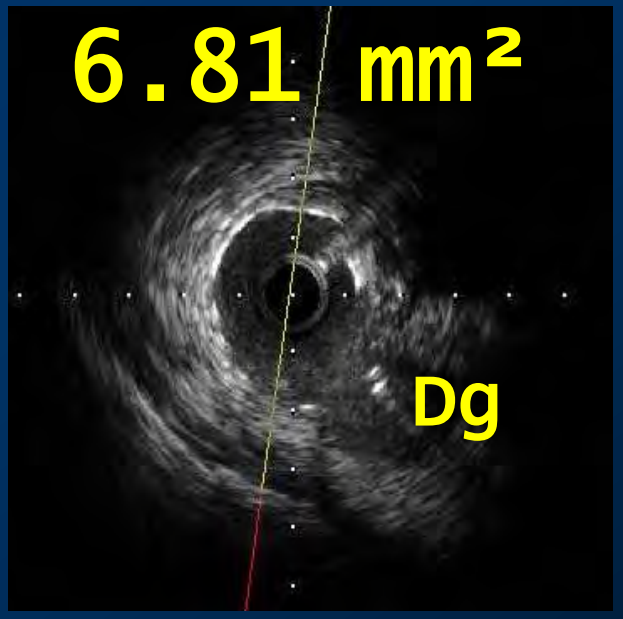


FFR was measured with a coronary pressure guidewire (Radi Medical Systems) at maximal hyperemia induced by intravenous adenosine, which was administered at a rate of 140 µg per kilogram of body weight per minute through IV.

Second Stage
LAD / DG





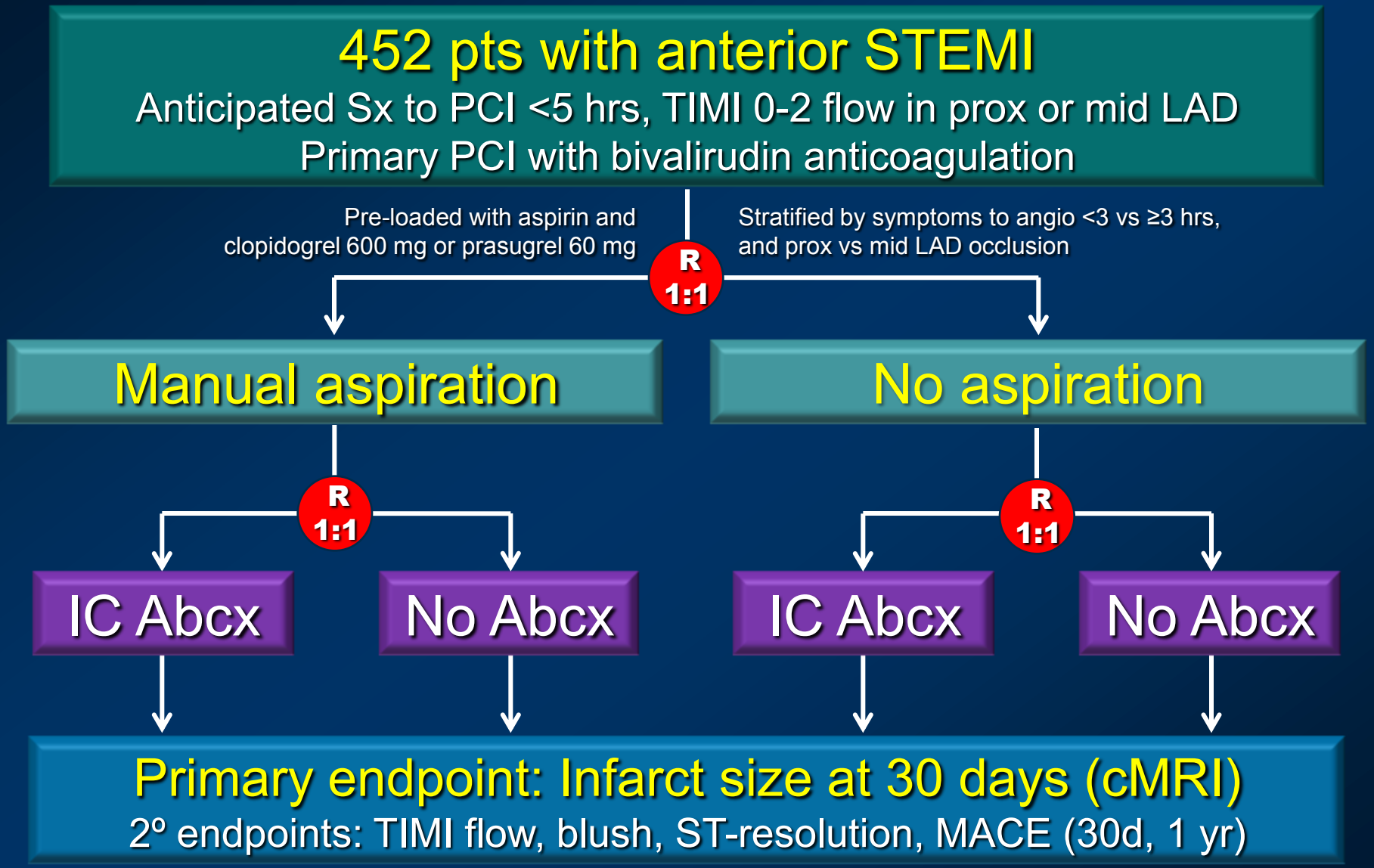


Pre

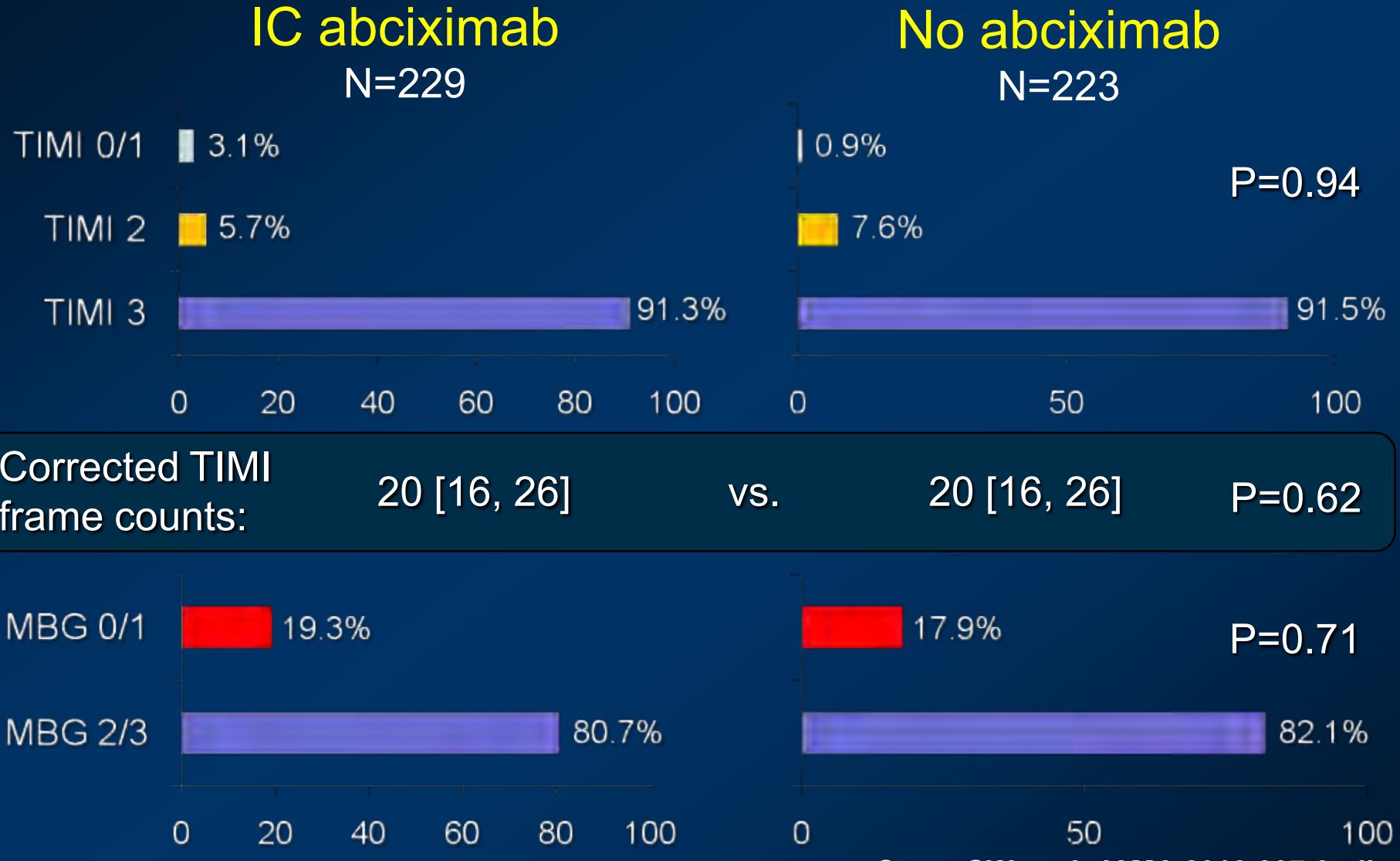
Post

IVUS

INFUSE-AMI Trial



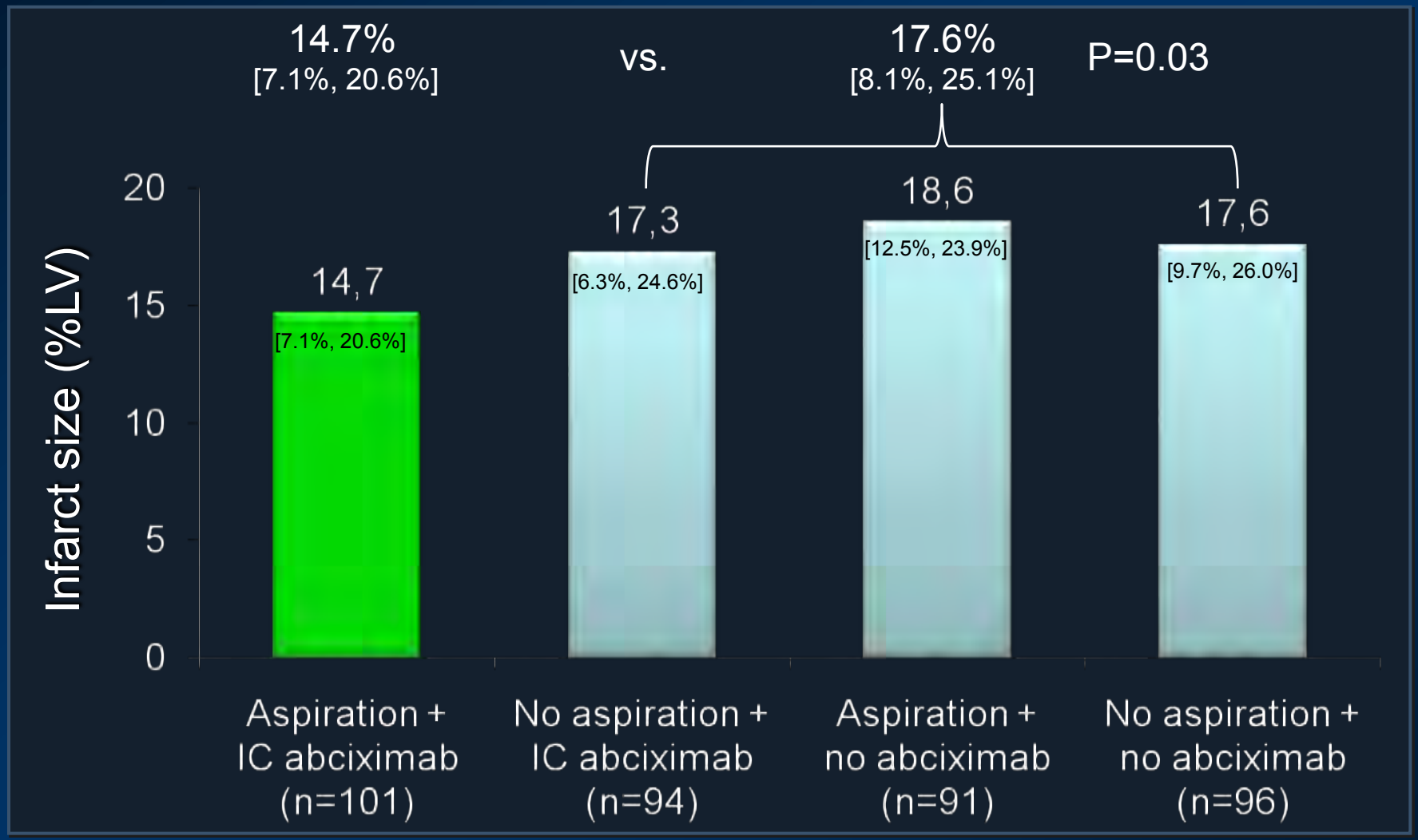
INFUSE-AMI: Reperfusion post-PCI*



Stone GW et al. JAMA 2012;307:0n-line

INFUSE-AMI: Infarct size at 30 days*

- 4 group analysis -



Stone GW et al. JAMA 2012;307:0n-line

Efficacy of intracoronary IIb/IIIa inhibitor during primary PCI.
Standard use or bailout only?

Sumary: Potential Benefits….

- Faster reduction thrombus burden
- Reinfarction ⇓
- Improved TIMI-flow…
- No-Reflow ⇓
- Infarct size ⇓
- Mortality ⇓
- MACE ⇓

Take Home Message

- Although technological and pharmaceutical evolution, AMI still remains a great challenge looking for improved outcomes.
- Intracoronary thrombus management is one of the most important factors limiting better results.
- IIb/IIIa inhibitors agents are a great allied in order to improve PCI results and clinical outcomes whenever thrombus is present.
- In Our Catch Lab used IIb/IIIa in 51 % of Pacients With SCA.
- However its usage should be indicated in selective group of patients !!!!!

Muito Obrigado

Arquivo pessoal: C. Costantini

Muito Obrigado

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Cardio Interv 2012

12th INTERNATIONAL INTERVENTIONAL CARDIOLOGY SYMPOSIUM

30 Nov - 01 Dec 2012 **Curitiba.PR.Brazil**

Conferences, discussions, round tables and live cases.

Organization

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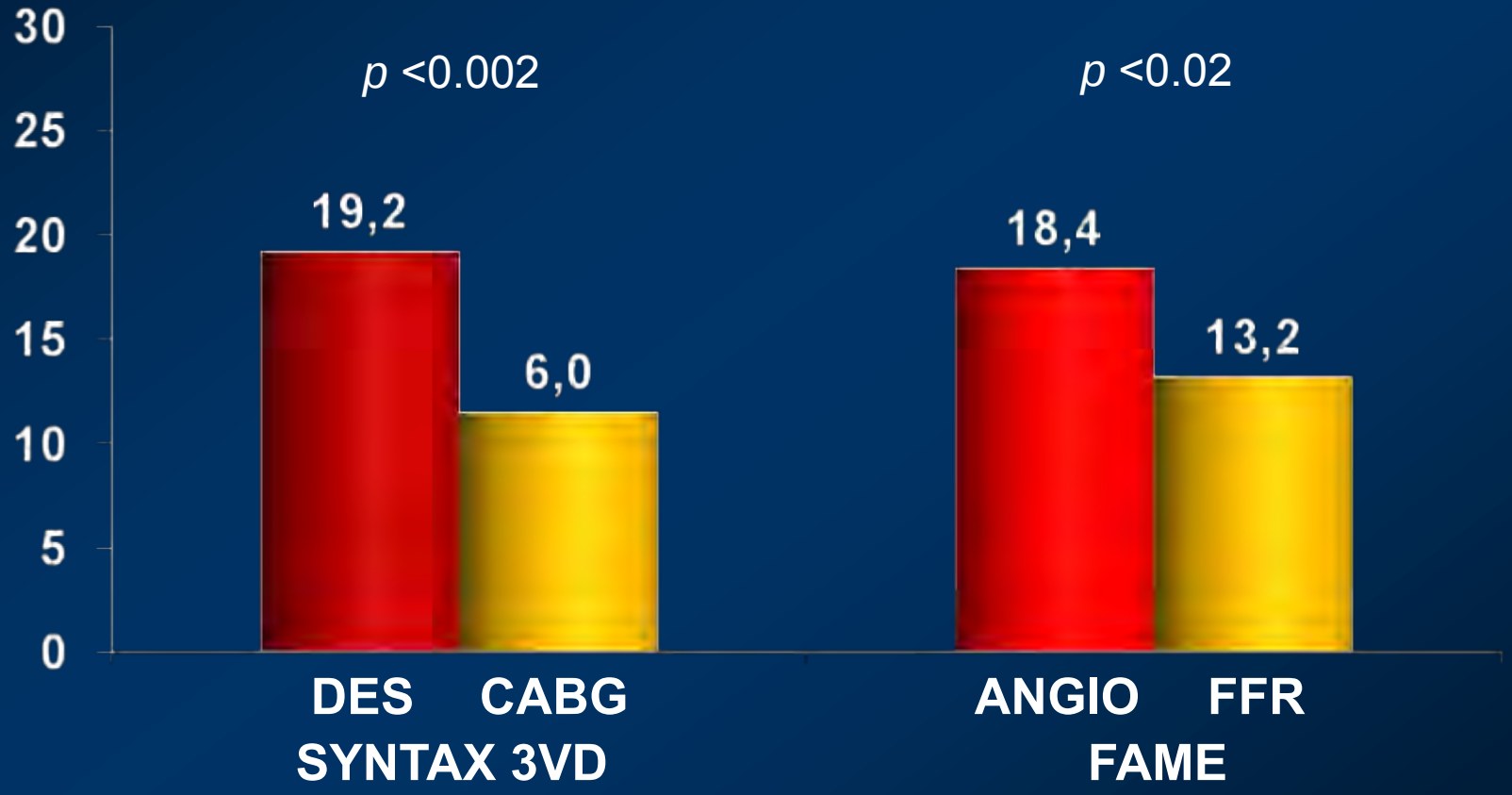
MACE 1 Year
1 Year Follow-Up
SYNTAX 3VD vs FAME



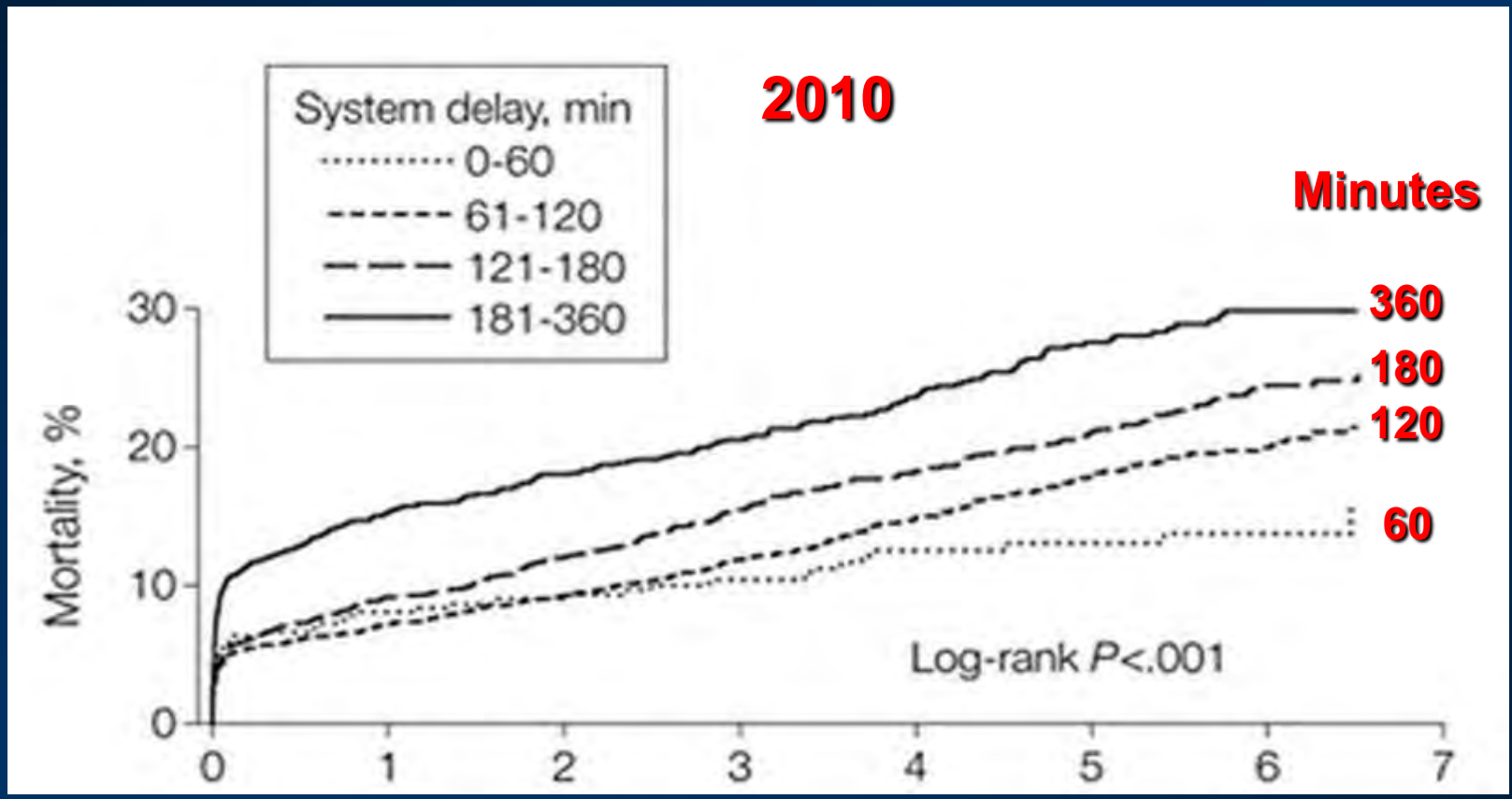
Patient and procedural characteristics from ARTS-II, and FAME

	ARTS-II (100% DES)	FAME (95% DES)	
		Angio	FFR
	N= 607	N= 496	N= 509
Age (yrs)	63	64.2	64.6
Male (%)	77	73	75
Previous MI (%)	34	36.3	36.7
Diabetes mellitus (%)	26	25.2	24.2
Unstable Angina (%)	36	35.5	29.4
Ejection fraction (%)	60	57.1	57.2
SYNTAX score	20.7	14.5	14.5
Lesions per patient	3.6	2.7	2.8
Number of stents	3.7	2.7	1.9
Length of stents (mm)	72.5	51.9	37.9
Procedural duration (mins)	85	70	71
Hospital stay (days)	3.4	3.7	3.4

Oral presentation Serruys; CIT, Beijing, 2009– Adapted Costantini SOLACI 2012

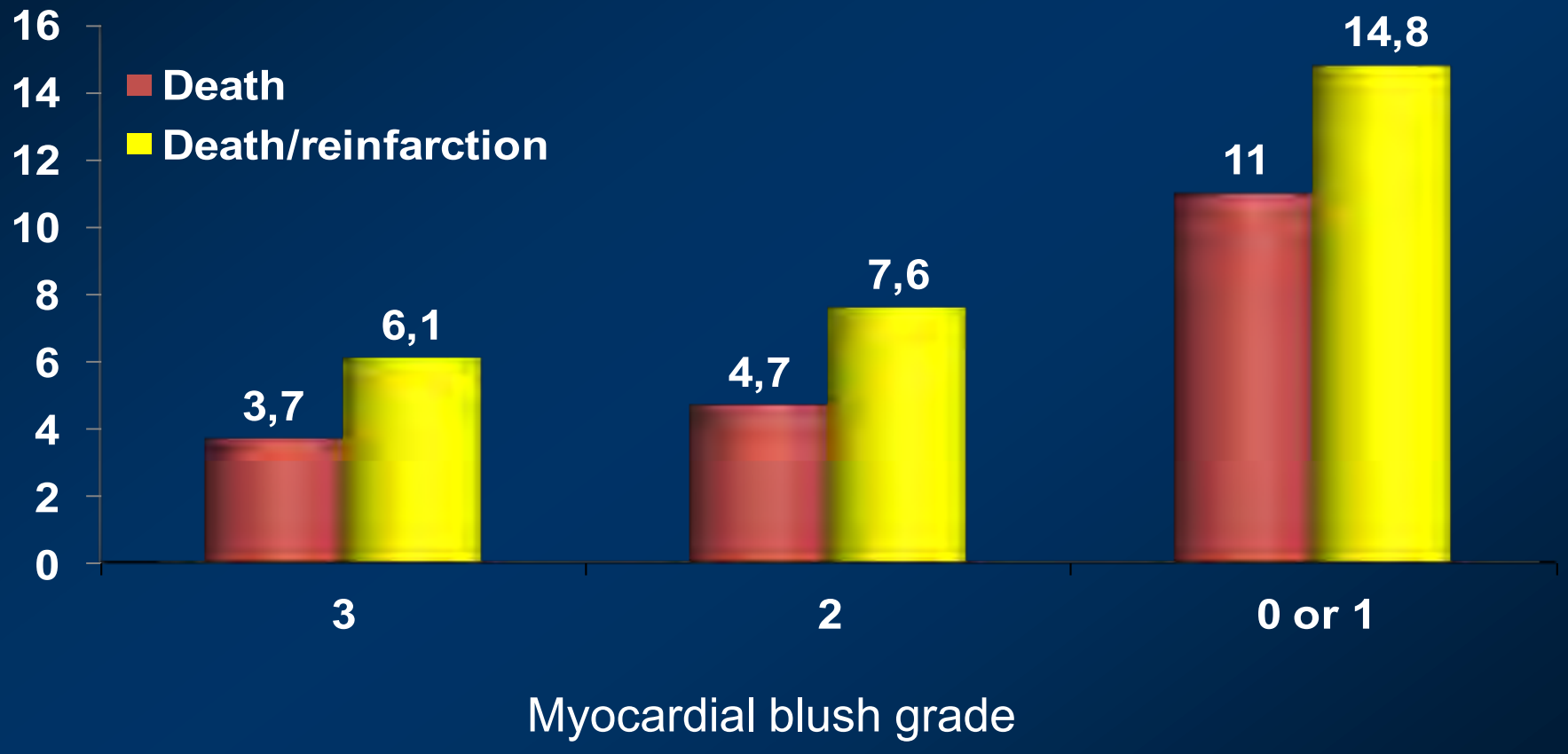
System delay

Time is Muscle



Terkelsen, C.J. et al JAMA 2010;304763-771

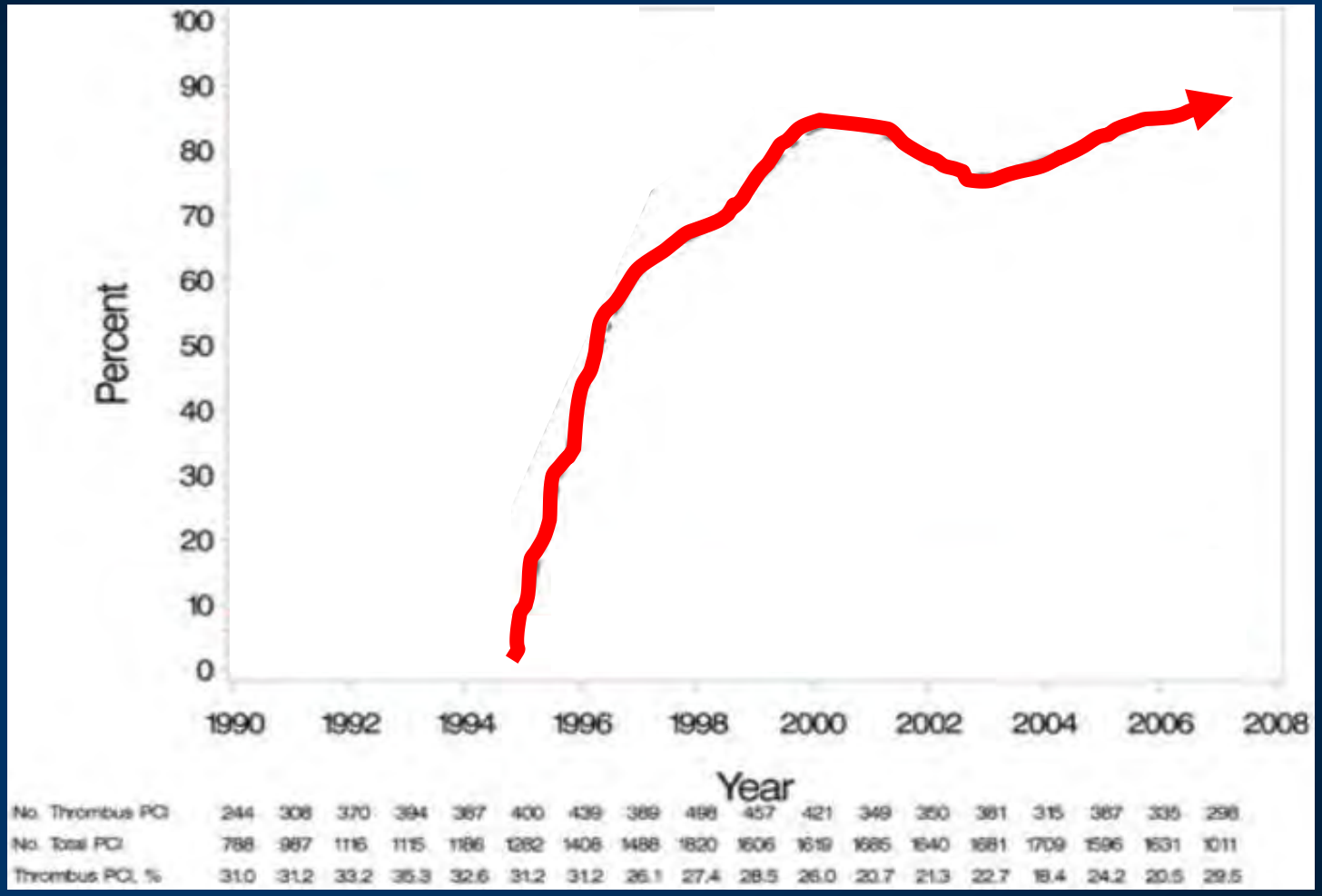
TAPAS one year outcome: Myocardial blush grade and death



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

2011 ACC/AHA PCI Guidelines

GP IIb/IIIa Inhibitor Therapy



No. Thrombus PCI	244	308	370	394	387	400	439	389	498	457	421	349	350	381	315	387	335	298
No. Total PCI	788	987	1116	1115	1186	1282	1406	1488	1820	1606	1619	1685	1640	1681	1709	1596	1631	1011
Thrombus PCI, %	31.0	31.2	33.2	35.3	32.6	31.2	31.2	26.1	27.4	28.5	26.0	20.7	21.3	22.7	18.4	24.2	20.5	29.5

J Am Coll Cardiol Intv. 2010;3(9):937-946

Primary Endpoint Analysis

6 months Follow up