PCI for Ostial Coronary Lesions

Ostial Lesion

Limitations of PCI

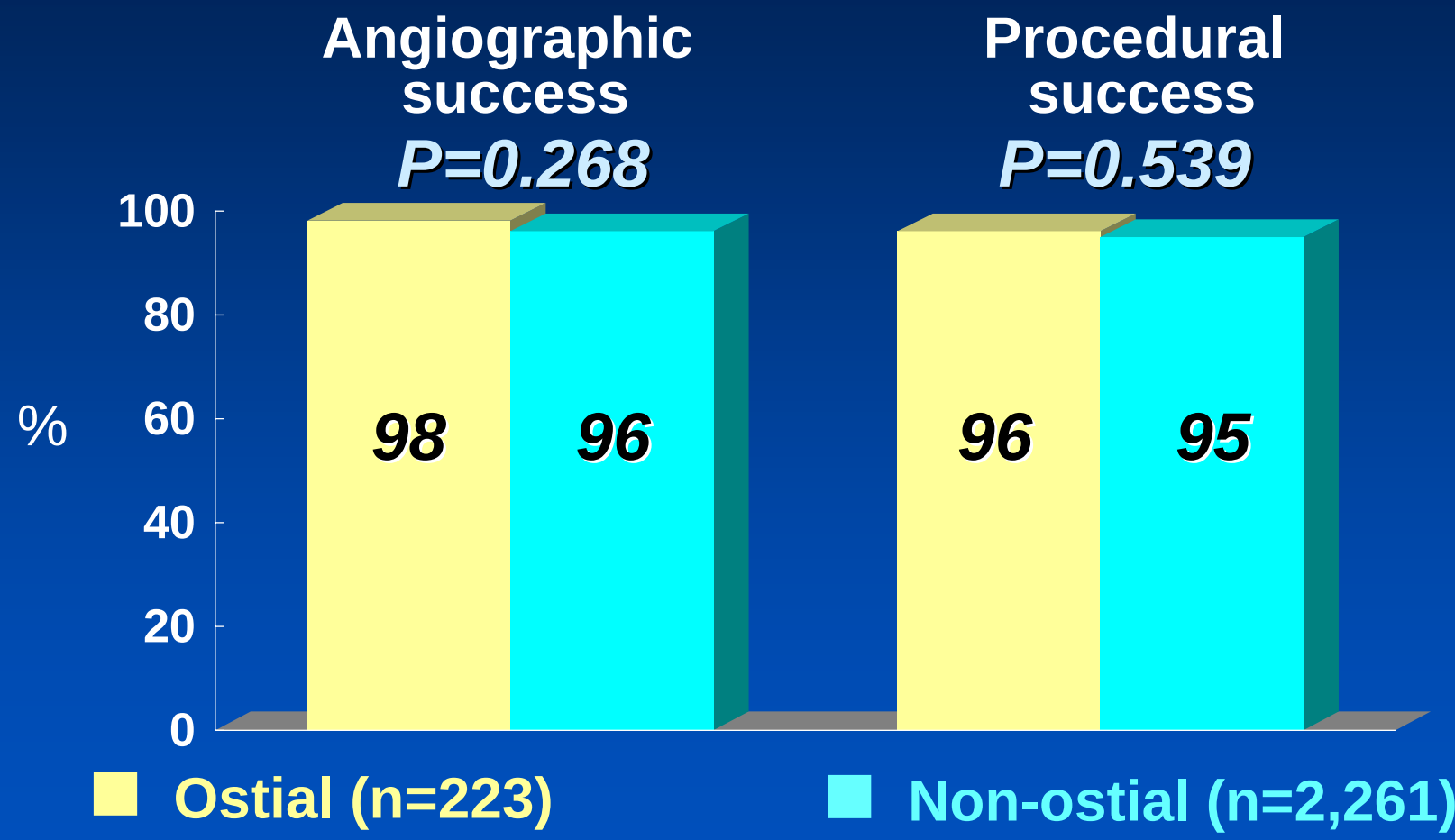
- **Technical challenges**
  - **Rigidity, Elastic recoil**
  - **Dissection, Plaque shifting**
  - **Guiding catheter support**

- **Long term outcomes**
  - **High restenosis rates**

Ostial Stenting
In the Era of Bare Metal Stent

Ostial vs. Non-ostial

BMS Era

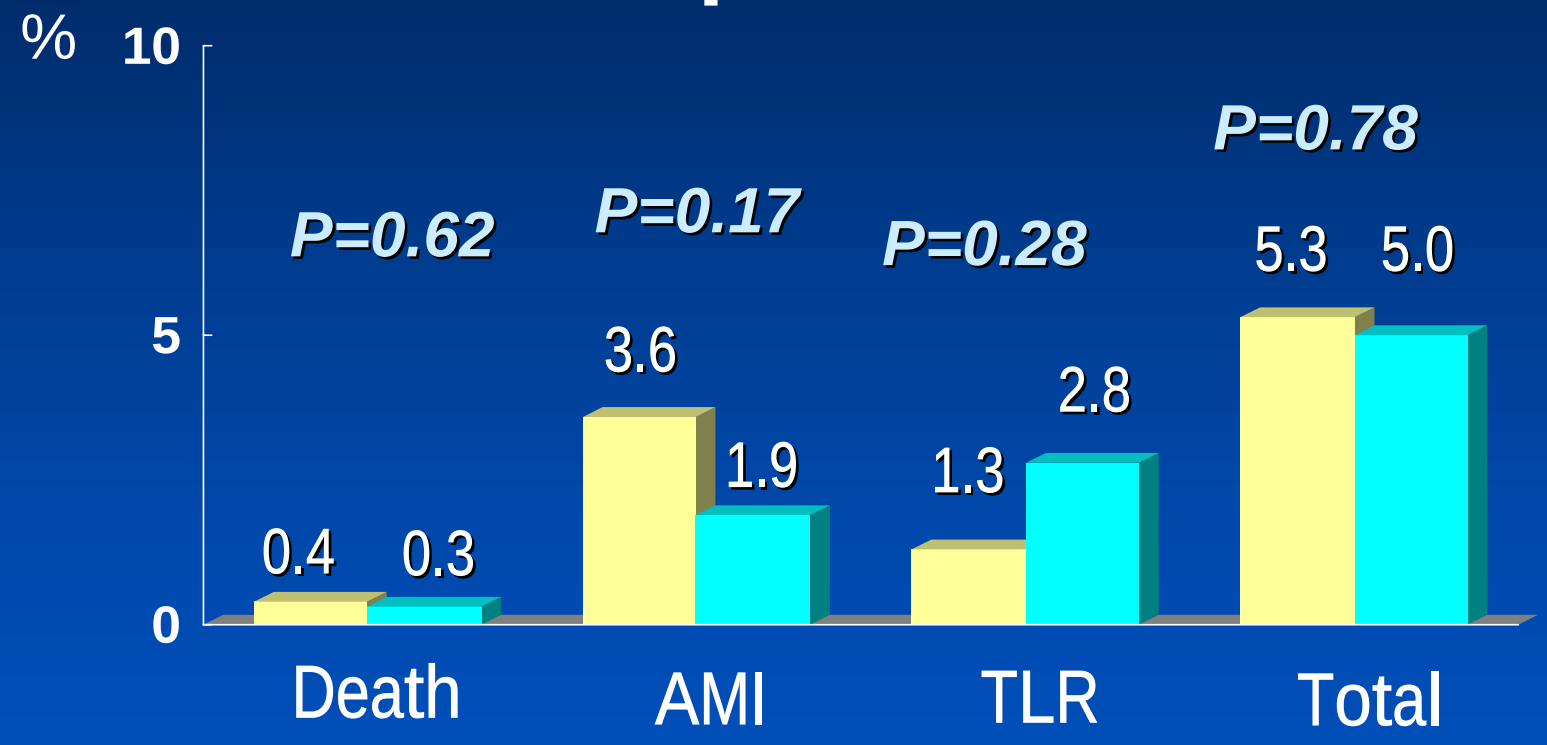


Mavromatis K, et al, Am J Cardiol 2004;94:583

Ostial vs. Non-ostial

BMS Era

In-hospital MACE

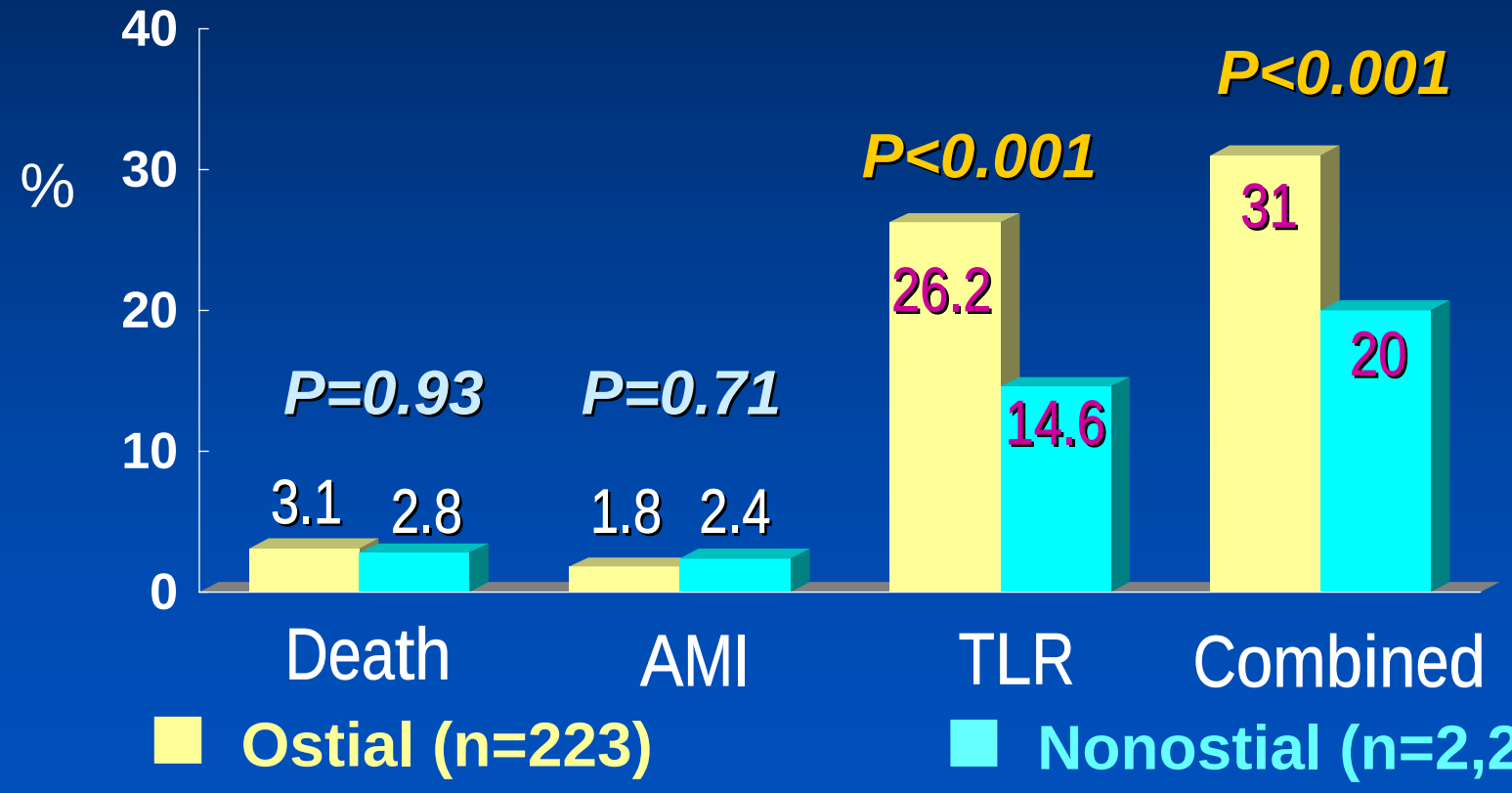


Mavromatis K, et al, Am J Cardiol 2004;94:583

Ostial vs. Non-ostial

BMS Era

One-year MACE



Mavromatis K, et al, Am J Cardiol 2004;94:583

Ostial vs. Non-ostial
BMS Era

In Conclusion

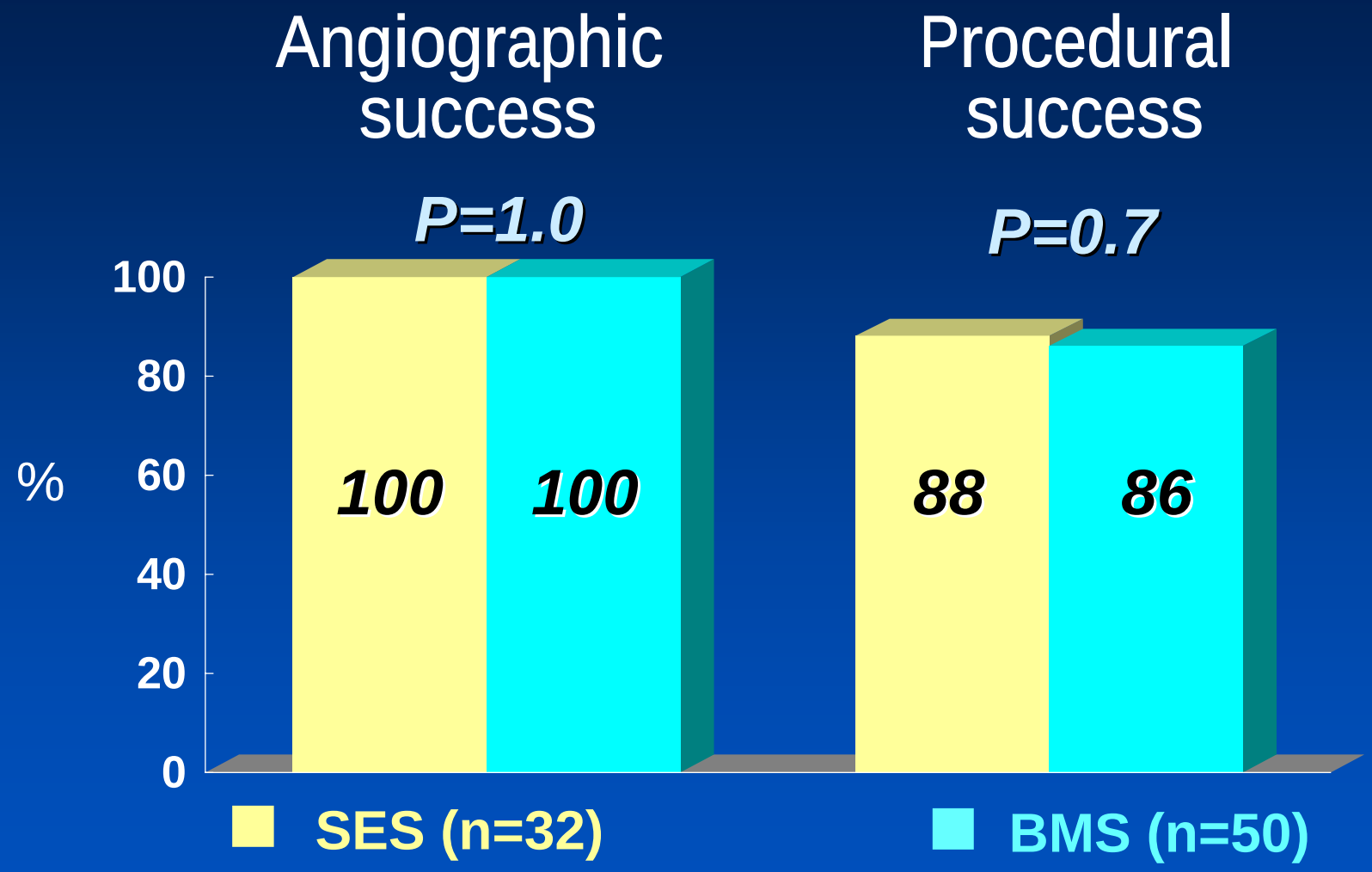
- PCI of ostial lesions appears safe.

- However, one-year MACE of ostial lesions was higher than that of non-ostial lesions in the BMS era.

Mavromatis K, et al, Am J Cardiol 2004;94:583

Ostial Stenting
In the Era of Drug-Eluting Stent

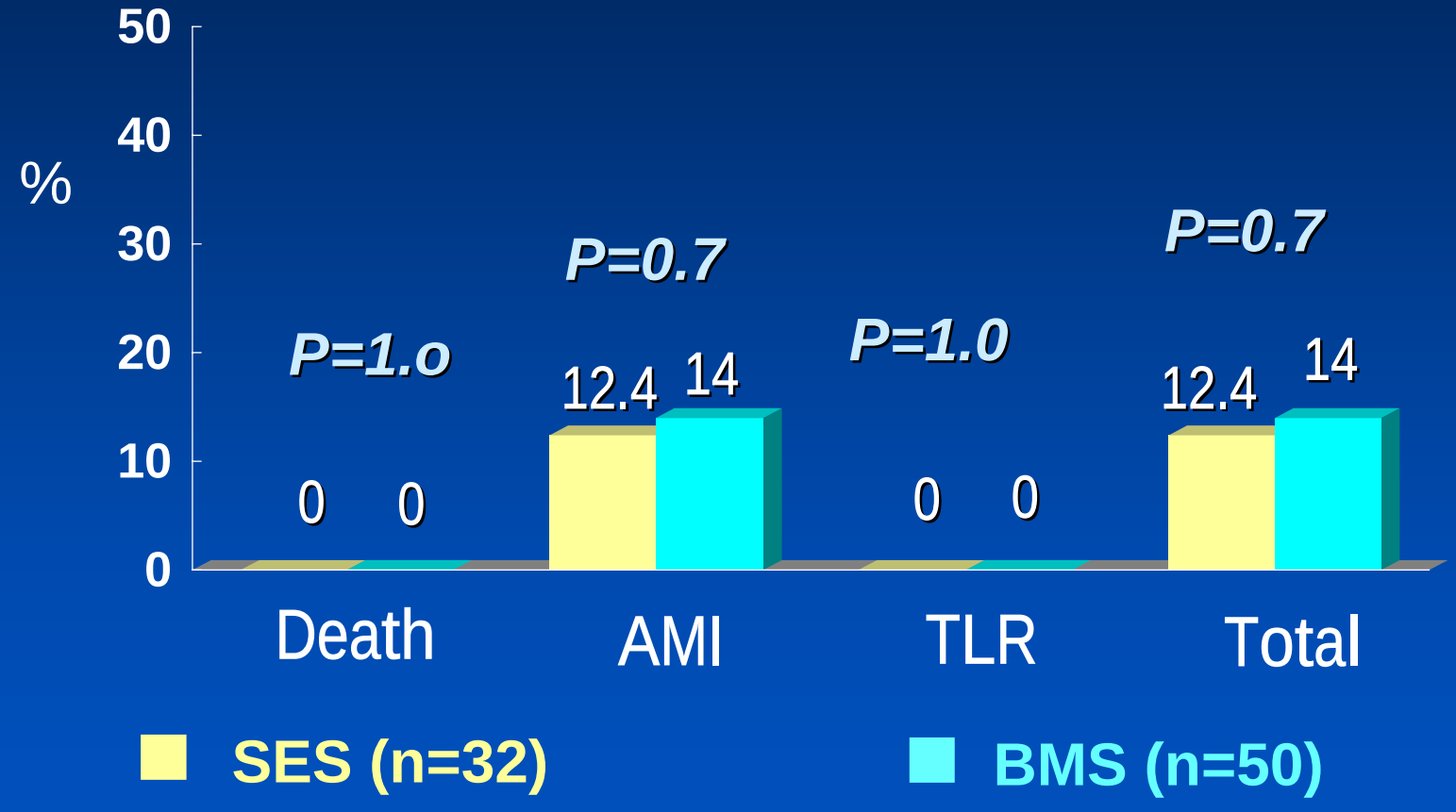
Aorto-ostial lesions in the DES era



Iakovou et al. J Am Coll Cardiol 2004;44:967

Aorto-ostial lesions in the DES era

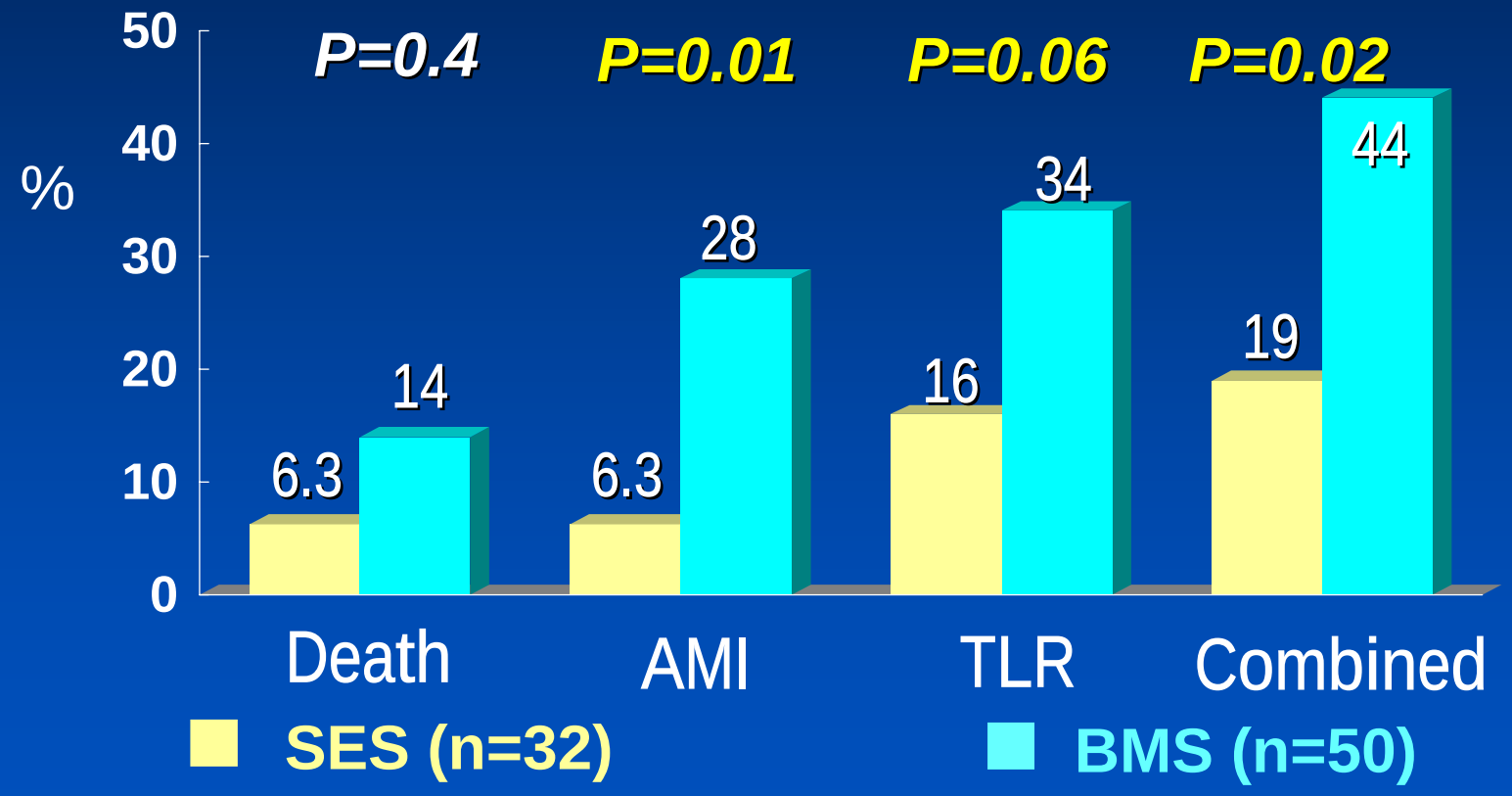
In-hospital MACE



Iakovou et al. J Am Coll Cardiol 2004;44:967

Aorto-ostial lesions in the DES era

10-month MACE



Iakovou et al. J Am Coll Cardiol 2004;44:967

Aorto-ostial lesions in the DES era

QCA at Follow-up

	SES	BMS	P
Reference, mm	3.61±0.43	3.50±0.83	0.6
MLD, mm	3.13±0.59	1.60±1.36	<0.001
DS, %	15±13	55±34	<0.001
Late loss, mm	0.21±0.31	2.06±1.37	<0.001
Restenosis	3 (11)	18 (15)	0.001

Iakovou et al. J Am Coll Cardiol 2004;44:967

Aorto-ostial lesions in the DES era

In Conclusion

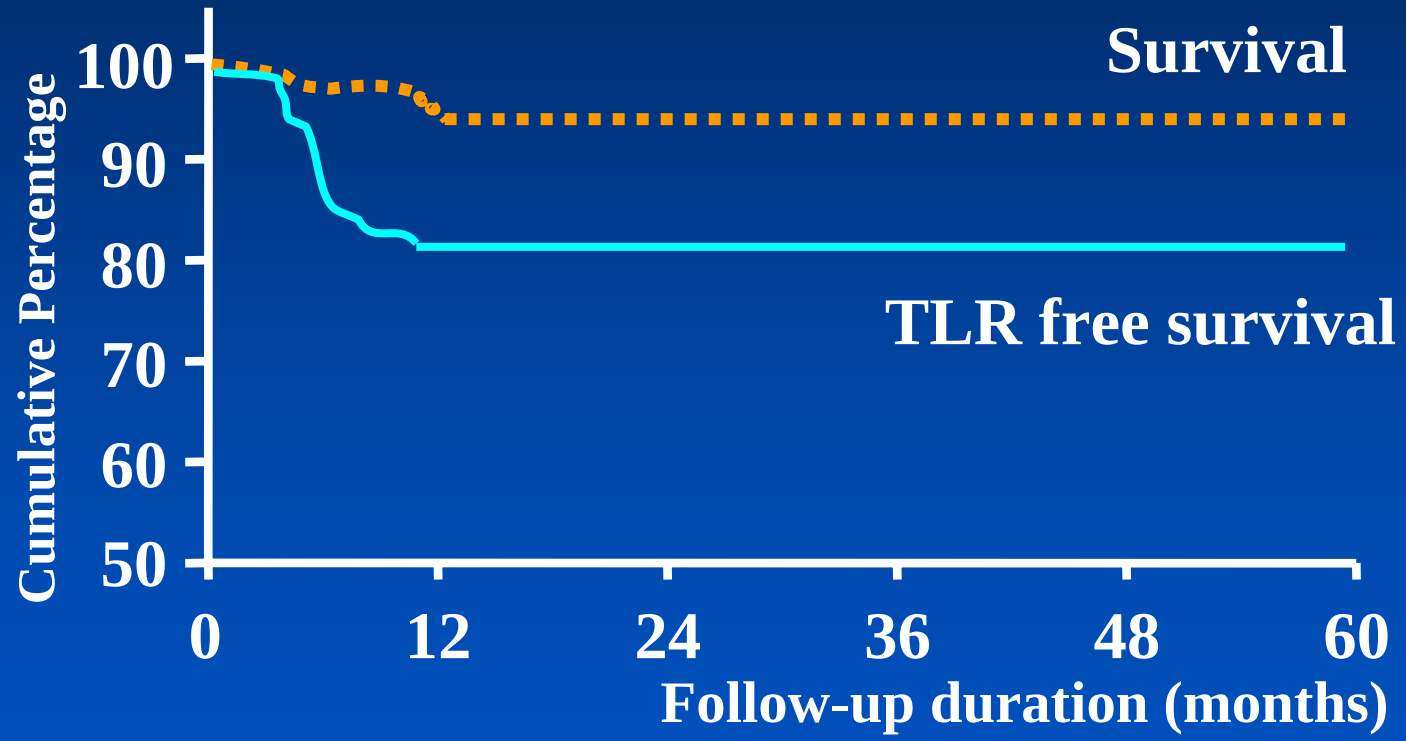
- **In comparison with the BMS, the SES in aorto-ostial lesions appears safe and effective with no increase in-hospital and 10-month MACE.**

Iakovou et al. J Am Coll Cardiol 2004;44:967

Ostial LAD Stenting
In the Era of Bare Metal Stent

Long-term Outcome of BMS

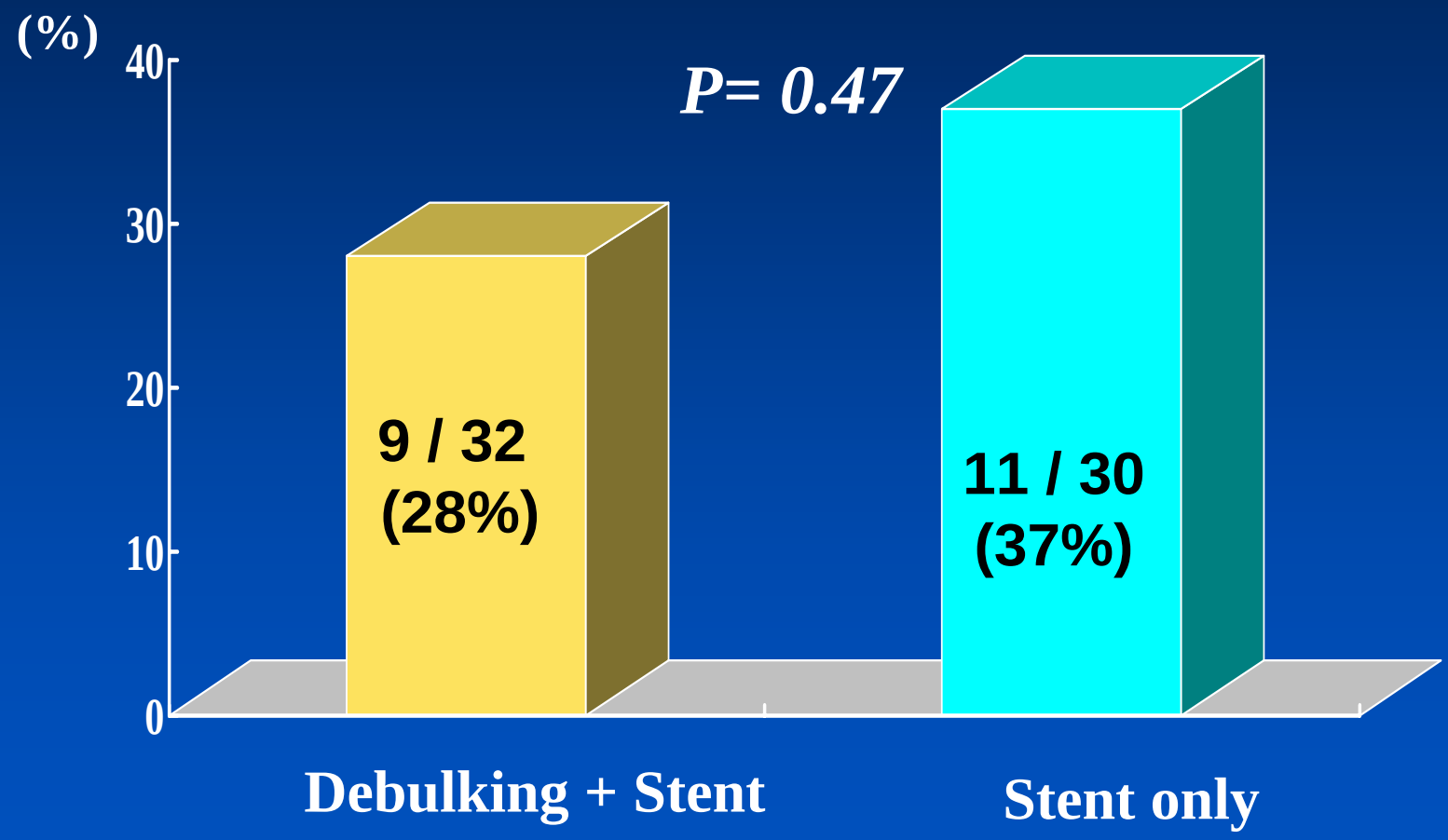
Early Experience of 111 Patients with Ostial LAD Stenosis in AMC



Park SJ, et al, Cathet Cardiovasc Intervent. 49:267-271, 2000

Role of Debulking In BMS Era

Restenosis Rate of the Randomized Study in AMC

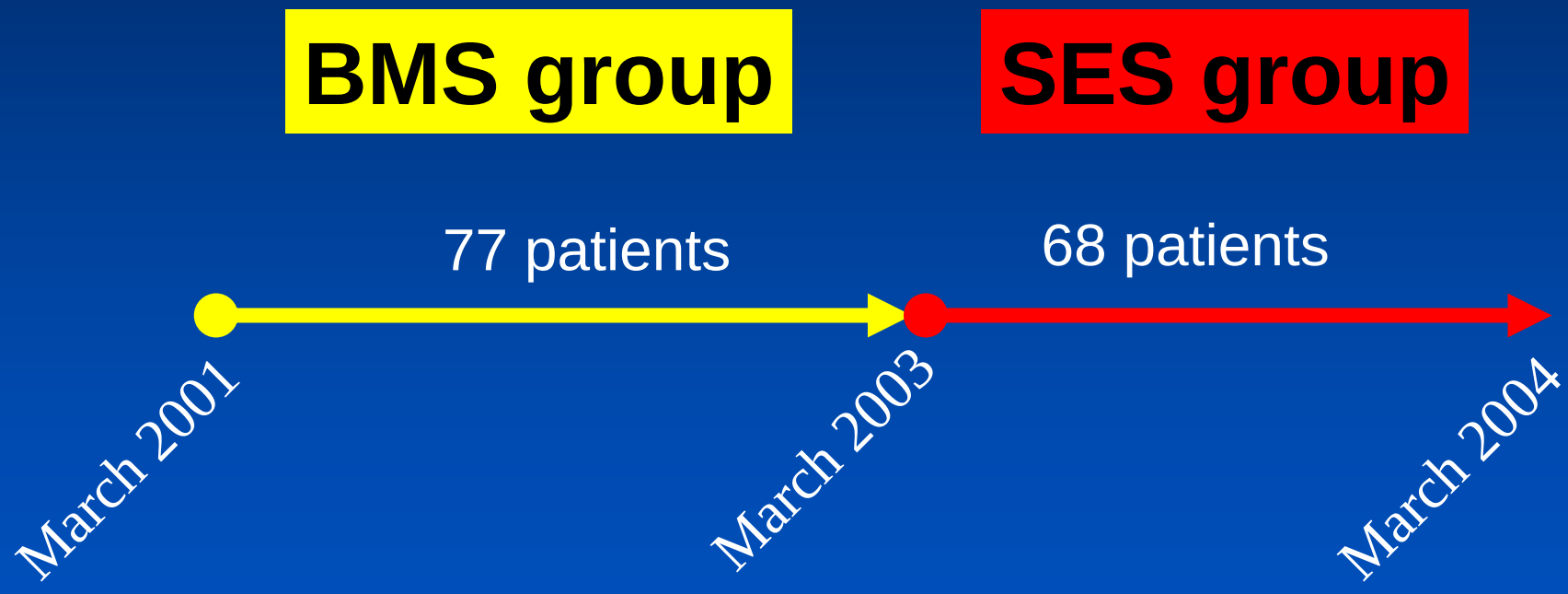


YH Kim et al. Am Heart J 148:663-9, 2004

Ostial LAD Stenting
In the Era of Drug-Eluting Stent

Ostial LAD Stenting in AMC

Matched Comparison with BMS



Seung KB, et al, J Am Coll Cardiol, (in-press)

Procedural Findings

	SES	BMS	P
Patients	68	77	
Multivessel PCI	19 (27.9)	7 (9.1)	0.003
Direct stenting	24 (35.3)	0 (0)	<0.001
Debulking atherectomy	1 (1.5)	38 (49.4)	<0.001
IVUS guidance	61 (89.7)	59 (76.6)	0.037
GP IIb/IIIa inhibitor	1 (1.5)	2 (2.6)	1.000

Seung KB, et al, J Am Coll Cardiol, (in-press)

Procedural Findings

	SES	BMS	P
Patients	68	77	
Stents per lesion	1.4±0.6	1.0±0.2	<0.001
Total stent length, mm	31.2±19.3	16.6±5.2	<0.001
Final balloon size, mm	3.8±0.4	3.9±0.6	0.0037
Inflation pressure, mm	17.6±3.1	14.9±2.6	<0.001
Final kissing balloon	12 (17.6)	4 (5.2)	0.0031

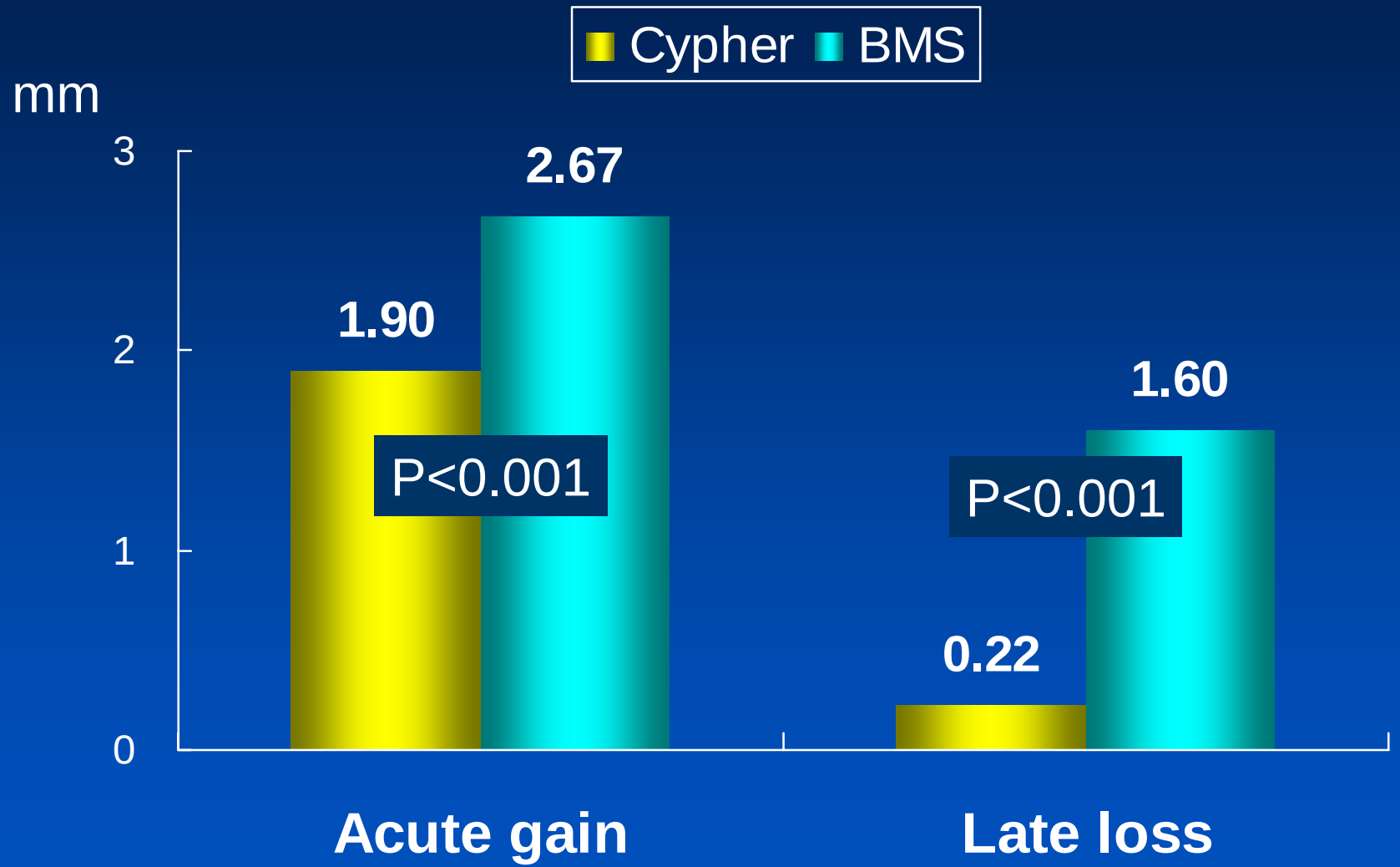
Seung KB, et al, J Am Coll Cardiol, (in-press)

In-Hospital Outcomes

	SES	BMS	P
Patients	68	77	
Procedural success	68 (100)	77 (100)	1.0
Death	0	0	1.0
MI	5 (7.4)	4 (5.2)	0.591
Q MI	0	0	
Non-Q MI	5 (7.4)	4 (5.2)	
Stent jail(≥ 50%)	1 (1.5%)	7 (9.1%)	0.067
Stent thrombosis	0	0	1.0
TLR	0	0	1.0

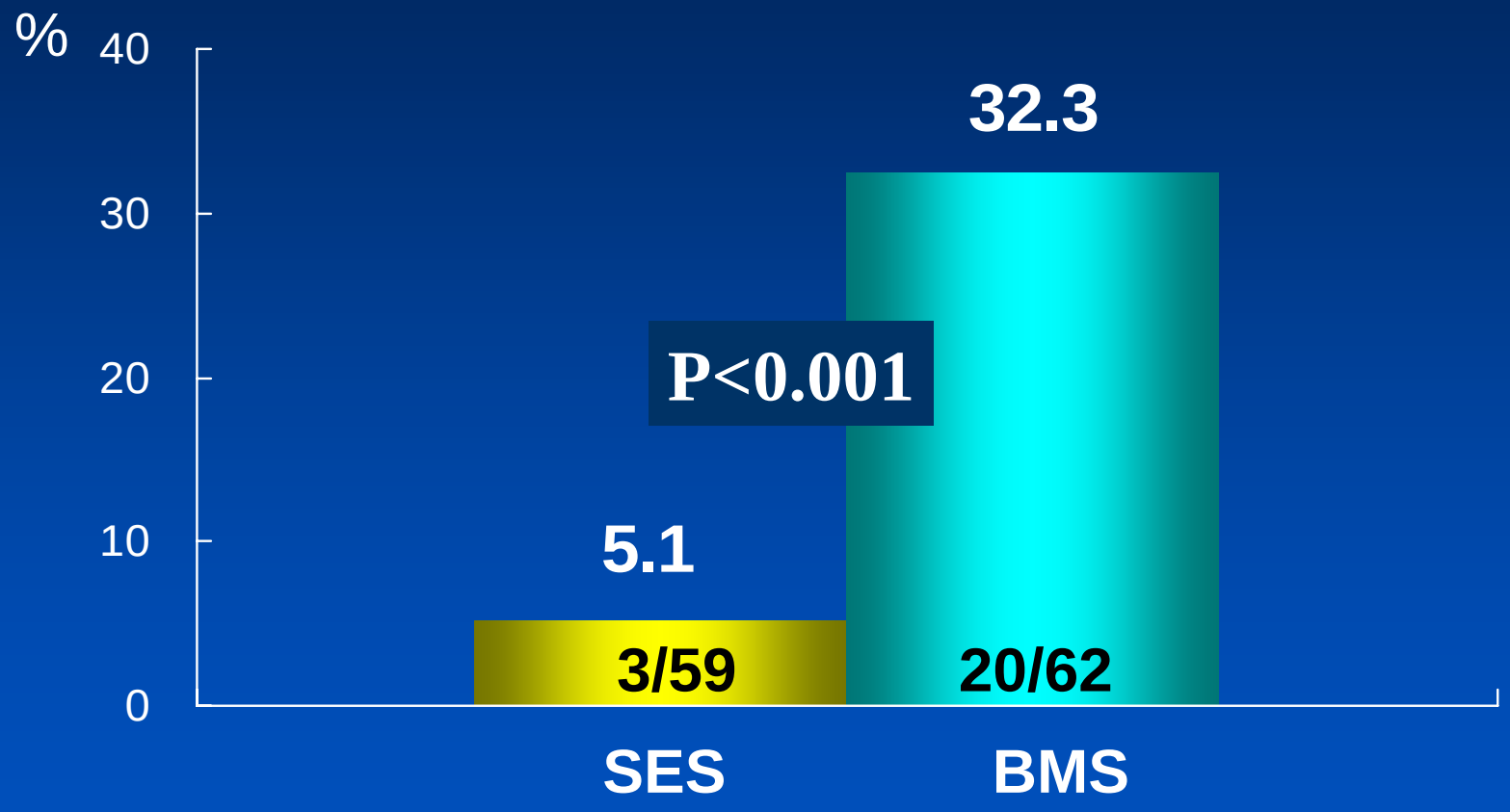
Seung KB, et al, J Am Coll Cardiol, (in-press)

Acute Gain & Late Loss



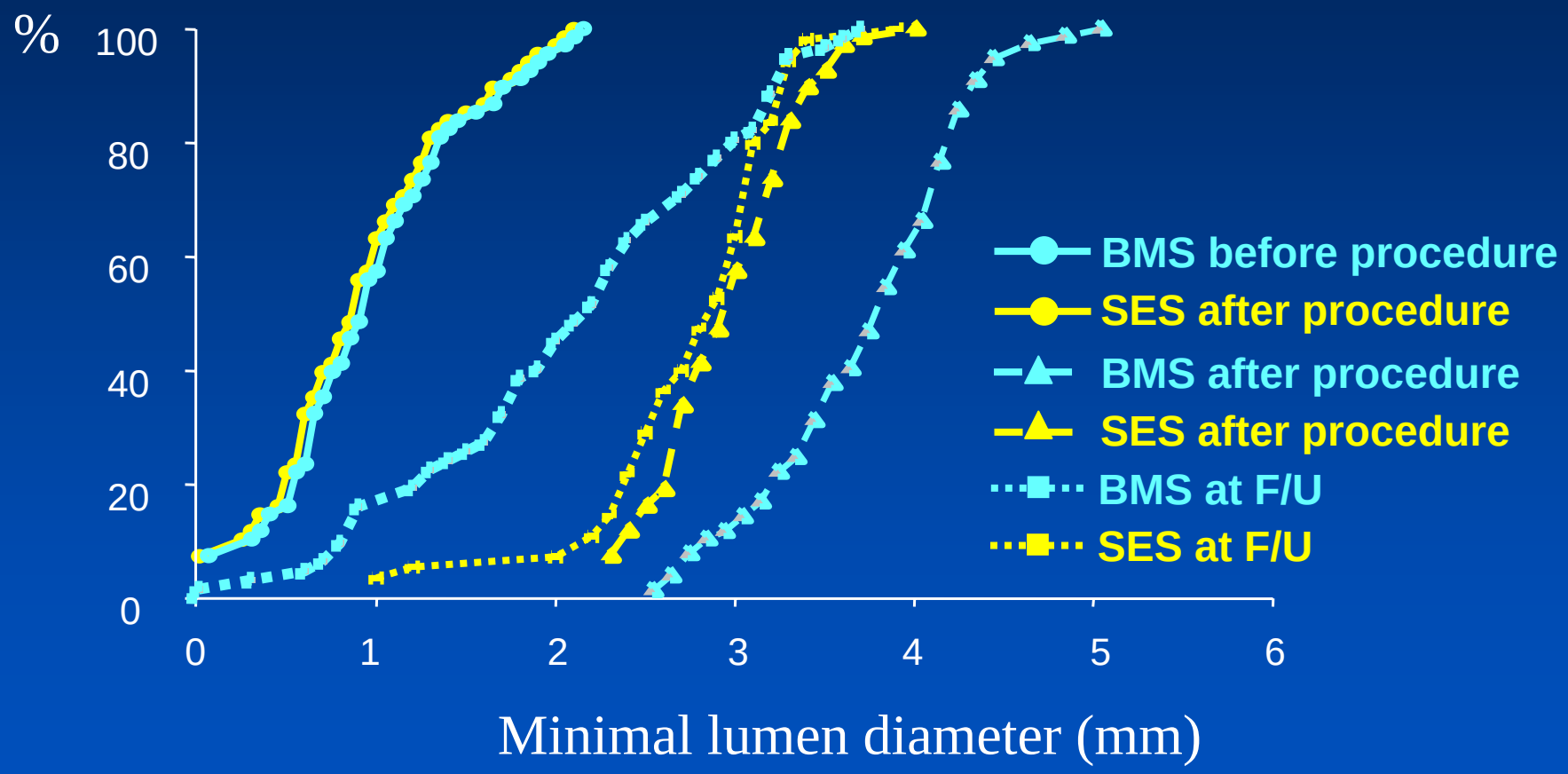
Seung KB, et al, J Am Coll Cardiol, (in-press)

Restenosis Rate at 6 Months



Seung KB, et al, J Am Coll Cardiol, (in-press)

Cumulative Incidence of MLD



Seung KB, et al, J Am Coll Cardiol, (in-press)

Clinical Outcomes at 9 Months

	SES	BMS	P
Patients	68	77	
Death	0	0	1.0
MI			1.0
Q MI	0	0	
Non-Q MI	0	0	
Stent thrombosis	0	0	1.0
TLR	0	13 (16.9%)	<0.001
MACE	0	13 (16.9%)	<0.001

Seung KB, et al, J Am Coll Cardiol, (in-press)

Two Stenting Strategy with SES
According to Lesion Characteristics

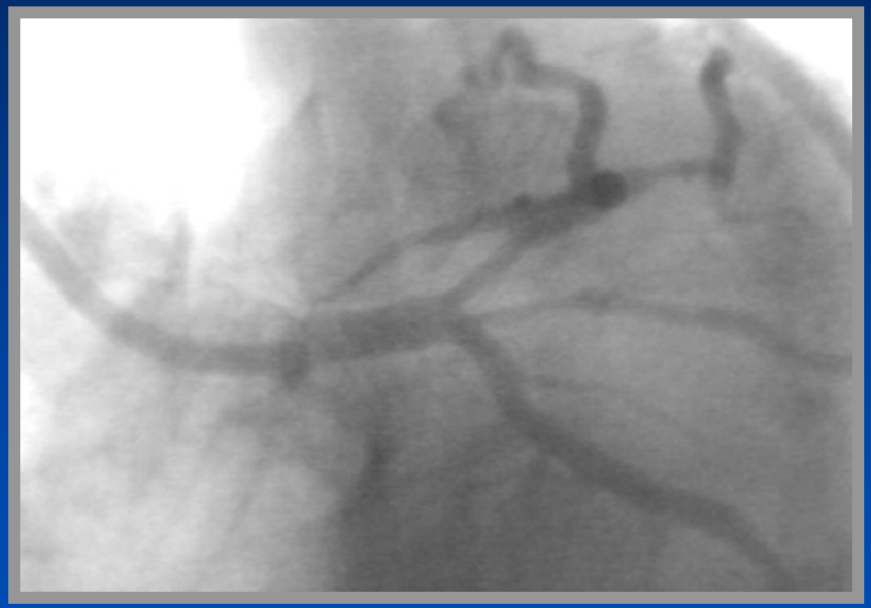
1. Precise Location at Ostial LAD

2. Stenting Covering the Distal LMCA

Seung KB, et al, J Am Coll Cardiol, (in-press)

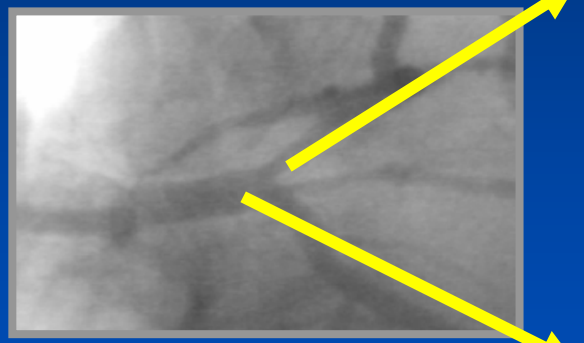
Precise Location

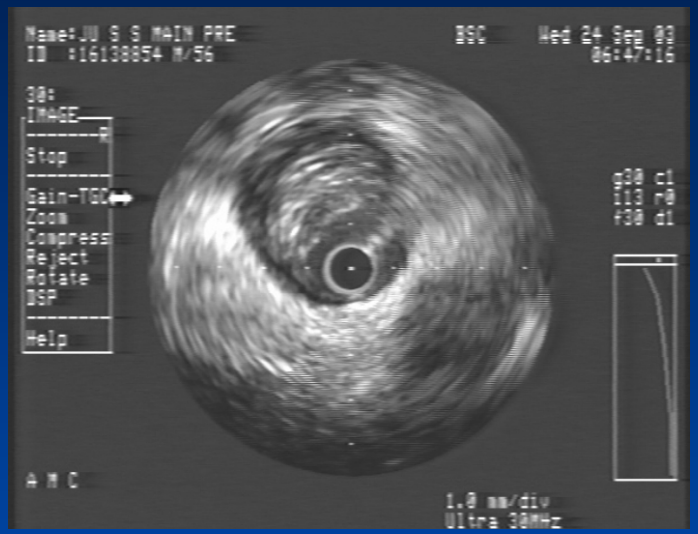
Ostial LAD Lesion

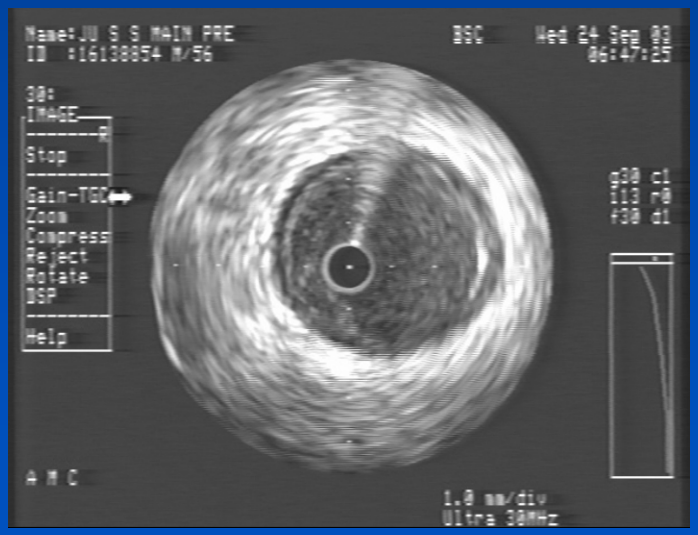


Seung KB, et al, J Am Coll Cardiol, (in-press)

Precise Location
IVUS Evaluation







Ostial LAD

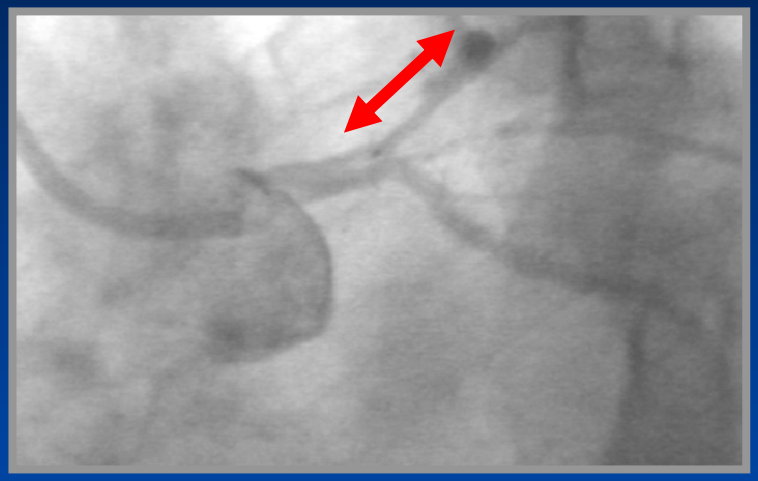
- Lumen CSA:2.86 mm^2
- EEM CSA:14.38 mm^2
- Plaque burden:80%

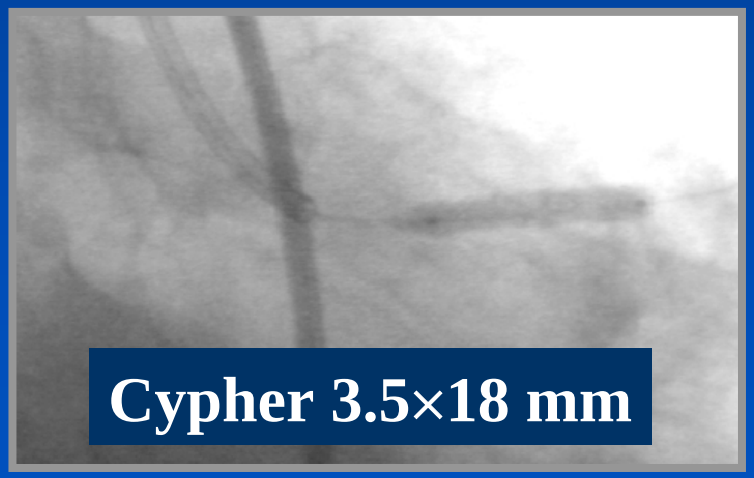
Distal LMCA

- Lumen CSA: 16.28mm^2
- EEM CSA: 17.89mm^2
- Plaque burden:10%

Precise Location

Stenting and Final Result





Seung KB, et al, J Am Coll Cardiol, (in-press)

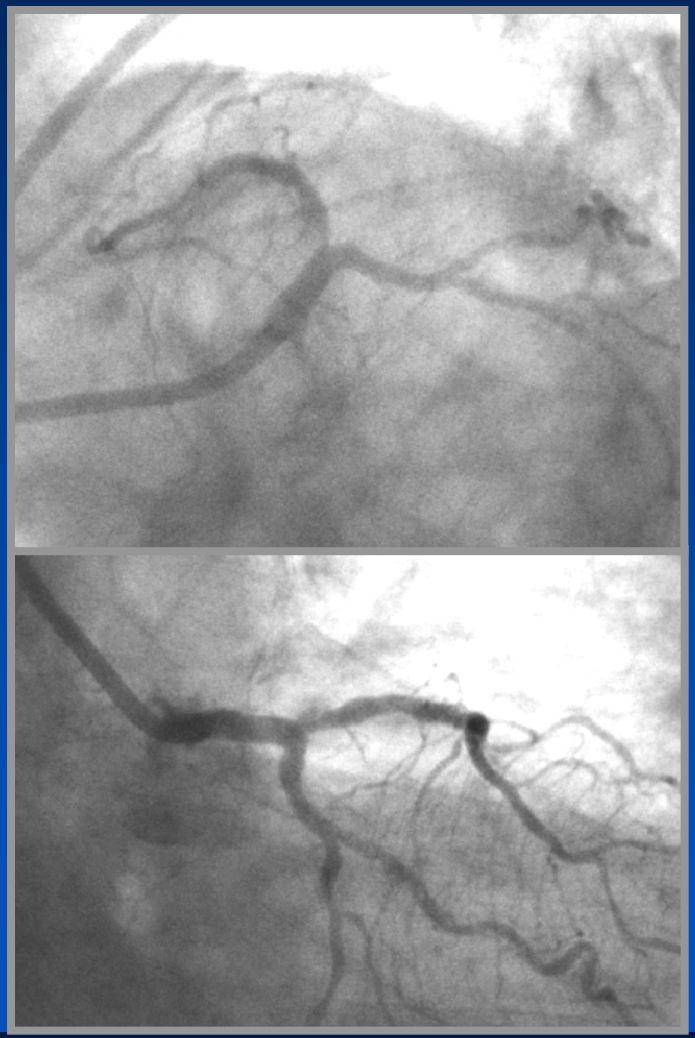
Stenting Covering the Distal LMCA

- **SES patients with significant mild narrowing at the LMCA bifurcation**
- **Definition of intermediate narrowing of the LMCA bifurcation by visual estimation**
  - **Diameter stenosis ≥ 30% on QCA**
  - **Plaque burden ≥ 40% on IVUS**

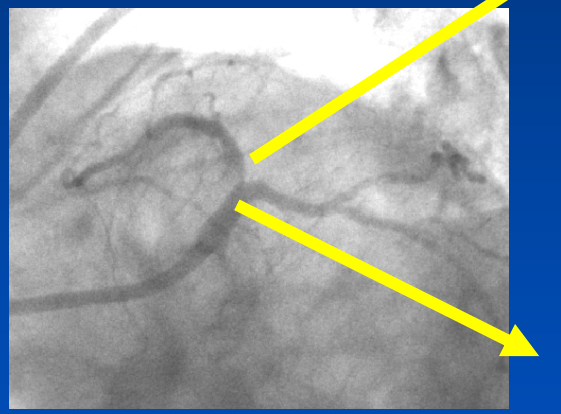
Seung KB, et al, J Am Coll Cardiol, (in-press)

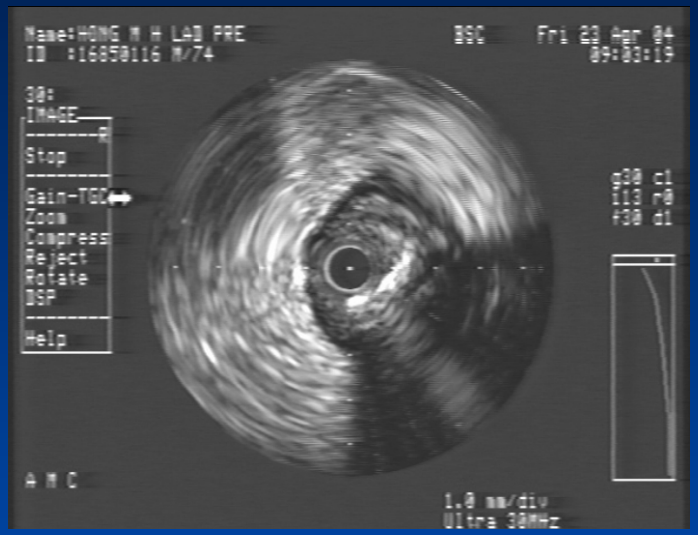
Stenting Covering the Distal LMCA

Ostial LAD Lesion

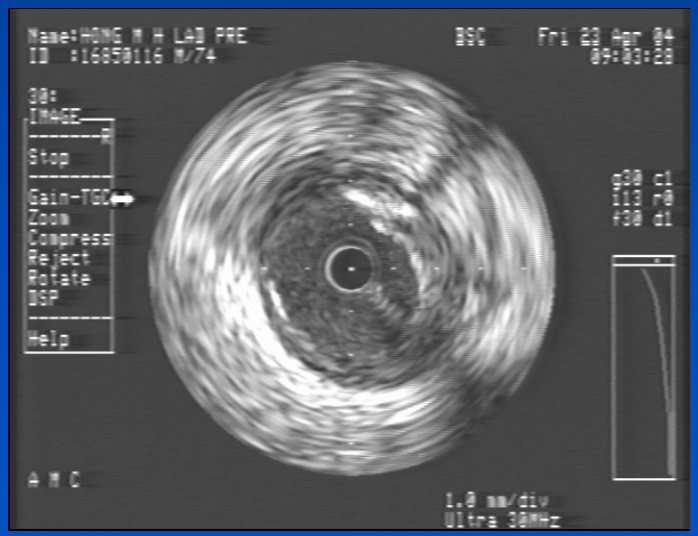


Precise Location
IVUS Evaluation





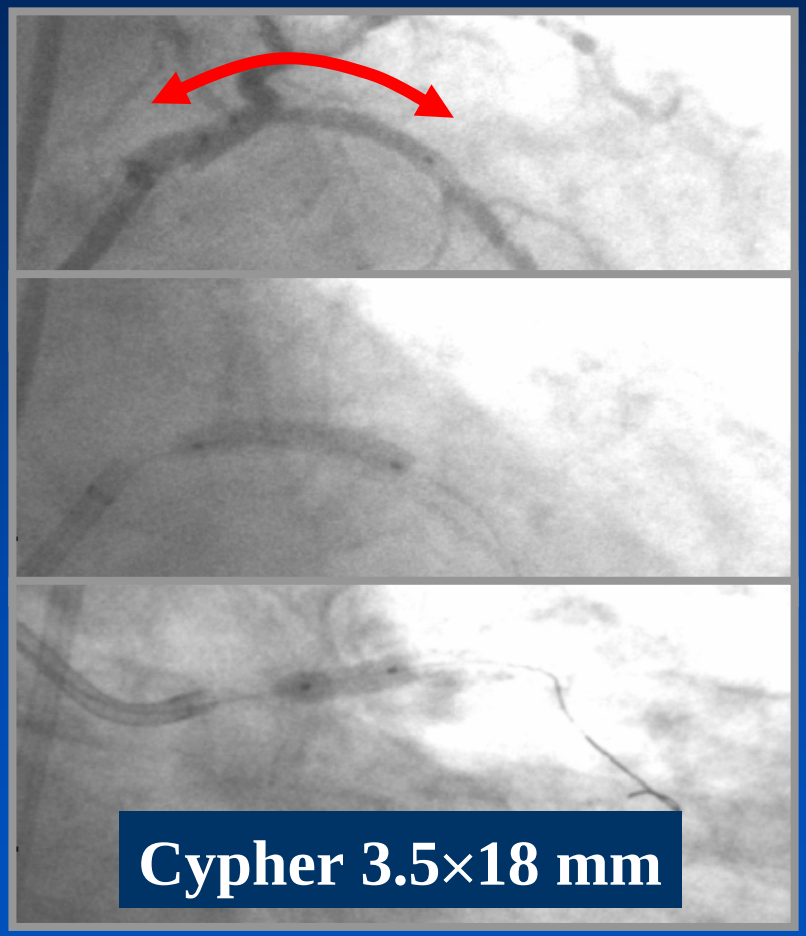
Ostial LAD
- Lumen CSA: 2.23mm^2
- EEM CSA: 14.35mm^2
- Plaque burden: 85%



Distal LMCA
- Lumen CSA: 8.27mm^2
- EEM CSA: 17.17mm^2
- Plaque burden: 52%

Stenting Covering the Distal LMCA

Stenting and Final Result



Seung KB, et al, J Am Coll Cardiol, (in-press)

QCA in Distal LMCA

	LM cover	Precise	P
Patients	23	45	
Reference diameter, mm	3.78±0.66	4.00±0.54	0.157
MLD, mm	2.38±1.01	3.67±0.62	<0.001
Diameter stenosis, %	33.8±25.8	7.7±13.7	<0.001

Seung KB, et al, J Am Coll Cardiol, (in-press)

QCA in Ostial LAD

	LM cover	Precise	P
Lesion length, mm	21.7±12.9	26.1±18.8	0.321
Reference diameter, mm	2.87±0.48	2.85±0.53	0.873
MLD, mm			
Baseline	1.00±0.54	0.88±0.52	0.400
Final	2.97±0.35	2.97±0.42	0.936
Follow-up	2.88±0.32	2.71±0.65	0.270
Diameter stenosis, %			
Baseline	64.8±19.4	65.4±13.4	0.902
Final	-5.6±10.94	-7.6±12.6	0.513
Follow-up	-6.2±11.89	0.3±21.9	0.224

Seung KB, et al, J Am Coll Cardiol, (in-press)

QCA Results: LCX Ostium

	SES	BMS	P
Reference diameter, mm	2.63±0.63	3.09±0.59	0.004
MLD, mm			
Baseline	2.17±0.59	2.78±0.66	<0.001
Final	2.08±0.69	2.73±0.58	0.936
Follow-up	1.99±069	2.63±0.57	0.254
Diameter stenosis, %			
Baseline	16.4±18.7	10.0±14.3	0.120
Final	21.7±22.8	13.5±15.0	0.513
Follow-up	24.1±21.8	13.3±14.4	0.320

Seung KB, et al, J Am Coll Cardiol, (in-press)

IVUS in Distal LMCA

	LM cover	Precise	P
Patients	20	41	
Before procedure			
EEM CSA, mm^2	19.64±6.33	20.57±5.38	0.574
Lumen CSA, mm^2	9.86±2.83	12.39±3.71	0.014
Plaque burden, %	48.01±11.47	39.75±8.22	0.004

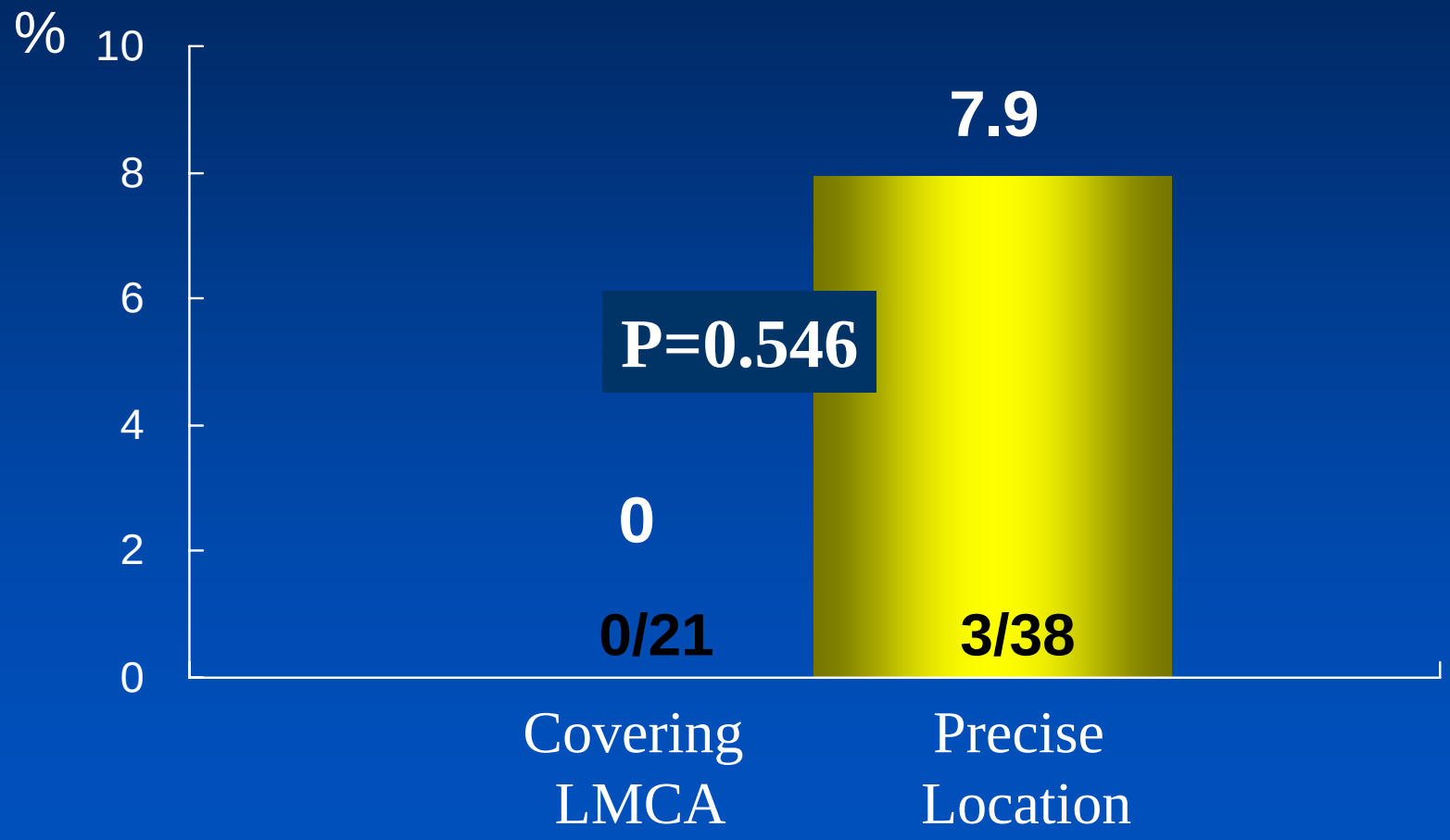
Seung KB, et al, J Am Coll Cardiol, (in-press)

IVUS in Ostial LAD

	LM cover	Precise	P
Patients	20	41	
Before procedure			
EEM CSA, mm^2	13.68±4.34	14.03±3.85	0.770
Lumen CSA, mm^2	2.26±0.50	2.39±0.76	0.532
Plaque burden, %	82.28±5.06	82.30±5.06	0.993
After procedure			
EEM CSA, mm^2	15.41±3.11	16.11±3.03	0.420
Lumen CSA, mm^2	7.35±1.69	7.42±1.25	0.866
Plaque burden, %	52.16±6.37	53.44±5.84	0.451

Seung KB, et al, J Am Coll Cardiol, (in-press)

Restenosis Rate at 6 Months



Seung KB, et al, J Am Coll Cardiol, (in-press)

Conclusions

- The SES implantation appears effective in reducing restenosis and target lesion revascularization for ostial LAD lesions, compared to BMS implantation.

- SES implantation covering the LMCA in cases with intermediate distal LCMA narrowing achieve complete lesion coverage and lead to favorable clinical outcomes.