

Bifurcation PCI Summary; *Techniques or Concept?*

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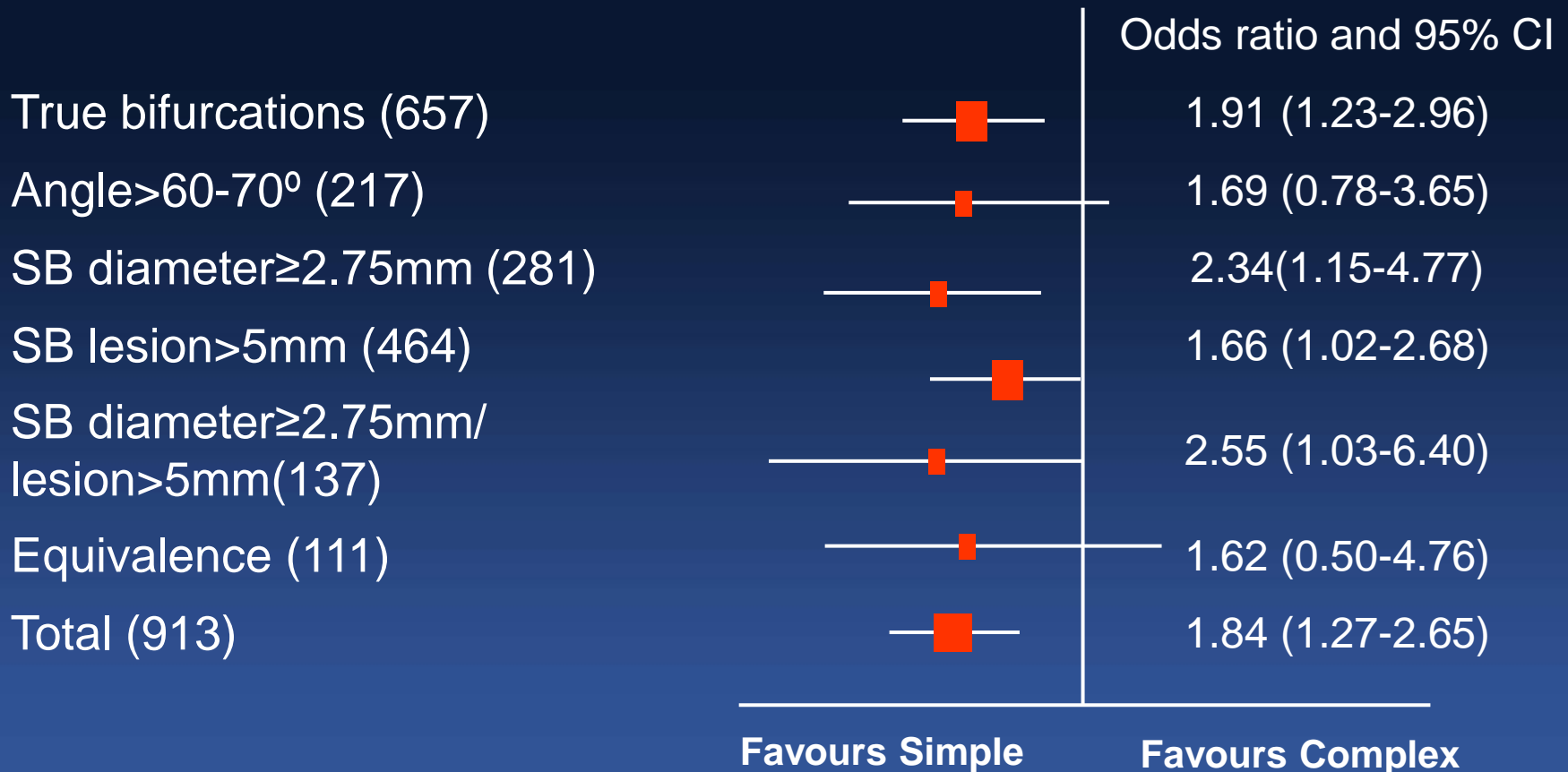
Non-LM Bifurcation PCI

How To Do ?

1. Provisional stenting of the side branch
2. Planned two stent technique

BBC ONE NORDIC Meta-analysis

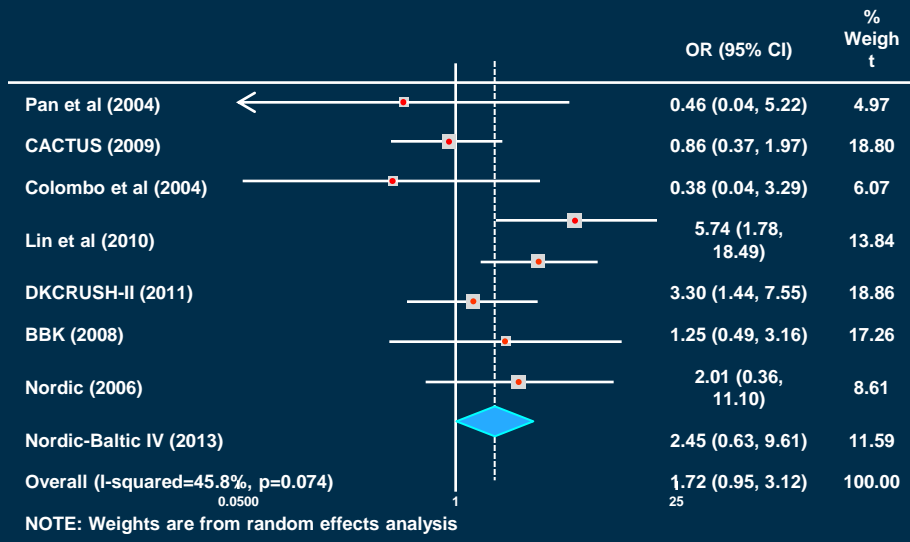
Provisional Stenting is Standard !



Recent Meta-Analysis

2 Stent Techniques Are Also Good !

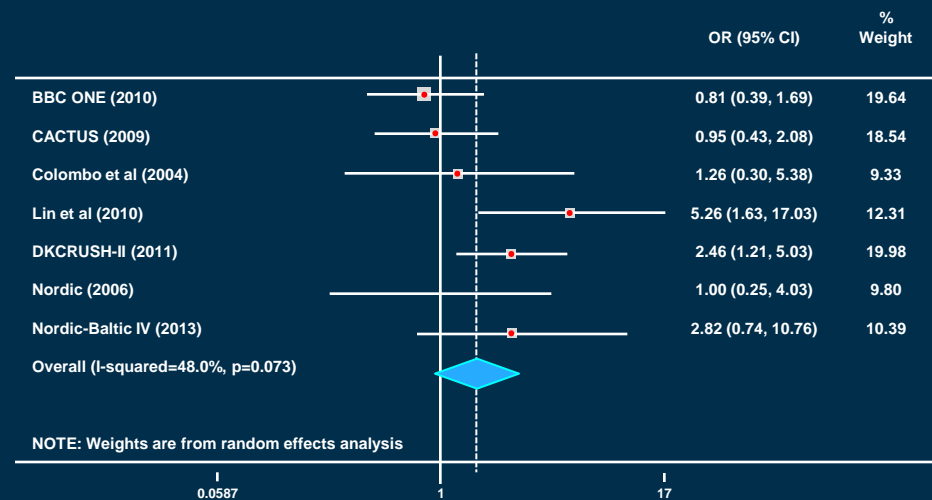
Target Lesion Revascularization



Favours
simple strategy

Favours
complex strategy

Target Vessel Revascularization



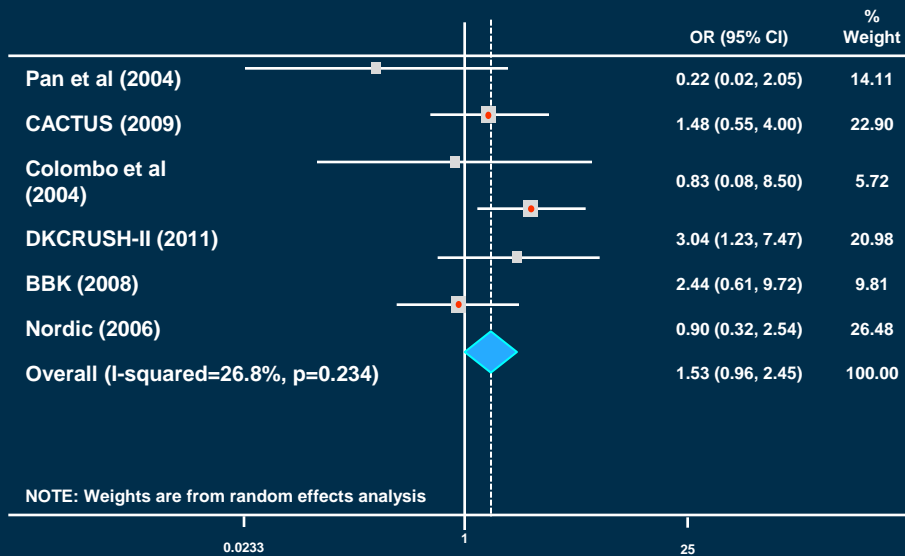
Favours
simple strategy

Favours
complex strategy

Recent Meta-Analysis

2 Stent Techniques Are Also Good !

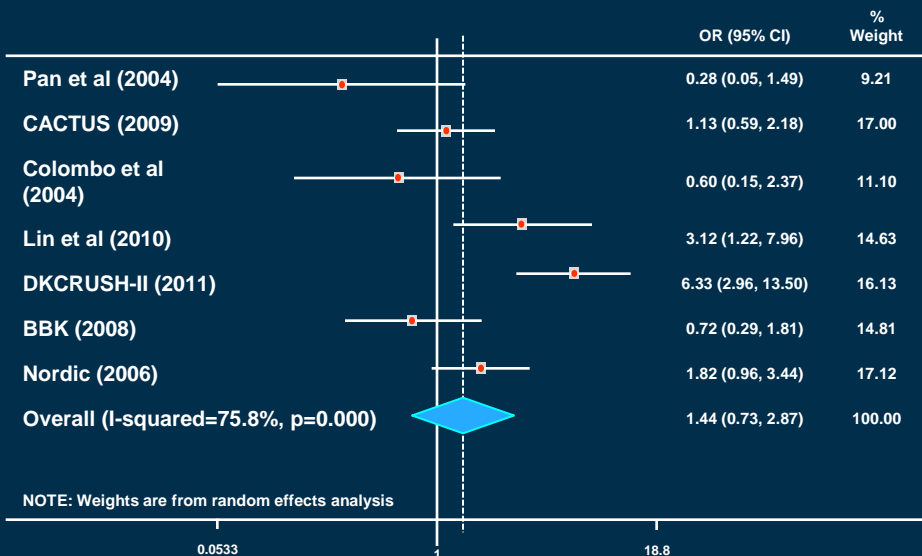
Main Vessel Restenosis



Favours simple strategy

Favours complex strategy

Side Branch Restenosis



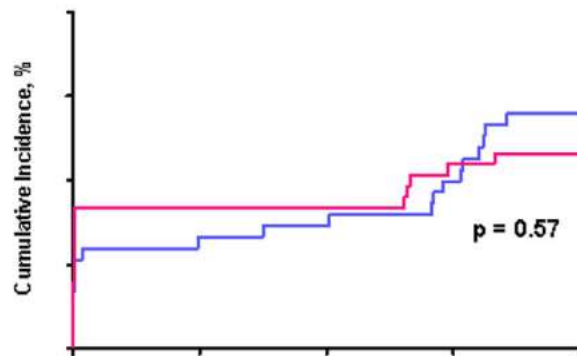
Favours simple strategy

Favours complex strategy

Recent Randomized Study in Era of DES

CROSS and PERFECT (n=920)

— Routine FKB
— Leave-it-Alone



No. at risk
Routine-
FKB

	151	141	140	136	129
Leave alone	155	149	149	139	137

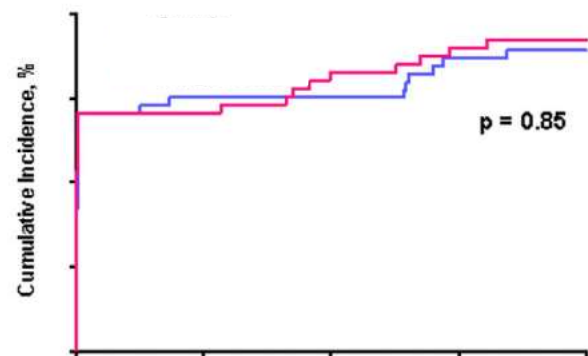
Days Since Randomization

No. at risk
Crush
technique
Single-
stent

	213	182	182	177	175
Single- stent	206	177	172	169	167

Days Since Randomization

— Crush Technique
— Single-Stent



Non-LM Bifurcation PCI

How To Do ?

Either Provisional Stenting or
Any 2 stent Technique Would Be OK !
But, Still the Simpler the Better !

When ?

2 Stent Technique

**Provisional
Stenting
(>70%)**

Normal Side Branch, Whatever Size Is,
(Medina 1.1.0., 1.0.0), or
Focal Diseased Side Branch

***2 Stent
Technique***

***Big (≥ 2.5 mm),
Diffusely Diseased Side Branch
(Medina 1.1.1., 1.0.1)***

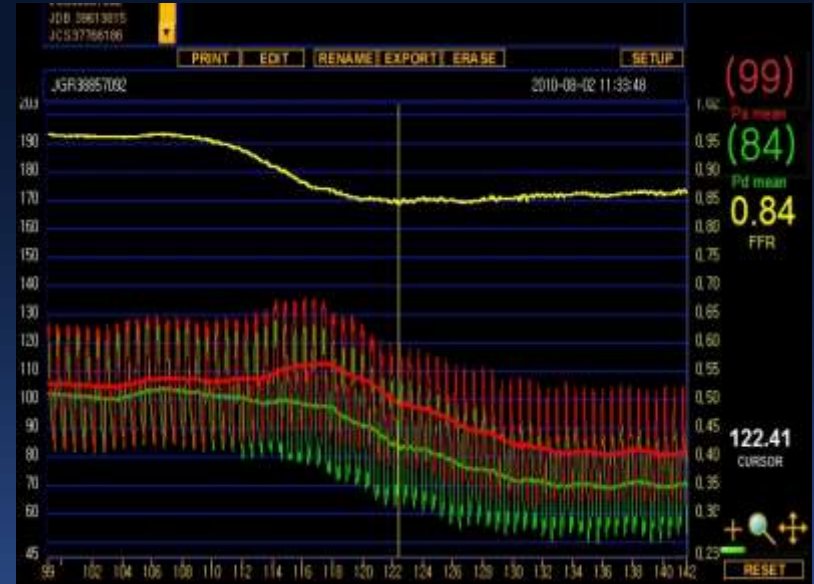
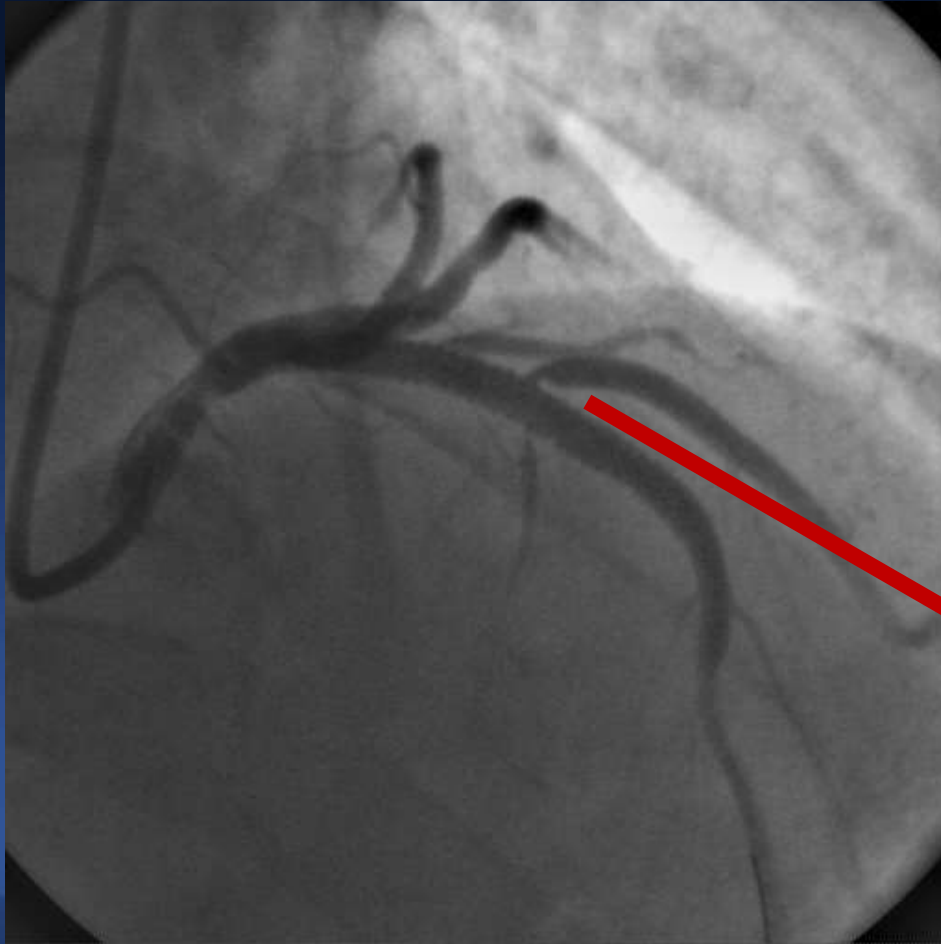
2 Stent Techniques

- T-stent, modified T-stent or TAP
- Mini-crush (or step crush), DKCRUSH
- Culotte
- V-stent
- Y-stent (SKS-simultaneous kissing stents)

Any Different Outcomes ? with Different 2 Stent Techniques

- Different Indications,
- Very Limited Data,
- Maybe, Small Difference in Soft End Point (TLR, Branch Restenosis).

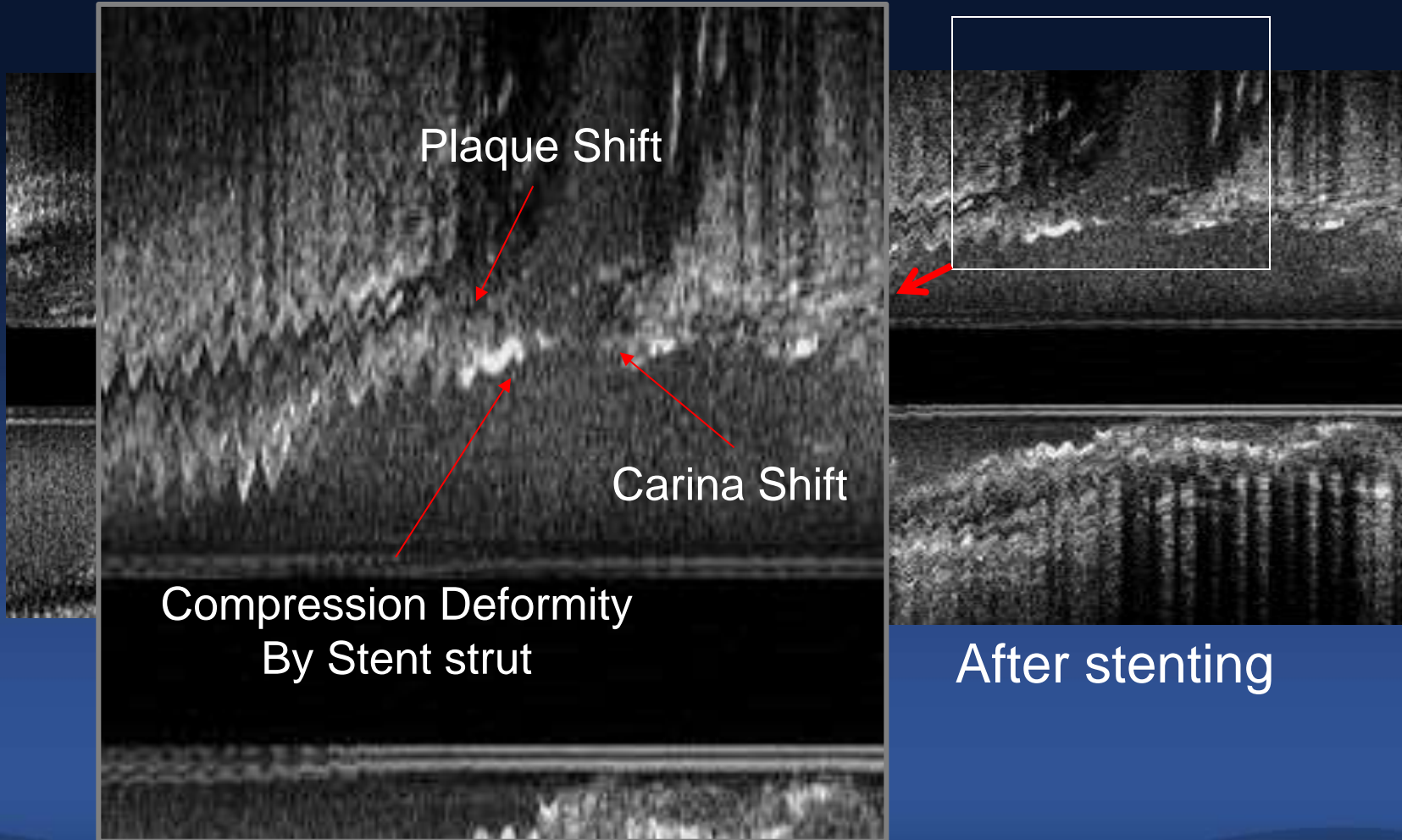
Jailing Side Branch After Main Vessel Stenting



FFR 0.84

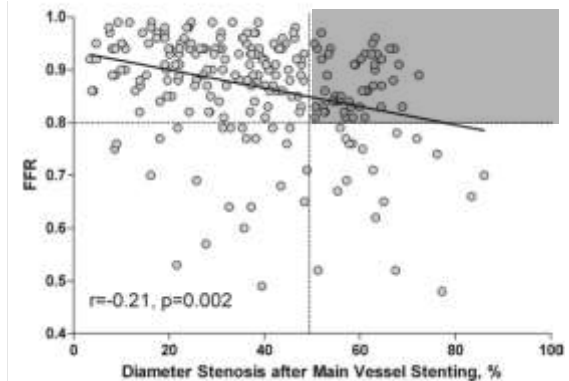
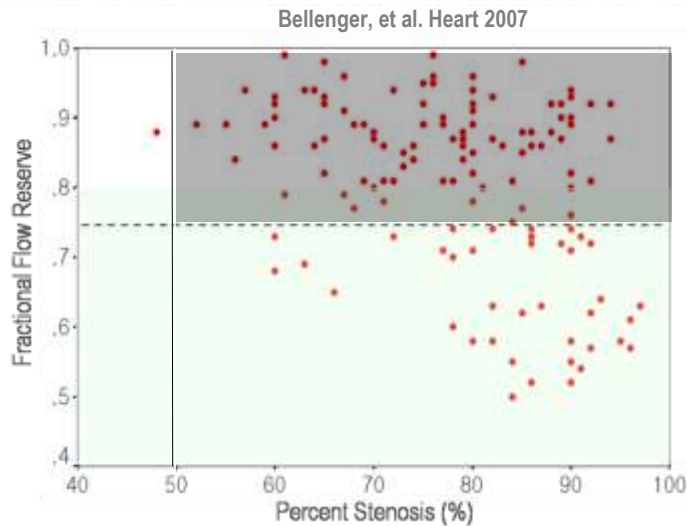
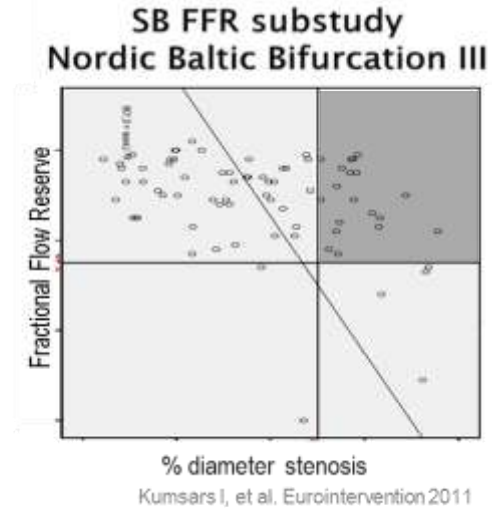
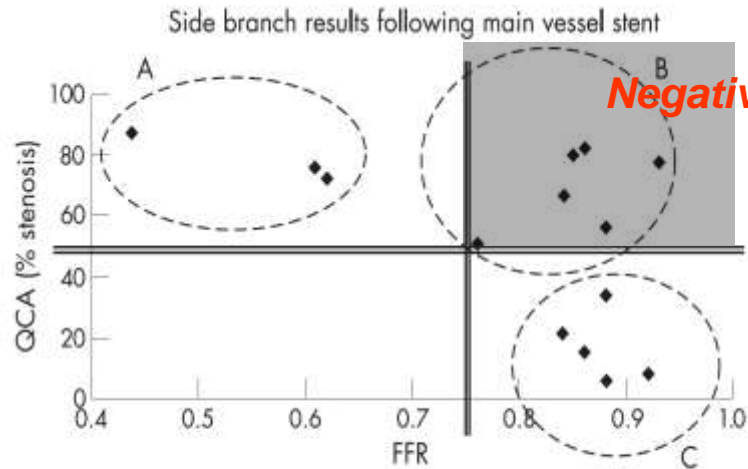
Morphology

Mechanism of Jailing Side Branch



Side Branch FFR

Function Is Usually Good!

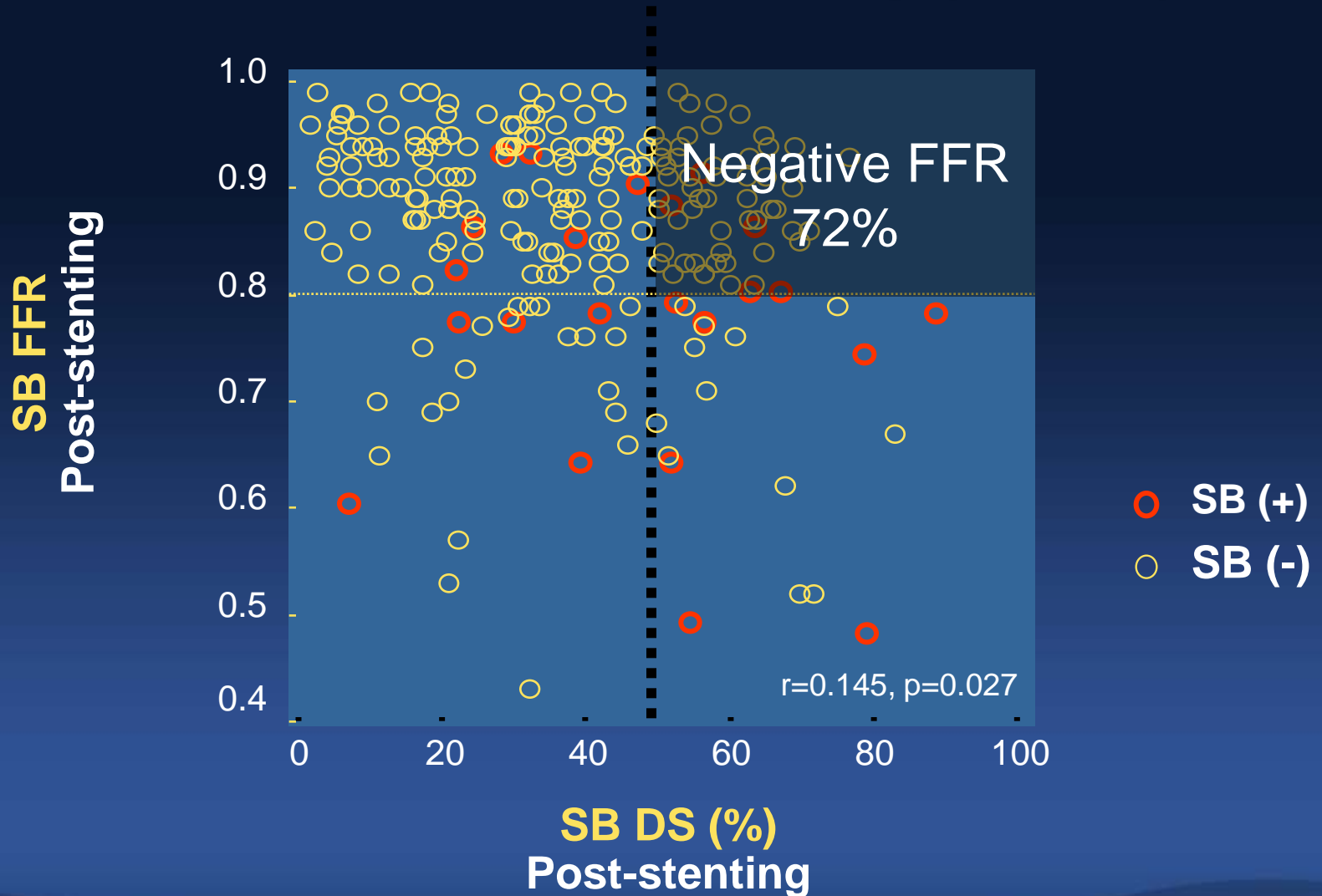


Park SH & Koo BK J Geriatr Cardiol 2012

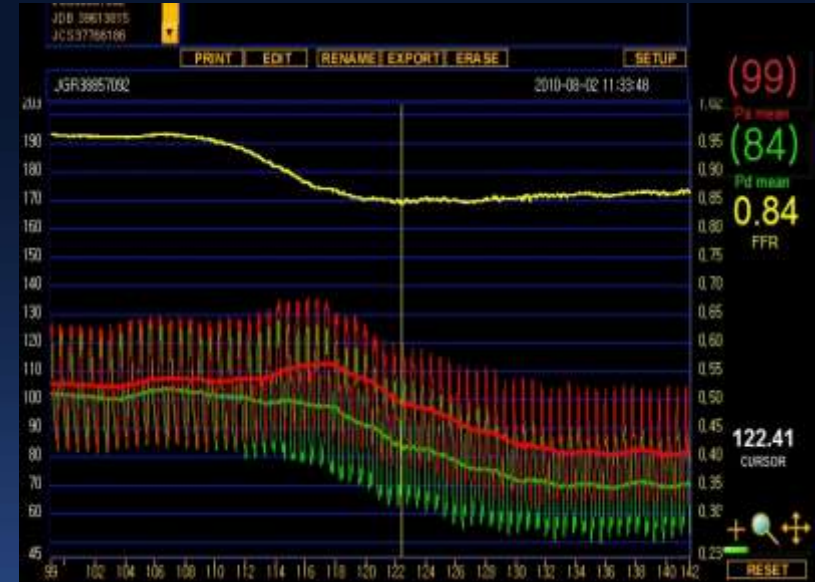
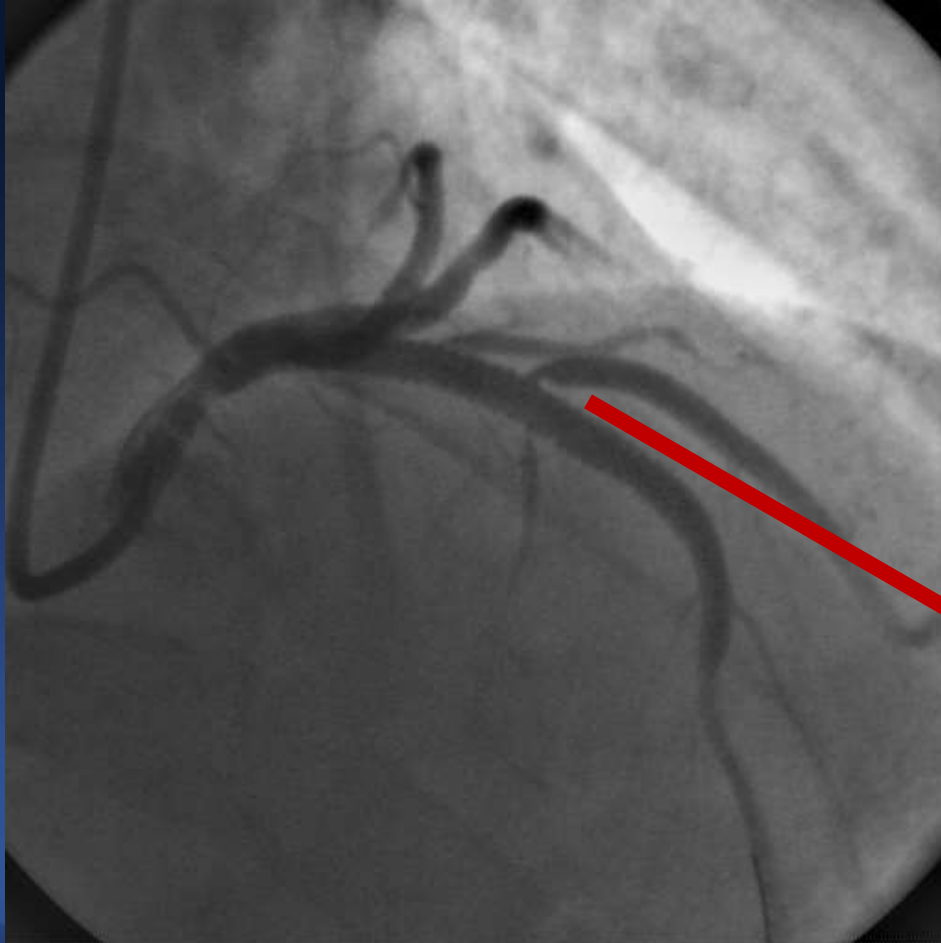
Ahn JM, et al. JACC interv 2012

Side Branch FFR

After Main Vessel Stenting (n=232)



To Treat or **Not To Treat ?** *Jailing Side Branch*



FFR 0.84

To Treat, *Why* ?

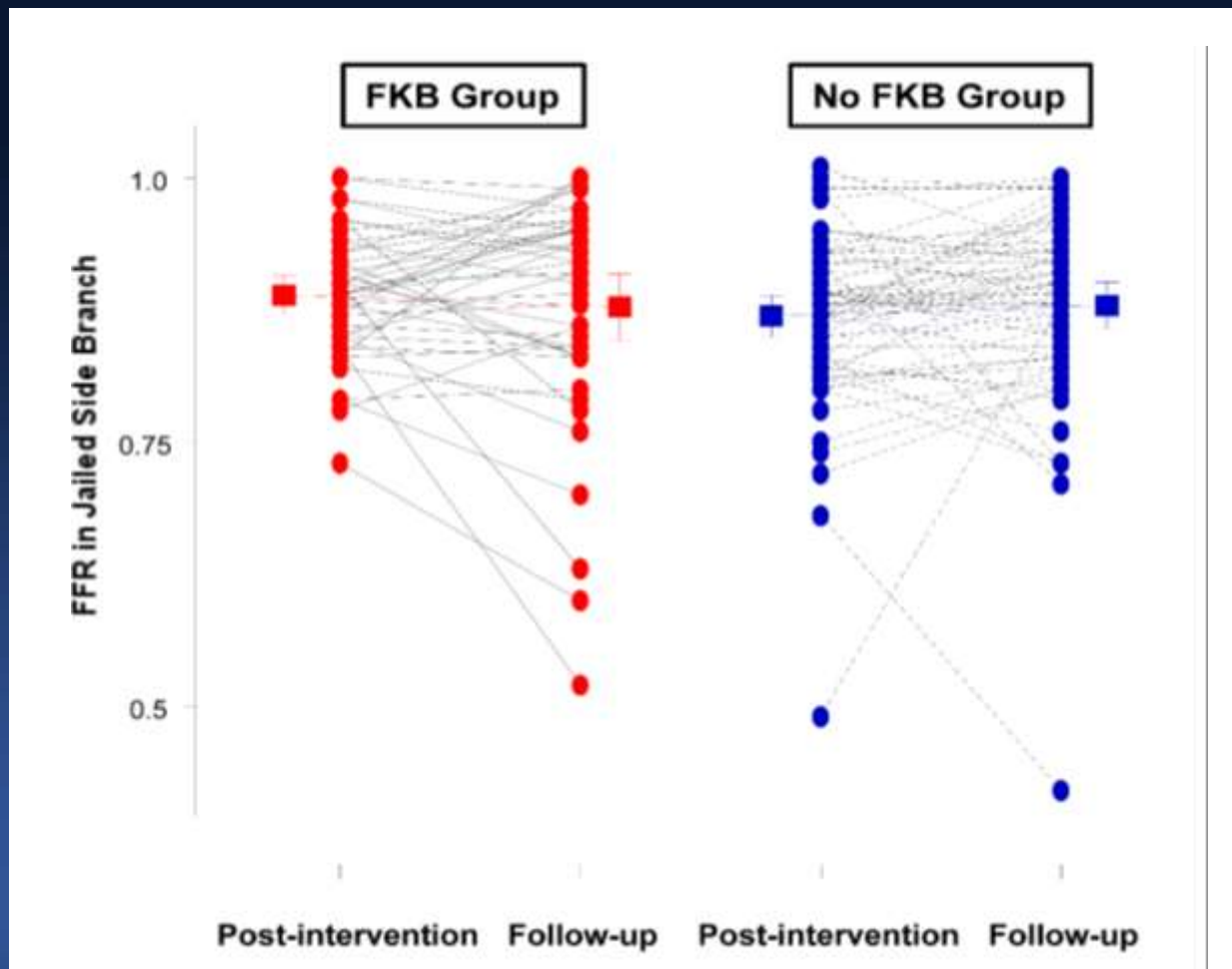
1. Still Visually Tight Stenosis ?
FFR Non-believer,
2. Subjective Symptoms ?
Negative FFR is Usually Asymptomatic,
3. Big Vessel, Large Jeopardy Myocardium ?
But, No Ischemia,

Not to Treat, Why ?

1. FFR believer, Negative FFR means *Excellent Prognosis (0.6%/year, Cardiac Death and MI)*, even in the presence of any angiographically proven disease.
2. Small Ischemic Myocardium.
3. Routine Kissing Balloon Inflation Is Not Always Good !

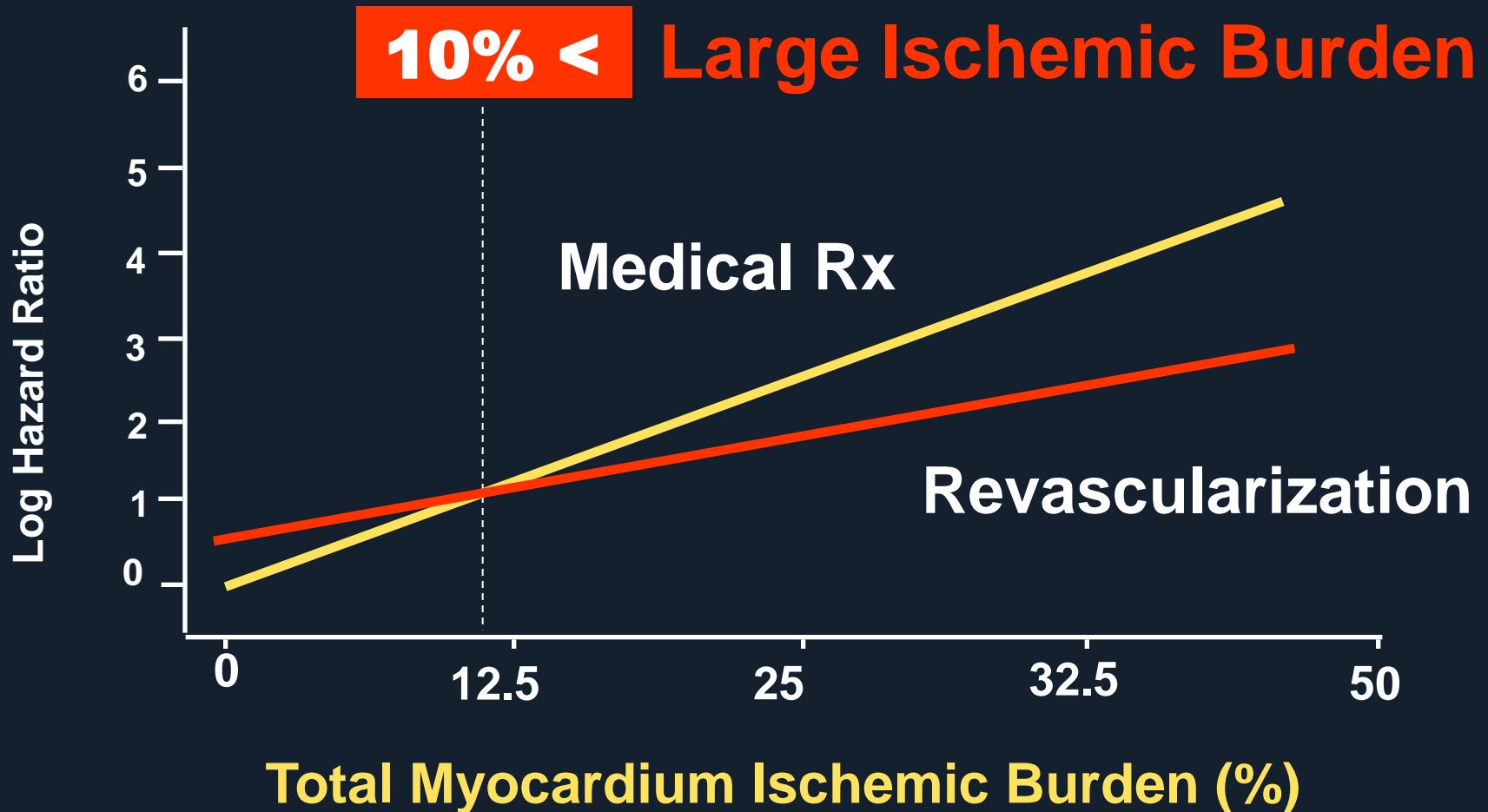
Serial Side Branch FFR

Kissing Balloon Inflation Can Not Make An Any Difference!

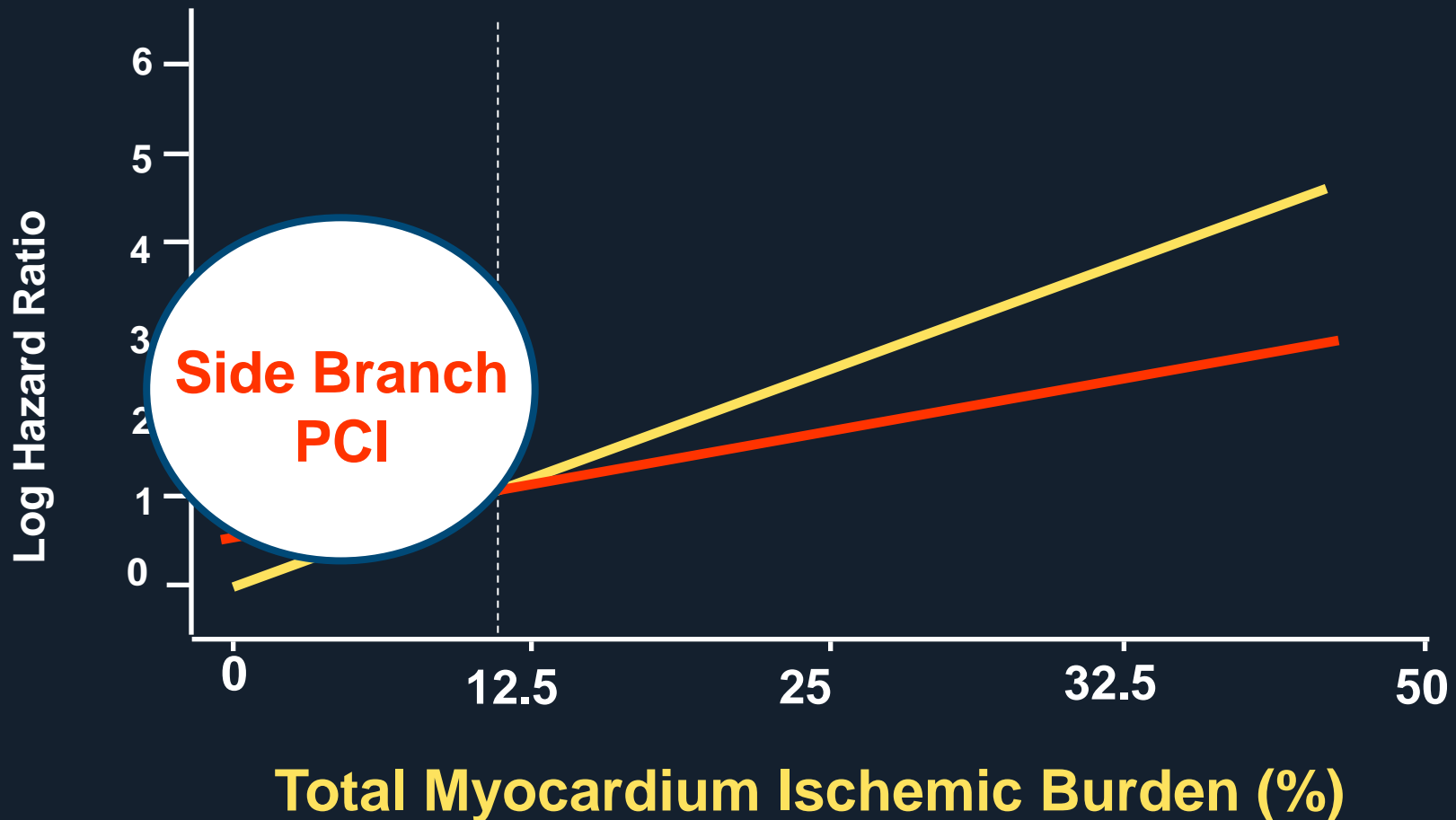


SNUH registry and Nordic-Baltic bifurcation study
Lee JM, Koo BK, et al. Eurointervention 2015

Survival Benefit of Revascularization



No Survival Benefit of Side Branch PCI



Non-LM Bifurcation PCI

**Provisional Stenting
Is Always Enough**

Any 2 Stent Technique

- Jailing Side Branch ?
- How to Treat ?

It Would Be OK !

Sequential High Pressure Inflation on Both Branches,
and Finally Kissing Balloon Inflation !

LM Bifurcation PCI

How To Do ?

1. Single stent cross over
2. Planned two stent technique for large left circumflex artery

When ?

2 Stent Technique

**Provisional
Stenting
(>70%)**

Normal LCX (Medina 1.1.0., 1.0.0)

Normal or Diminutive LCX

Small LCX with < 2.5 mm in diameter

Focal disease in distal LCX

***2 Stent
Technique***

Diseased LCX (Medina 1.1.1., 1.0.1)

Large LCX with \geq 2.5 mm in diameter

Diseased left dominant coronary system

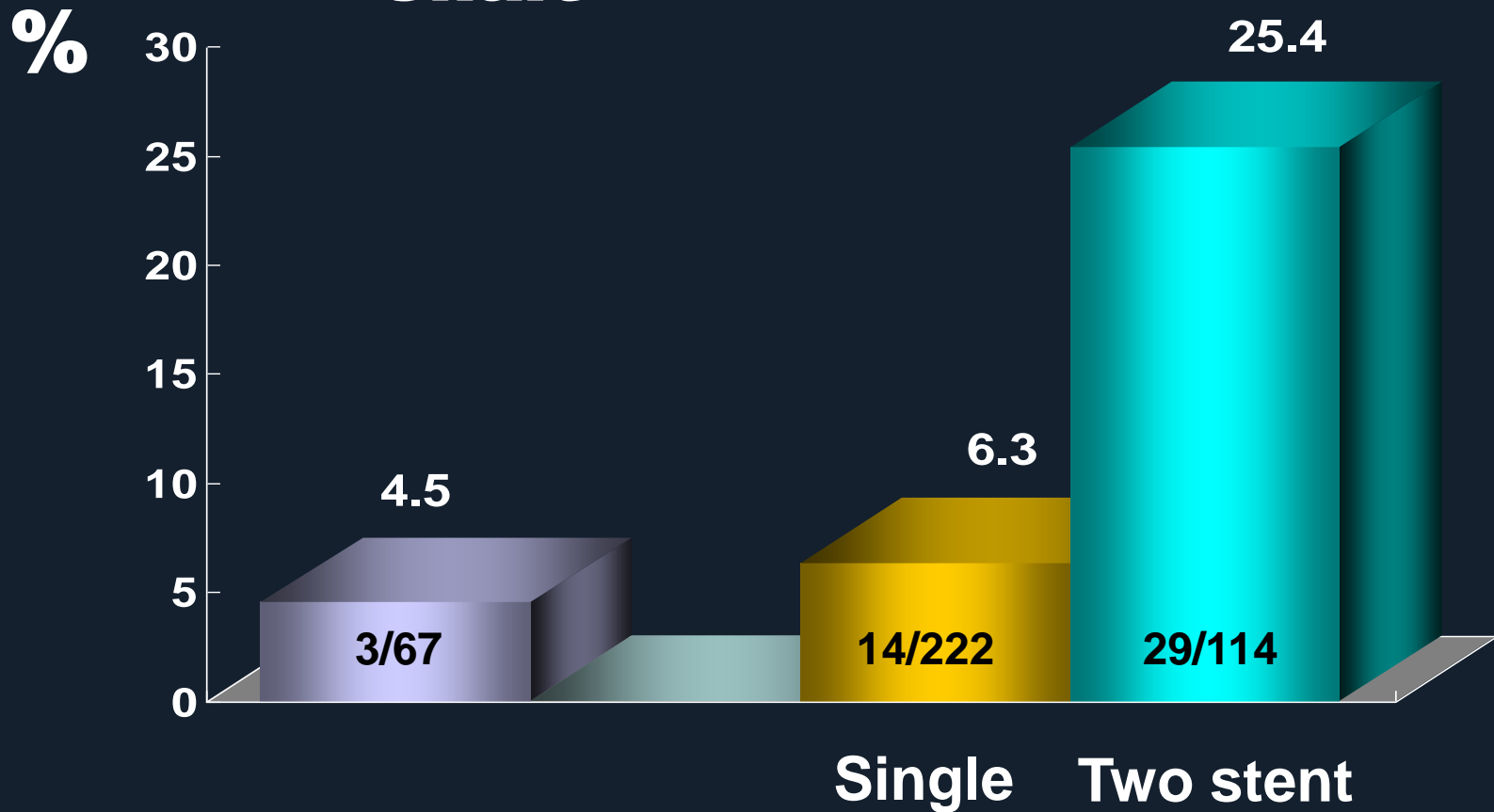
Concomitant diffuse disease in distal LCX

Restenosis at 2 year

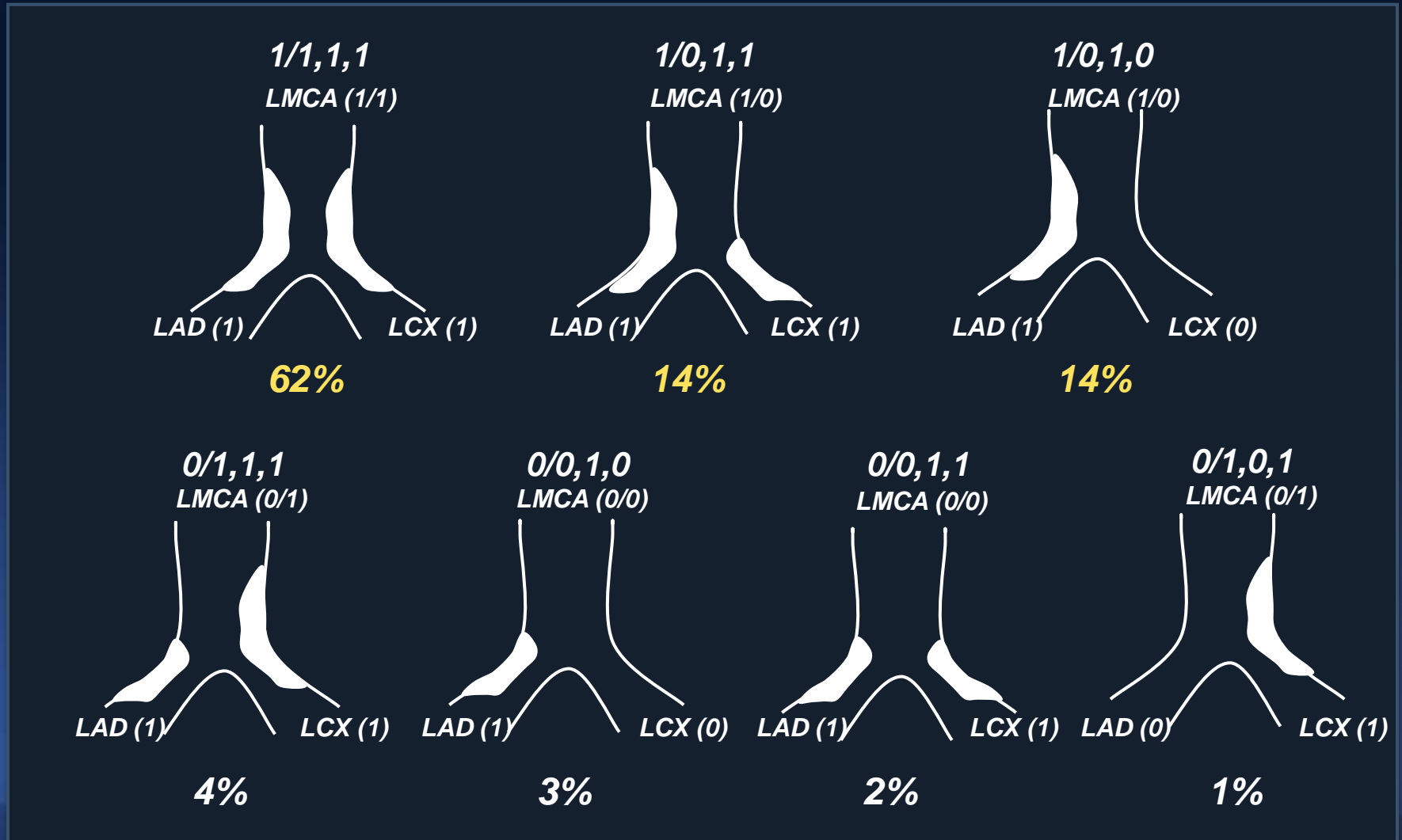
LM PCI Using SES (n=423)

Ostial and Shaft

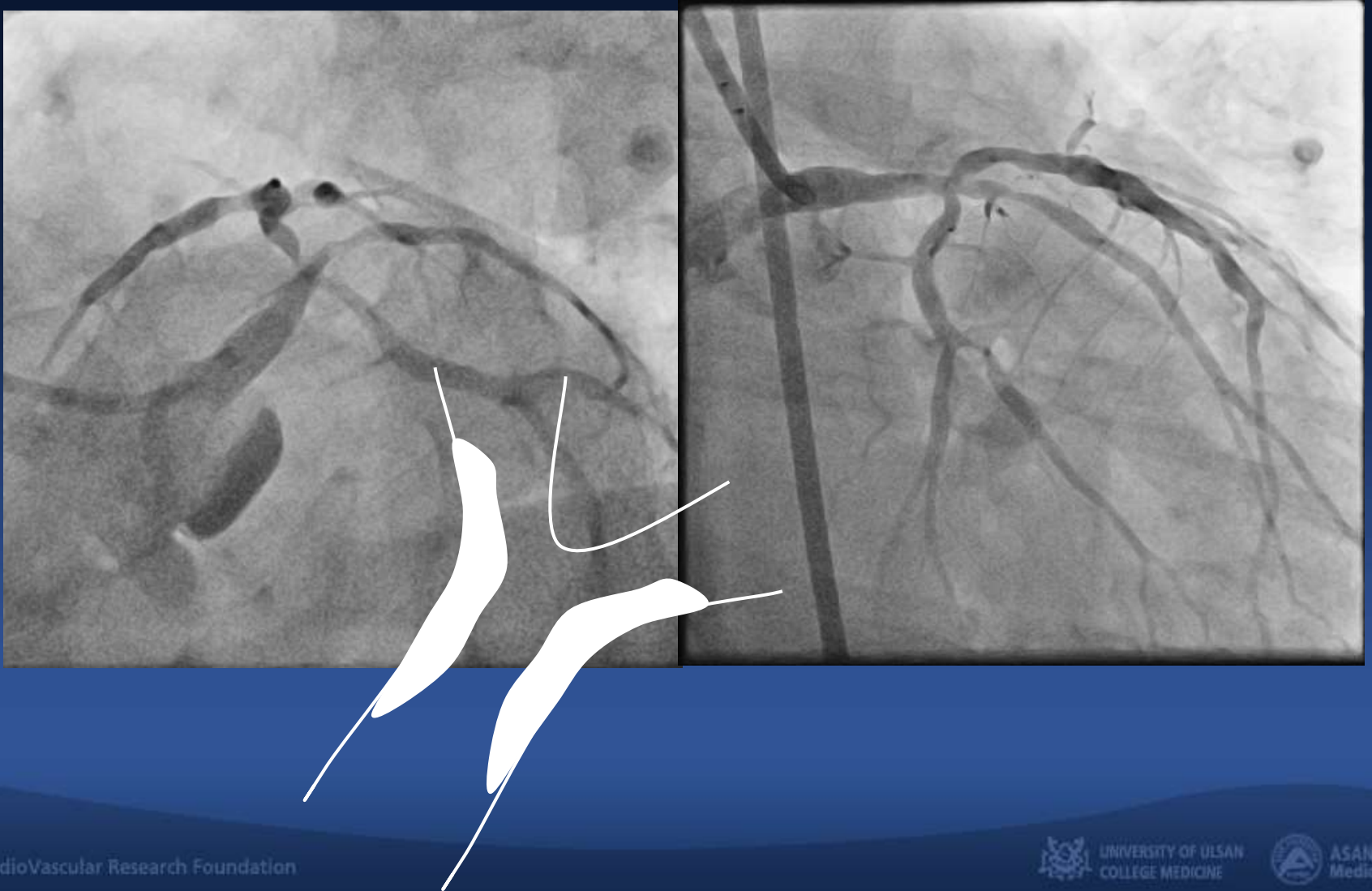
Bifurcation PCI



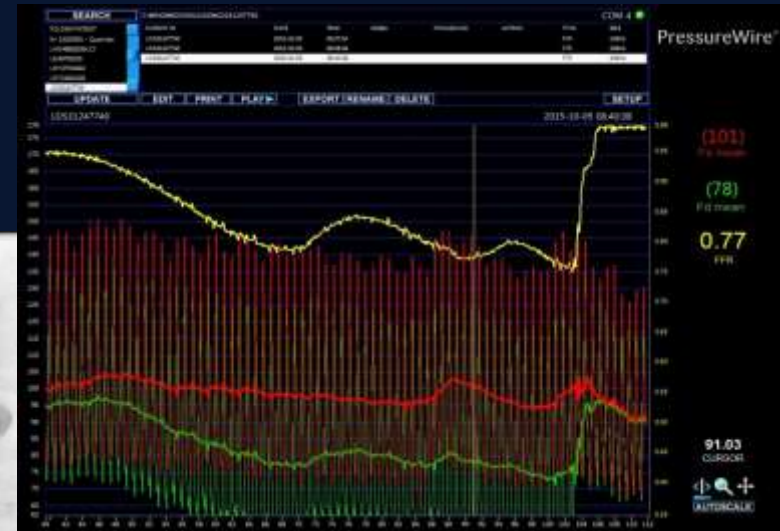
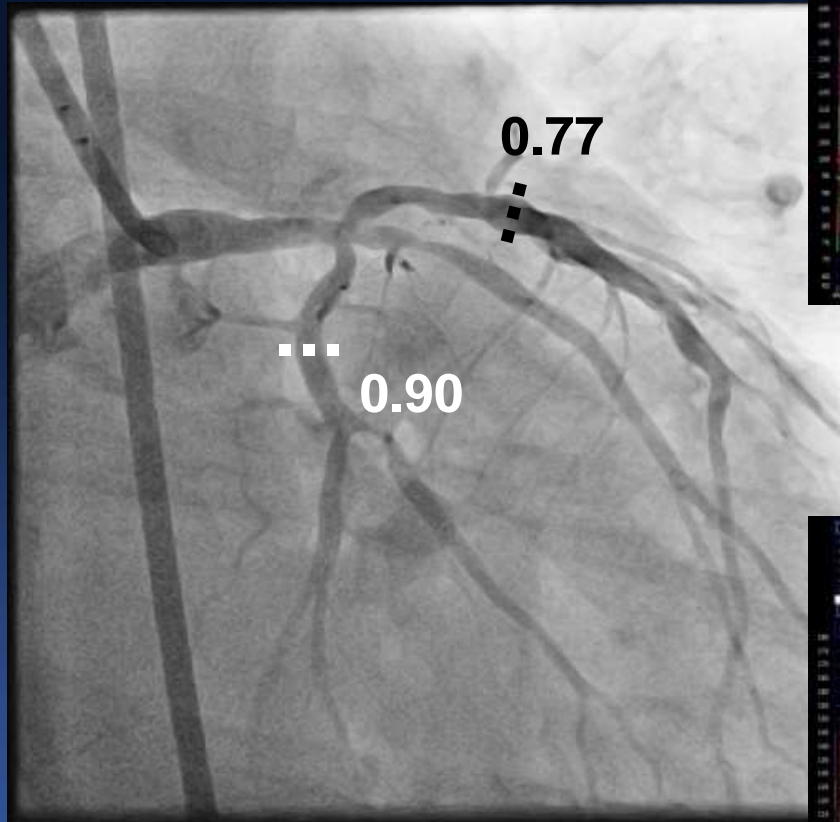
In 90% of LM Bifurcation Disease, Plaque Extends from LMCA to LAD



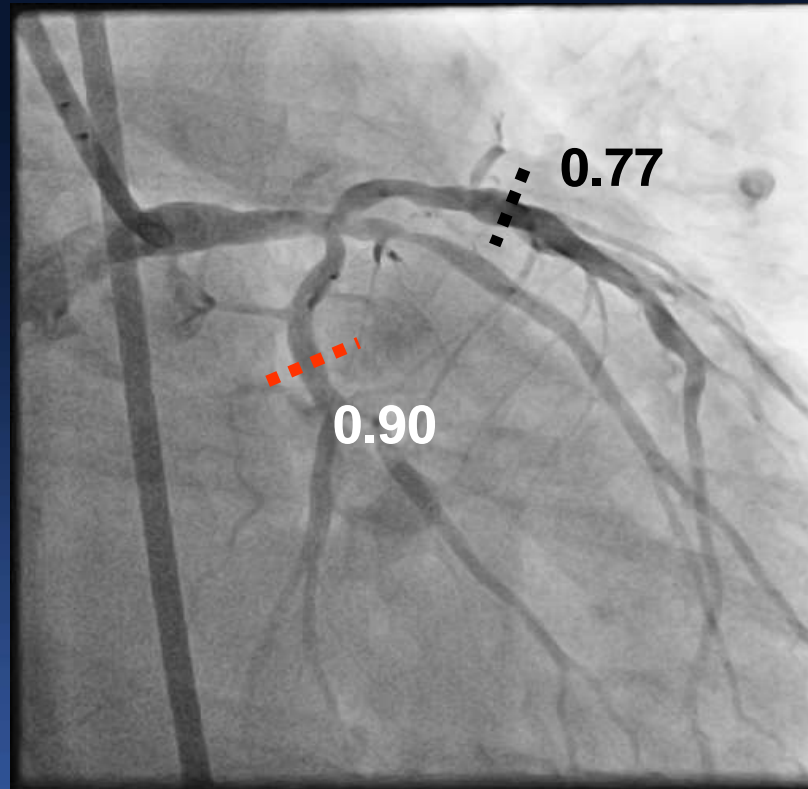
Case 1, 55/M, Effort Chest Pain



FFR in Both LAD and LCX,



1 or 2 Stent ?

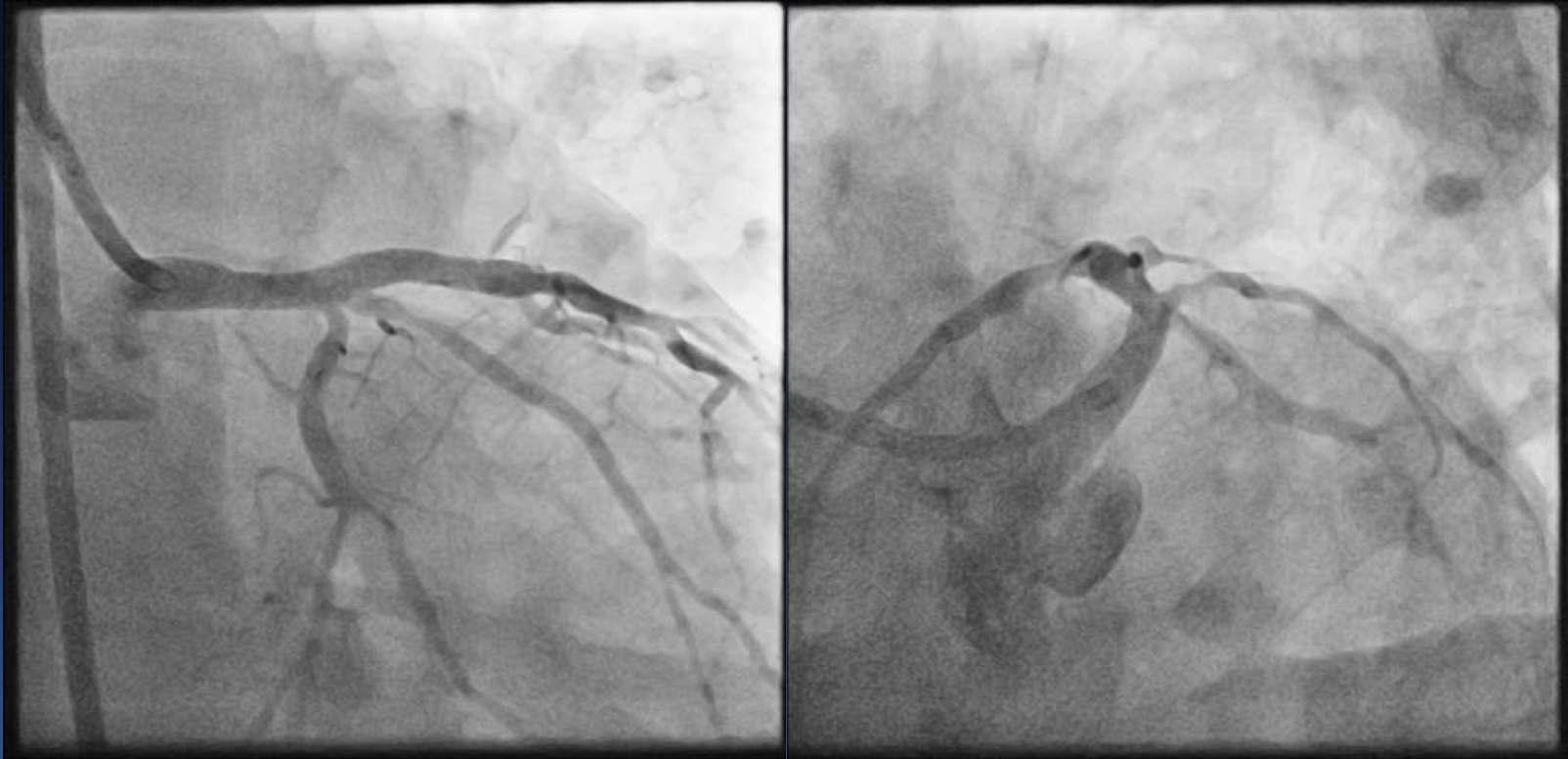


Single Stent Crossover

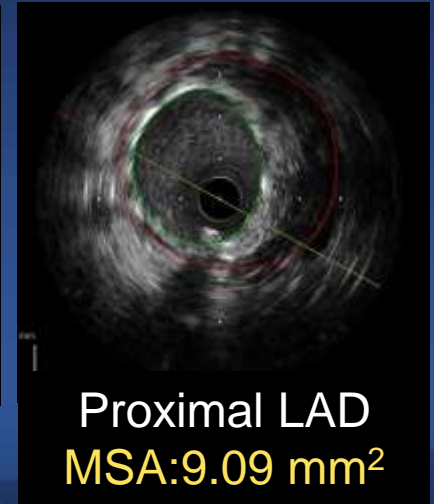
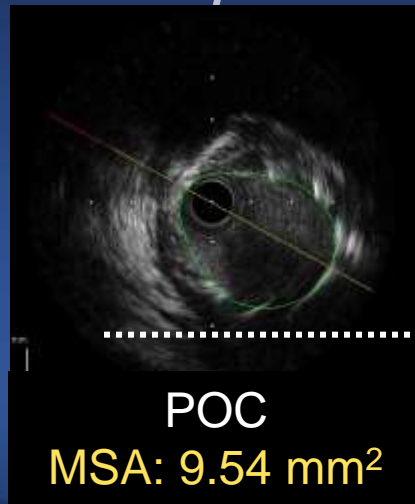
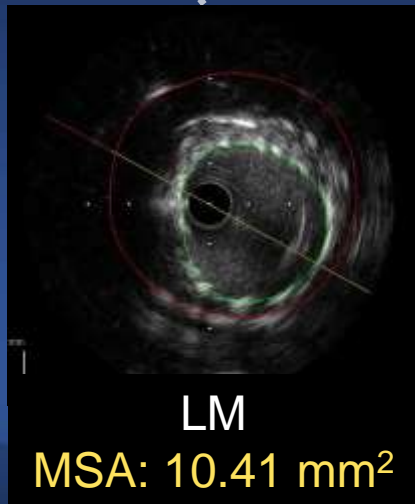


XIENCE Alpine
4.0mm x 30mm

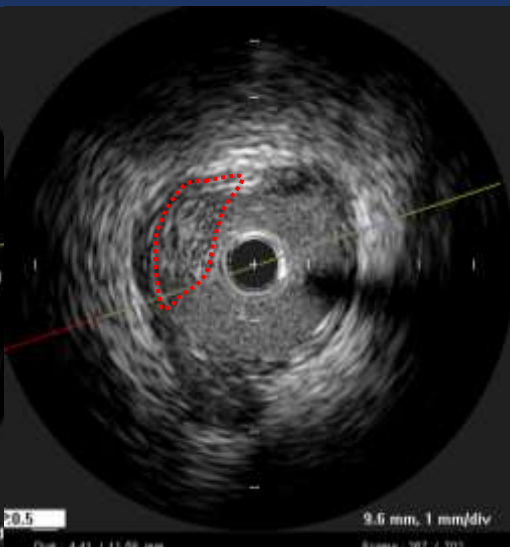
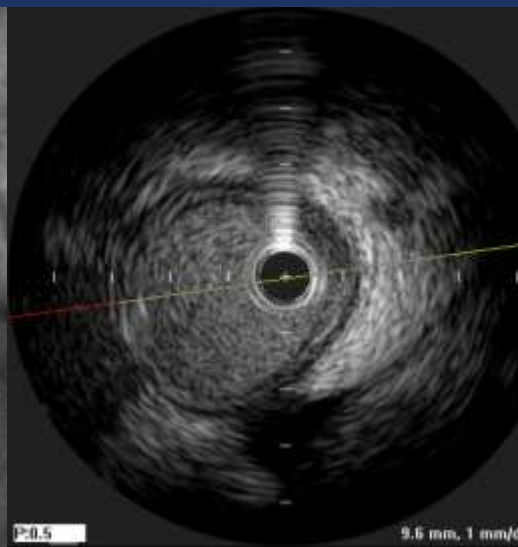
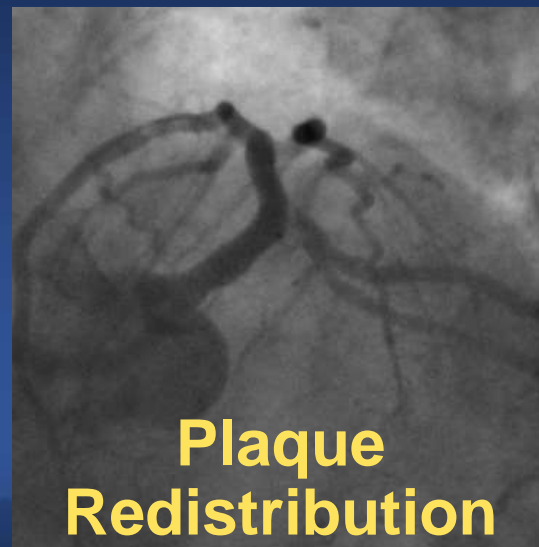
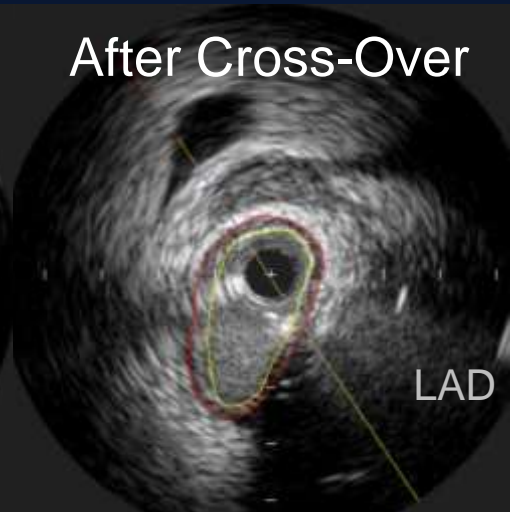
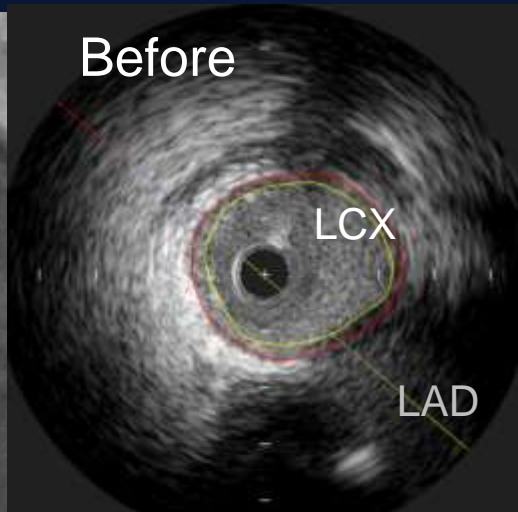
Final Angiogram



Post-PCI IVUS

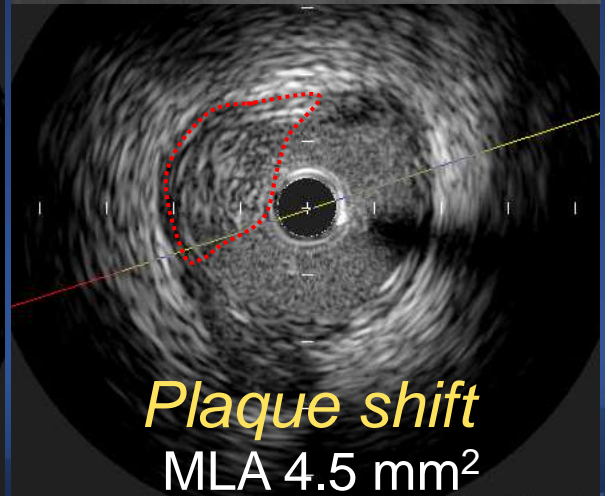
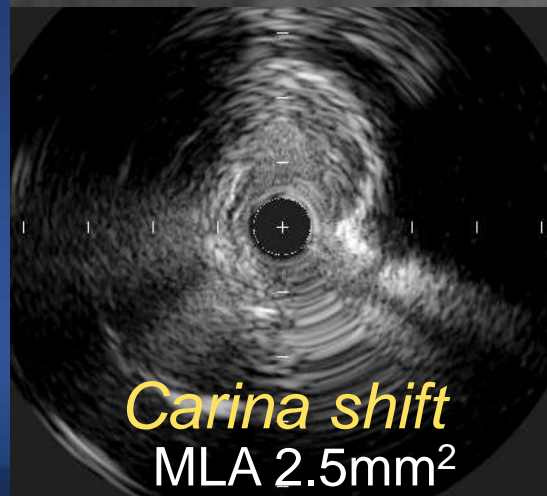
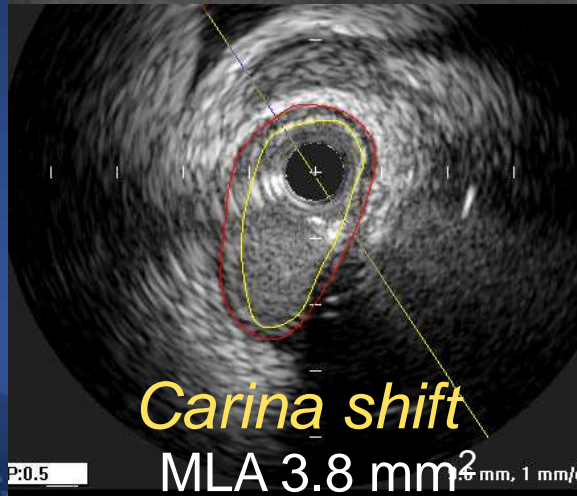
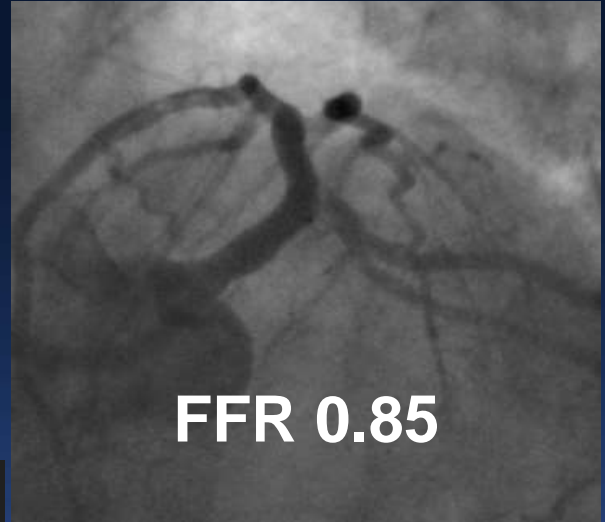
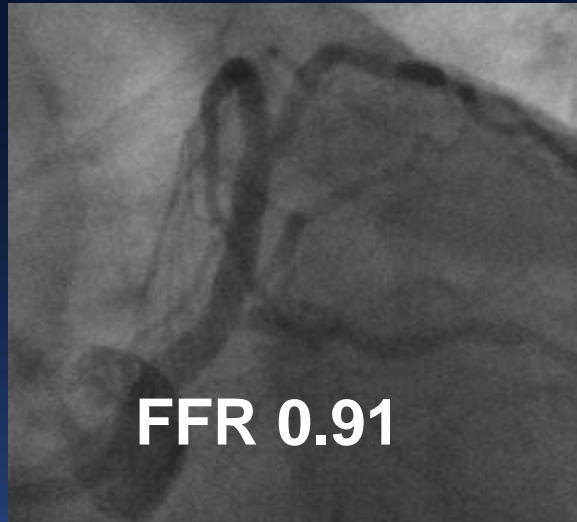


Mechanism of LCX Jailing After Stent Cross-Over

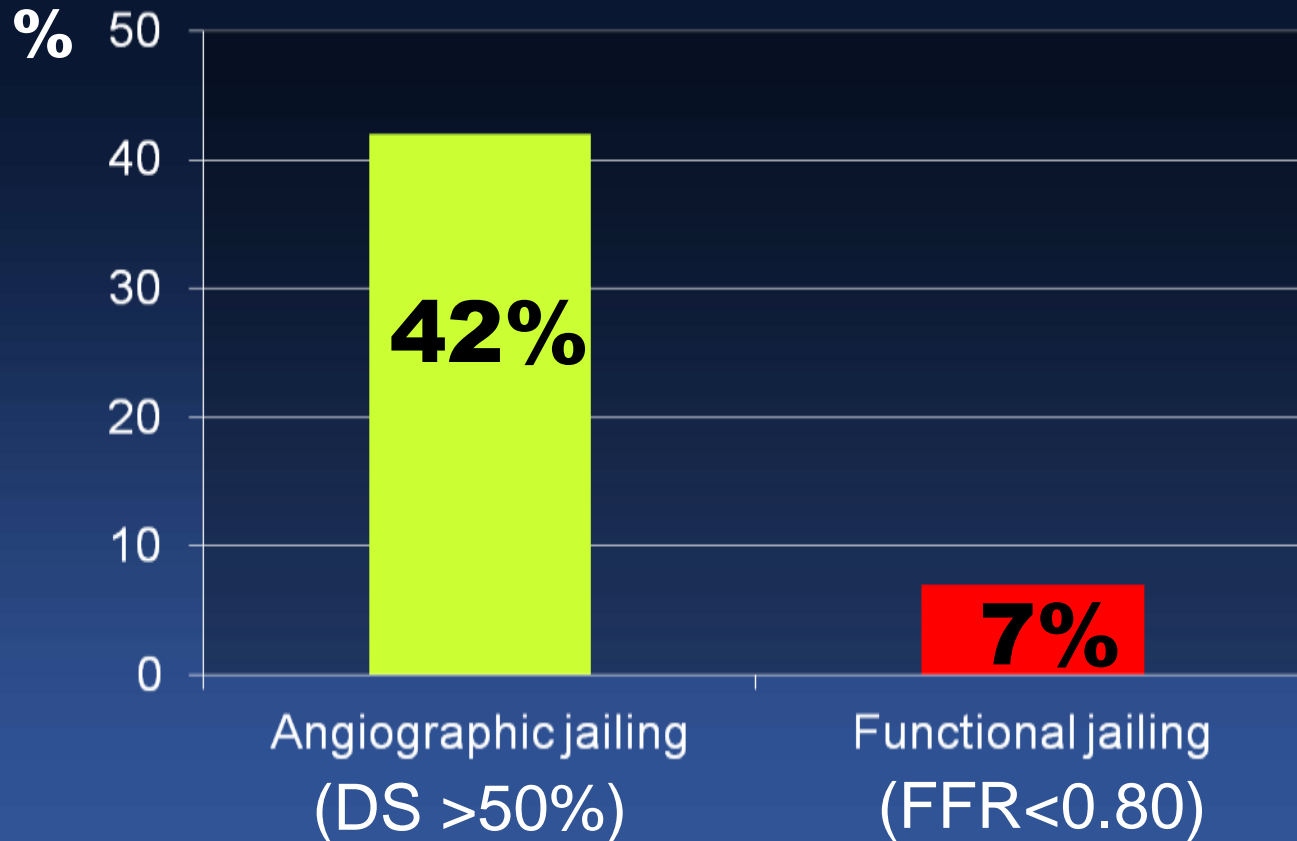


Any Jailing Morphology Cannot Predict Functional Significance of Jailed LCX

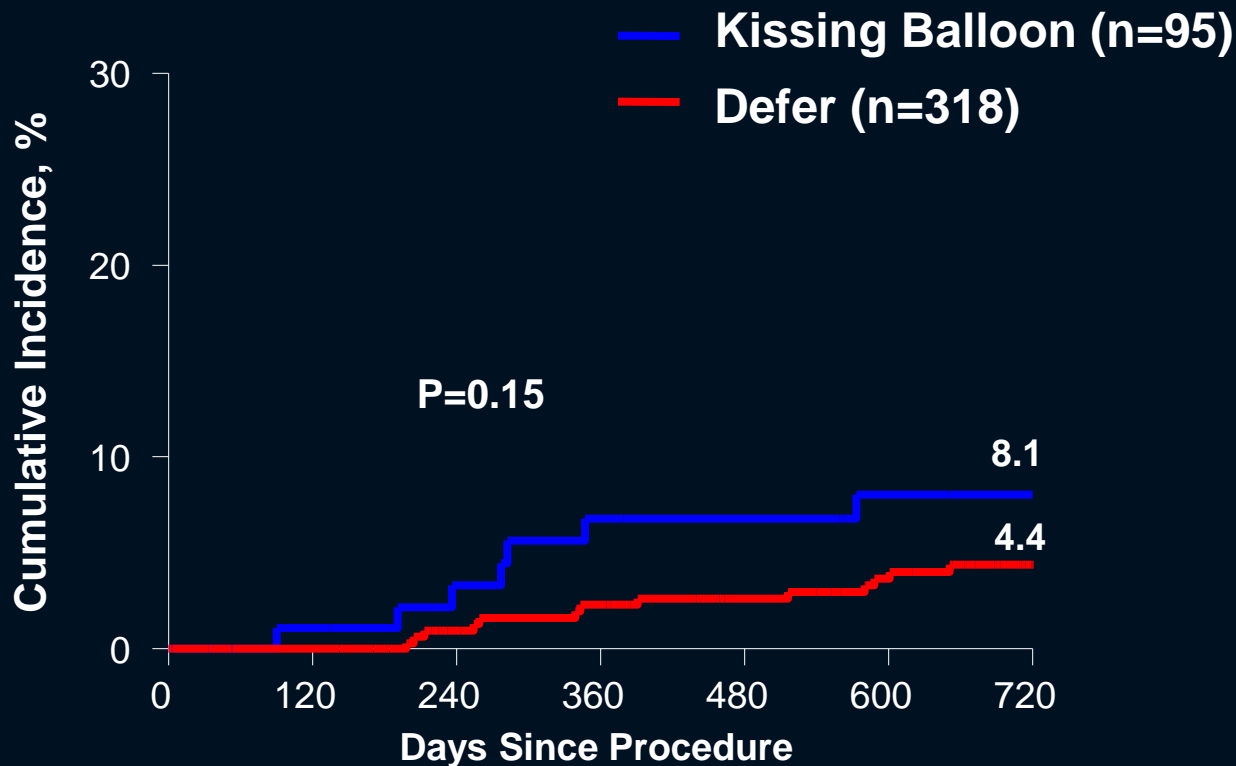
After Stent Cross-Over



Functionally Significant LCX Jailing After Stent Crossover



Left Main-TLR at 2 Years

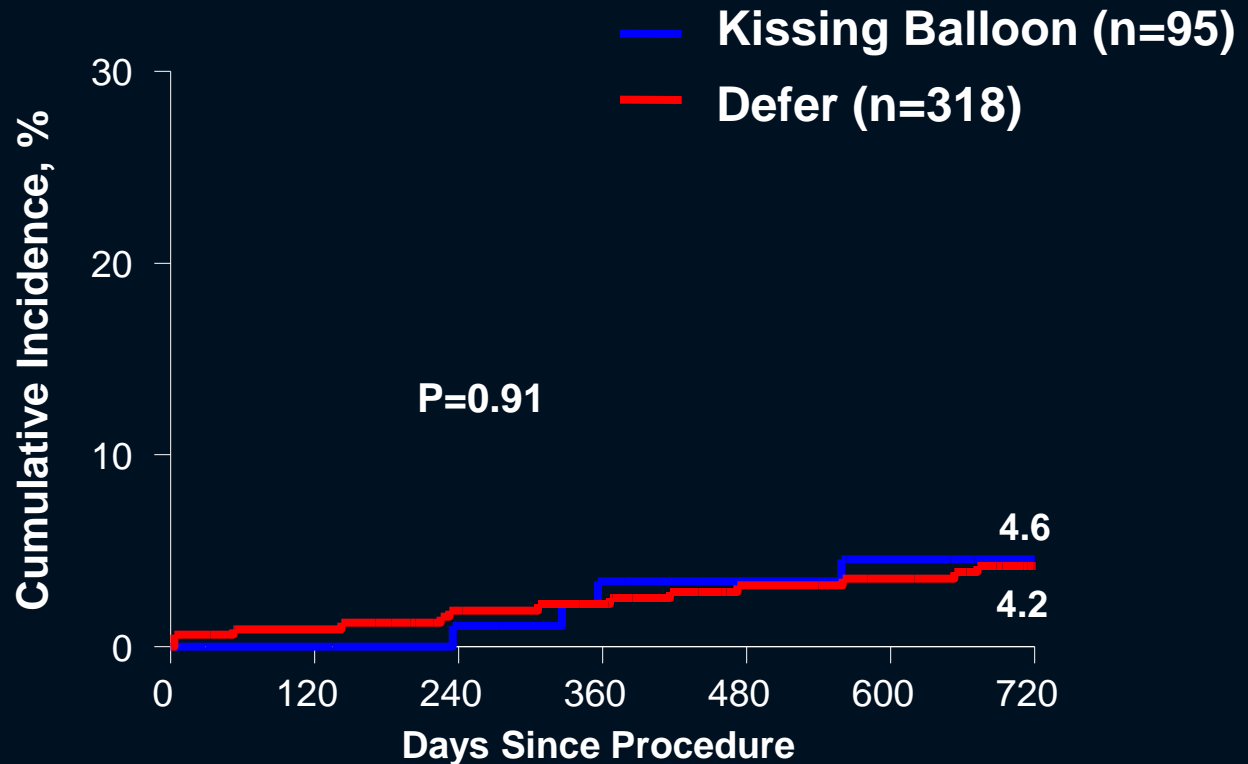


No. at Risk

FKB	95	79	74
No-FKB	318	293	265

Death or MI at 2 Years

LCX Jailing Defer Is Safe and Good !



No. at Risk

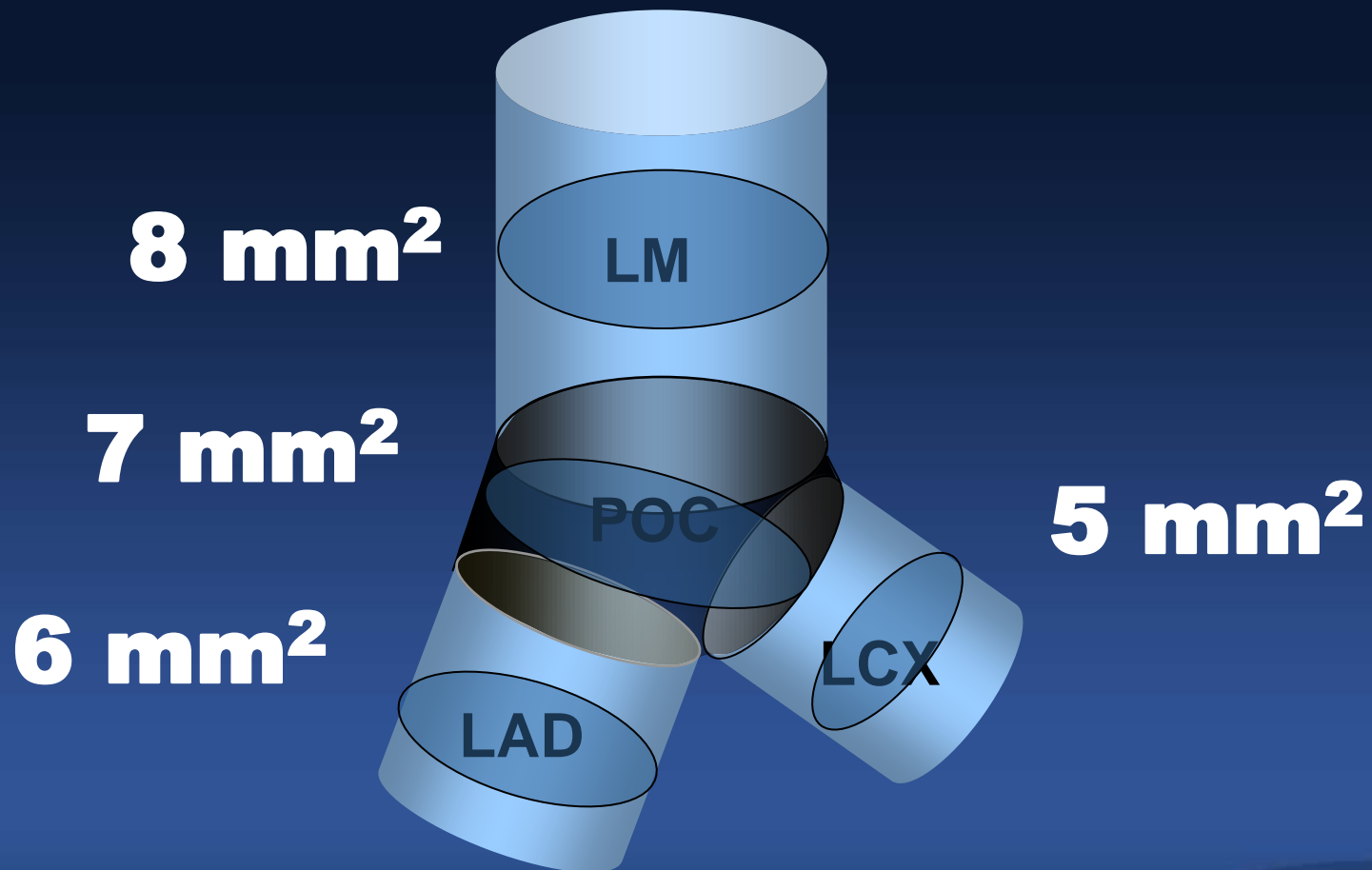
FKB	95	85	80
No-FKB	318	300	278

Any 2 Stent Techniques

- T-stent, modified T-stent or TAP
- Mini-crush (or step crush), DKCRUSH
- Culotte
- V-stent
- Y-stent (SKS-simultaneous kissing stents)

Effective Stent Area (Rule of 5,6,7,8 mm²)

*Can Make a Good Clinical Outcomes,
Restenosis Rate < 5% and TLR < 2%*



LM Bifurcation PCI

Single Stent

Any 2 Stent

**After
Stent Cross-Over**

How to Optimize ?

- Do You Want to Treat the Jailed Side Branch ?
- How to Treat ?

IVUS Minimal Stent CSA Criteria 5-6-7-8 mm²
May Improve Long-term Clinical Outcomes.

What Really Matters in Bifurcation PCI ?

Either Provisional Stenting or Any Planned 2 stent Technique Would Be OK in the Era of DES, Depending On Jeopardy Myocardium Supplied by Side Branch and Patient's Symptoms.

It's a Matter of Concept rather than Technique !