

Long-term Clinical Outcome after a First Definite Stent Thrombosis

On behalf of the Dutch Stent Thrombosis investigators

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Background

- Estimated incidence of Stent thrombosis (both DES and BMS): 1-4%
- Short-term clinical outcome after ST varies in registries (mortality 10- 40%)¹⁻³
- Long-term clinical outcome after ST is less extensively studied

¹Iakovou, JAMA 2005

²Kuchulakanti, Circulation 2006

³de la Torre-Hernández, JACC 2008



Dutch Stent Thrombosis Registry

- Multicenter observational study, enrolling all consecutive patients with definite ST (by angio ARC)
- Inclusion period: Jan 2004 – Feb 2007
- The angiograms (index procedure and ST) were reviewed independently by two interventional cardiologists
- Follow-up: patient interview, hospital records, referring physicians, general practitioner



Aim

- To study the short- and long-term clinical outcome after a first “*definite*” stent thrombosis
- To identify predictors of adverse clinical outcome



Endpoints

Primary:

- A composite of cardiac death and definite recurrent stent thrombosis

Secondary:

- Cardiac death
- All-cause death
- Definite recurrent ST
- Definite or probable RST
- Myocardial Infarction
- Any TVR

431 patients with a first “definite” stent thrombosis

Inclusion period: Jan 2004 – Feb 2007

421 Emergent PCI's:

- 203 Balloon angioplasty alone
- 214 PCI with additional stent
- 4 aspiration only

10 patients:

- 4: target artery too small
- 2: passage failure of balloon
- 2: emergent CABG
- 2: died before reperfusion

MACE



Patient Characteristics at index PCI

N=431

Male sex – no.(%)	323 (74.9%)
Age – yr	61.1±11.8
BMI – kg/m ²	27.2 ± 4.1

Diabetes mellitus	100 (23.2%)
Hypercholesterolemia	229 (53.1%)
Hypertension	202 (46.9%)
Family Hx of CAD	213(49.4%)
Myocardial infarction	128 (29.7%)
PCI	102 (23.7%)
CABG	21 (4.9%)
Current smoking	280 (65.0%)

LVEF after the index procedure - %	
< 30%	45 (10.4%)
30-45%	72 (16.7%)
> 45%	314 (72.9%)

Stable Angina	110 (25.5%)
ACS (NSTEMI/STEMI)	321 (74.5%)

A/B1	101 (23.4%)
B2/C	330 (76.6%)

Bifurcated-lesion– no.(%)	223 (51.7%)
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LAD*	269 (62.4%)
RCA*	127 (29.5%)
RCX*	65 (15.1%)
Vein graft*	4 (0.9%)

BMS only	265 (61.5%)
DES only	150 (34.8%)
BMS+DES	16 (3.7%)

*exceeds 100% because of multivessel stenting

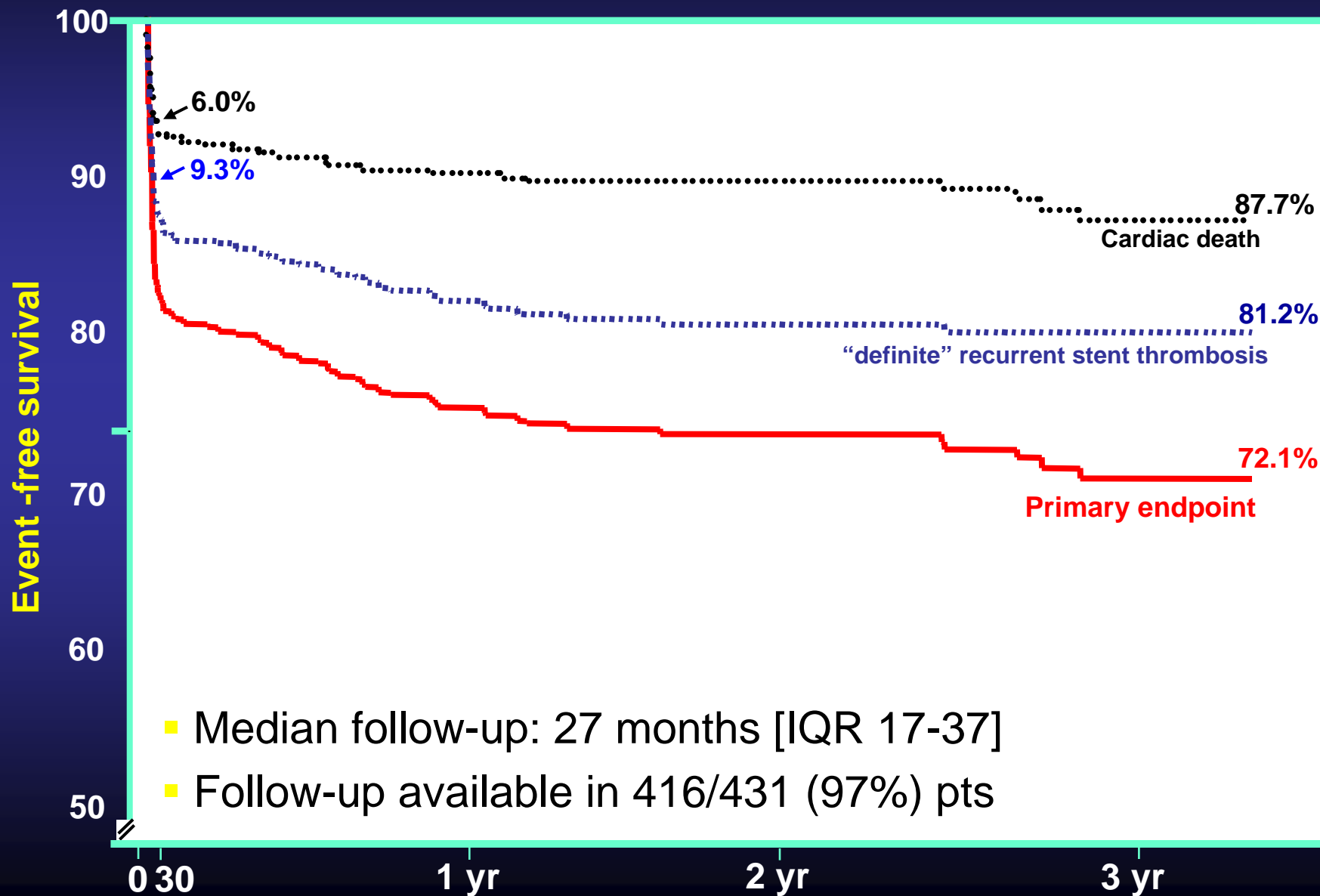


Details of 1st Stent thrombosis

Timing of stent thrombosis– no.(%)	
Acute stent thrombosis	140 (32.5 %)
Subacute stent thrombosis	177 (41.0%)
Late stent thrombosis	57 (13.2%)
Very late stent thrombosis	57 (13.2%)
Antiplatelet therapy at 1 st ST	
Aspirin	375 (87.0%)
Clopidogrel	297 (68.9%)
No antiplatelet drugs	33 (7.7%)
Post-PCI TIMI-flow grade 0/1/ 2	57 (13.2%)
Post-PCI TIMI-flow grade 3	374 (86.8%)
LVEF after 1 st stent thrombosis - %	
<30%	92 (21.4%)
30-45%	96 (22.3%)
>45%	243 (56.4%)

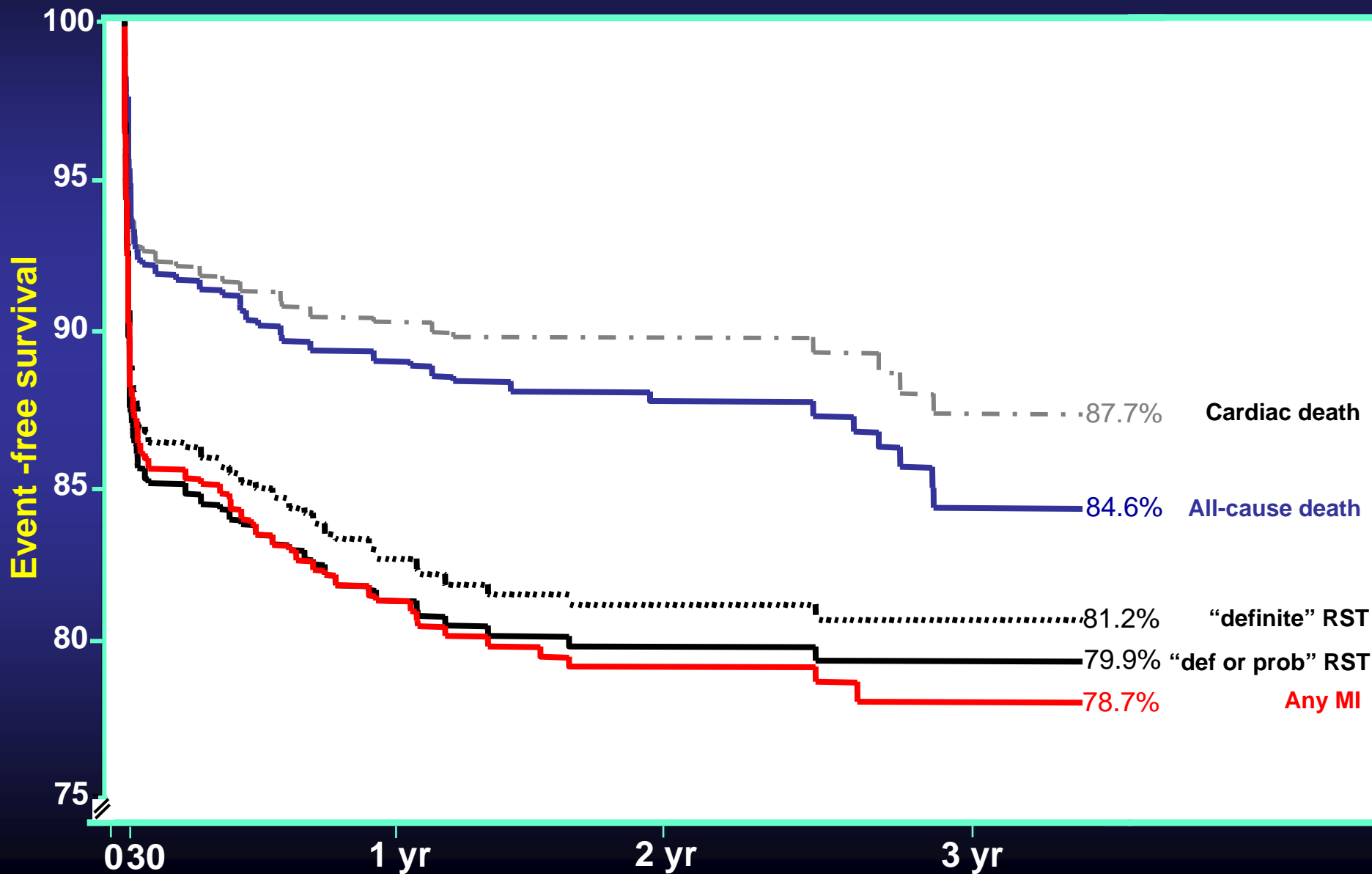


Primary Endpoint



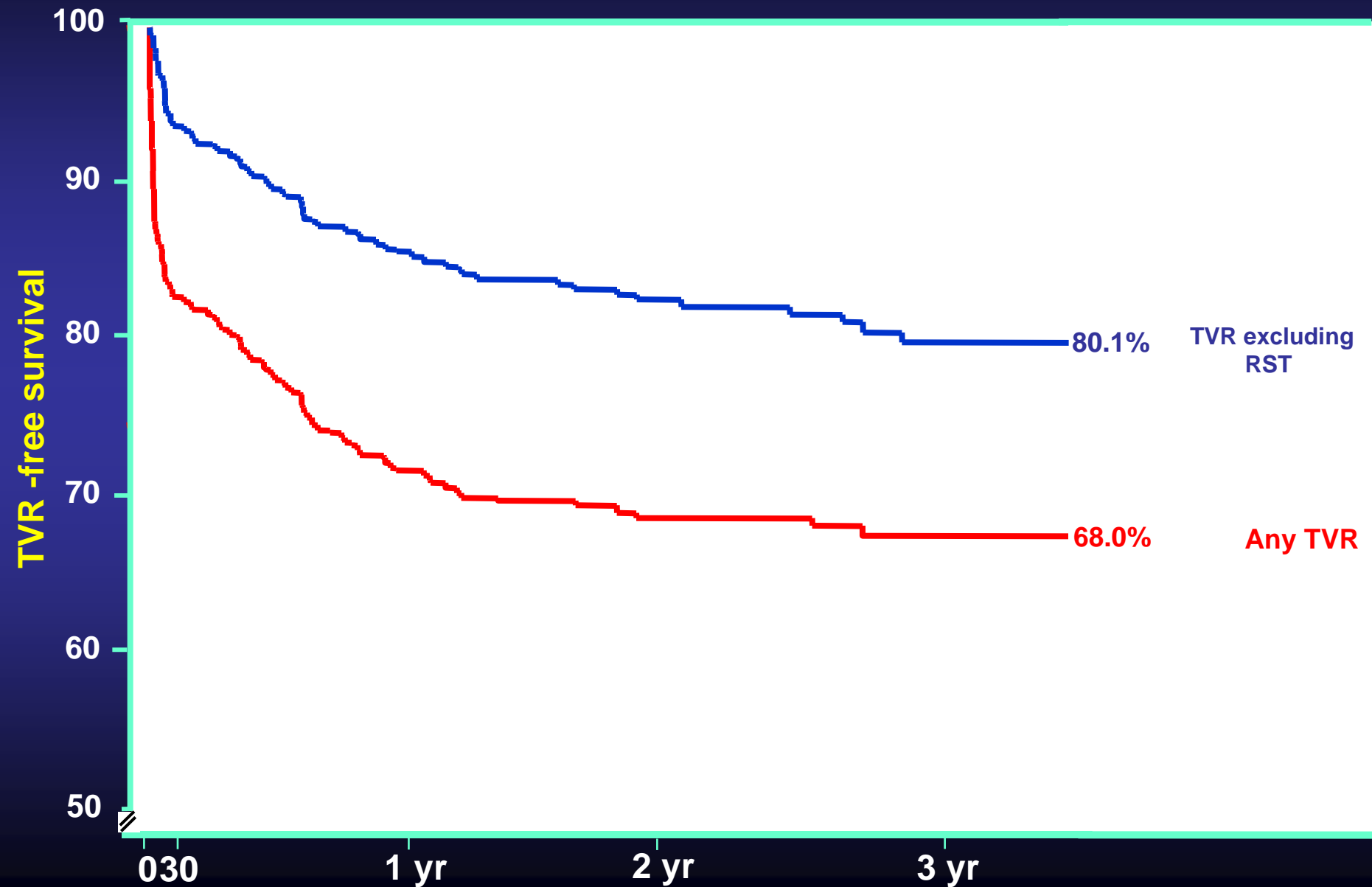


Secondary Endpoints





TVR





Predictors of Cardiac Death and ST

	HR (95%-CI)	p-Value
Clinical Characteristics		
Diabetes Mellitus	1.97 (1.27-3.00)	0.002
Male gender	1.64 (0.98-2.74)	0.06
LVEF after stent thrombosis <45%	1.72 (1.08-2.71)	0.02
Angiographic Characteristics		
Severe Calcification	1.69 (1.21-2.35)	0.0019
B2/C lesion	2.65 (1.65-4.24)	<0.0001
Stent in LAD	2.33 (1.15-4.76)	0.02
Total stent length (per mm)	1.026 (1.005-1.028)	0.006
Procedural Characteristics		
Additional stent implantation	1.73 (1.14-2.61)	<0.001
TIMI-flow post emergent PCI < grade3	1.27 (0.99-1.60)	0.05

The type of coronary stent (BMS vs. DES) or the timing of the stent thrombosis were not associated with adverse outcome.



Conclusion (1)

- Dutch Stent Thrombosis Registry:
largest registry thus far with longest follow-up (431 cases with “definite” ST)
- Mortality at 3 yrs ~ 15%
- Recurrent stent thrombosis at 3 yrs ~ 20%



Conclusion (2)

Predictors of death or definite RST:

Index Procedure

- DM
- Severe lesion calcification
- Complex lesion stenting
- Longer stent length
- LAD stenting

1st stent thrombosis

- LVEF <45%
- Additional stent implantation
- TIMI flow post-PCI <3



Acknowledgements

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