

How to Optimize LM Bifurcation PCI?

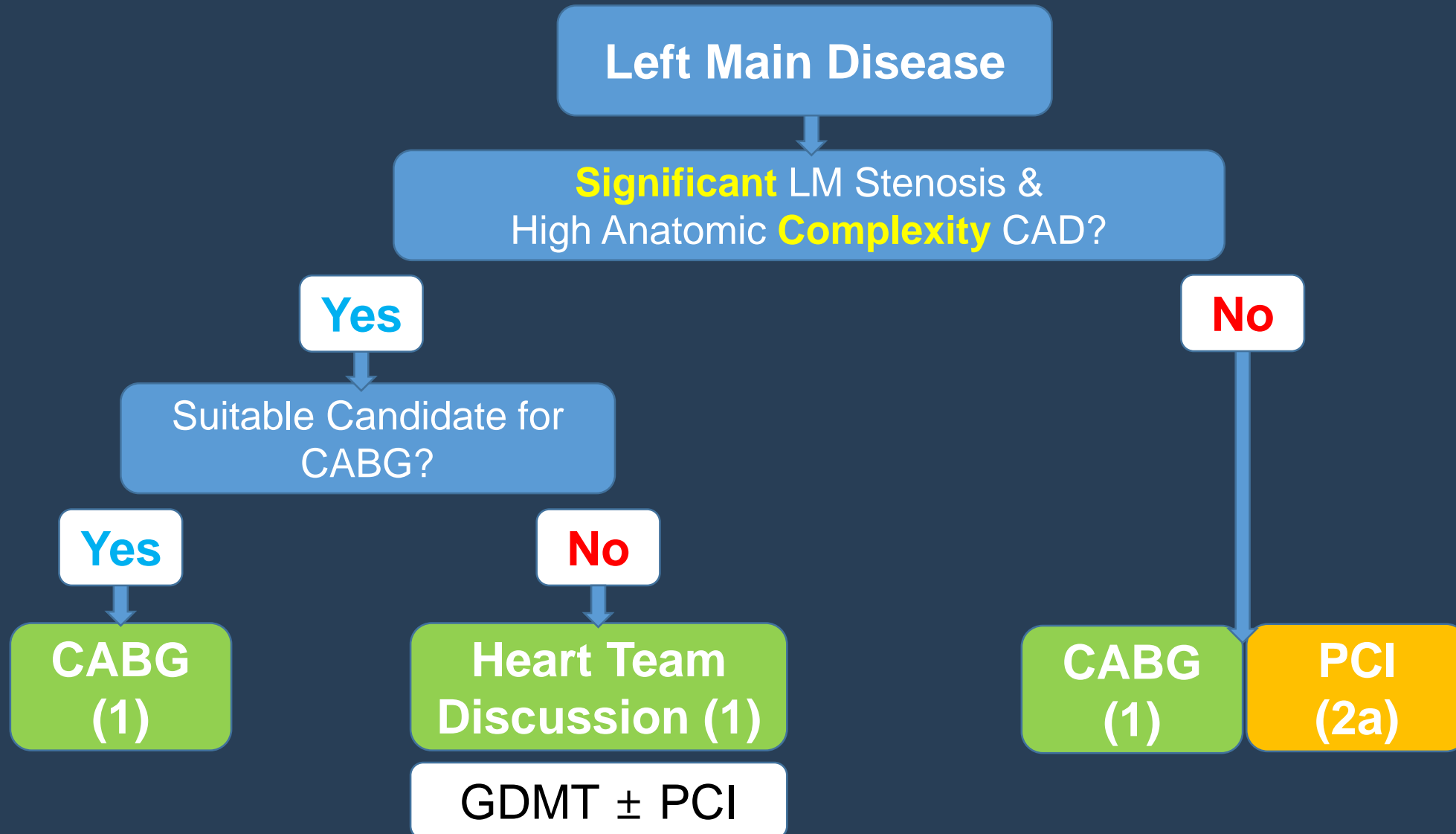
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Disclosure

- I, Do-Yoon Kang, have nothing to disclose.

2021 AHA/ACC/SCAI Coronary Revascularization Guideline



2021 AHA/ACC/SCAI Guideline for LM CAD

- In patients with SIHD and significant left main stenosis, CABG is recommended to improve survival
- In selected patients with SIHD and significant left main stenosis for whom PCI can provide equivalent revascularization to that possible with CABG, PCI is reasonable to improve survival

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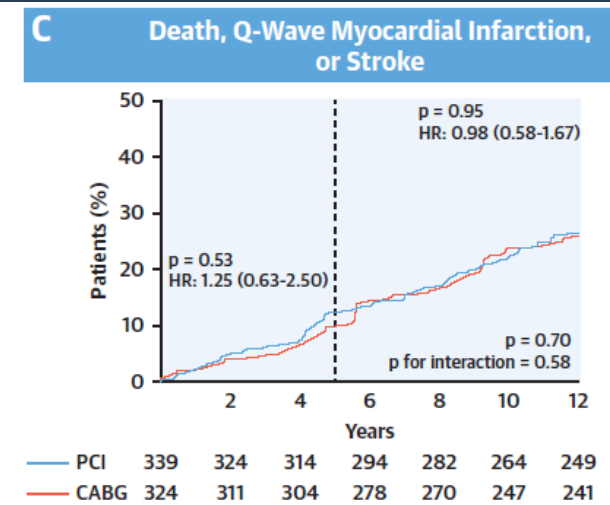
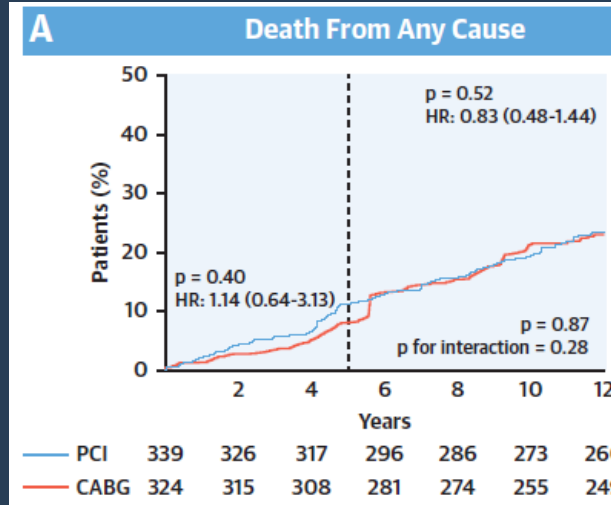
**How Can We Provide
Equivalent Revascularization with CABG
in LM PCI ?**

We Have to **Achieve the Best Results** for LM PCI !

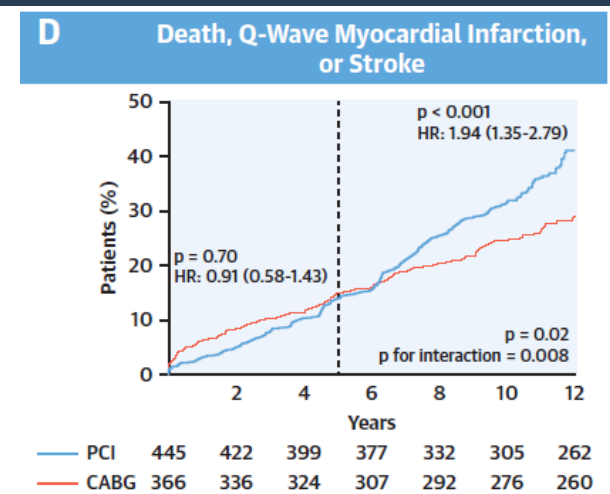
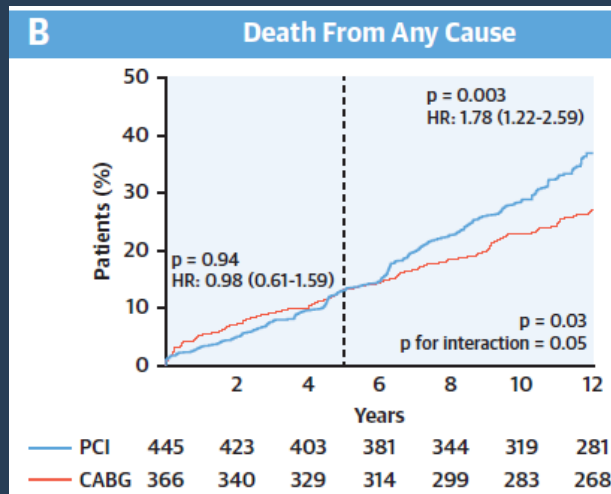
PCI Optimization is Really Important in the LM Bifurcation

MAIN-COMPARE: CABG was better than PCI beyond 5 years in distal LMCA diseases

Ostial / Shaft Disease



Distal Bifurcation Disease



How to Optimize LM Bifurcation PCI?

- Selection of PCI Favorable Patients & Lesions
- FFR / iFR - Selection of Functionally Significant Lesion
- IVUS - Guided Stent Optimization
- Optimal Medical Therapy

Why Do We Need IVUS for LM Bifurcation PCI?

- **Planning the PCI**

- Stent Strategy (1-stent vs. 2-stent) by Accurate SB Evaluation
- Reference Vessel Size Measurement
- Select Bigger Stent & Balloons Under Vessel Size

- **Finalizing the PCI**

- Evaluate Stent Expansion, Strut Apposition, Edge Problems

Imaging-Guided Complex PCI, What Is Different?

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Imaging Guided PSP

Under the Intracoronary Imaging Guidance

Inspection of lesion characteristic by IVUS

Calcification
Plaque burden and configuration
Opening of side branch

Selection of stent size and length by IVUS

Stent landing zone configuration
Lesion length
Reference vessel size

Surveillance of stent outcomes

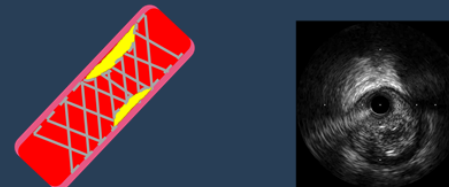
Stent apposition
Stent area
Procedural complications

P Pre-dilation



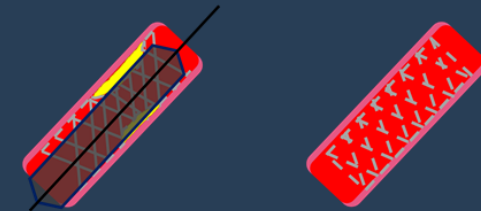
Lesion pre-modification for stent delivery and expansion:
High pressure balloon
Cutting or scoring balloon
Rota-ablation

S Stent Sizing



Full lesion coverage
Adequate stent size

P Post-dilation



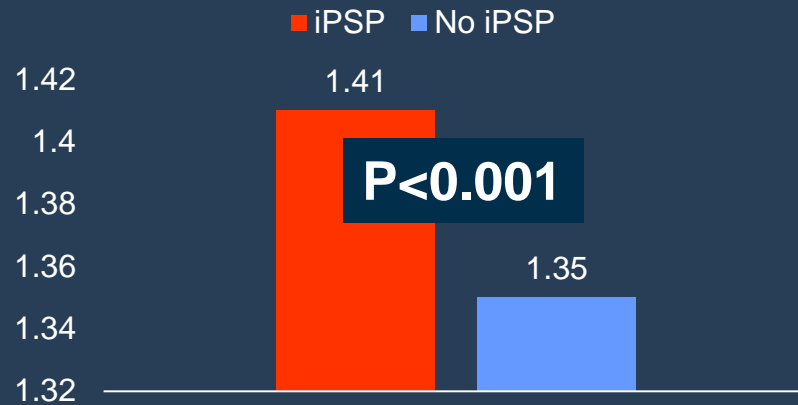
Complete stent apposition
Sufficient stent area
No geographic miss
No procedural complications

Imaging-Guided Complex PCI, What Is Different?

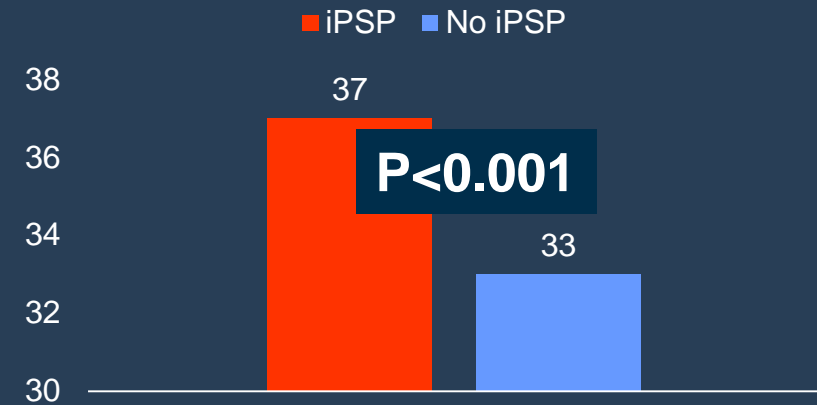
- From IRIS-DES Registry (NCT01186133) Between 2008 and 2017.
- A total 9525 patients with single complex coronary lesions were enrolled in this analysis.
- Complex coronary lesions were included
 1. **LMCA**
 2. Bifurcation
 3. Diffuse lesion (>30mm)
 4. Severely calcified lesion
 5. In-stent restenosis
- Primary outcome : composite of cardiac death, target vessel MI and TVR

Imaging-Guided Complex PCI, What Is Different?

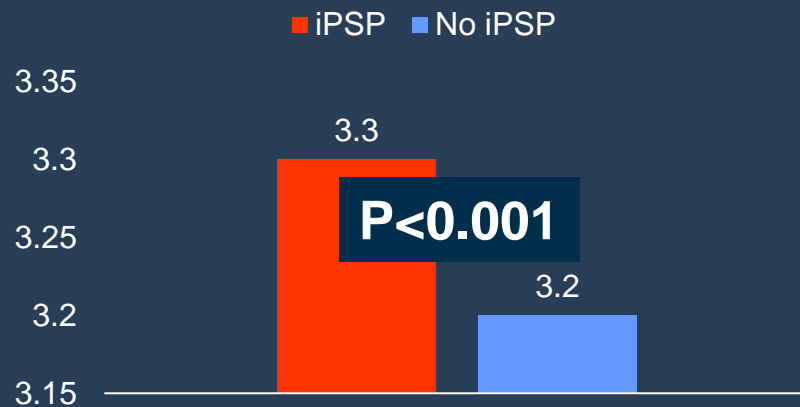
Stent Number



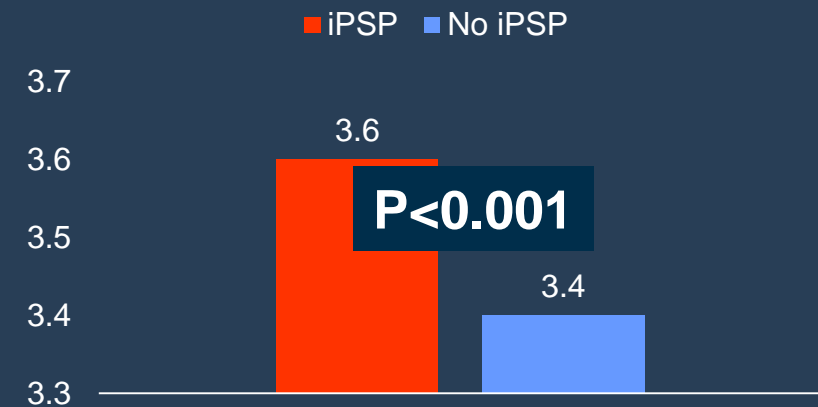
Stent Length (mm)



Stent Diameter (mm)



Final Balloon Size (mm)



Imaging-Guided Complex PCI, What Is Different?



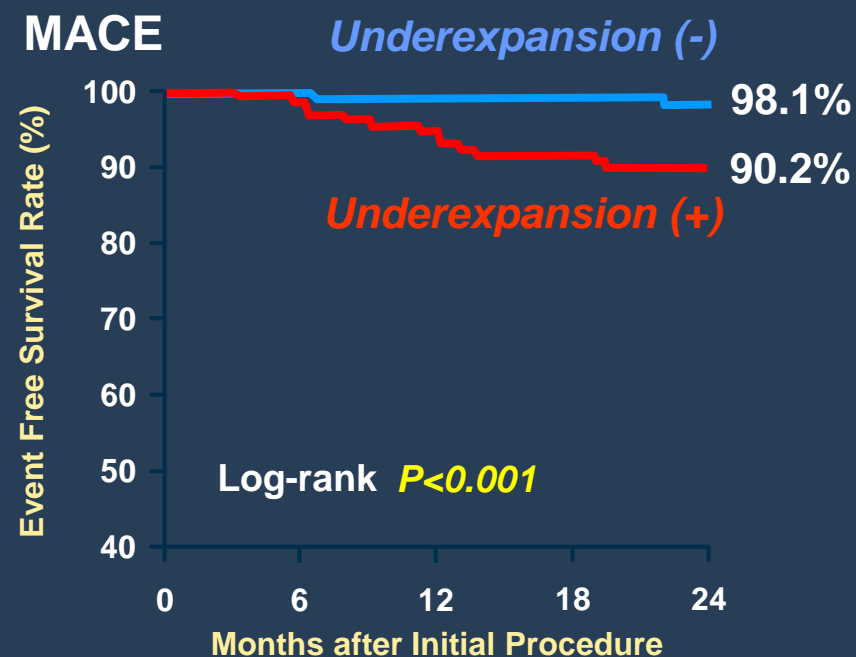
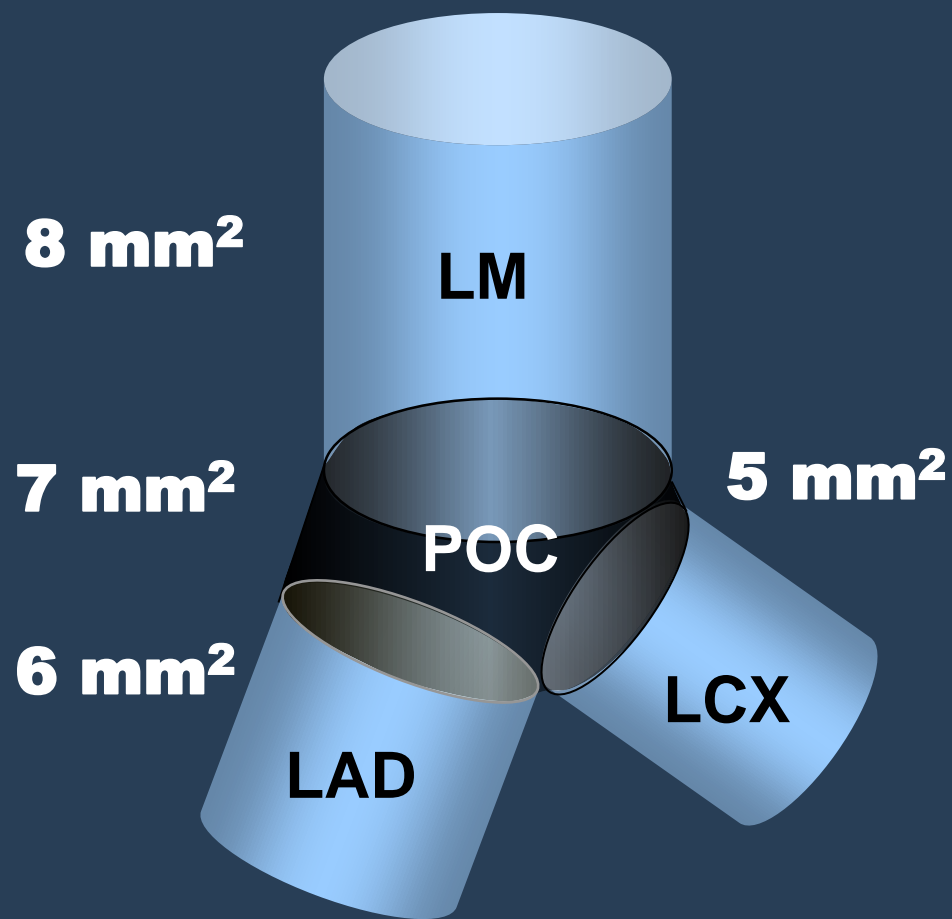
	Crude cumulative incidence (%)			Multivariate analysis		PS matching		IPTW	
	iPSP	No iPSP	P	HR (95% CI)	P	HR (95% CI)	P	HR (95% CI)	P
Primary outcome	5.7	8.0	0.001	0.74 (0.61-0.90)	0.003	0.71 (0.56-0.90)	0.005	0.71 (0.63-0.81)	<0.001
Cardiac death	2.3	3.6	0.003	0.73 (0.53-0.99)	0.047	0.78 (0.53-1.15)	0.20	0.62 (0.51-0.75)	0.003
Target vessel MI	0.2	0.5	0.19	0.68 (0.30-1.55)	0.36	0.78 (0.29-2.09)	0.62	0.65 (0.38-1.10)	0.10
TVR	3.4	4.6	0.02	0.73 (0.57-0.94)	0.02	0.68 (0.50-0.92)	0.01	0.74 (0.63-0.87)	<0.001

Imaging-Guided Complex PCI, What Is Different?

- With IVUS, the Operators Selected Larger Stent & Balloon.
- IVUS Enabled Safe and Effective Complex PCI (including LM PCI) with Better Clinical Outcomes.

Stent Area after LM Bifurcation PCI : Bigger the Better

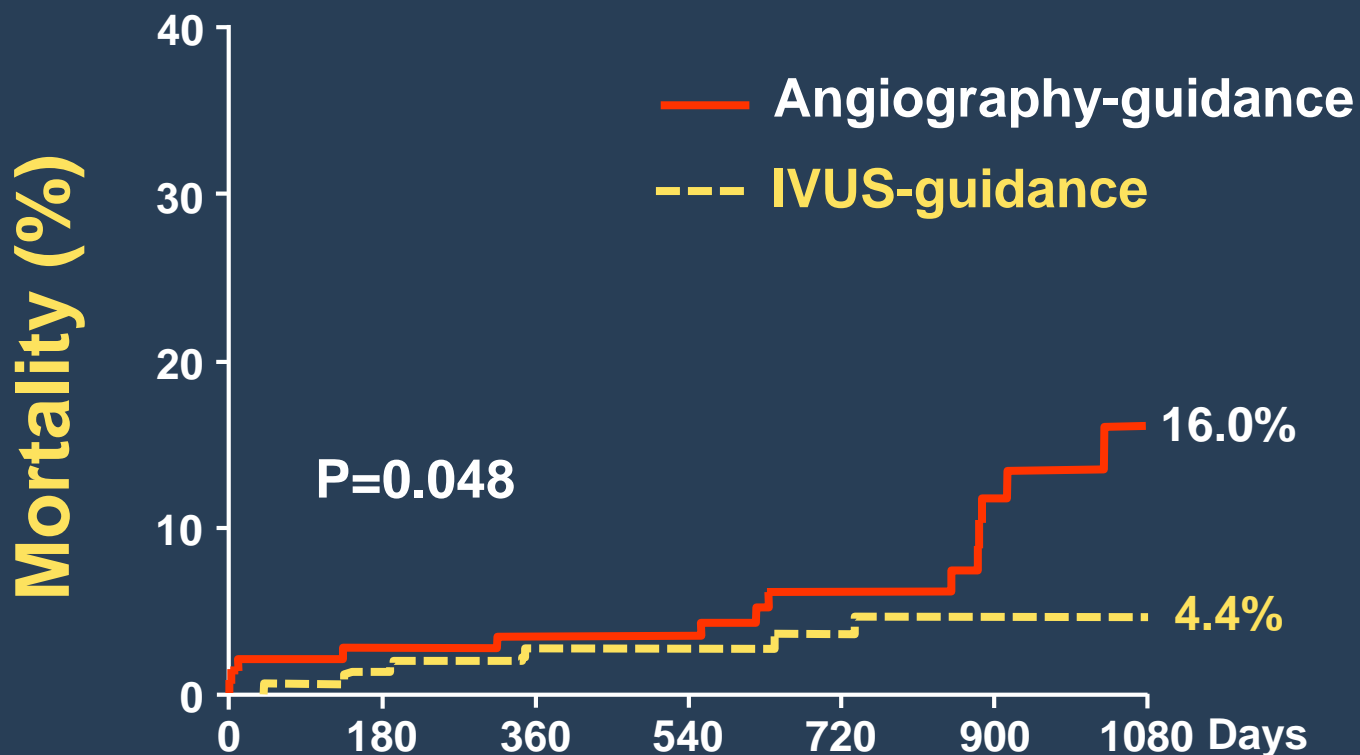
Rule of 5, 6, 7, 8



No. at risk	0	6	12	18	24
Underexpansion (+)	133	131	126	121	75
Underexpansion (-)	260	260	255	246	129

IVUS-Guidance in the MAIN-COMPARE Registry

IVUS use was associated with Decreased Mortality after LM PCI



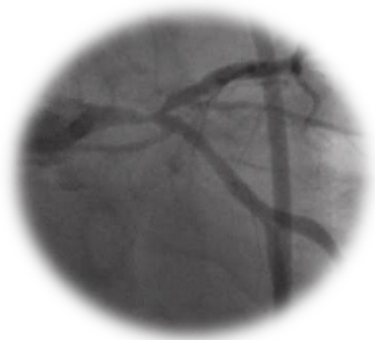
Patients after risk

IVUS-guidance	145	140	98	37
Angiography-guidance	145	137	88	29

IVUS-Guidance in the MAIN-COMPARE 10-Year FU

IVUS use was associated with better very long-term clinical outcomes

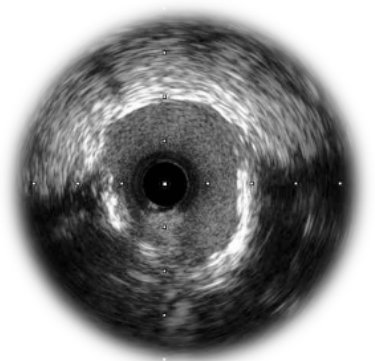
Left Main Disease



10-Year
Follow-up



IVUS-guided PCI



Guideline Recommendations on IVUS-Guidance for LM PCI

2018 ESC Guidelines on Myocardial Revascularization

- IVUS **should be** considered to optimize treatment of **unprotected left main lesions**

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2021 ACC/AHA/SCAI Guideline for Coronary Artery Revascularization

- In patients undergoing coronary stent implantation, IVUS **can be useful for procedural guidance**, particularly in cases of **left main** or complex coronary artery stenting, to reduce ischemic events

IIa

B

Conclusion

- LM Disease is Life-threatening Disease. We Must Use All the Weapons to Achieve the Best Results.
- IVUS-Guidance is the Key for Optimizing the LM PCI.
- IVUS Enables Safe and Effective PCI with Larger Stent & Balloon, Resulting in a Larger Final Stent Area.
- Larger MSA after LM Bifurcation PCI was a Key Predictor of the Better Clinical Outcomes.

Conclusion

Let's Use IVUS-Guidance for the Best LM PCI !

Thank you for your attention !