

Malaysia LIVE @ TCTAP 2015 : How to Manage Difficult Lesions

Case 2 : LMS Bifurcation
How Would I Treat the Case

Gim-Hooi Choo
MBBS(Mal); MRCP(UK)

28th. April, 2015

Disclosures of Financial Interest

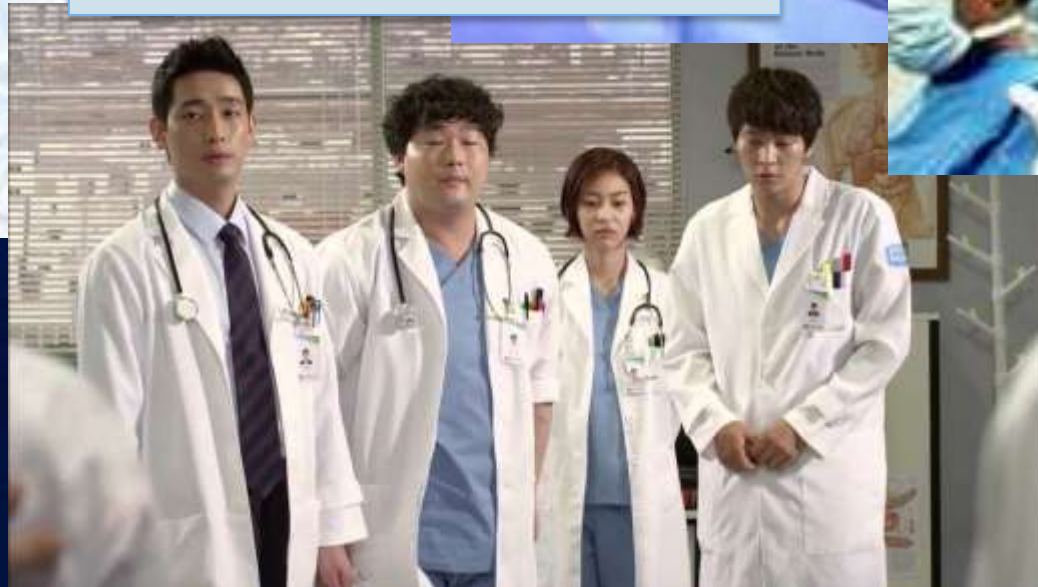
- Speaking honorariums from Novartis, MSD, Roche, Solvay Pharma, Xepa-Soul Pattinson, Servier, Cordis J&J, Astra Zeneca, Lilly, Sanofi Aventis, Medtronic, Novo Nordisk, Terumo, Alvimedica
- Small share-holding of Biosensors stock



Key History: A Physician Colleague



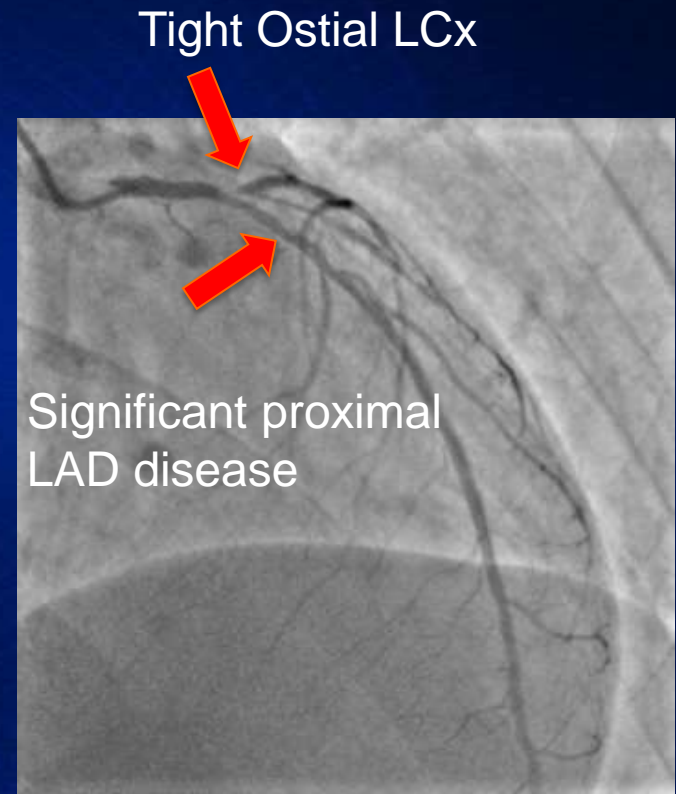
Friend & Comrade in
Medical 'Battlefield'



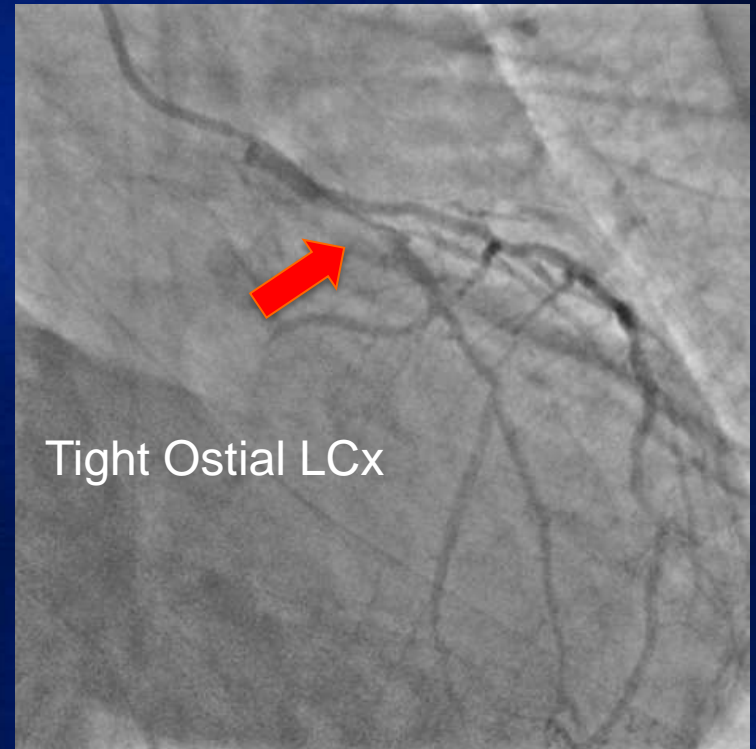
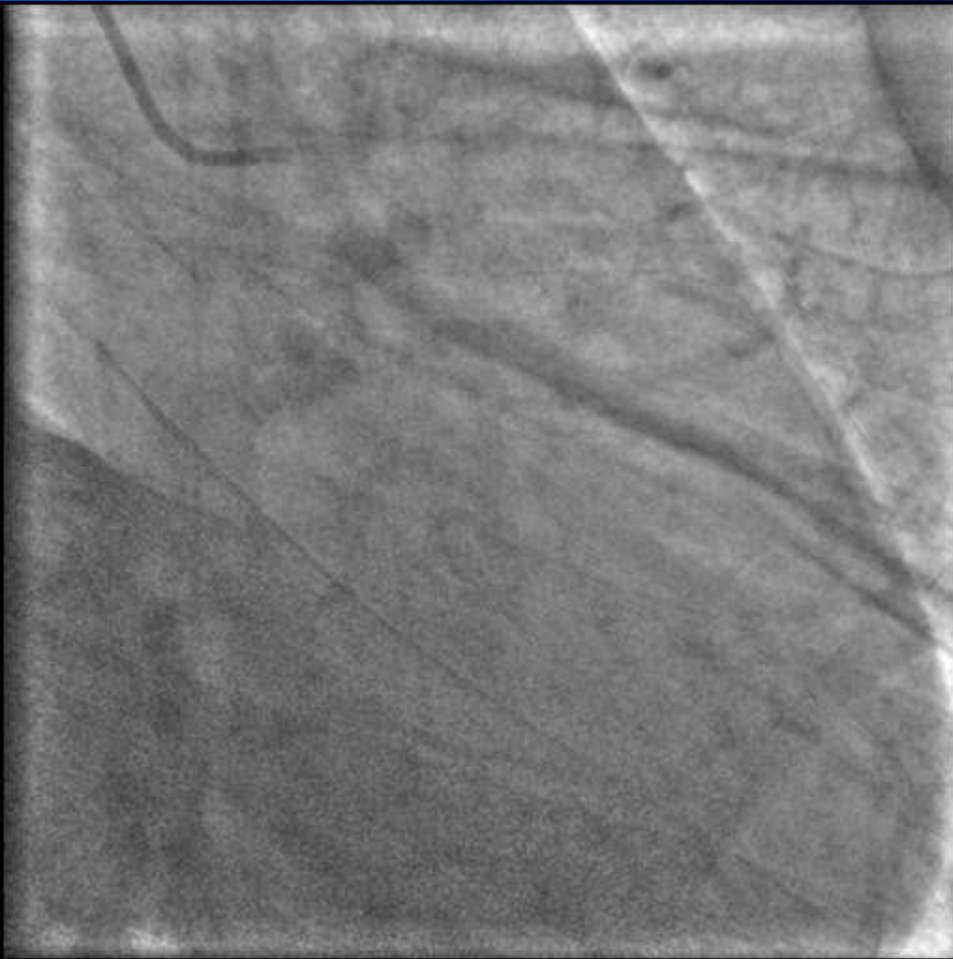
Key Background History:

- 25 year old young physician colleague
- Exertional Angina
- Familial Hypercholesterolaemia (Severe heterozygous/ Homozygous) : LDL-C >9mmol/l

LCA : RAO Cranial View

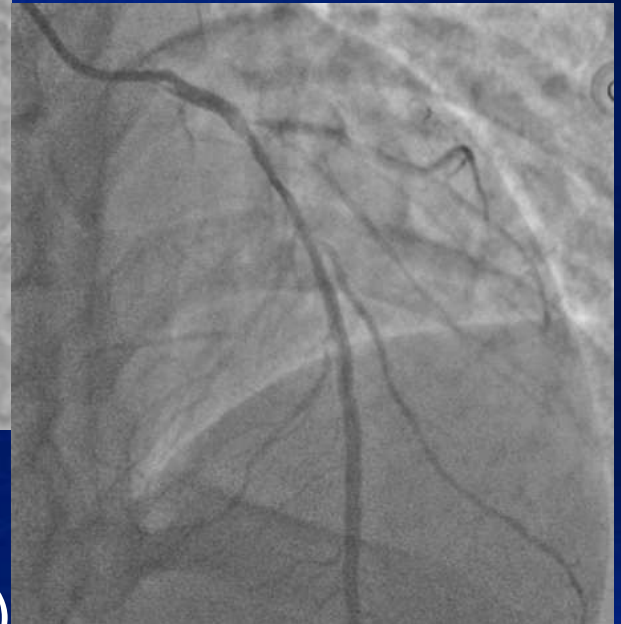
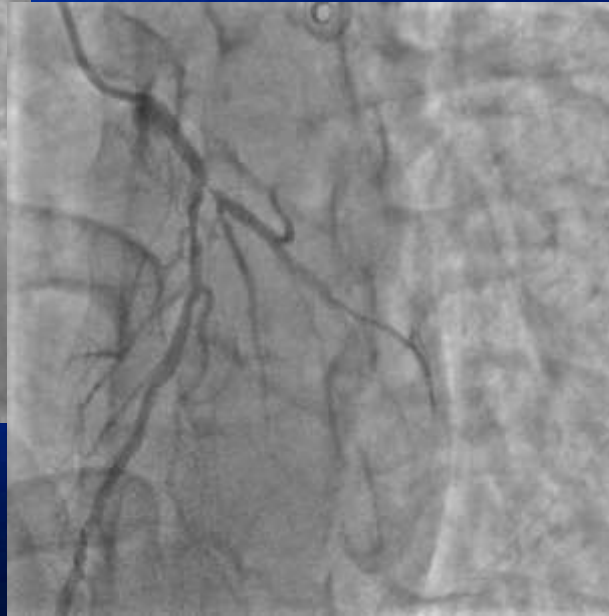


RAO Caudal



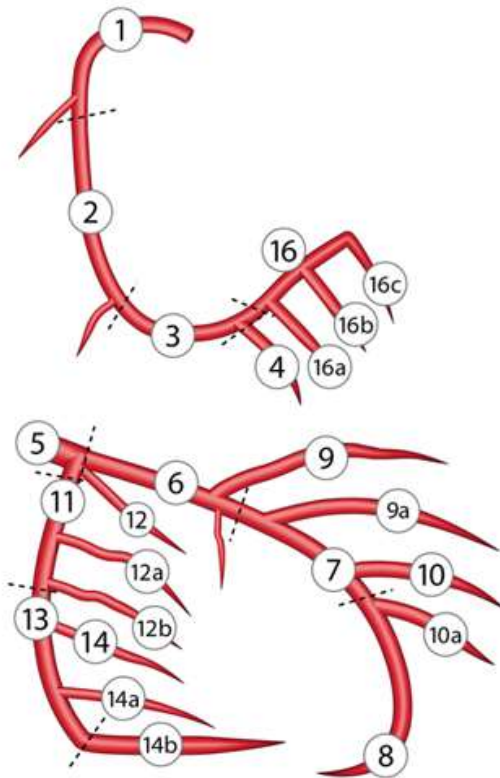
Tight Ostial LCx

Tight Discrete Ostial LCx Stenosis



Anatomic Dx :
LM Bifurcation Disease (Medina 0,1,1)

SYNTAX SCORE



3. Specify which segments are diseased for **lesion 1**. 
Click on the coronary tree image to select or unselect segments.

	Lesion:	1	
<i>Segments:</i>			
RCA	RCA proximal	1	<input type="checkbox"/>
	RCA mid	2	<input type="checkbox"/>
	RCA distal	3	<input type="checkbox"/>
	Posterior descending	4	<input type="checkbox"/>
	Posterolateral from RCA	16	<input type="checkbox"/>
	Posterolateral from RCA	16a	<input type="checkbox"/>
	Posterolateral from RCA	16b	<input type="checkbox"/>
	Posterolateral from RCA	16c	<input type="checkbox"/>
LM	Left main	5	<input type="checkbox"/>
LAD	LAD proximal	6	<input checked="" type="checkbox"/>
	LAD mid	7	<input type="checkbox"/>
	LAD apical	8	<input type="checkbox"/>
	First diagonal	9	<input type="checkbox"/>
	Add. first diagonal	9a	<input type="checkbox"/>
	Second diagonal	10	<input type="checkbox"/>
	Add. second diagonal	10a	<input type="checkbox"/>
LCX	Proximal circumflex	11	<input checked="" type="checkbox"/>
	Intermediate/anterolateral	12	<input type="checkbox"/>
	Obtuse marginal	12a	<input type="checkbox"/>
	Obtuse marginal	12b	<input type="checkbox"/>
	Distal circumflex	13	<input type="checkbox"/>
	Left posterolateral	14	<input type="checkbox"/>
	Left posterolateral	14a	<input type="checkbox"/>
	Left posterolateral	14b	<input type="checkbox"/>

SYNTAX SCORE : 14

Lesion 1

(segment 6): $3.5 \times 2 =$	7
(segment 11): $1.5 \times 2 =$	3
Bifurcation Type: Medina 0,1,1:	2
Angulation $< 70^\circ$	1
Length > 20 mm	1
<i>Sub total lesion 1</i>	<i>14</i>

TOTAL: 14

What would I do for my colleague?



Heart Team Discussion :



Heart Team's Decision

He's going under the
Knife ! Hehehe!

What about me?
Anybody cares
about what I think?

I think it's better for
trans-radial PCI



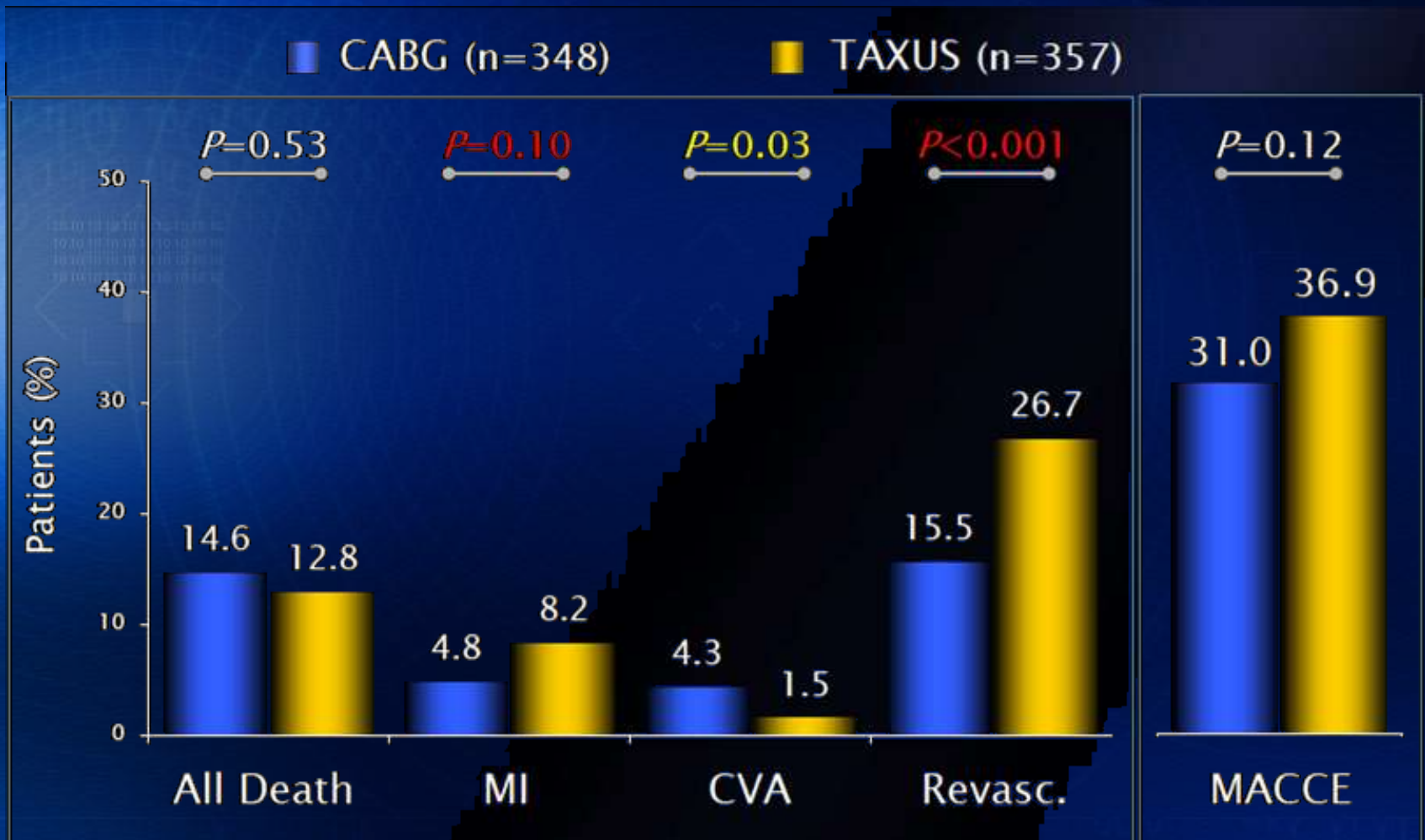
Patient : “So, what’s the verdict?”



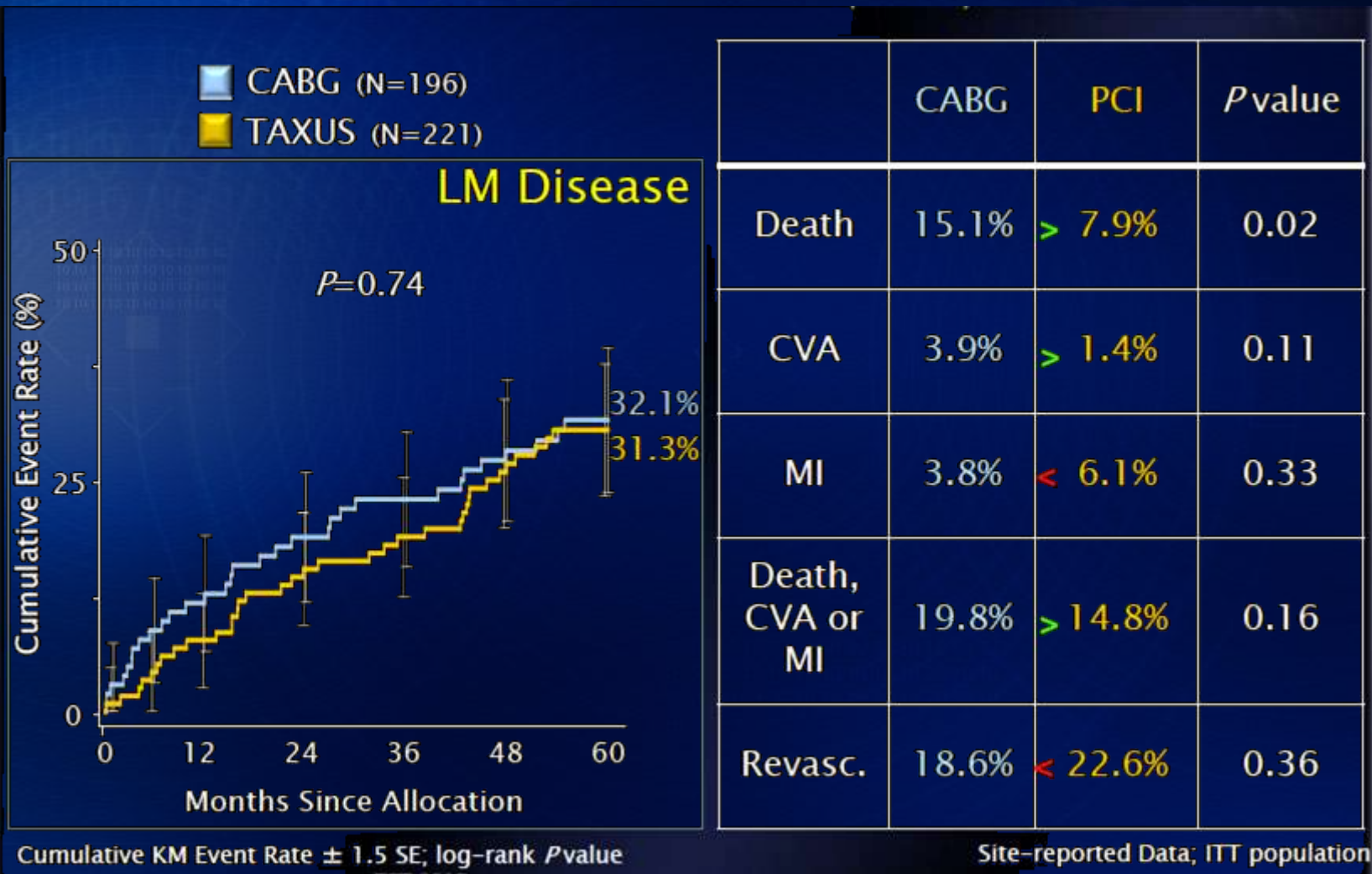
Revascularisation Options:



SYNTAX : Left Main Subgroup 5 – year Outcomes (n=705)



MACCE to 5 years by SYNTAX Score Tercile : Low to Intermediate Scores (0-32)





Other Factors : Young Age;
Concerns with future need &
risks for Redo-CABG



LMCA Bifurcation PCI :

1 – stent vs 2-stents strategies

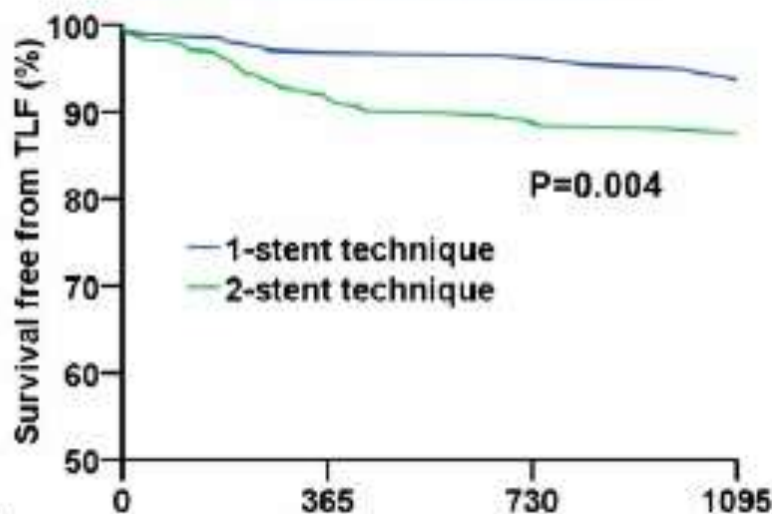
Stent Cross Over	<i>Normal Ostial LCX (Medina 1.1.0., 1.0.0)</i> Normal or Diminutive LCX Small LCX with < 2.5 mm in diameter Focal disease in distal LCX
Two Stent	<i>Diseased LCX (Medina 1.1.1., 1.0.1)</i> Large LCX with ≥ 2.5 mm in diameter Diseased left dominant coronary system Concomitant diffuse disease in distal LCX

Park SJ, Kim YH, Colombo A, Issam D. Moussa et al.
Textbook of Bifurcation Stenting

COBIS Registry II 1-stent vs. 2-stent for LMCA bifurcation

TLF in Propensity-Matched Cohort

Non-LM bifurcation



No. at risk

1-stent
2-stent

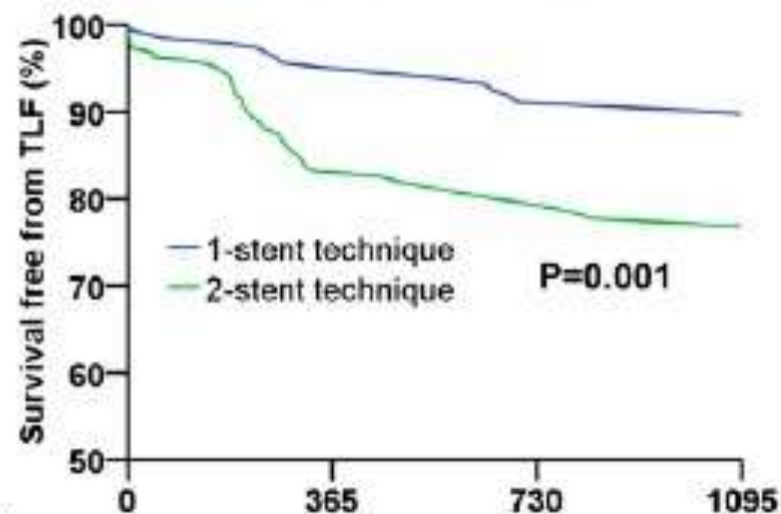
442
442

366
360

294
311

186
217

LM bifurcation



No. at risk

1-stent
2-stent

192
192

164
146

128
108

76
64

Single Versus Double Stenting for Unprotected Left Main Coronary Artery Bifurcation Lesions: A Systematic Review and Meta-Analysis

Wassef Karrowni, MD¹; Nader Makki, MD²; Amandeep S. Dhaliwal, MDCM²; Ankur Vyas, MBBS²; Amy Blevins²; Saadeddine Dughman, MD²; Saket Girotra, MBBS, SM²; Peter Cram, MD²; Phillip A. Horwitz, MD²

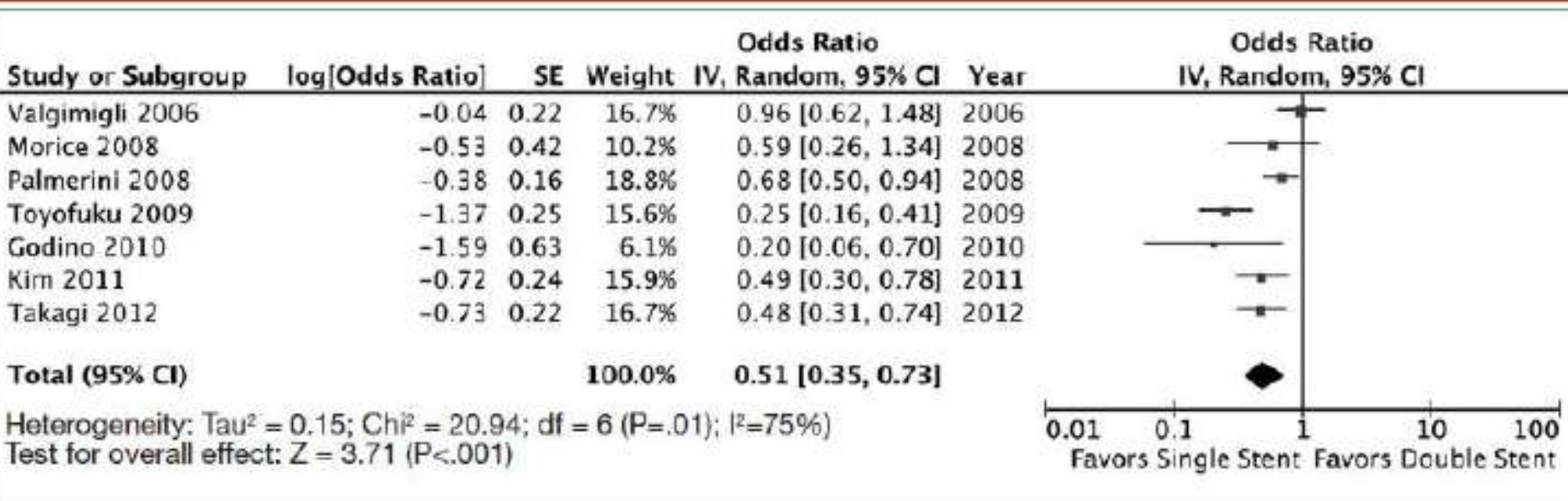
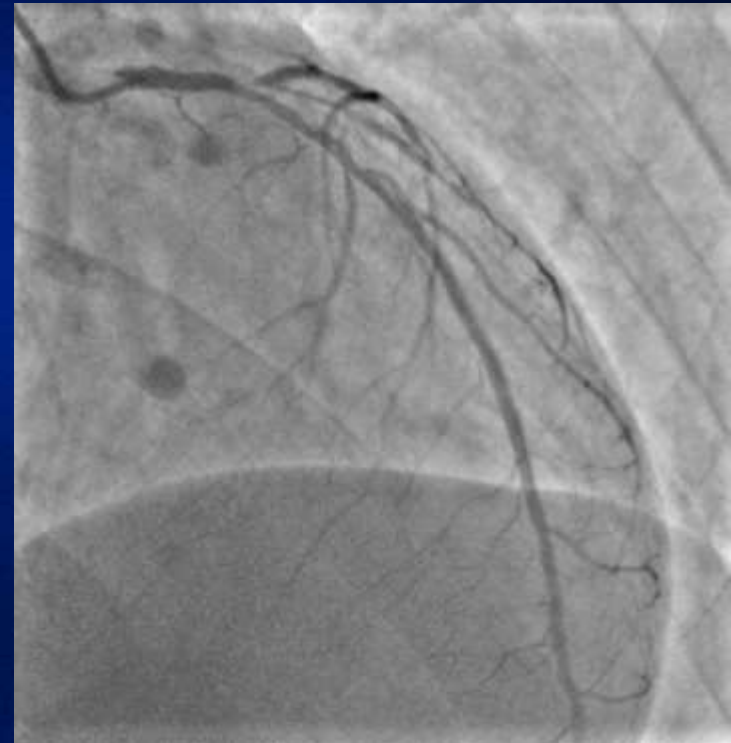
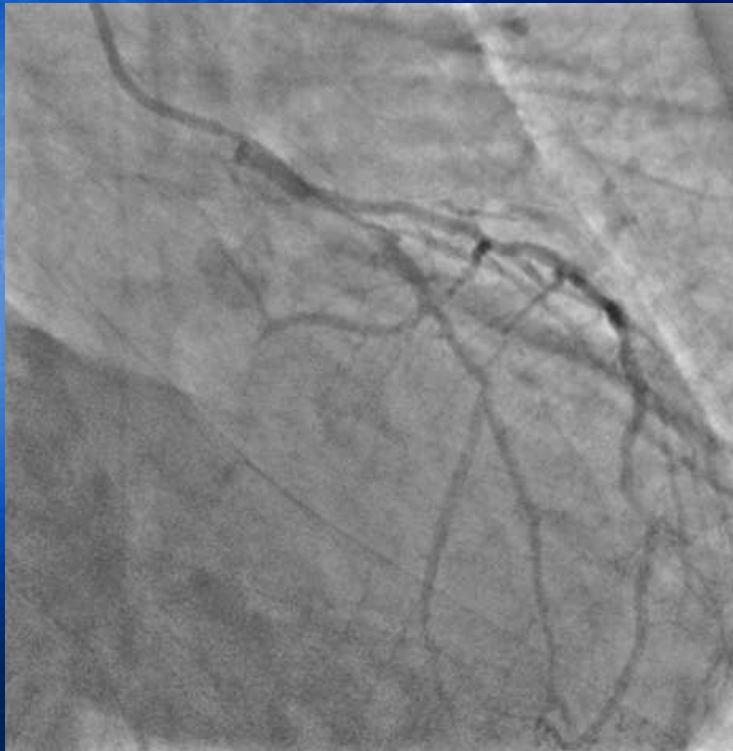


Figure 2. Odds ratios for major adverse cardiovascular events in groups with single-stent strategy vs groups with double-stent strategy.

LM Bifurcation (Medina 0,1,1)

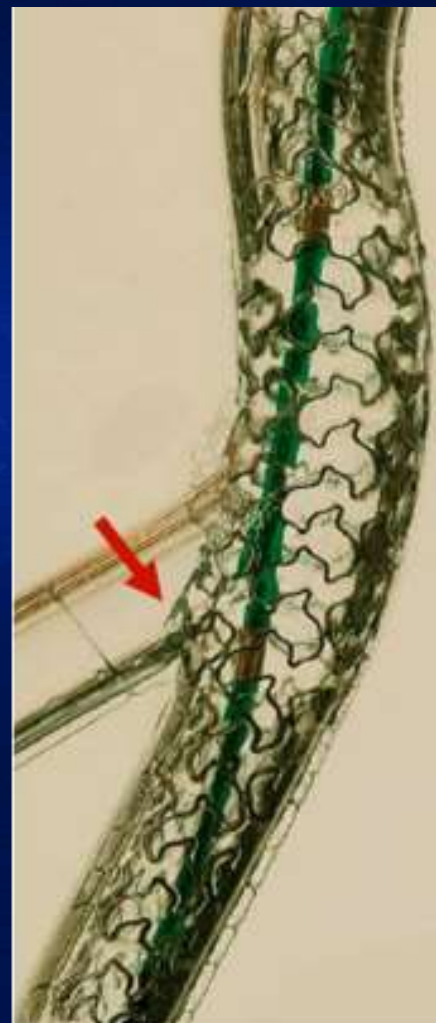
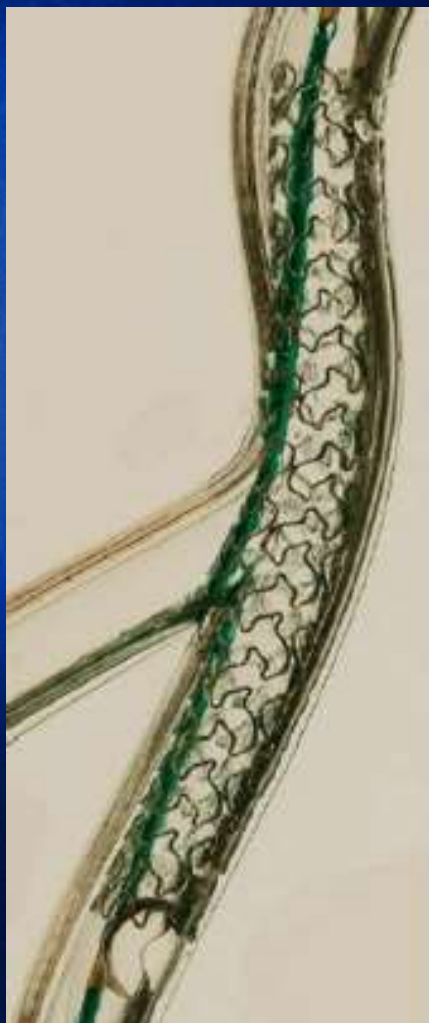
Short, discrete LCx involvement



My PCI strategy : Single LM Crossover DES Stent Strategy
with DEB to LCx & Provisional Stenting

Proximal Optimisation Technique (POT) : Optimises LM stent expansion & reduces carinal shift

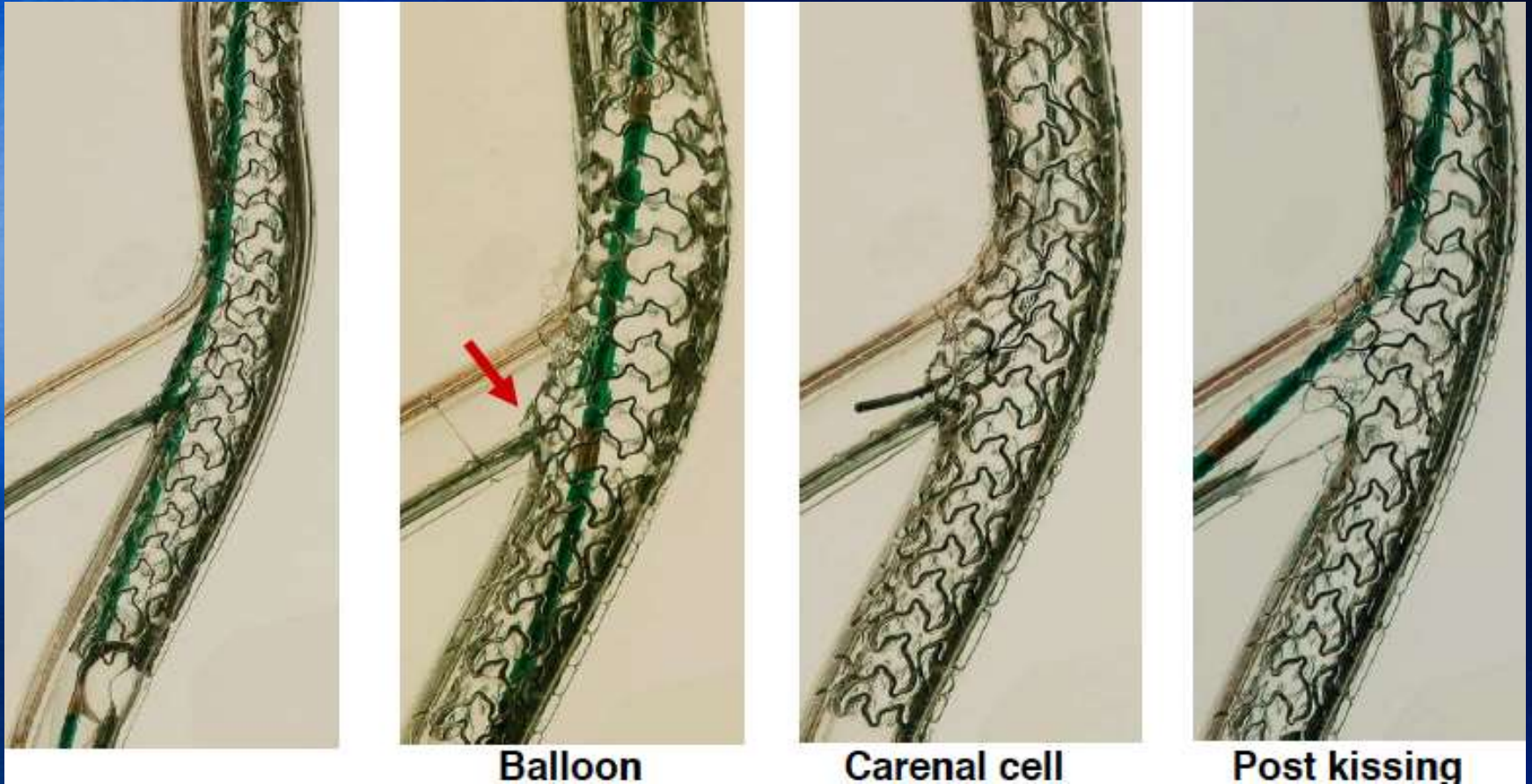
Stent
3.0 x 20mm



Balloon
3.5 x 8mm
At & Proximal
To Bifurcation

5th. European Bifurcation Club Consensus : In single stent technique, MV stent should be sized according to the distal MV reference diameter

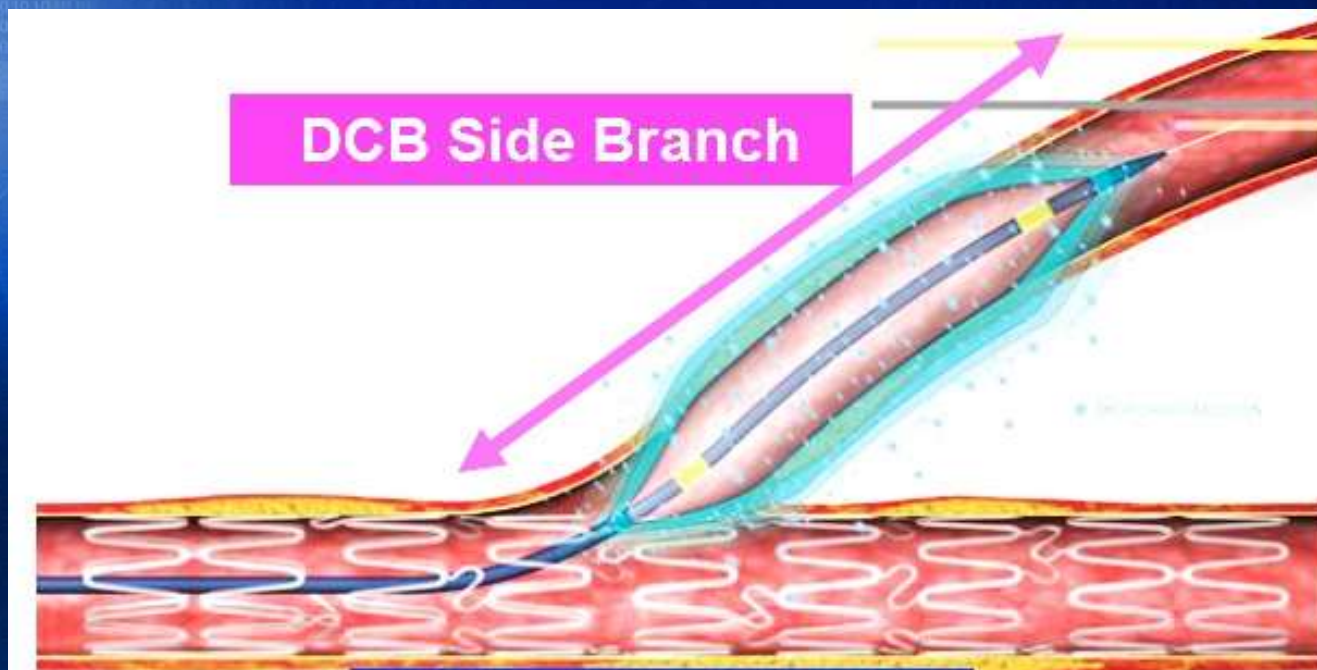
Proximal Optimisation Technique



Treatment of bifurcation lesions with a drug-eluting balloon: the PEPCAD V (Paclitaxel Eluting PTCA Balloon in Coronary Artery Disease) trial

Detlef G. Mathey^{1*}, MD; Imke Wendig¹, MD; Michael Boxberger², PhD; Klaus Bonaventura³, MD; Franz X. Kleber³, MD

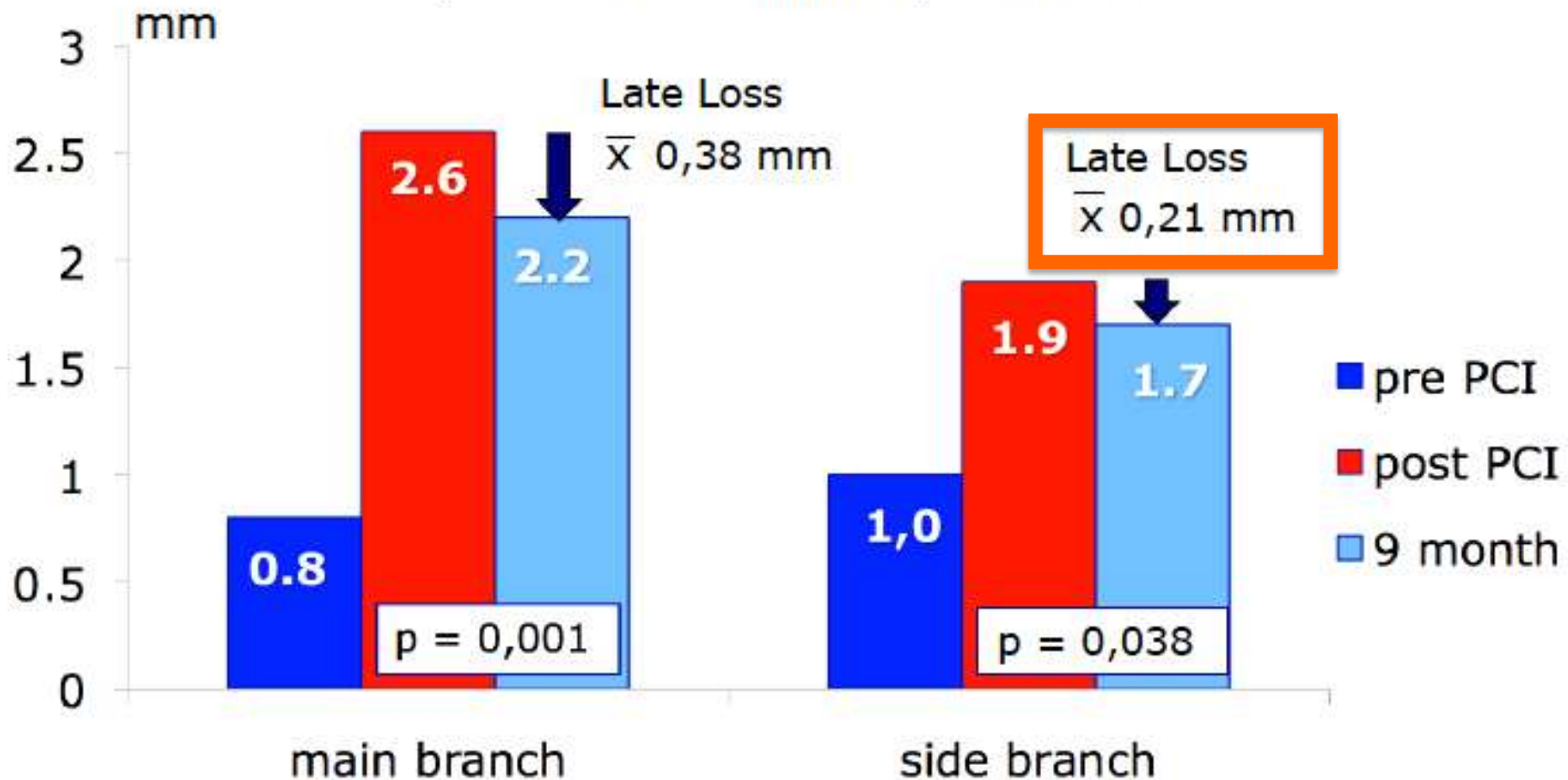
1. Universitäres Herzzentrum Hamburg, Germany, 2. B. Braun Melsungen AG, Berlin, Germany, 3. Ernst von Bergmann Klinikum, Potsdam, Germany



Minimal Lumen Diameter: 9 mth f/up

MLD: Pre PCI, Post PCI, 9 Month FU

pre PCI vs. 9 month: $p < 0,001$



Distal LM Bifurcation PCI :

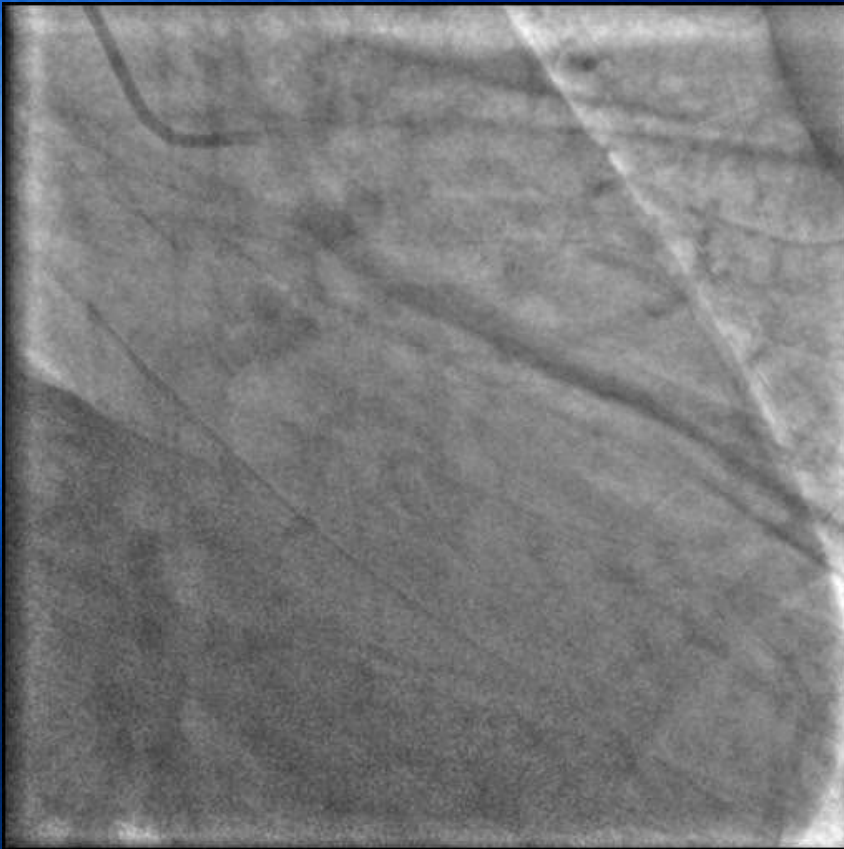
If 2-stent strategy, which technique?

Technique

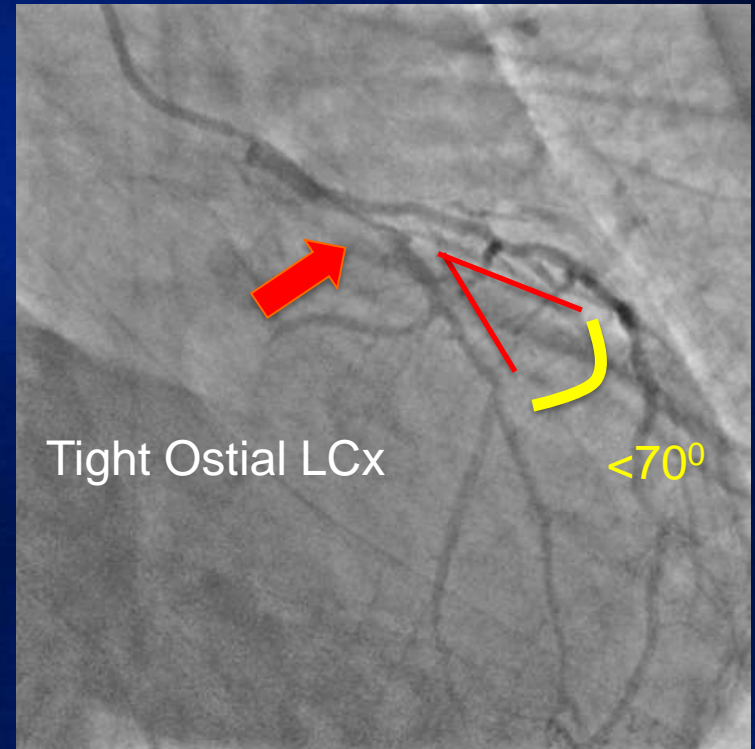
When to choose

- | | |
|------------------------|----------------------------------|
| 1) T, modified T, TAP: | 75-90° angled LCX |
| 2) Culotte: | Y bif with matched LAD/LCX dia. |
| 3) Mini-crush: | Y bif with LAD/LCX dia. mismatch |
| 4) V stent: | Medina 0,1,1 (true LMEQ ds) |
| 5) SKS: | Short LM, unstable pt |

If 2-stent technique :
Owing to narrow bifurcation angle,
I will use DK-Crush / Culotte



RAO Caudal



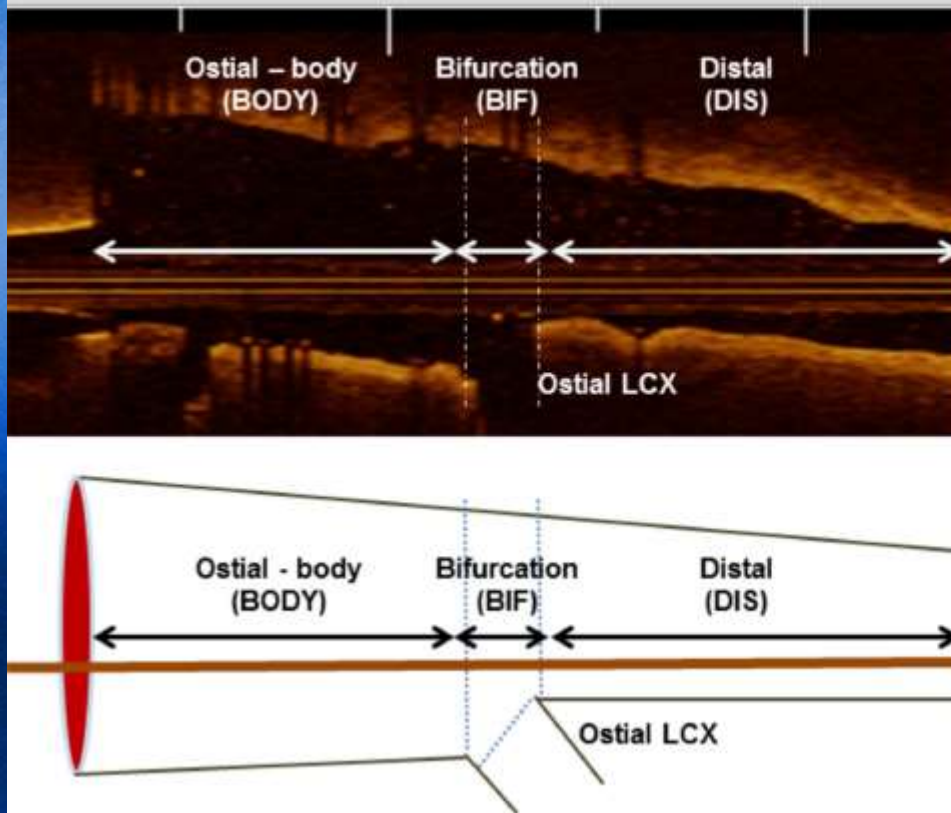
Regardless of which 2-stent technique chosen, always end with
Final Kissing Balloon(FKB) Inflation

For LMCA PCI :

- Invasive Imaging for optimisation
- \pm FFR for SB assessment

FD-OCT Assessment of LMCA post-PCI

33 pts with ULMCA PCI with SES, EES

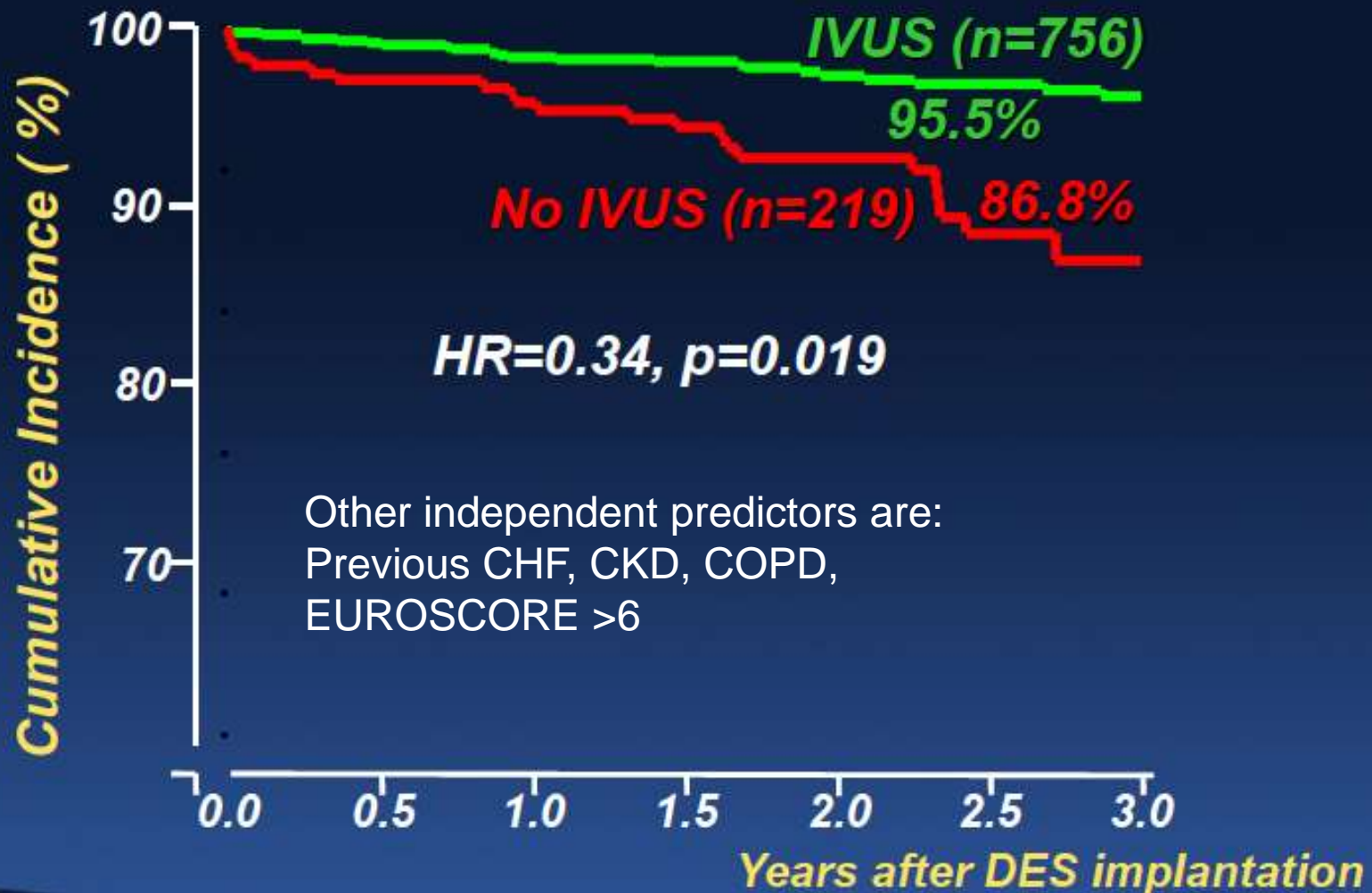


Malapposition seen more proximally (prox 5% > bif 2% > dis 0.6%)

Uncovered struts seen more proximally (body 19% > bif 12% > dis 3%)

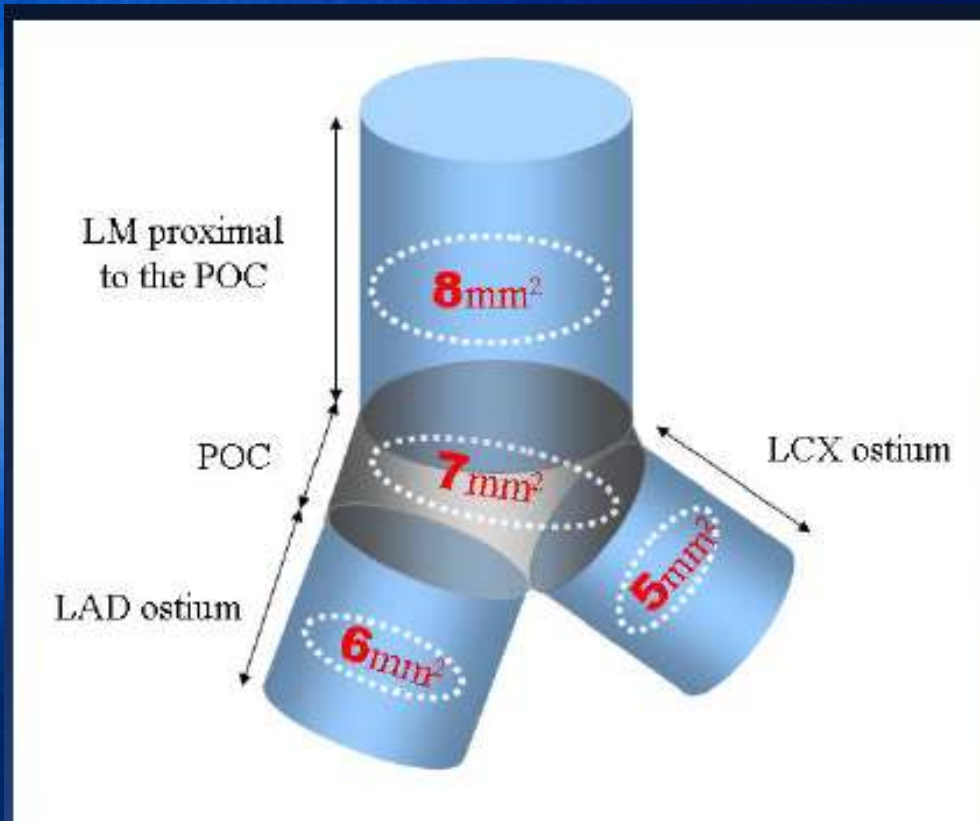
Malapposition associated with less NIH, no thrombus

MAIN-COMPARE Registry : All-cause mortality after LMCA DES PCI – Impact of IVUS Guidance



Optimal PCI/stenting of distal LMCA Bifurcation with IVUS Guidance (MSA)

N= 403

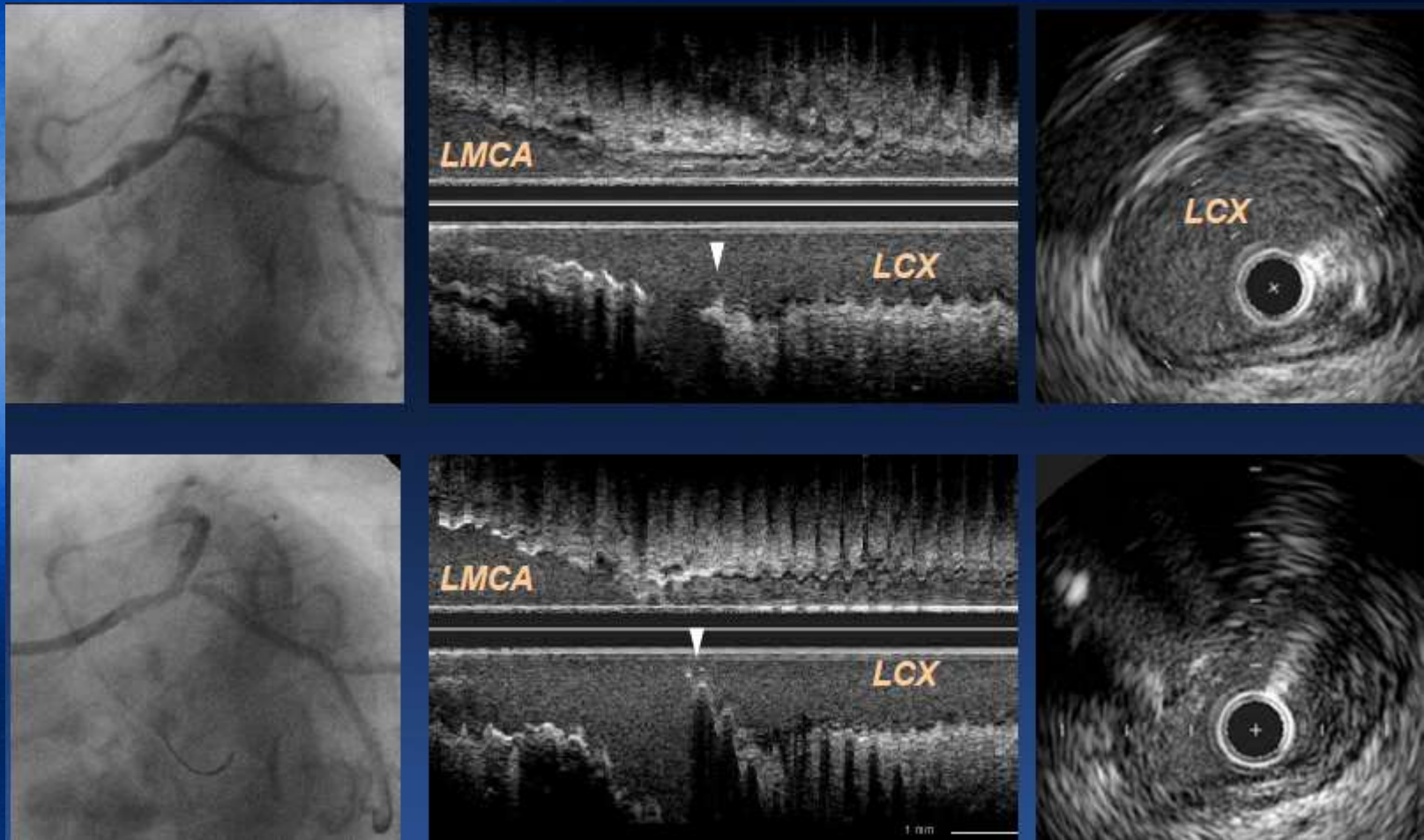


133 pts (33.8%) had underexpansion of ≥ 1 segment

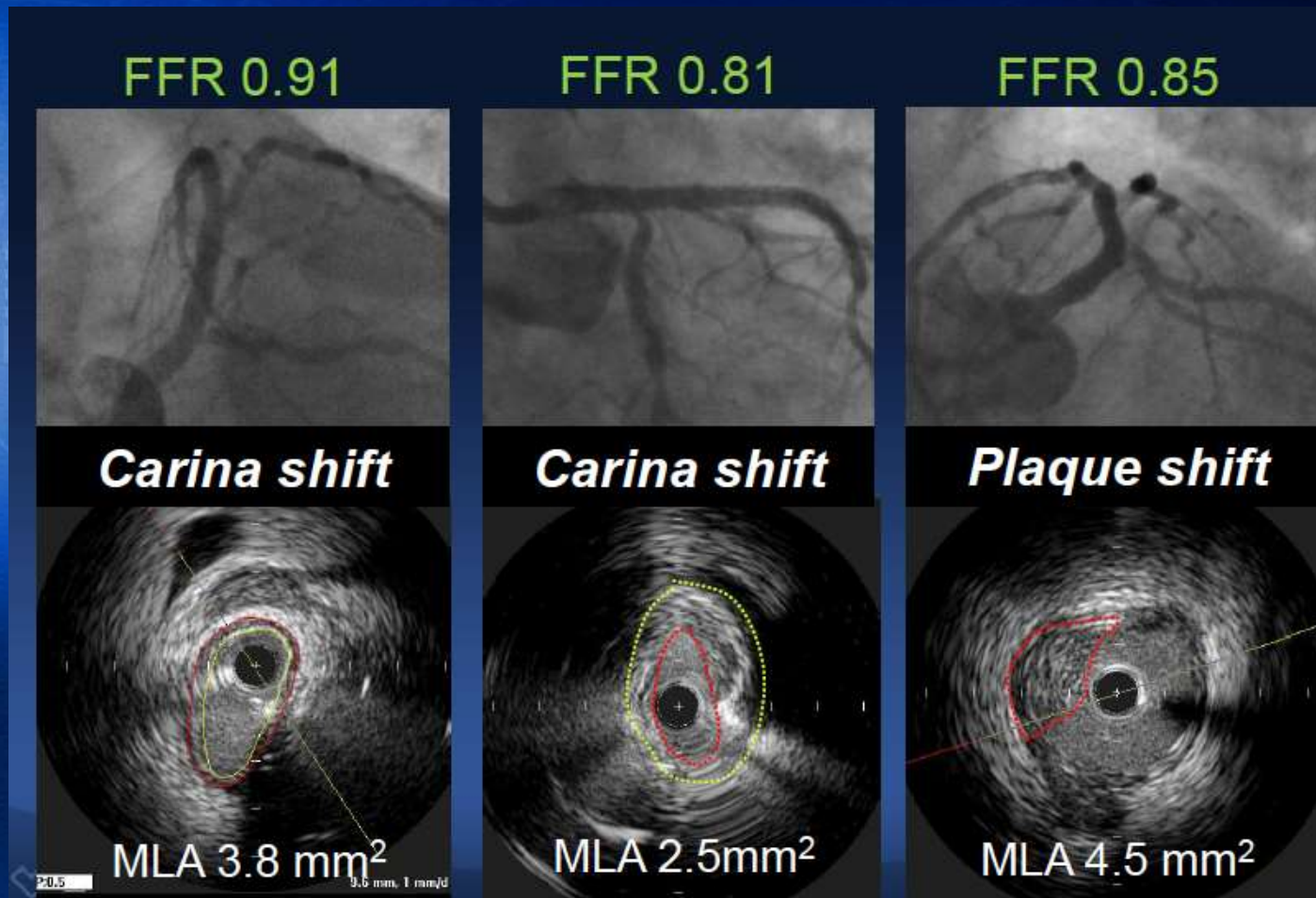
2-year MACE-free survival was lower in pts with vs. without underexpansion (89.4% vs. 98.1%; adj HR 5.56 [1.99 -15.49]; P<0.001)

2-year TLR-free survival was lower in pts with vs. without underexpansion (90.9% vs 98.5%; adj HR 6.08 [1.94 -19.02]; P=0.002); 12/16 TLRs (80%) occurred in cases with underexpansion

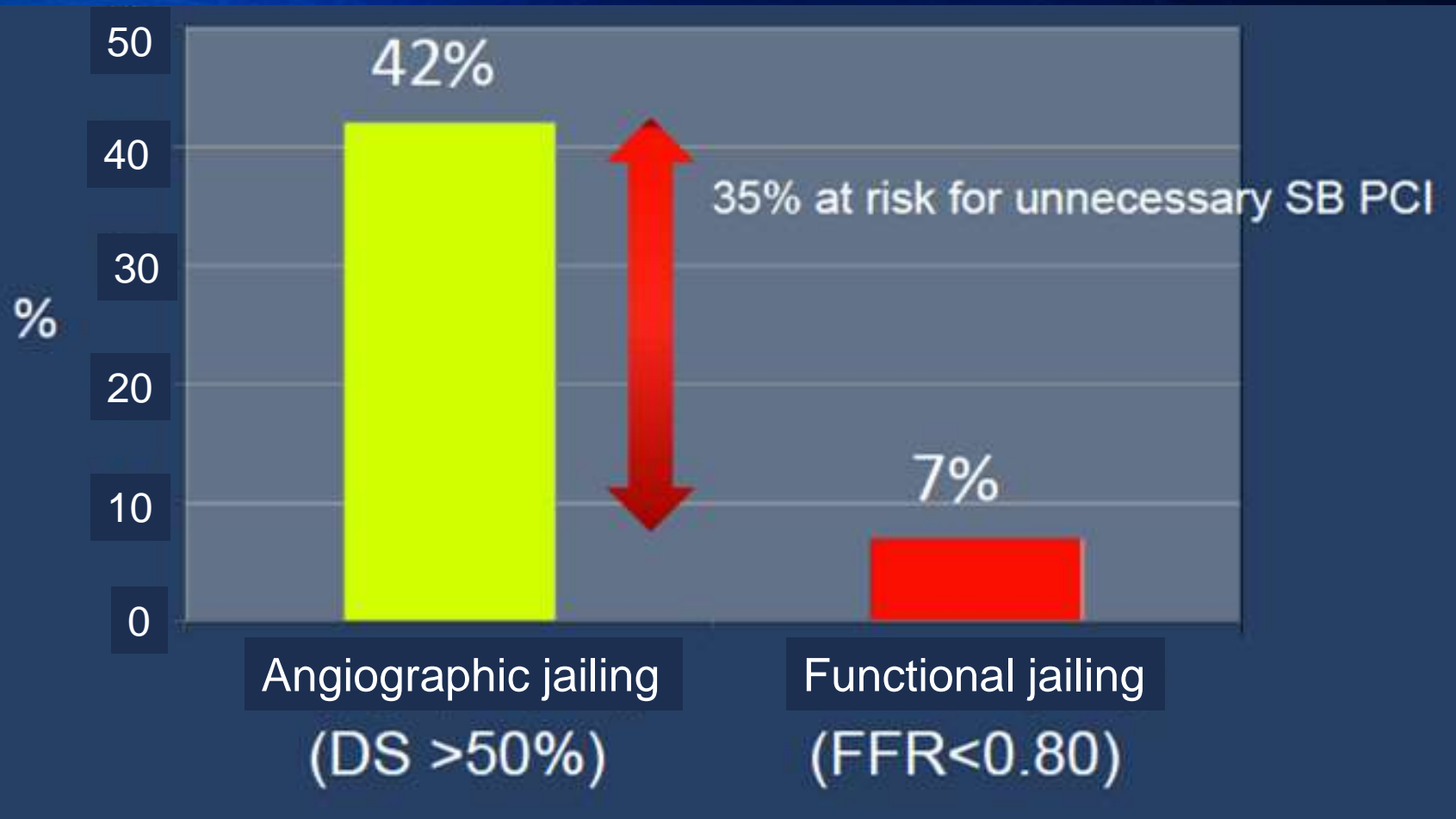
LCx ostial – carina shift after LM crossover stenting



Anatomy vs Functional Significance of Ostial LCx Jailing



LCx ostial 'pinching' post-LM crossover stenting



Post-PCI Management :

- DAPT x 1 year or more?
- Aggressive LDL-C reduction : Intensive Statin Therapy + Ezetimide \pm Fibrates
- ? LDL-apheresis
- ? PCSK-9 inhibitor
- Lifestyle modifications