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Left Main and Bifurcation Summit I

Apr 29 8.56-9.09

Lessons from European LM Studies

Alaide Chieffo, MD

S. Raffaele Hospital, Milan, Italy

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- Nothing to disclose regarding this presentation

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Lesion Location

886±308 days Clinical Follow-Up

	n = 147
Death, n (%)	5 (3.4)
Cardiac Death	4 (2.7)
TLR, n (%)	1 (0.7)
TVR, n (%)	7 (4.7)
MI, n (%)	0
MACE, n (%)	11 (7.4)

Chieffo et al Circulation 2007;116(2):158-162.

6-Month Angiographic Follow-Up

Angiographic Fup was performed in 106 (73%) of the pts

	n=106
Restenosis, %	1 (1)
Late Loss, mm	-0.01

Chieffo et al Circulation 2007;116(2):158-162.

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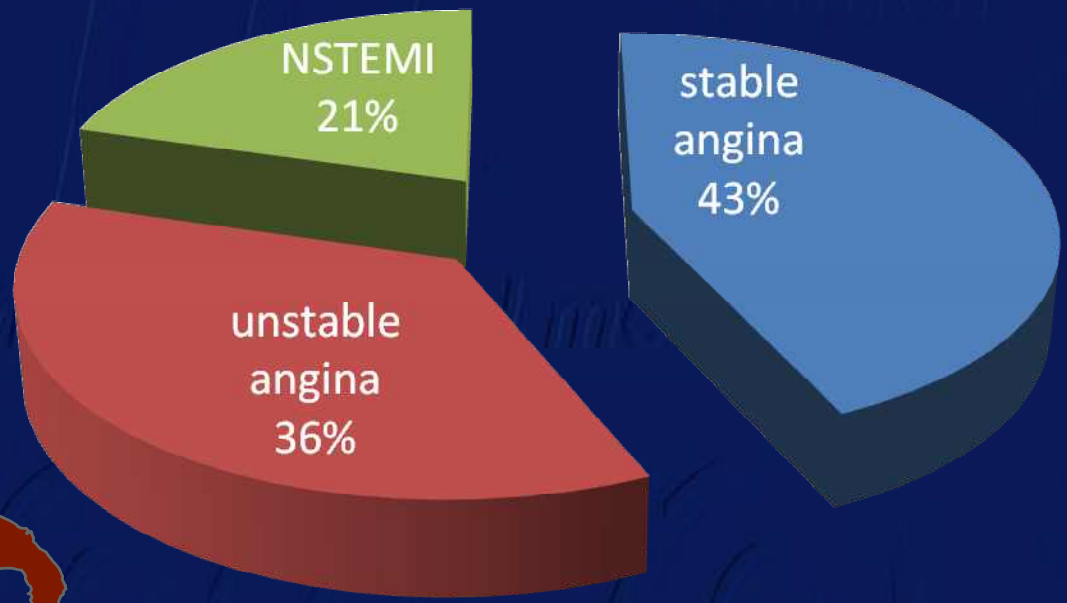
GISE-SICI survey on Left Main Stenting

n = 1,453 patients, 19 Italian centers enrolled

DES n=1111
BMS n= 342



Palmerini, et al. Am J Cardiol 2008 102:1463-1468

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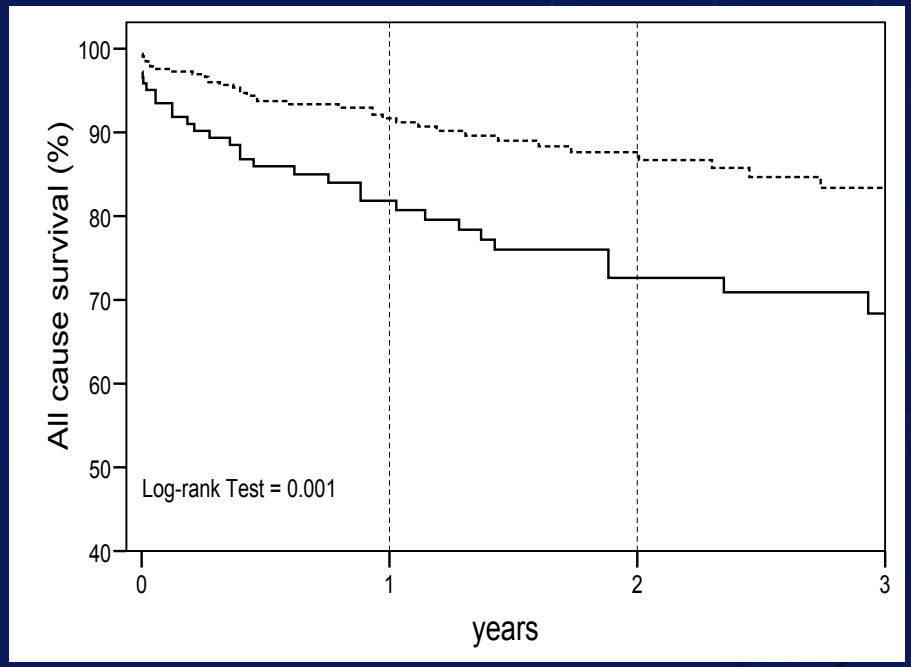
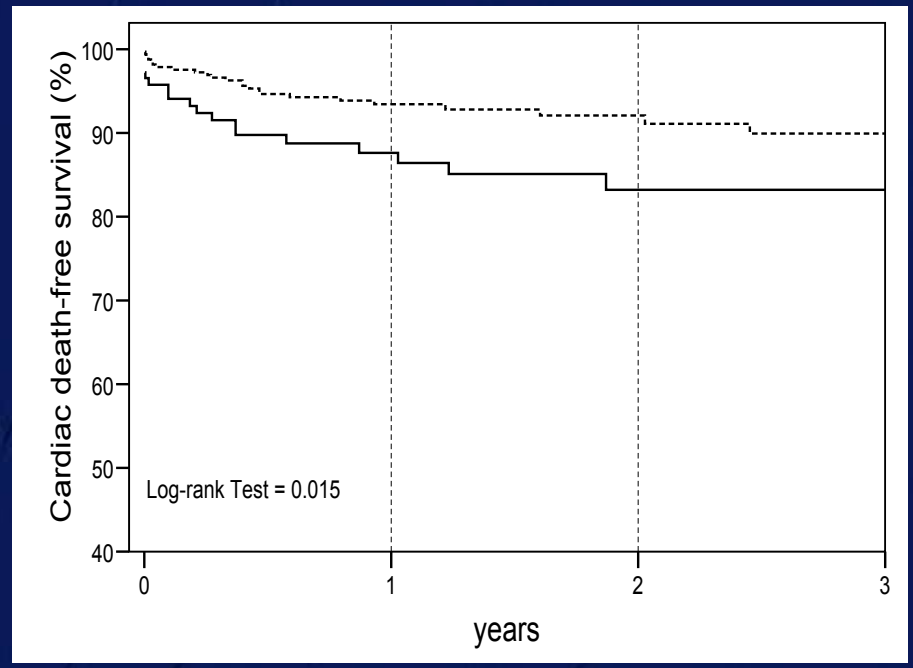
GISE SIC Registry
Ostium and Shaft Subanalysis
BMS vs DES





Overall mortality - unadjasted

Cardiac mortality – unadjasted

P < 0.001

P = 0.015

BMS=145 DES= 334

Tamburino et al Eur Heart J. 2009 May;30(10):1171-9

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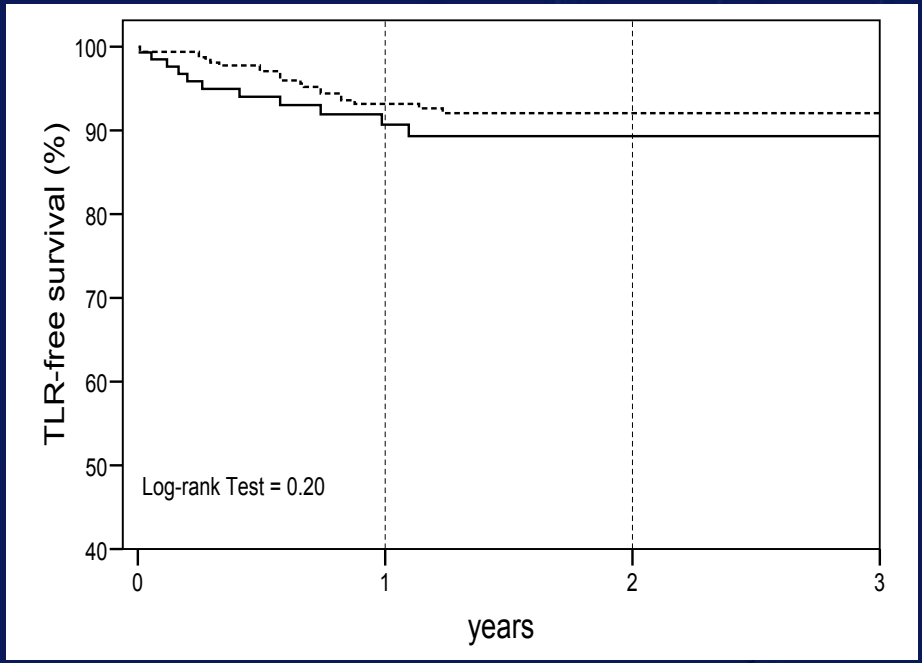
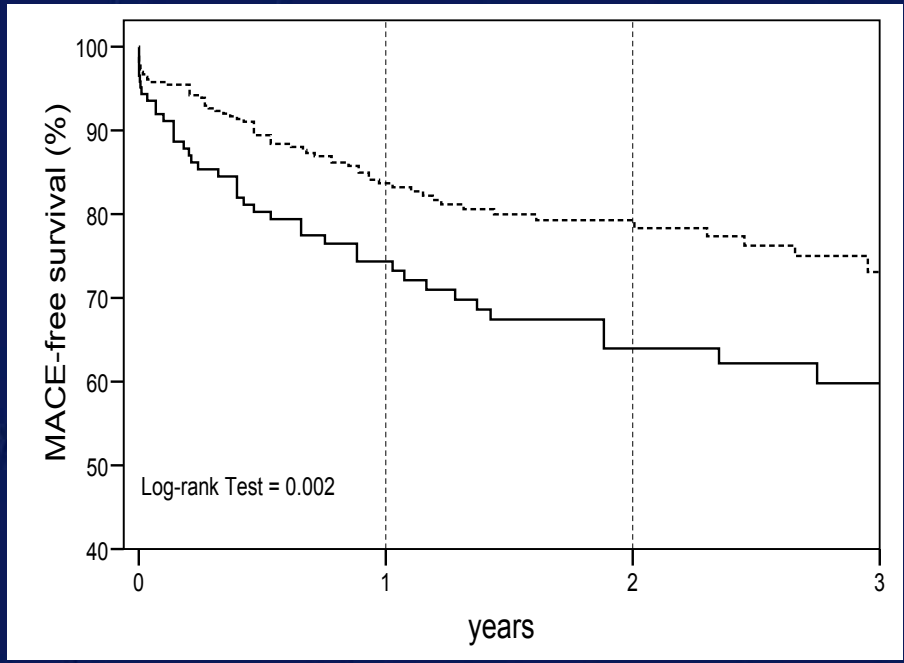
GISE SIC Registry
Ostium and Shaft Subanalysis
BMS vs DES





TLR - unadjasted

MACE–unadjusted

P = 0.20

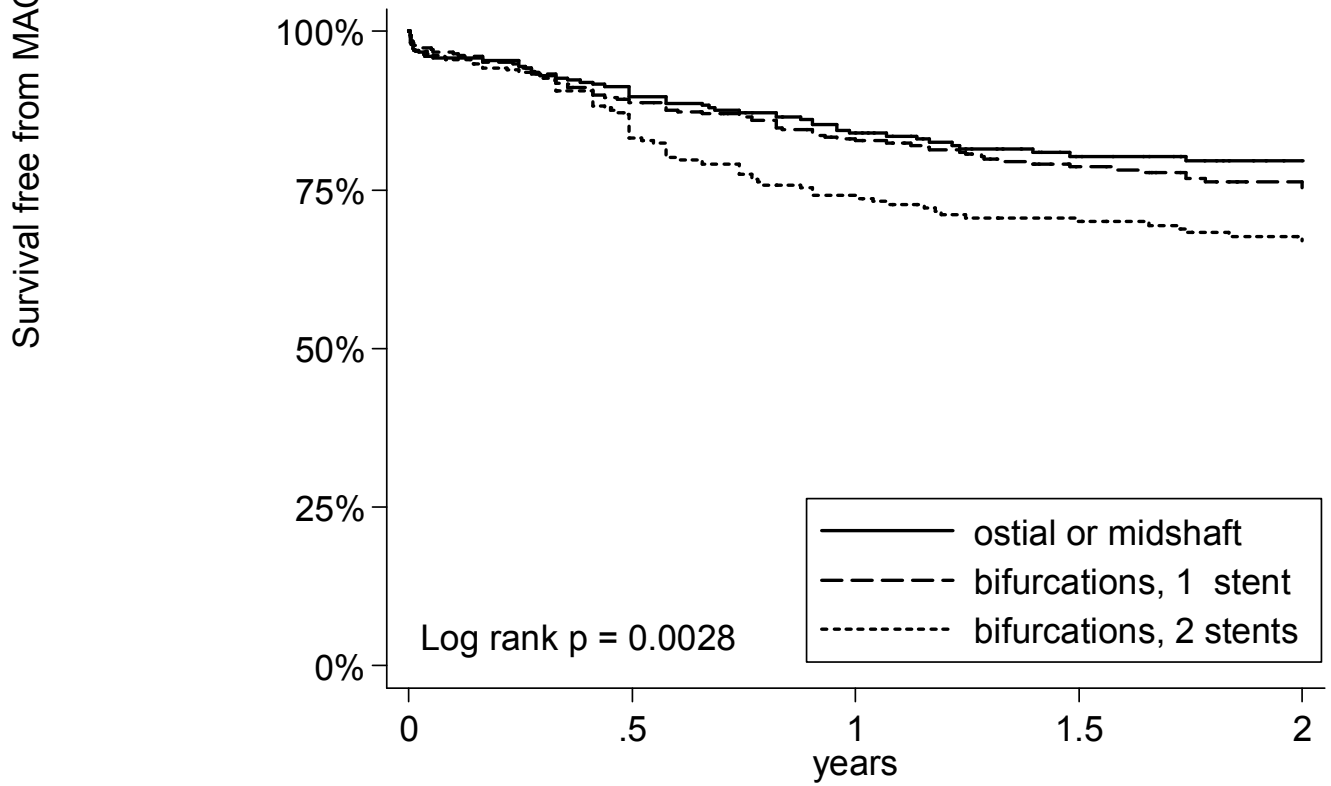
P = 0.002

BMS=145 DES= 334

Tamburino et al Eur Heart J. 2009 May;30(10):1171-9

GISE SIC REGISTRY

Ostial vs Bifurcations 1 stent vs 2 stents



At-risk					
ostial or midshaft	334	259	194	125	100
bifurcations, 1 stent	456	358	269	180	134
bifurcations, 2 stents	317	227	164	121	102

Palmerini et al Eur Heart J. 2009 Sep;30(17):2087-94.

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Clinical Presentation

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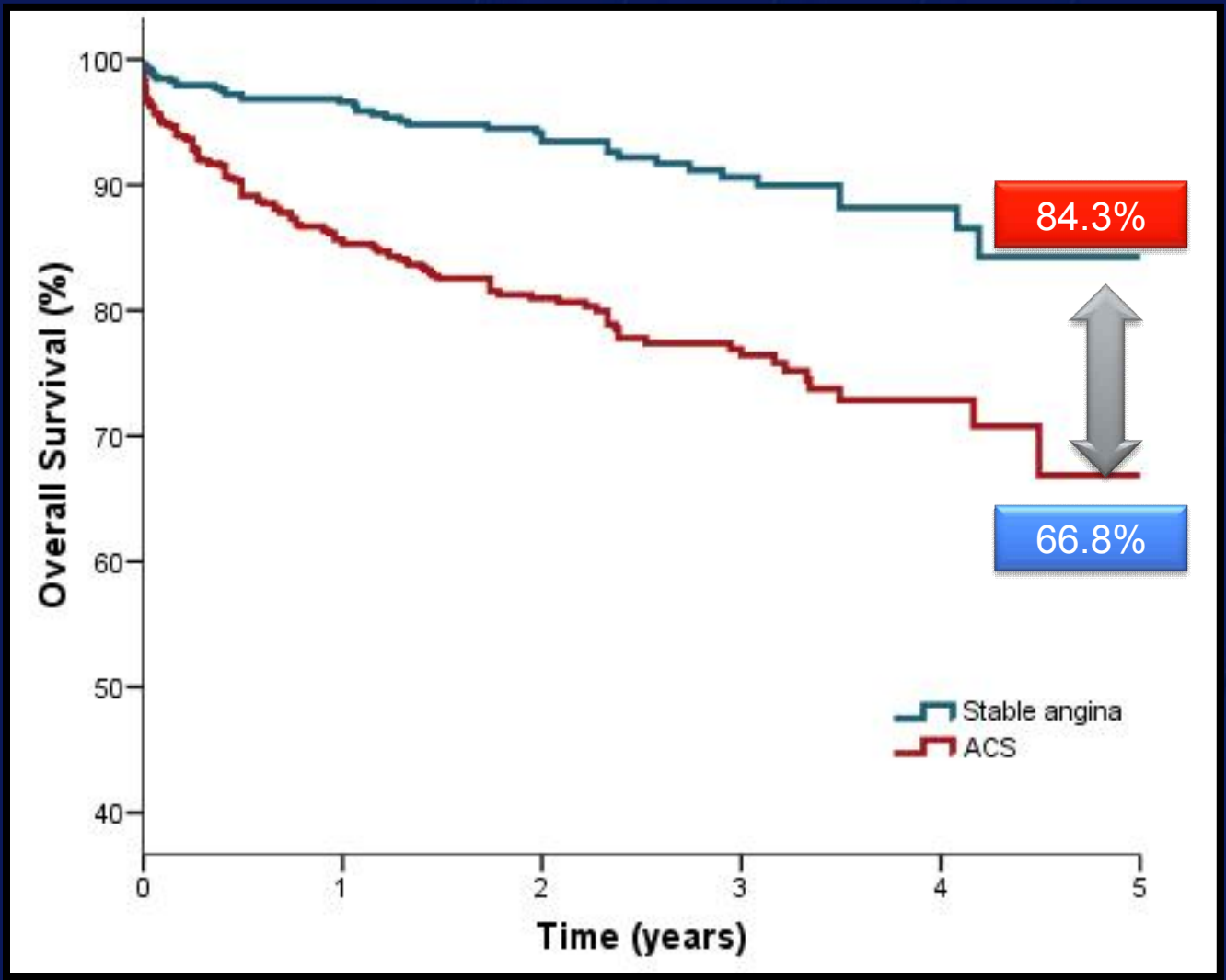
GISE SIC Registry

Acute Coronary Syndrome vs Stable Angina



HR 3.0 (2.1-4.2)

ACS=849
SA=591

Tamburino, et al. Am J Cardiol 2009;103:187-193

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Drug Eluting stent for LeFT main (DELFT) Registry

Study population

April 2002 → April 2004

358
consecutive patients with
de novo ULMCA disease

↓

SES or PES

Meliga et al J Am Coll Cardiol. 2008 Jun 10;51(23):2212-9

Baseline Clinical Characteristics

Diagnosis at admission	
Stable Angina	44.1%
Unstable Angina	41.9%
AMI	8.4%
AMI+shock	2.8%
Silent Ischemia	2.8%
LVEF	48.6±12.8
EuroScore	6.4±4.1
>6	20.1%
>9	31.0%
Elective	5.7±3.8
Emergent	9.9±3.5

19.6% Emergent PCI

Meliga et al J Am Coll Cardiol. 2008 Jun 10;51(23):2212-9

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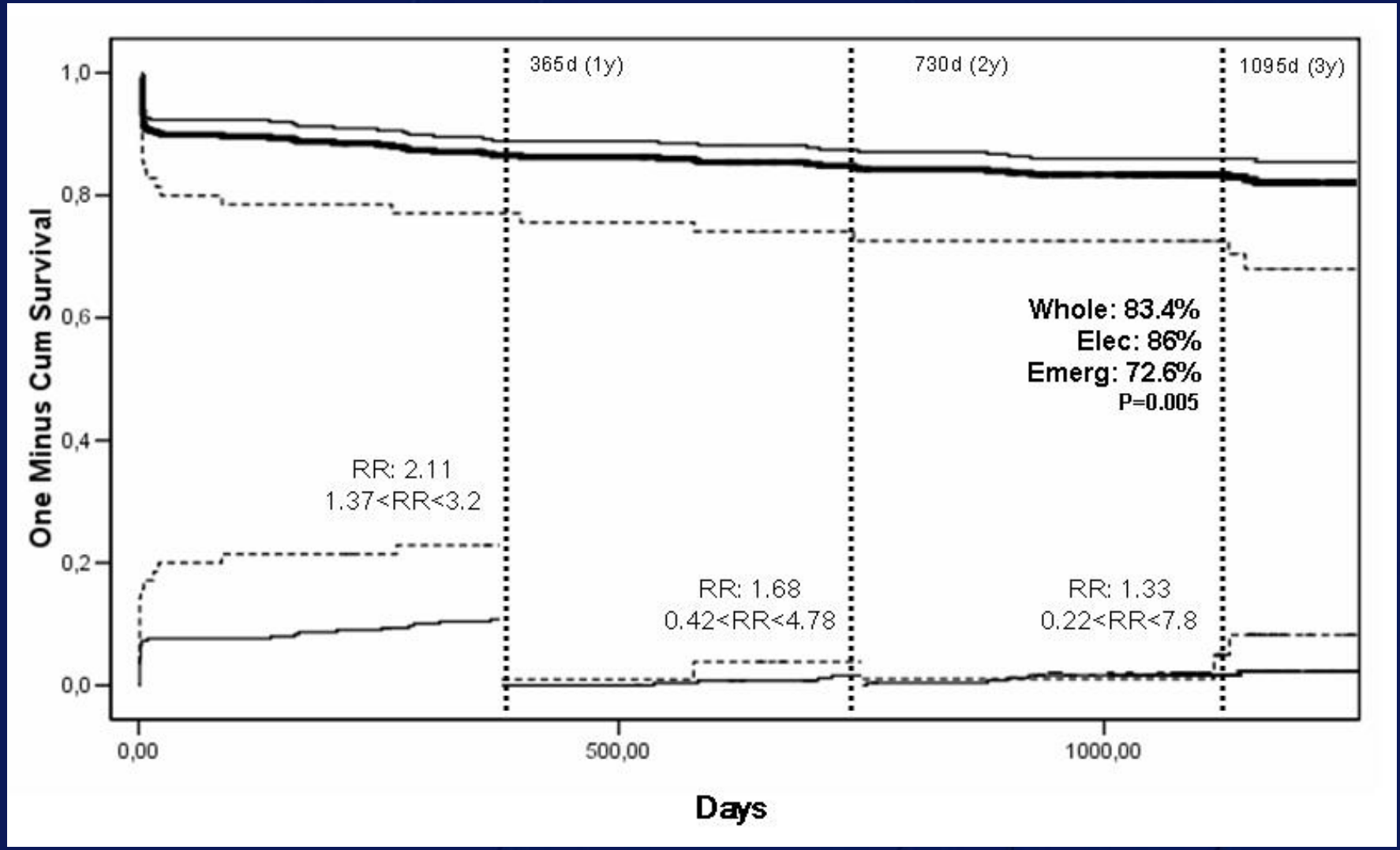
DELFT
K-M survival analysis – Death + MI



Meliga et al J Am Coll Cardiol. 2008 Jun 10;51(23):2212-9

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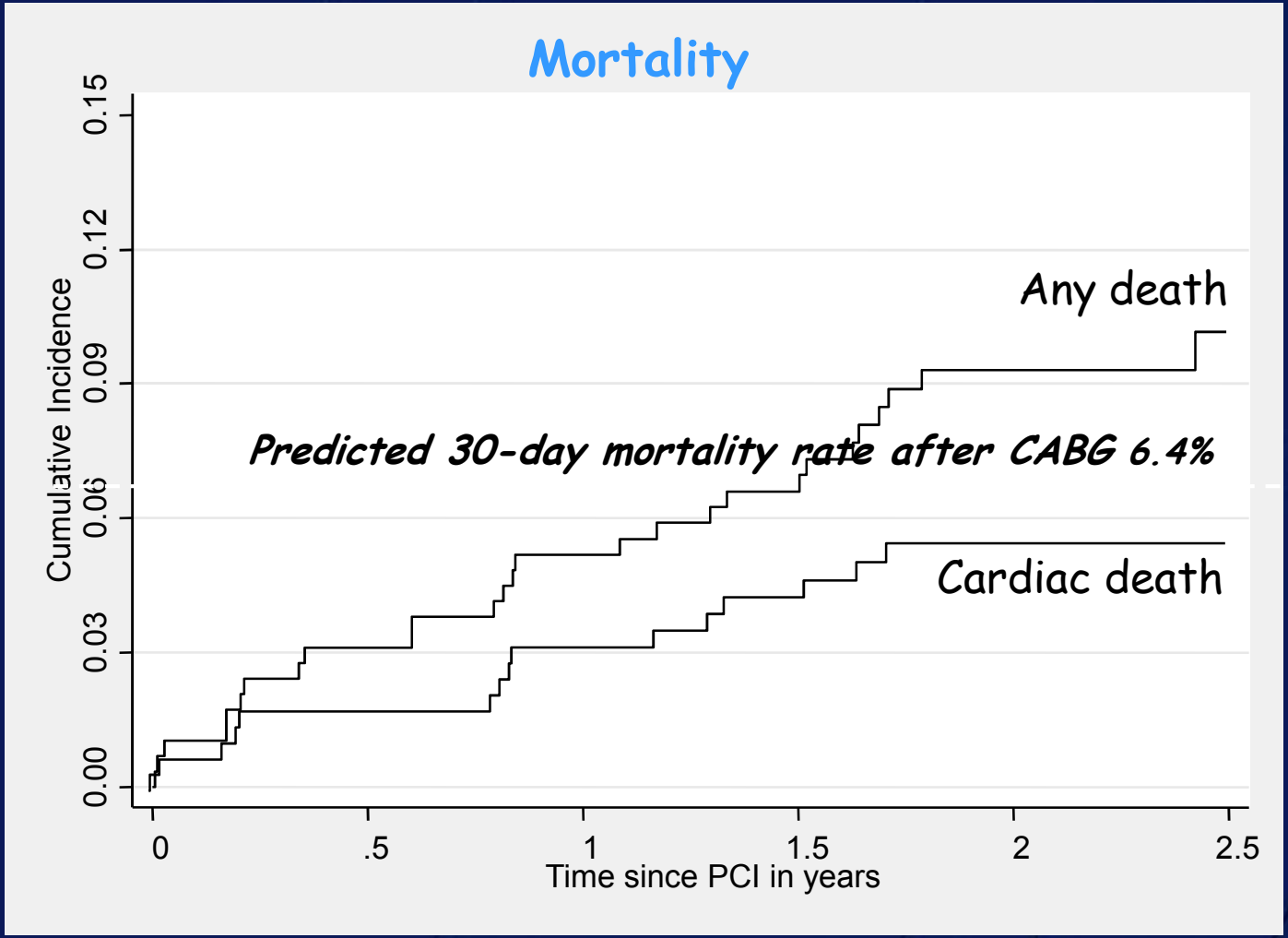
French Left Main Taxus Pilot Study
2 Year Outcome



5.4%

Vaquerizo et al Circulation. 2009;119:2349-2356

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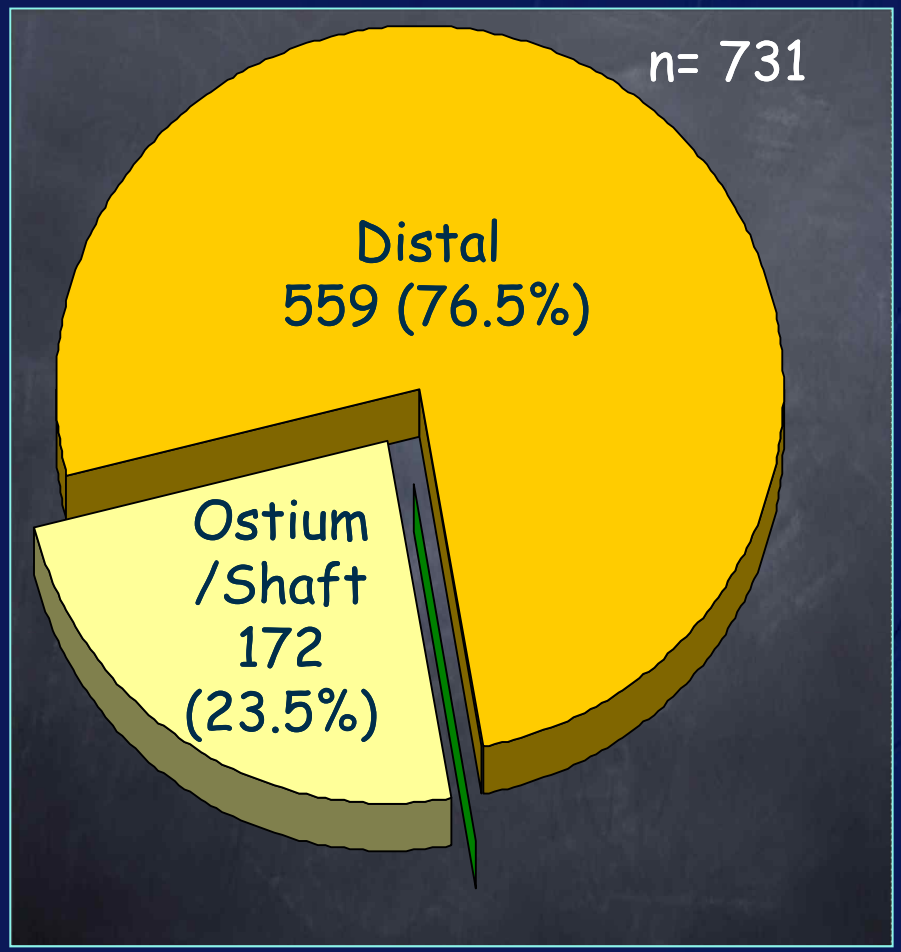
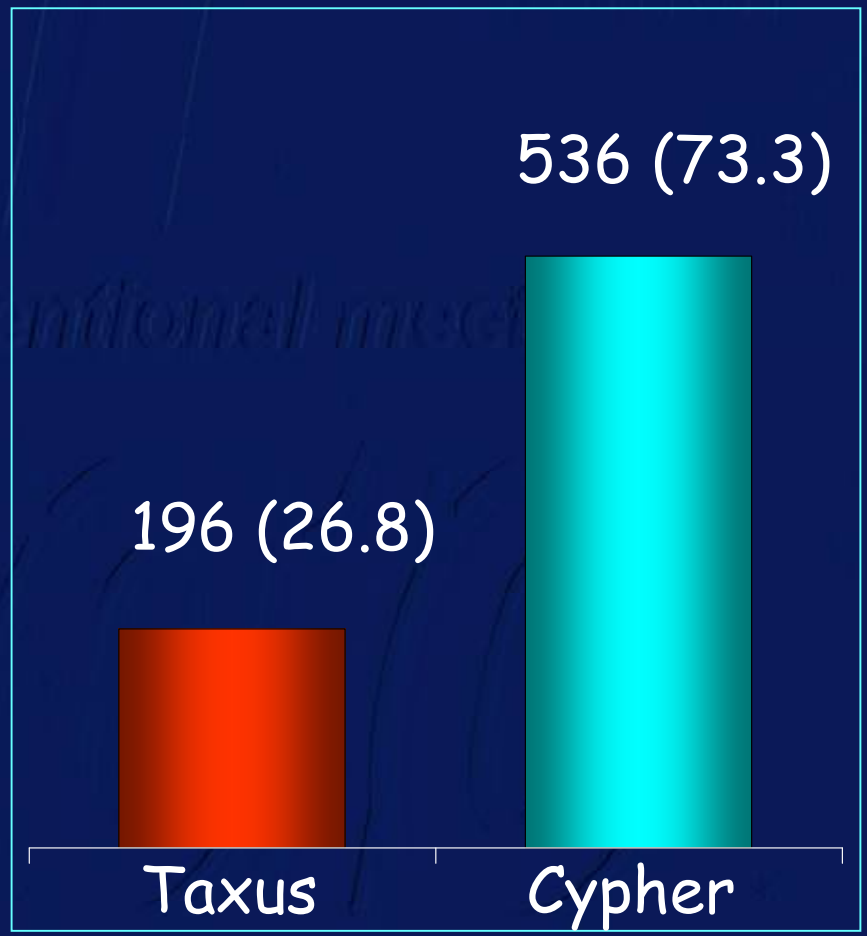
Stent Thrombosis

Lesion and Procedural Characteristics

Lesion Location



Stent Type



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Late and Very Late Stent Thrombosis Multicenter Registry

In-Hospital and Long Term Fup

	In Hospital n=731	Follow-up (29.5.±13.7 ms) n= 726
Cardiac Death,n (%)	5 (0.7)	26 (3.6)
Total Death, n (%)	5 (0.7)	40 (5.5)
MI, n (%)	69(9.4)	11 (1.5%)
TLR, n (%)	2 (0.3)	76 (10.5)
TVR, n (%)	2 (0.3)	95 (13.0)
MACE, n (%)	73 (9.9%)	138 (19.0)

Chieffo et al Eur Heart J 2008 Jun 18

Stent Thrombosis

ARC Definitions

	n = 731
Definite Stent Thrombosis	4* (0.54%)
Probable Stent Thrombosis	3 (0.4%)
Possible Stent thrombosis	20 (2.7%)

0.9%

*Late thrombosis in a Taxus stent in LAD at 3 ms

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CABG vs DES

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Baseline Clinical Characteristics I

	PCI	CABG	P value
	n= 107	n=142	
Age, years	63.6±10.3	6.5±9.7	0.0026
Diabetes mellitus	20 (18.7%)	33 (23.2%)	0.44
Smokers	53 (49.5%)	84 (59.1%)	0.16
Hypertension	63(58.8%)	108(76.0%)	0.006
Hyperchol	75 (70.0%)	98(69.0%)	0.89
Euroscore	4.4±3.6	4.3±3.4	0.85
Euroscore≥6	34 (31.7)	41(28.8)	0.67

Chieffo et al Circulation 2007;116(2):158-62

Chieffo et al J Am Coll Cardiol Cardiovascular Interventions 2010

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Baseline Clinical Characteristics II

	PCI	CABG	P value
	n= 107	n=142	
Renal Failure	2 (1.9)	12 (8.4)	0.02
Disease in RCA	42 (40.4)	98 (69.0)	0.0001
RCA Treatment	18 (16.9)	68(48.3)	0.0001
LVEF, %	52.0±10.4	52.2±11.4	0.91
Unstable angina	34 (31.8)	31(21.8)	0.08

Chieffo et al Circulation 2007;116(2):158-62

Chieffo et al J Am Coll Cardiol Cardiovascular Interventions 2010

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Lesion and Procedural Characteristics in DES group

	DES n= 107
Vessel diameter, mm	3.3±0.68mm
IABP (%)	22 (20.5)
Distal LMCA stenosis , n (%)	87 (81.3)
Bifurcation, n	77
Trifurcation, n	10
Both Branch stented, n (%)	64 (73.6)
Crush Technique, n (%)	38 (59.4)
Culotte, n (%)	7 (10.9)
V stenting, n (%)	19 (29.7)

Chieffo et al Circulation 2007;116(2):158-62

Chieffo et al J Am Coll Cardiol Cardiovascular Interventions 2010

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Procedural Characteristics in CABG group

	n= 142
• IABP , n (%)	13 (9.1)
• Off Pump , n (%)	56 (39.4)
• LIMA , n (%)	134 (94.4)
• LIMA+RIMA, n (%)	25 (17.6)
• Radial conduit, n (%)	8 (5.6)
• Complete arterial revasc, n (%)	18 (12.7)
• LIMA+SVG, n (%)	95 (66.9)
• Complete revascularization, n (%)	98 (69.0%)

Chieffo et al Circulation 2007;116(2):158-62

Chieffo et al J Am Coll Cardiol Cardiovascular Interventions 2010

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In-Hospital Outcome

	DES n = 107	CABG n = 142	On Pump n=86	Off Pump n=56
MI	10 (9.3%)	37 (26.05%)	29 (33.7%)	8 (14.3%)
Q- MI	0	5	4	1
TVR	0	3 (2.1%)	1 (1.2%)	2 (3.5%)
CVE	0	2 (1.4%)	1 (1.2%)	1 (1.7%)
Death	0	3 (2.1%)	2 (2.3%)	1 (1.7%)

Chieffo et al Circulation 2007;116(2):158-62

Chieffo et al J Am Coll Cardiol Cardiovascular Interventions 2010

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Hierarchical End Point at 5 Years

	DES n= 107	CABG n = 142	Undajusted OR 95% CI, P value	Adjusted OR 95%CI, P value
CD*	7.5%	11.9%	0.59 (0.21 to 1.5; P=0.34)	0.502; (0.16 to 1.46; P=0.24)
CD+MI	8.4%	16.9%	0.41 (0.16-0.95; p=0.04)	0.408; (0.14 to 1.06; P=0.06)
CD+MI +CVE	11.2%	20.4%	0.38 (0.16-0.86; P=0.02)	0.43; (0.17- 0.97; P=0.04)
MACCE	38.3%	32.4%	1.41 (0.79-2.51; P=0.26)	1.57; (0.82 to 3.05; P=0.18)
TVR	28.0%	8.4%	4.19 (1.9- 9.6; p=0.0001)	4.41; (1.82- 11.3; p= 0.0004)

*CD= cardiac death

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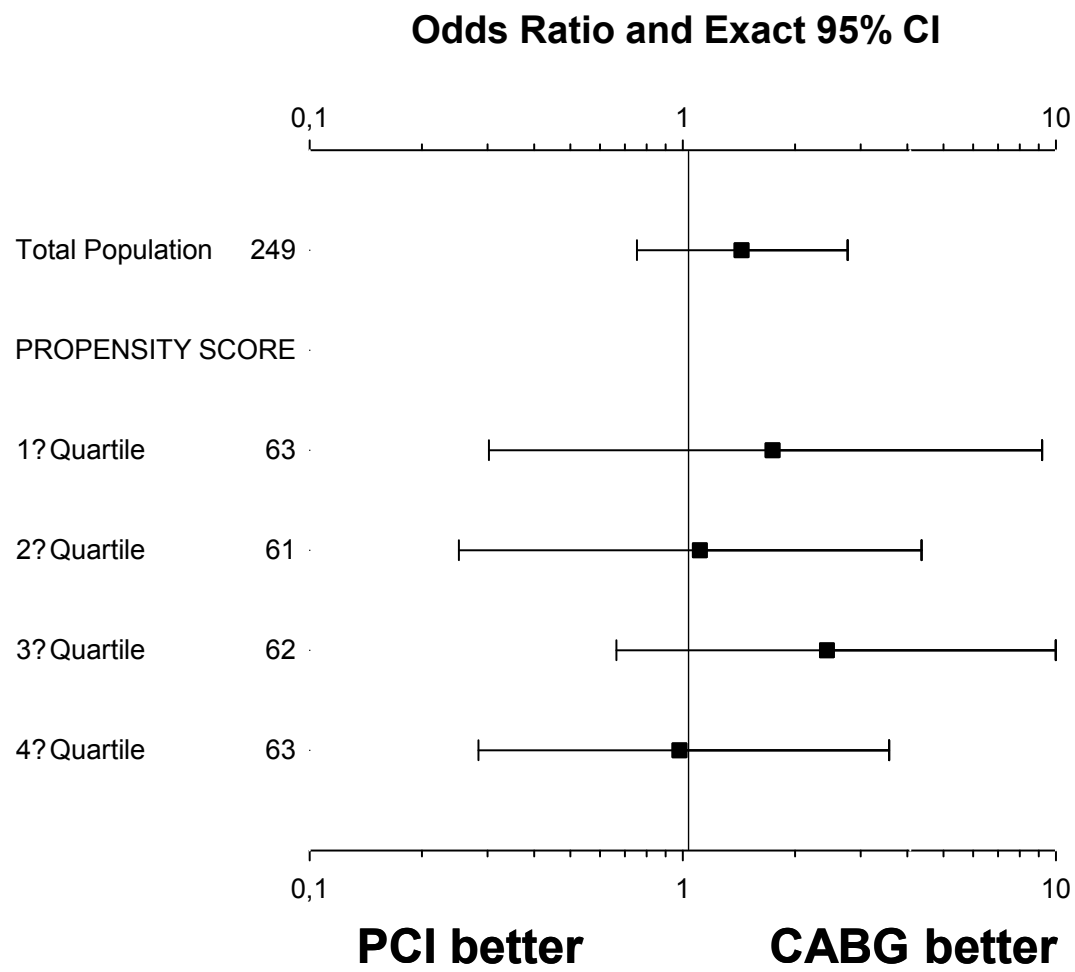
CABG vs. DES Milan Experience

MACCE at 5 years (including repeated revascularization)



(adjusted OR=1.578; 95% CI=0.825 to 3.054; P=0.18).

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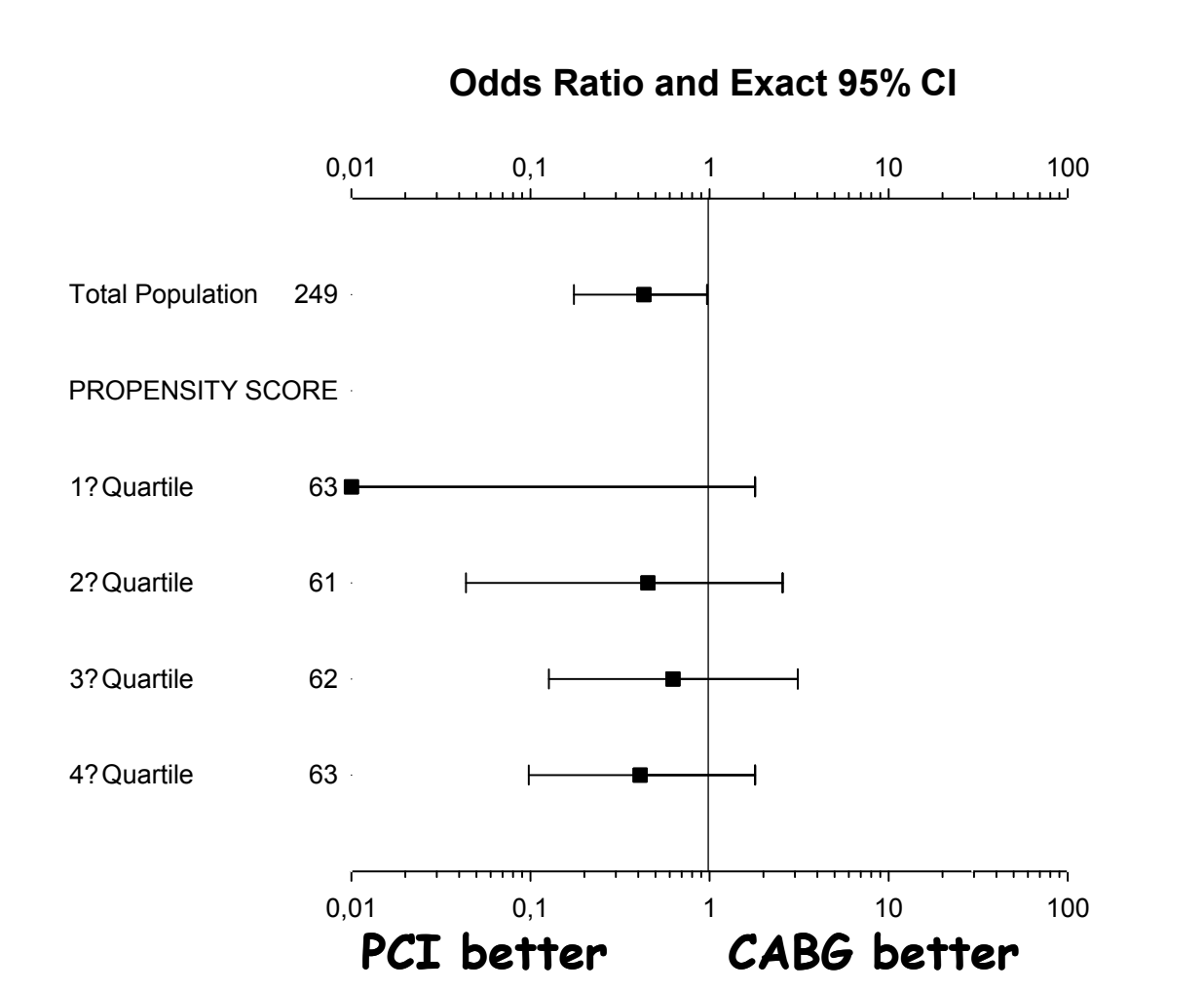
CABG vs. DES Milan Experience

CVE+Death+MI at 5 years



(OR=0.399; 95% CI=0.151 to 0.989; P=0.04)

Chieffo et al J Am Coll Cardiol Cardiovascular Interventions 2010

Participating Centers The DELTA Registry

Principal Investigators

A. Chieffo, Milan and E. Meliga, Turin

Investigators

YH Kim, SJ Park, Seoul

Palacios, R.J.P. Margey, Boston; R. Mehran,M. Leon, J. Moses, New York; R. Makkar, Los Angeles

P.W. Serruys, Y. Onuma, Rotterdam

J. Fajadet, C. Naber, Toulouse; T. Lefevre, MC Morice, M. Bande, Paris

A. Colombo, A. Latib, O. Alfieri, Milan;
C. Tamburino, P. Capranzano, D. Capodanno, A. La Manna, Catania;
I. Sheiban, S. Marra, Turin; M. Valgimigli, Ferrara

A. Erglis, S. Jegere, Riga

P. Buszman, Katowice

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Study Population DELTA Registry

April 2002 → April 2006

ALL
consecutive patients with
de novo ULMCA disease

PCI with DES
n=1873

CABG
n=901

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Baseline Clinical Characteristics I

	PCI	CABG	
%, mean±SD	(n=1873)	(n=901)	p
Age	65,8±11,5	66,5±9,8	0.24
Gender (M)	73.9	63.6	<0.01
Familiar H	29.1	25.3	0.038
Hypertension	64	67.7	0.06
Hypercol	61.8	64.7	0.15
Active Smoker	45.2	42.7	0.22
Diabetes	27.7	34	<0.01
IDDM	6.1	7.1	
NIDDM	21.6	26.8	<0.01
CKD	7.3	4.1	<0.01

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Baseline clinical characteristics -II

%, mean±SD	PCI (n=1873)	CABG (n=901)	p
NSTEMI	11.6	11.0	<0.01
STEMI	2.9	0.8	<0.01
Prev CABG	10.7	2.7	<0.01
Prev PCI	24.8	13.7	<0.01
EuroSCORE	4.9±3.6	5.1±2.6	0.17
SYNTAX Score	28.6±14.3	38.9±13.2	<0.01
LVEF	53.8±12.0	53.3±11.5	0.29

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Procedural and Angiographic Characteristics I

	PCI	CABG	
%, mean±SD	(n=1873)	(n=901)	p
LM Lesion Location			
Ostial/Shaft	39.7	41.6	0.23
Distal	60.3	58.4	0.36
Multivessel Disease	79.8	94.2	<0.01
Number of Vessels Treated	1.4±0.84	2.1±0.9	<0.01
True bifurcation	39.8%		
2 stent strategy	43.1%		
Off Pump		14.0%	

33.1% of the patients underwent IVUS during PCI

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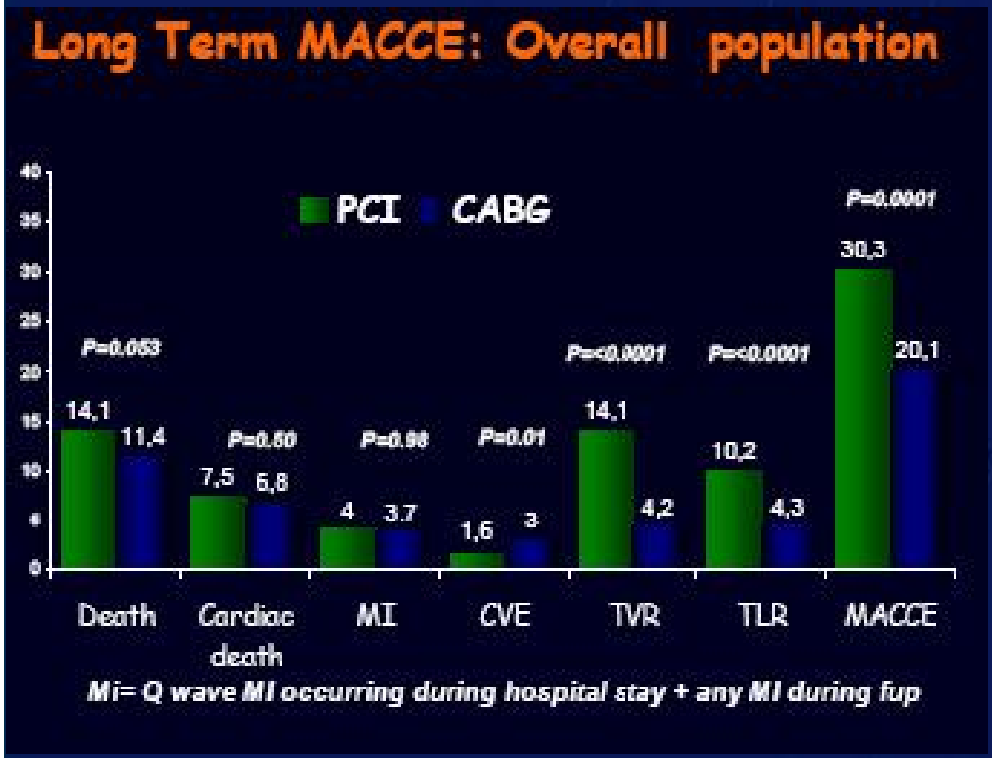
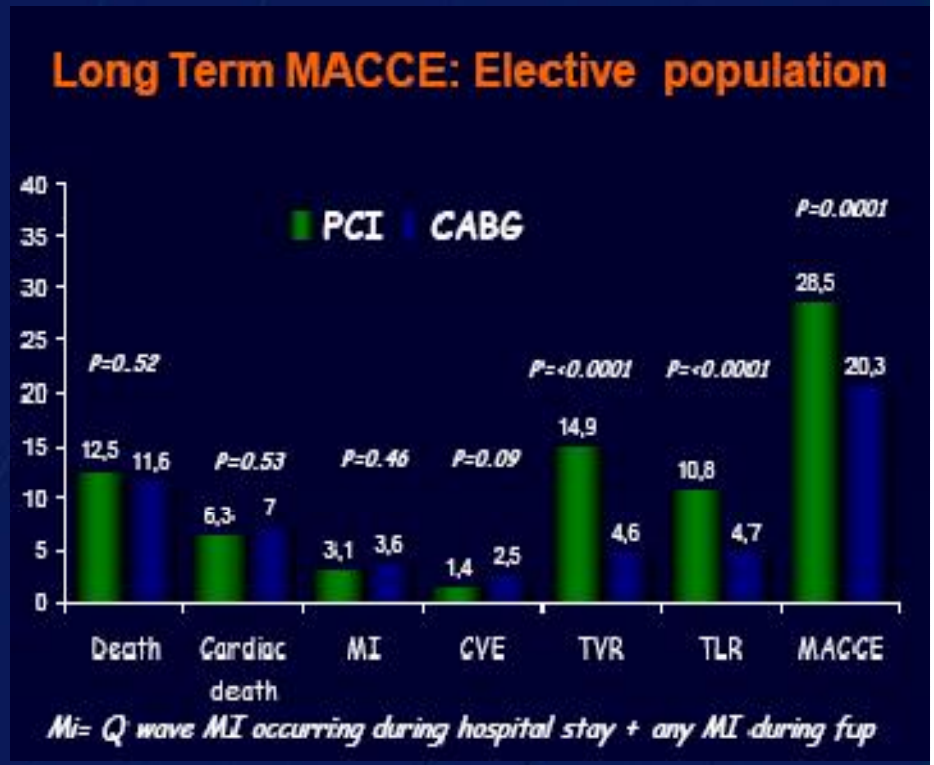
MACCE in the Overall and Elective Population





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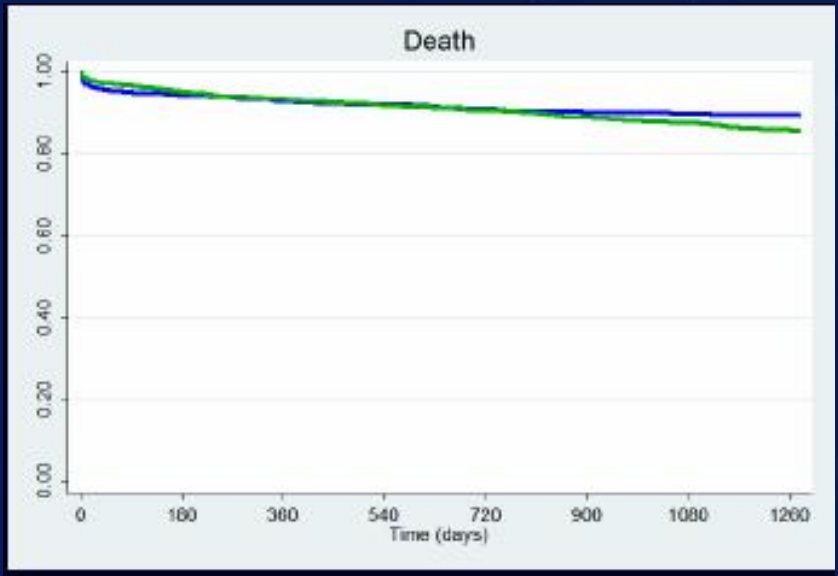
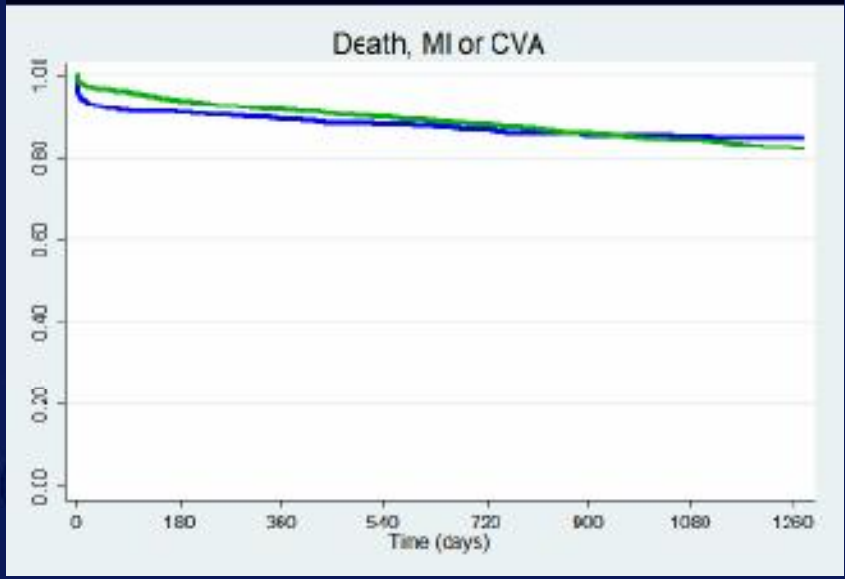
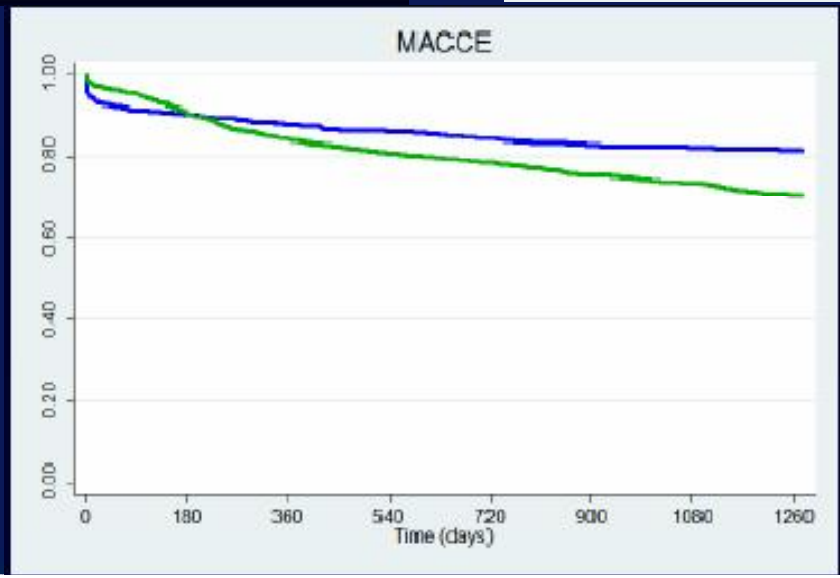
Kaplan Survivals







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Conclusions I

- Encouraging mid-term results were observed in observational multicenter registries evaluating DES in unprotected LMCA lesions.
- Recently 5 year outcome from larger multicenter registries have confirmed the results from preliminary single center registries
- In particular ostial and shaft and simple bifurcation LM have been associated with good outcomes

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Conclusions II

- Distal bifurcation LMCA lesions are still limited by the need to repeated revascularization.
- Careful lesion preparation, second generation DES, optimization stenting techniques and IVUS guided postdilatation could be useful in order to lower these events