

FFR-guided Optimization of Bifurcation PCI

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CASE

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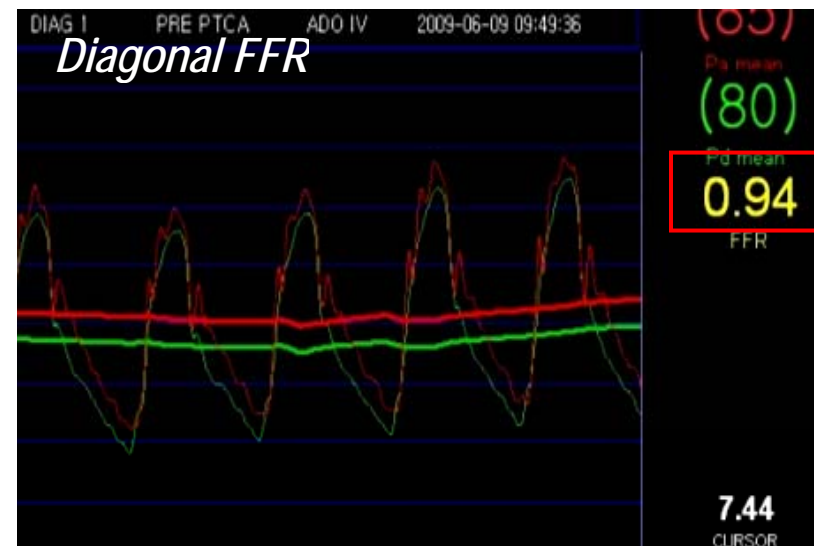
Asymptomatic, Risk assessment for planned vascular surgery



Pitfalls of anatomical evaluation

- Angiography
 - Single directional assessment
 - Variability in stenosis assessment
 - No validated criteria for side branch intervention
 - Not physiologic
- IVUS/OCT
 - Can not be performed in tight stenosis (ex. jailed SB)
 - No validated criteria for side branch intervention
 - Not physiologic

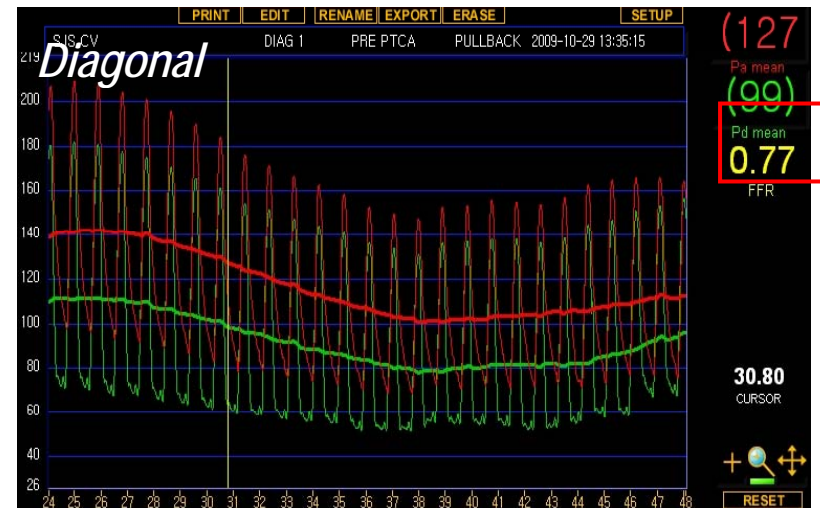
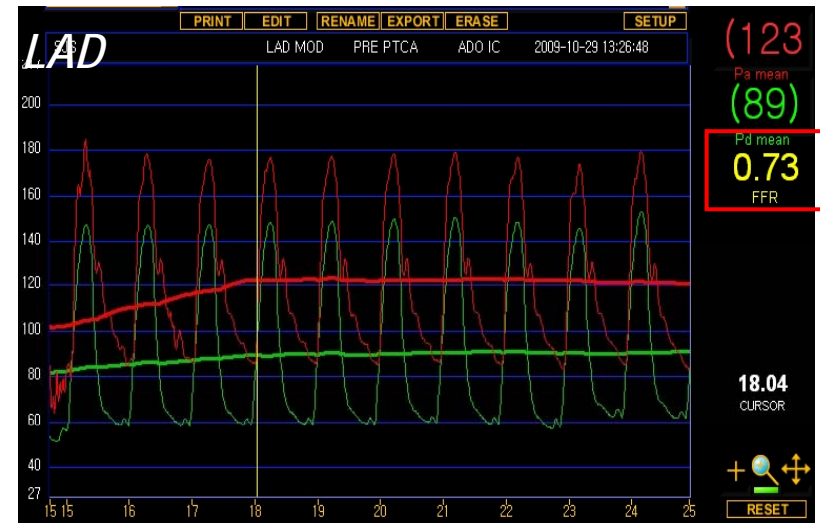
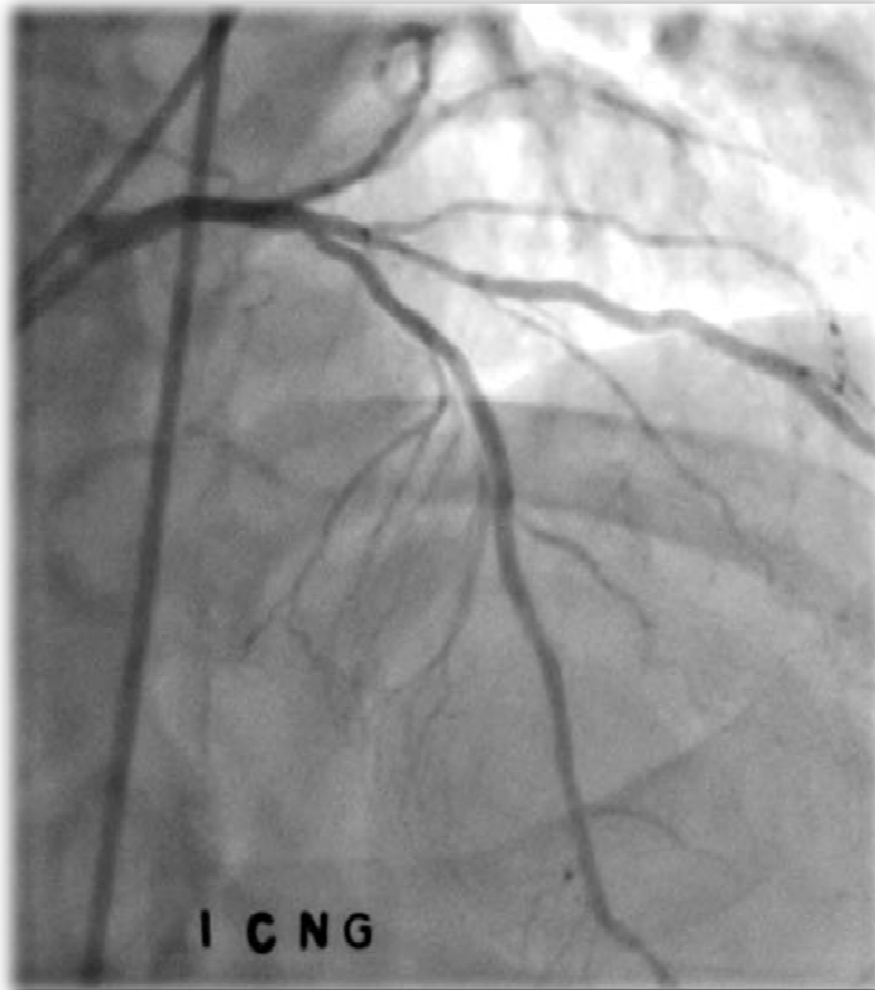
Bifurcation lesion?



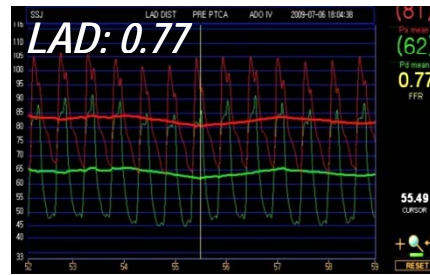
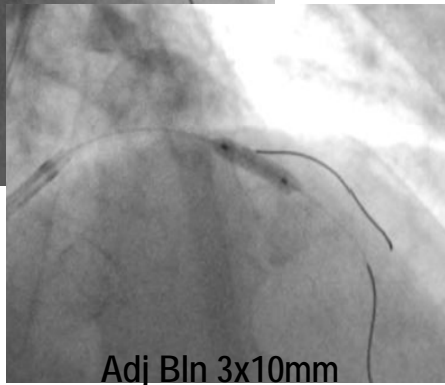
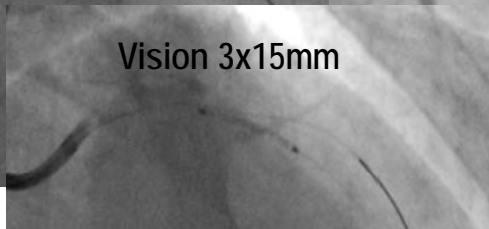
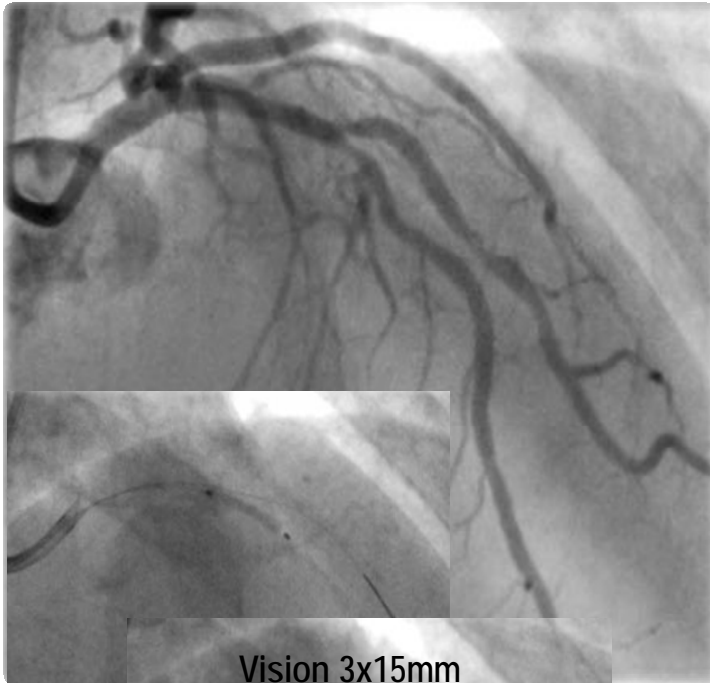
Bifurcation lesion?

CT angiography: 1VD (RCA)

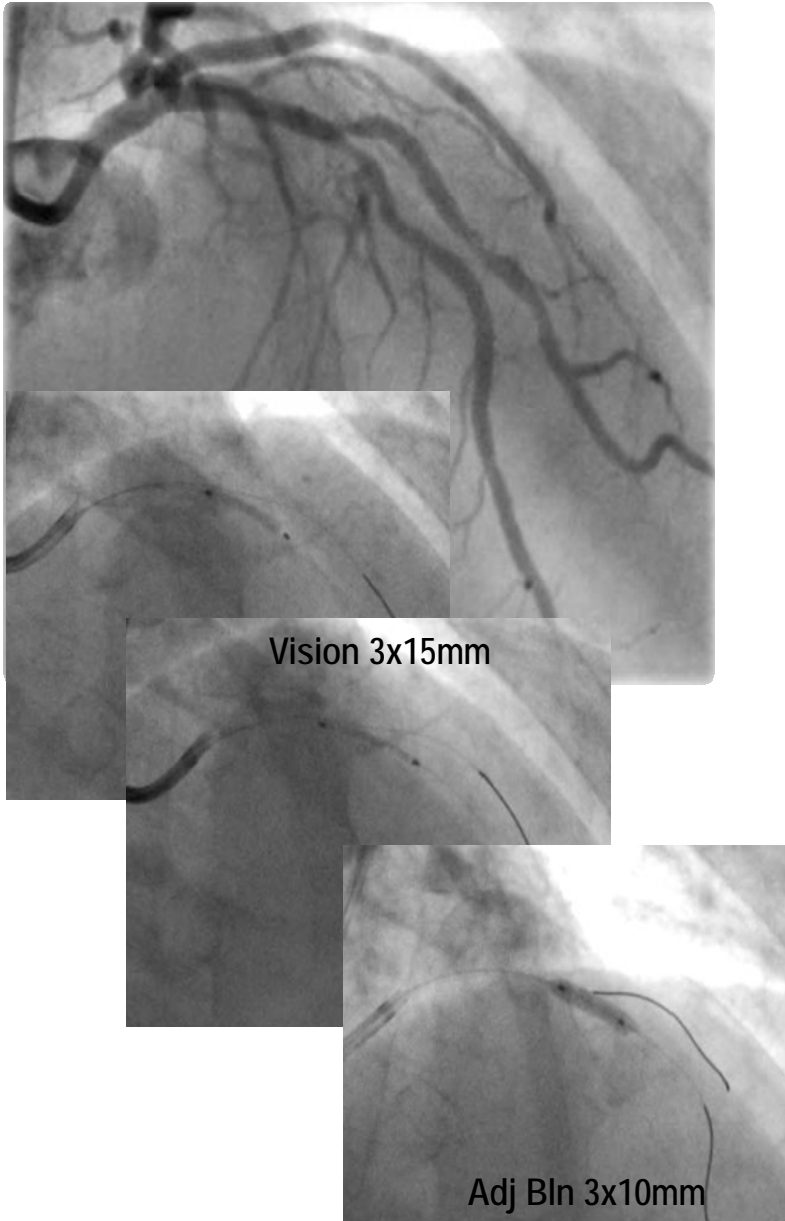
Coronary angiography: 1VD (RCA)



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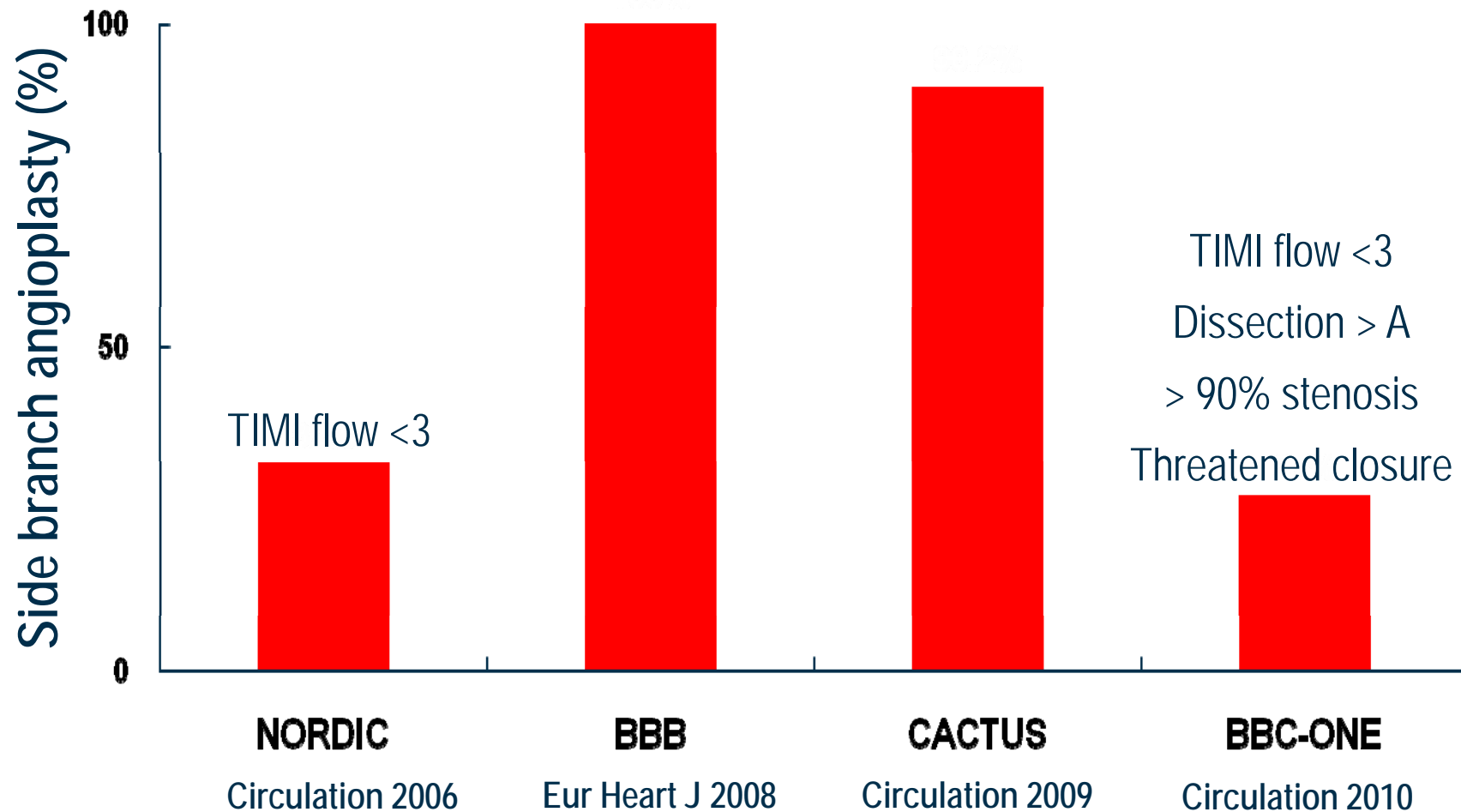
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Side branch angioplasty?

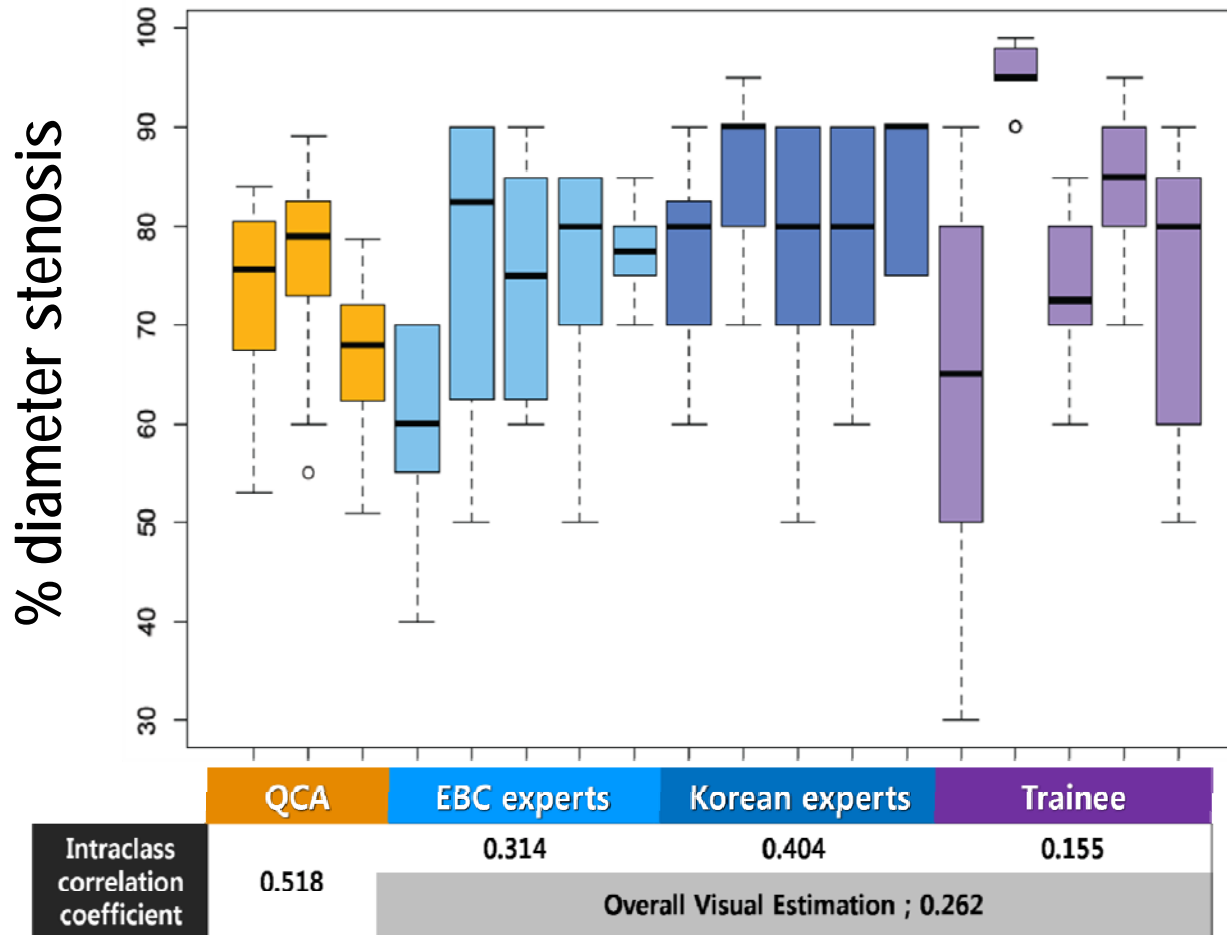
Do we have valid criteria for SB intervention?

Different criteria from different studies.....



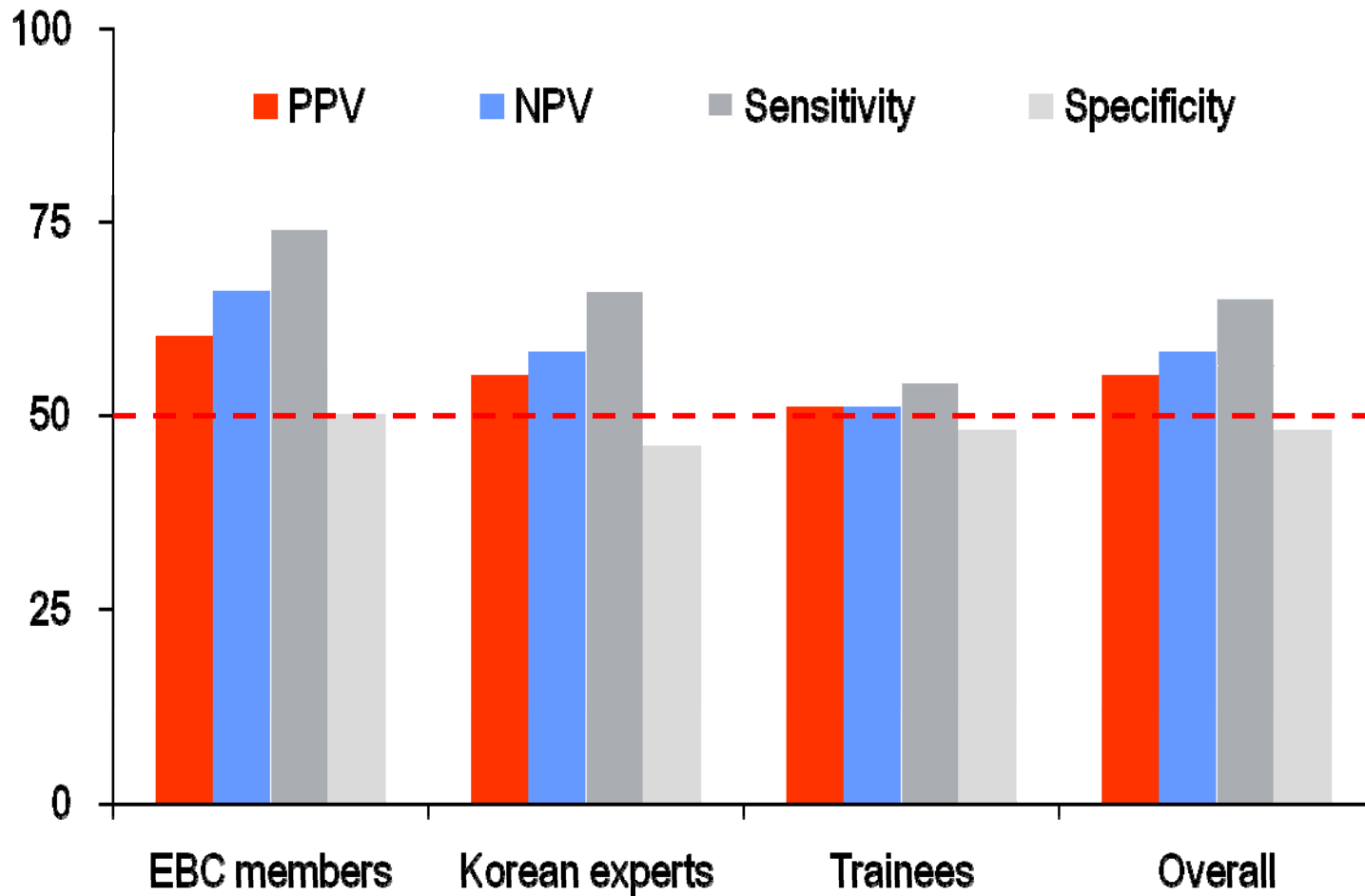
How accurate is our assessment?

Variability of QCA and visual estimation in 20 jailed SB lesions



How accurate is our assessment?

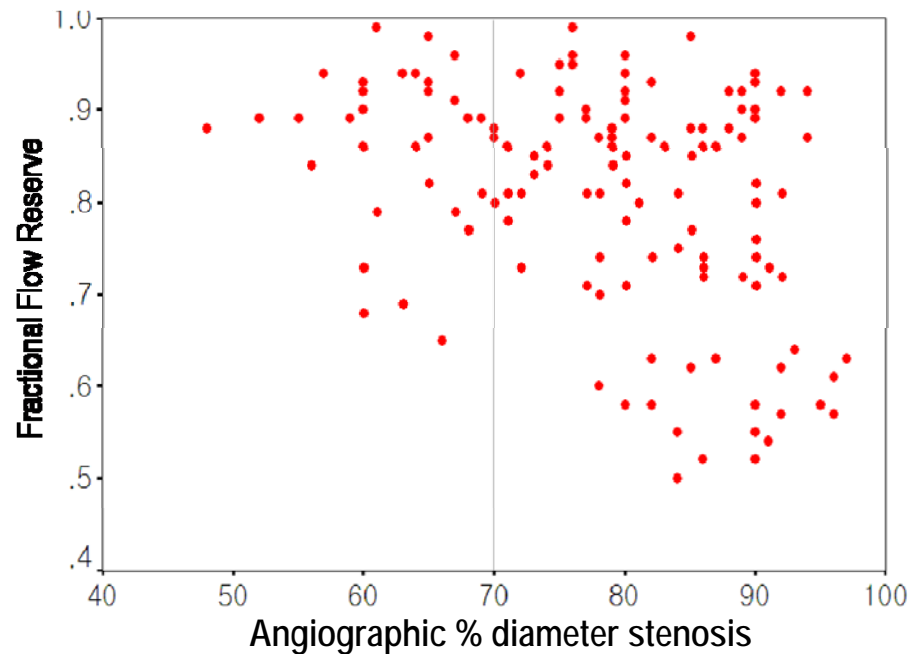
Estimation of “functional significance” in 20 jailed SB lesions



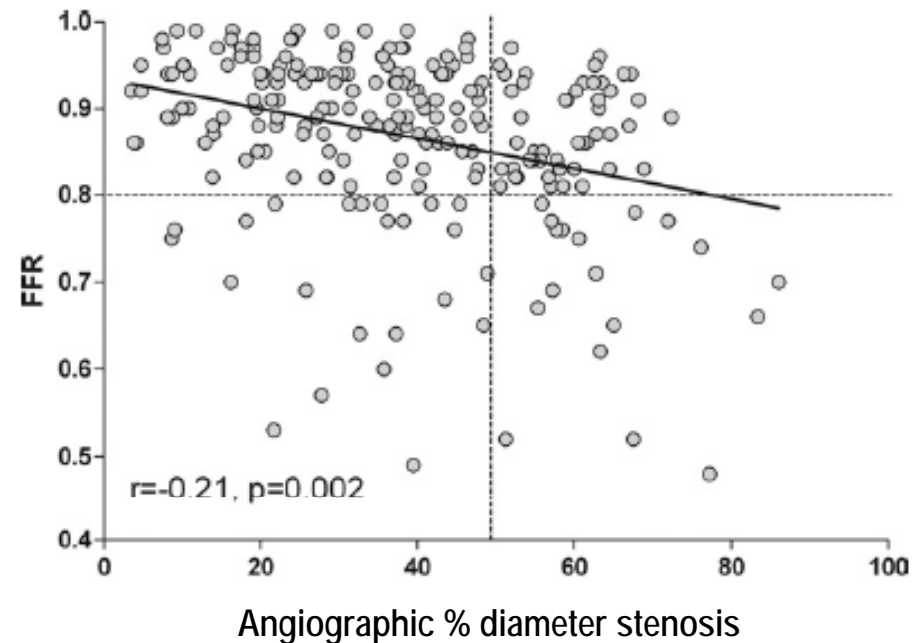
Does anatomical stenosis of a side branch ostium matter?

Angiographic inaccuracy to predict the presence of myocardial ischemia

FFR vs. % diameter stenosis in jailed side branches



Koo BK, et al JACC 2005, EHJ 2008, Circulation CVI 2010



Ahn JM, et al. JACC intv 2012

Why discrepancy between anatomy and physiology?

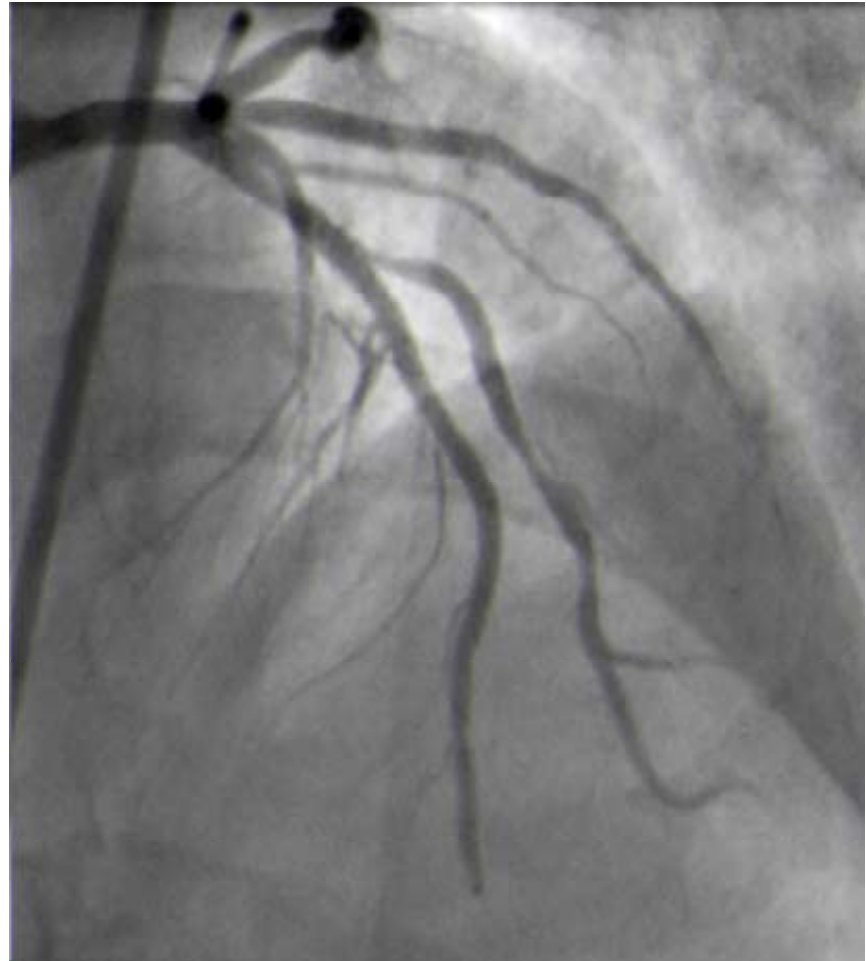
- Various size, various amount of supplying myocardium
- Side branch ostial lesion is **unique**
 - Underlying plaque → **Eccentric plaque**
 - Remodeling → **Negative remodeling**
 - Mechanisms of luminal narrowing
 - **Carina shift, plaque shift, stent struts, thrombus.....**

Koo BK. et al, *Circulation Intv* 2010

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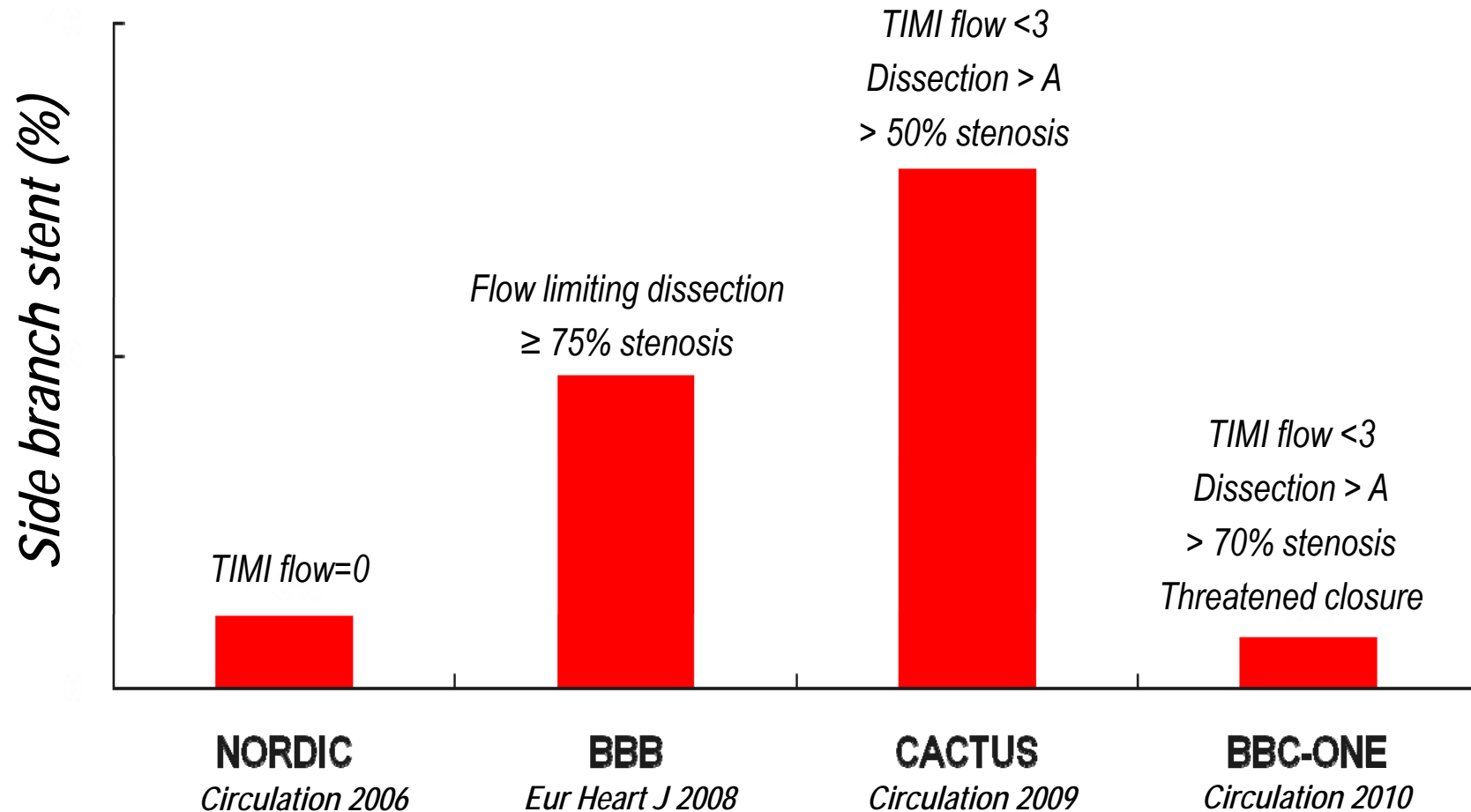
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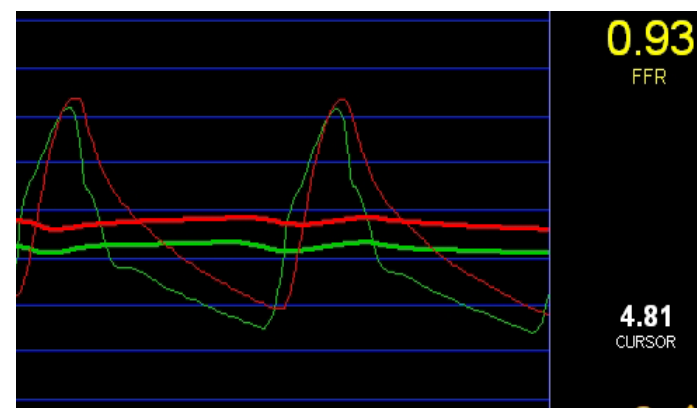
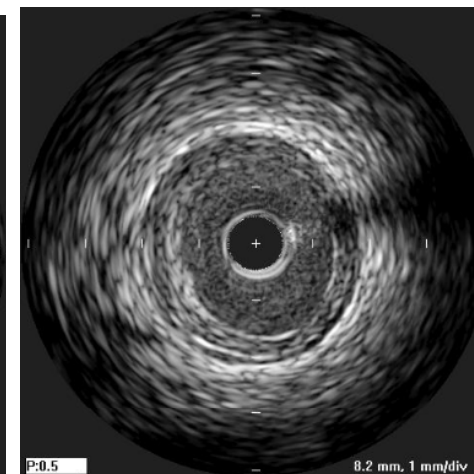
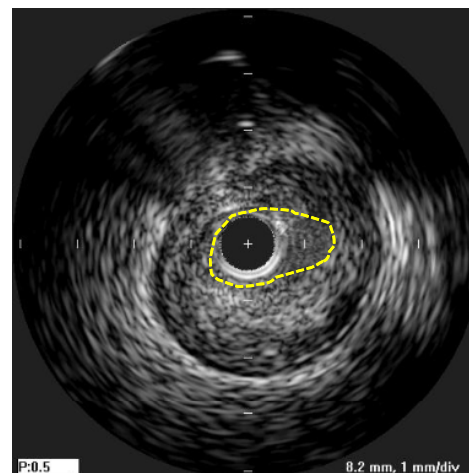
Side branch stenting?

Side branch stenting ?

Different criteria from different studies.....

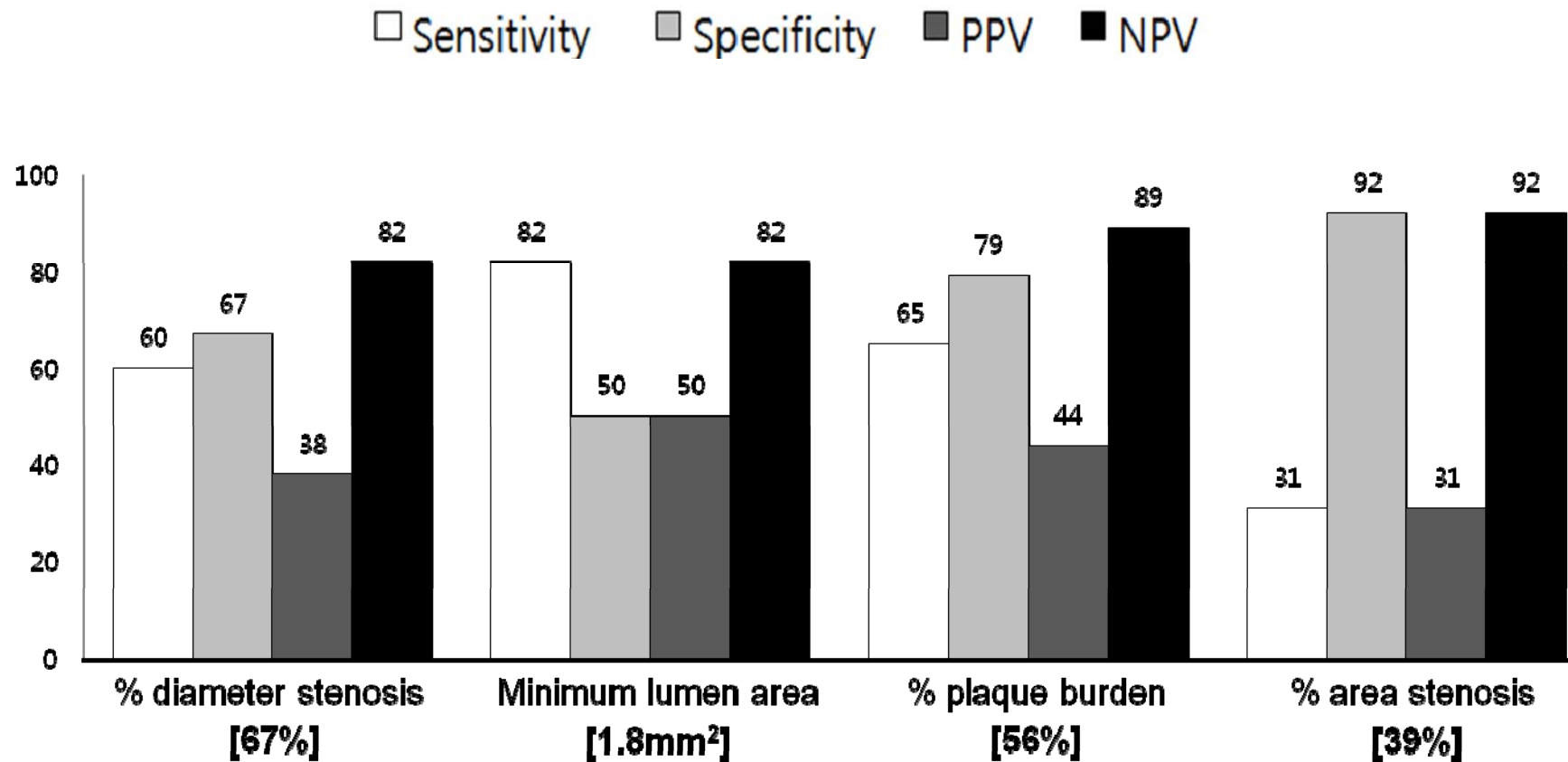


IVUS vs. FFR after kissing balloon inflation

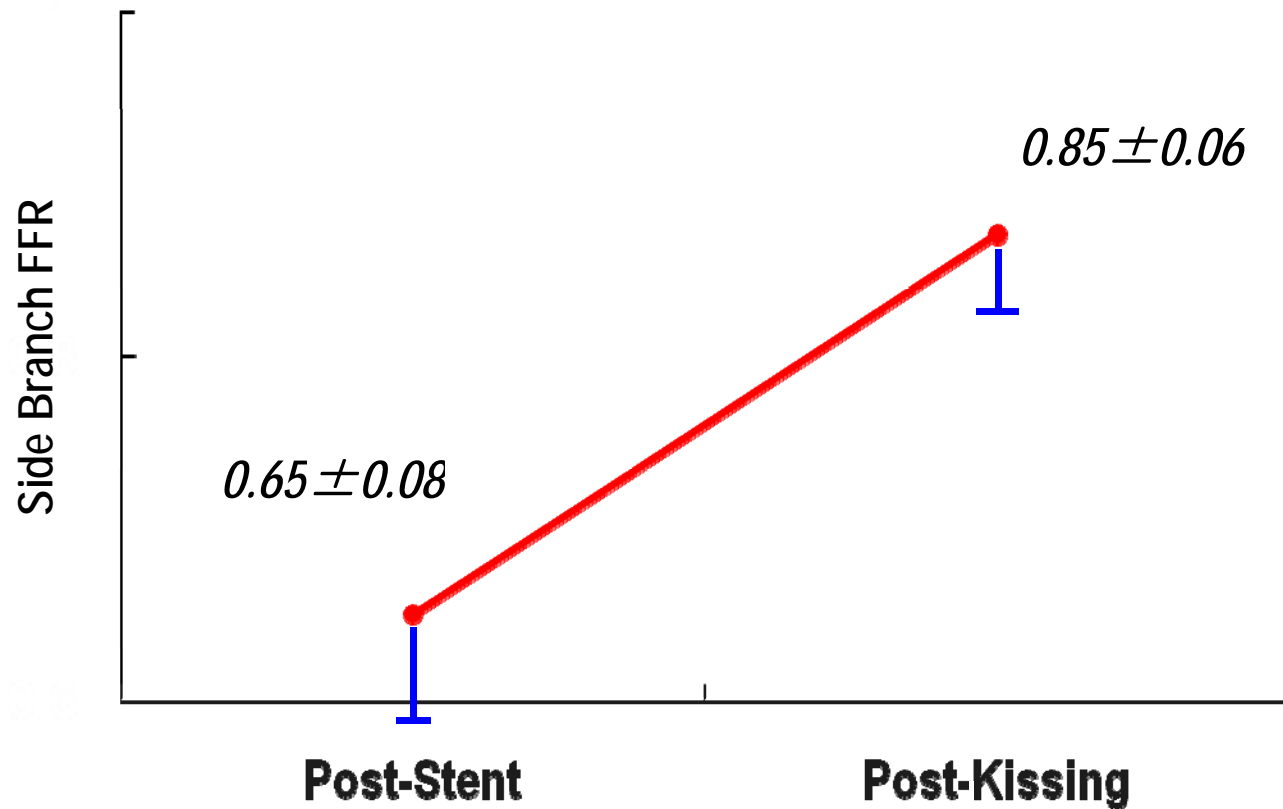


Why FFR?

Diagnostic accuracy of anatomic parameters in pure SB ostial lesions

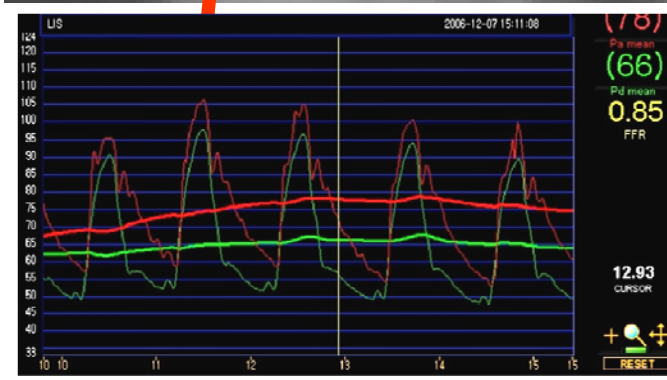
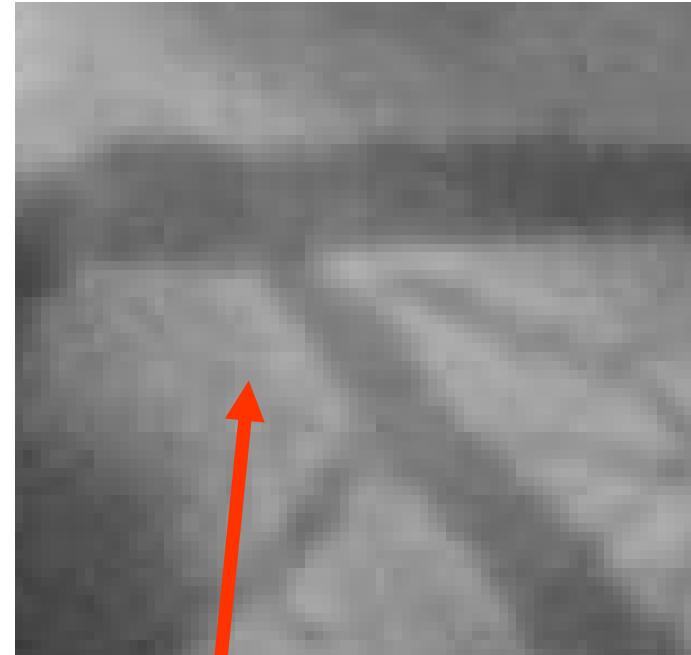
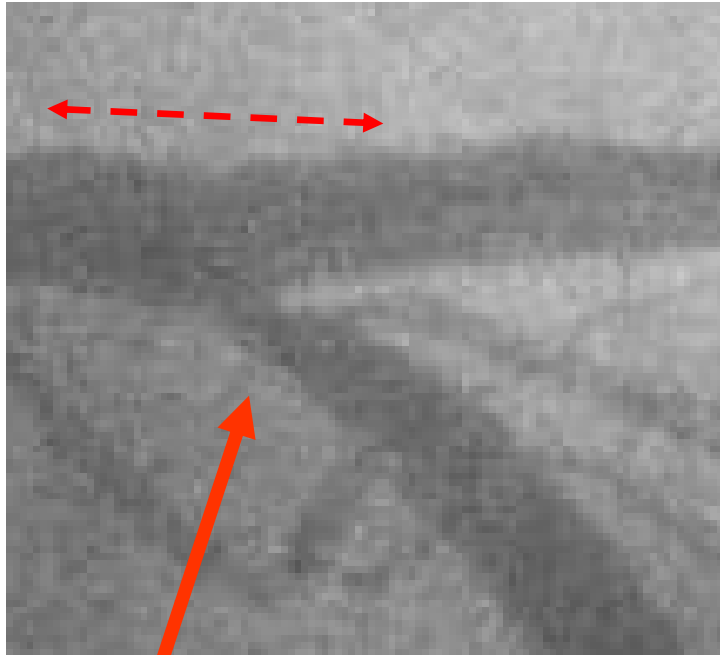


Changes of side branch FFR after kissing ballooning

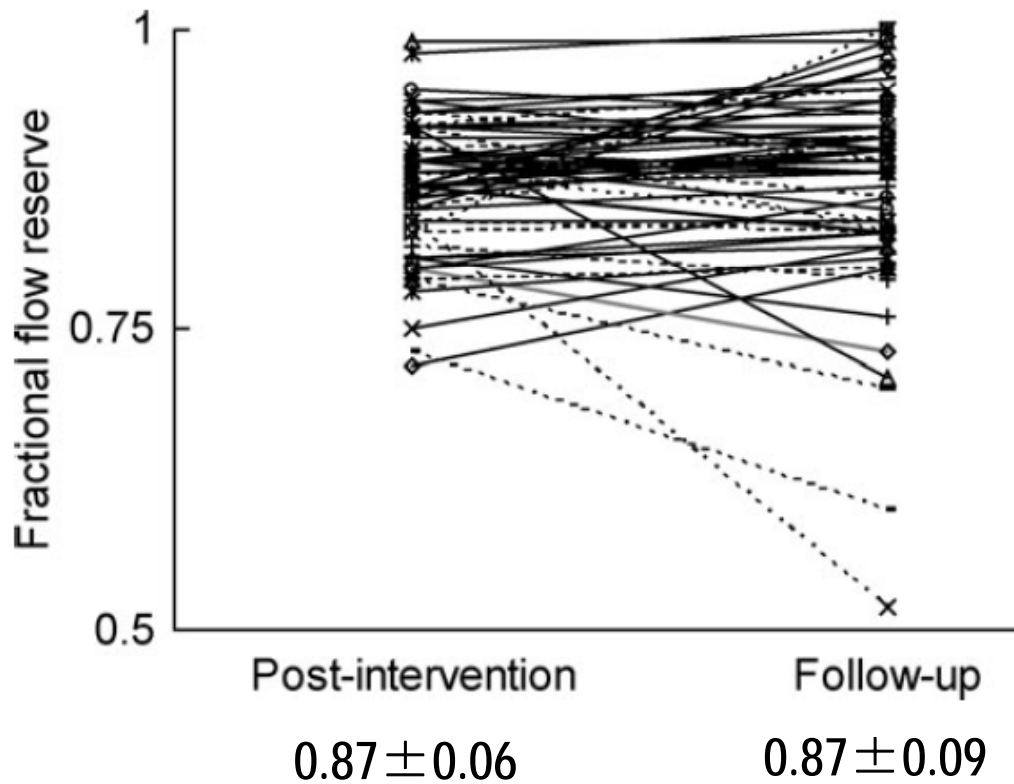


Koo BK. et al, *Eur Heart J* 2008

Outcomes?

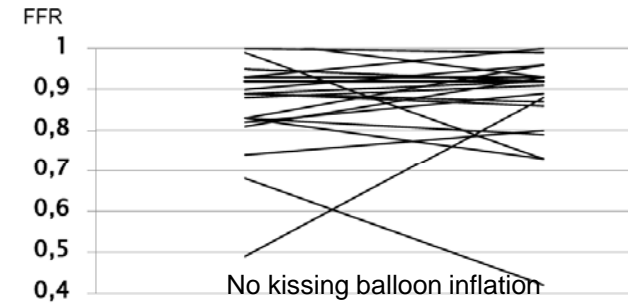


Functional outcome of Jailed side branches

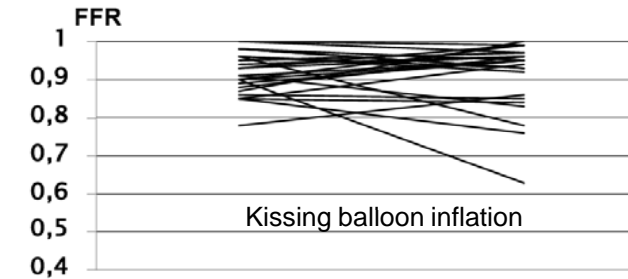


Koo BK. et al, *Eur Heart J* 2008

SB FFR substudy Nordic Baltic Bifurcation III



After PCI		Follow-up	
	n	Mean	
After PCI	n=21	0,87	p=0,911
Follow-up	n=21	0,87	

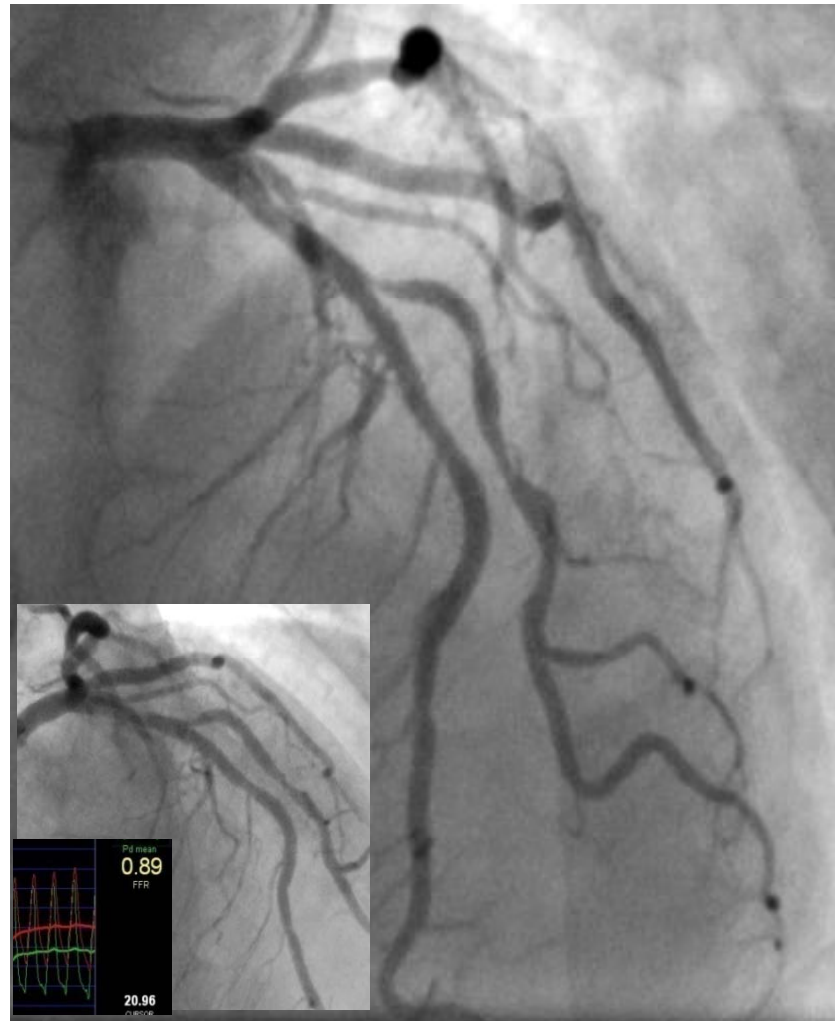


After PCI		Follow-up	
	n	Mean	
After PCI	n=25	0,92	p=0,804
Follow-up	n=25	0,91	

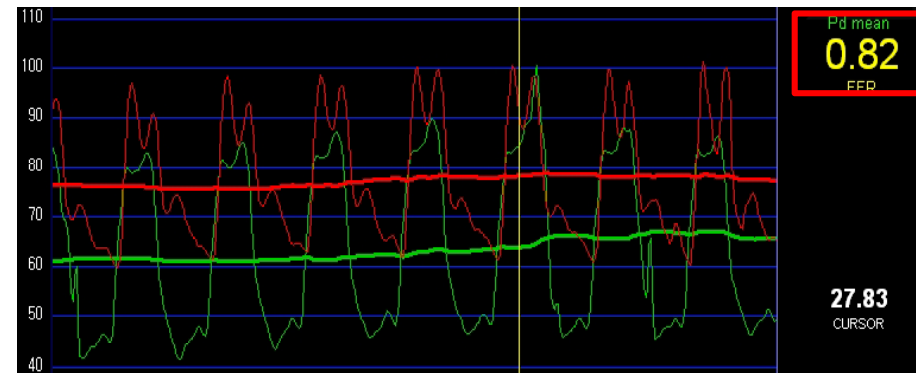
Kumsars I, et al. *Eurointervention* 2012

Functional outcome of Jailed side branches

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11 month Follow- Up



179 bpm EXERCISE STAGE 4 09:58 BRUCE 2.9 km/h 16.0 %



FFR in Bifurcation lesion

- FFR-guided revascularization is feasible and can reduce unnecessary complex interventions for bifurcation lesions.
- FFR of a side branch does not mean the clinical significance of that branch. → FFR should be measured in proper (?) side branches.
- Adequate knowledge on coronary physiology and pitfalls of FFR is mandatory to properly use this (complex?) tool during complex bifurcation PCI.