Kissing or not kissing in LM PCI?

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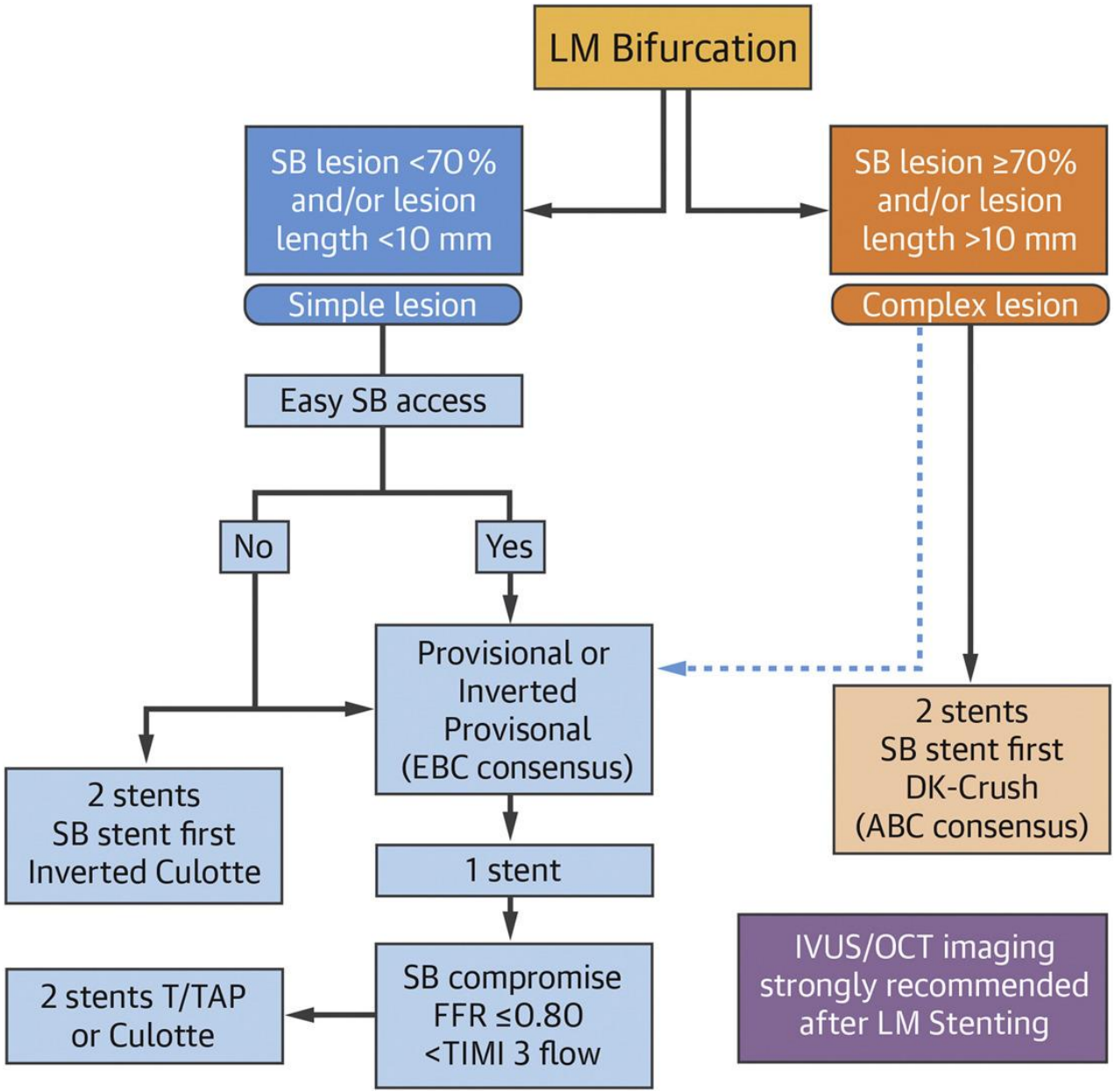
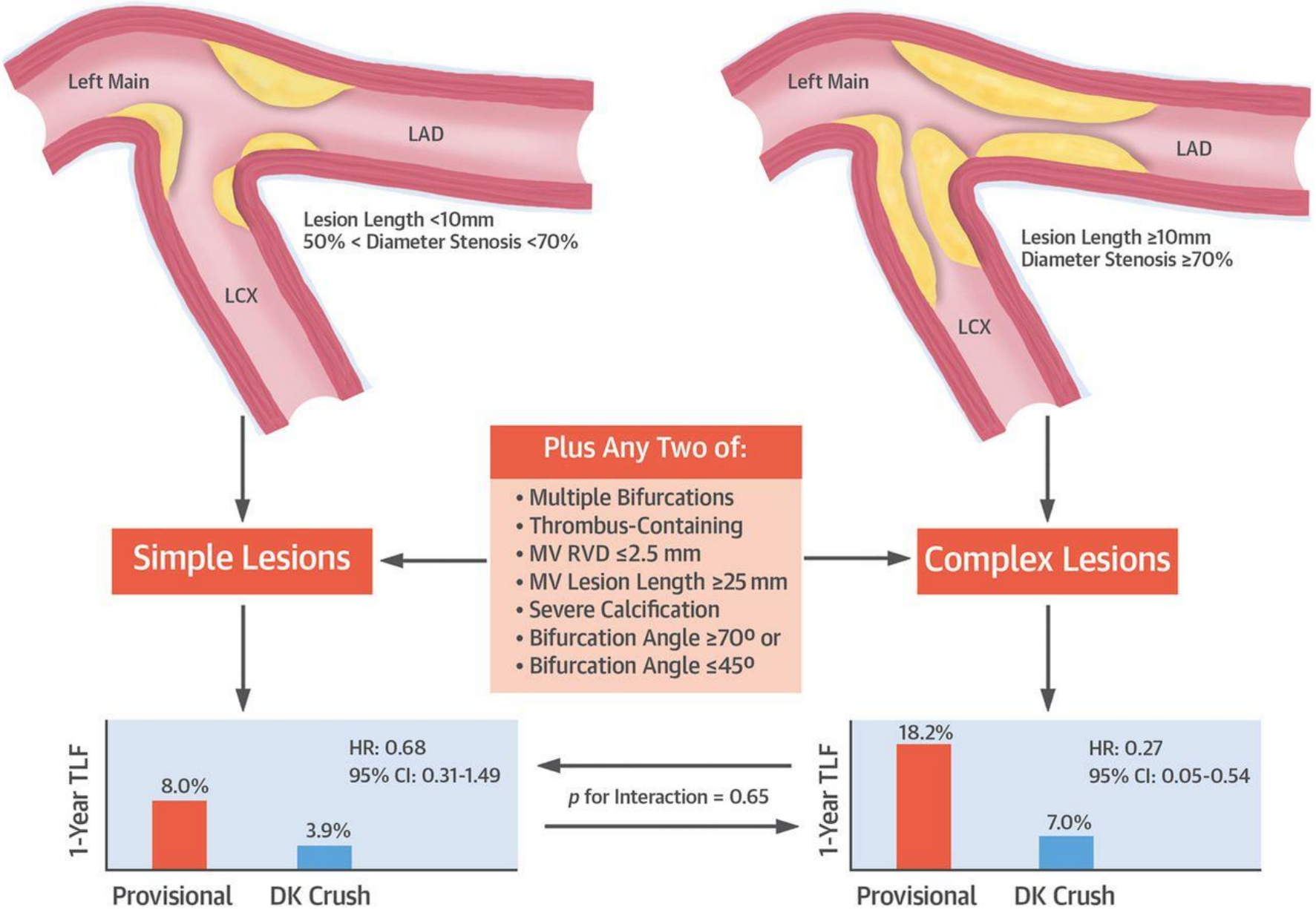
Disclose

I have nothing to disclose

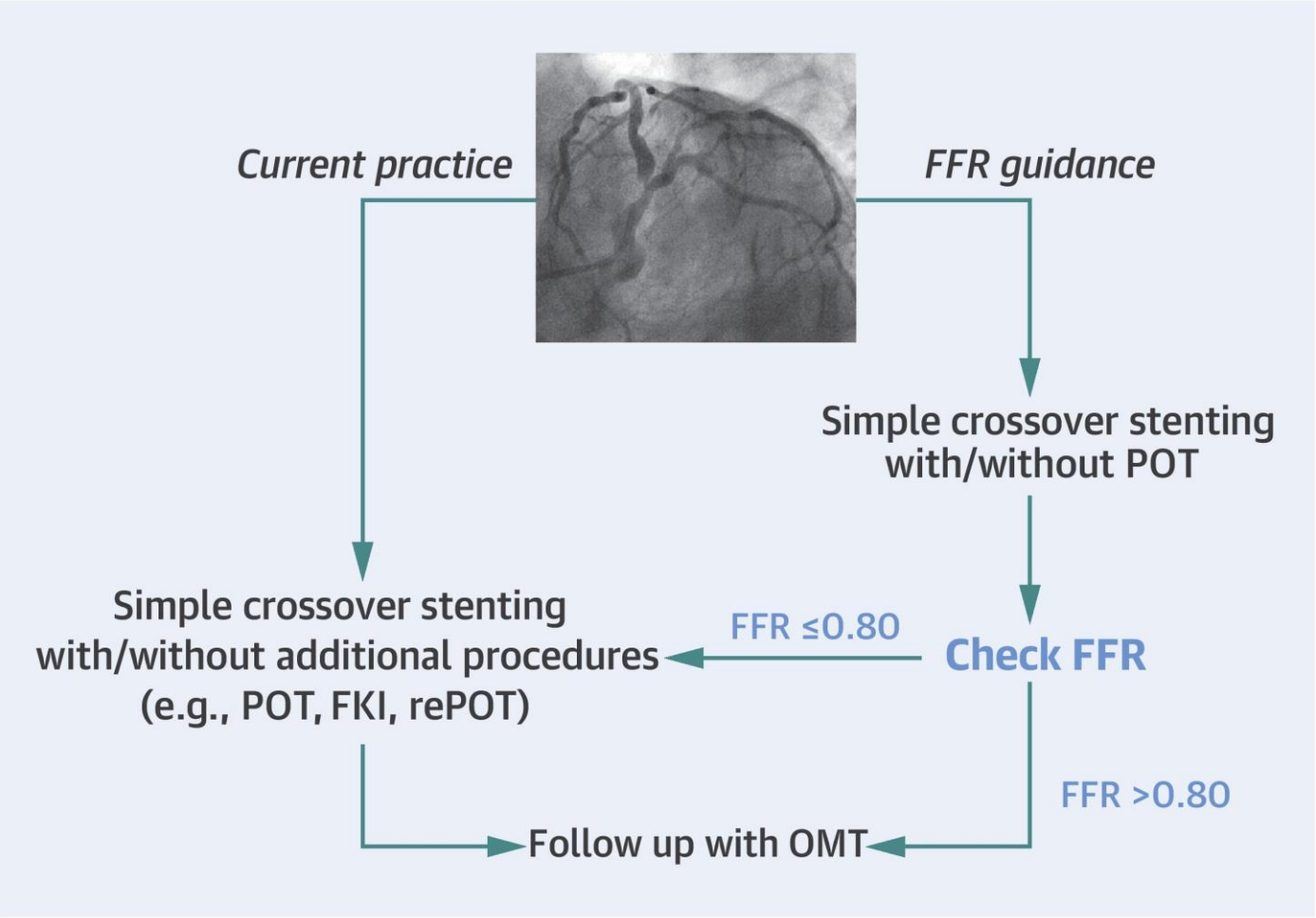


Shao-Liang Chen et al. JACC 2017;70:2605-2617



Shao-Liang Chen et al. JACC 2017;70:2605-2617

CENTRAL ILLUSTRATION: FFR guidance of LM Simple Crossover Stenting

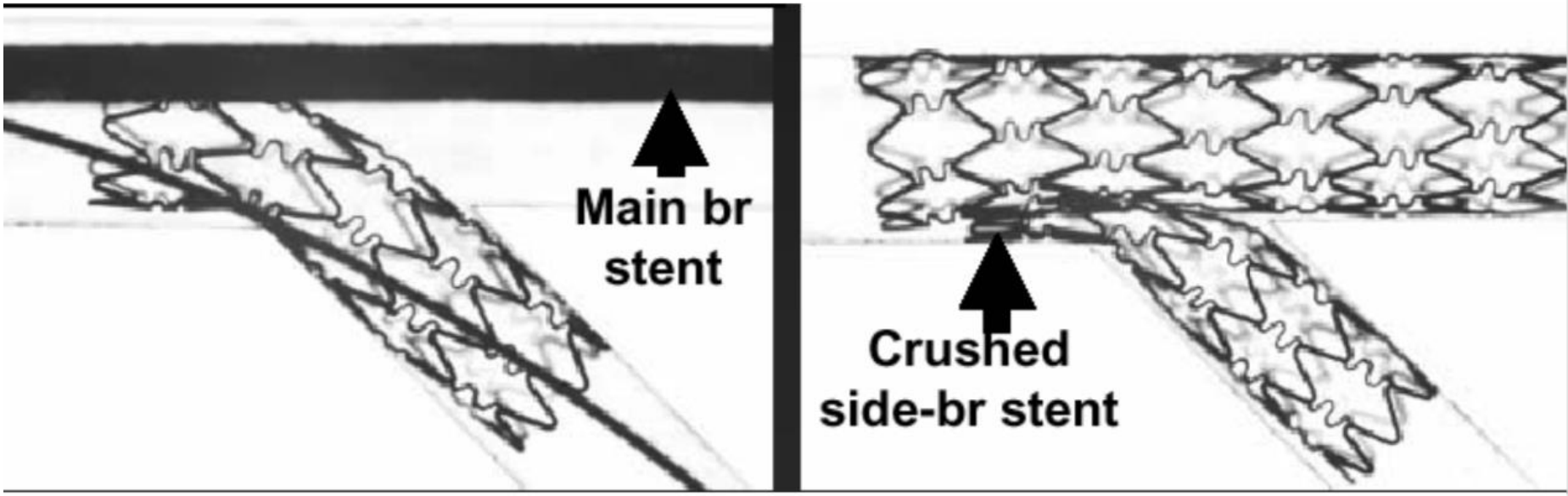


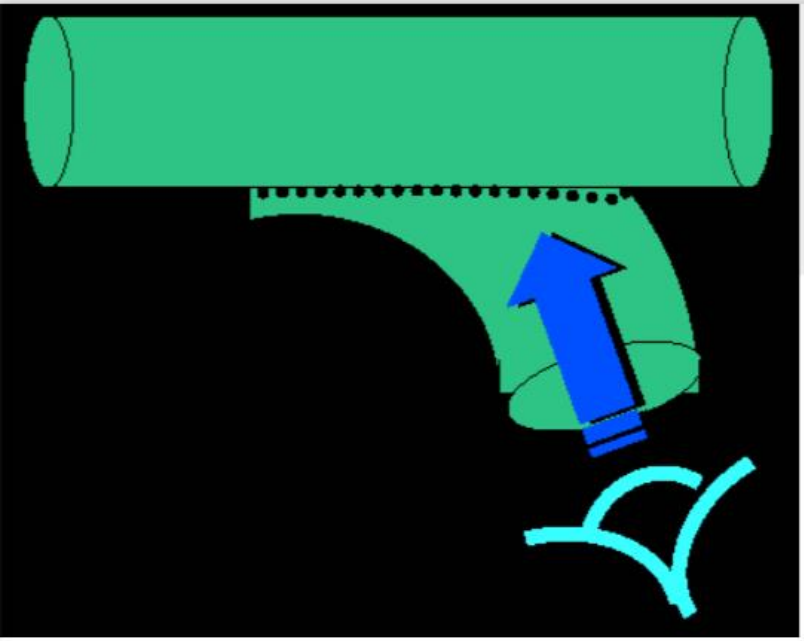
Lee, C.H. et al. J Am Coll Cardiol Intv. 2019;12(9):847–55.

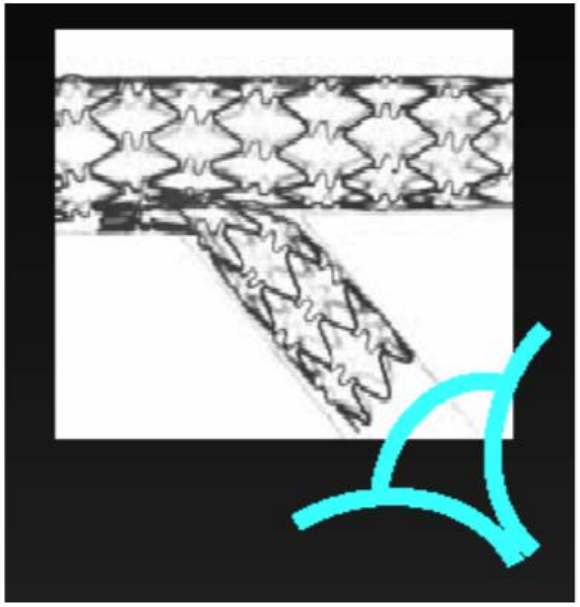
Two stents technique

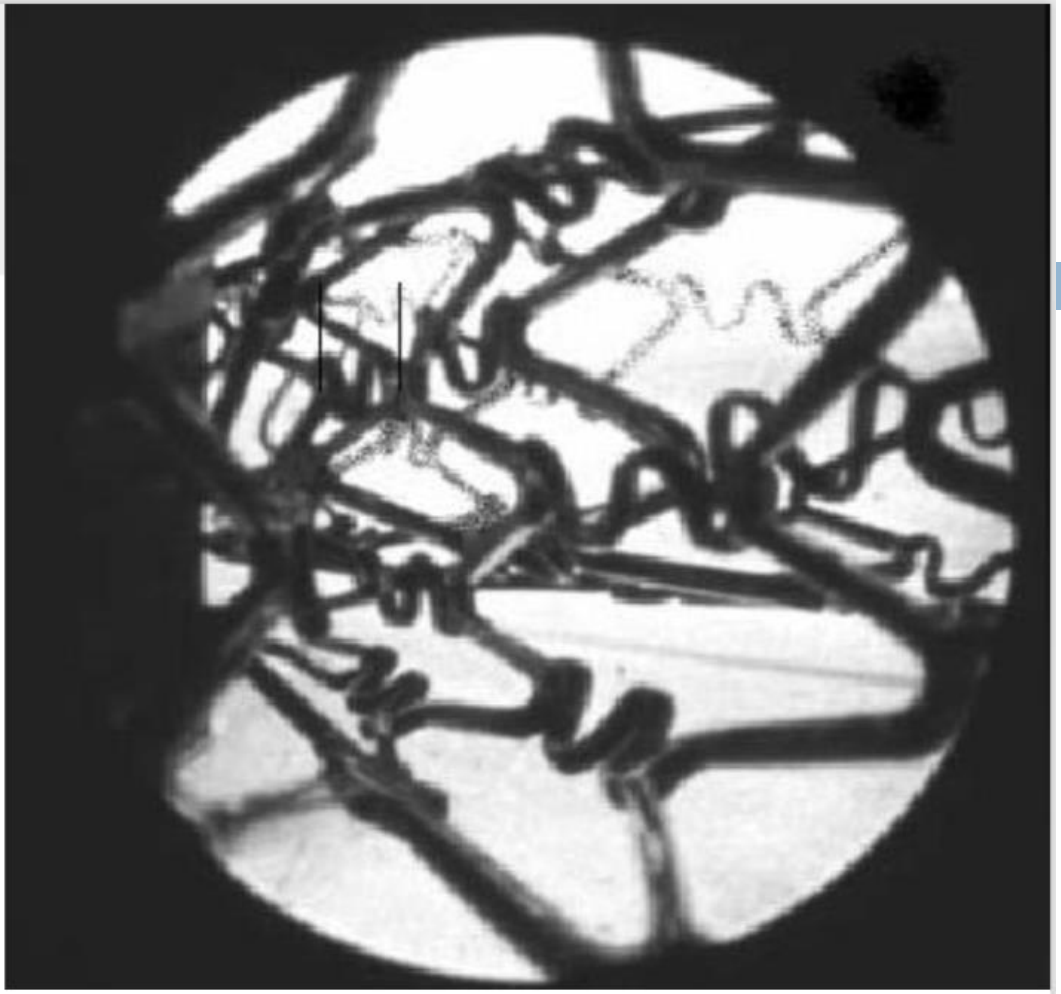
1. Kissing Balloon Inflation is a must

The Classic Crush Technique



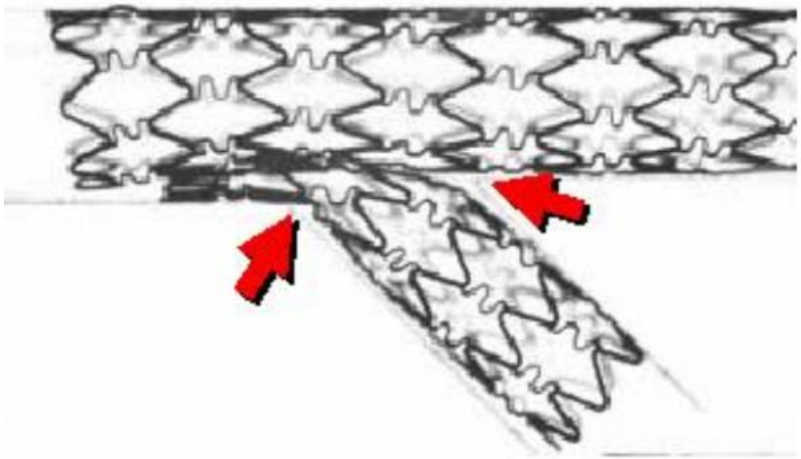






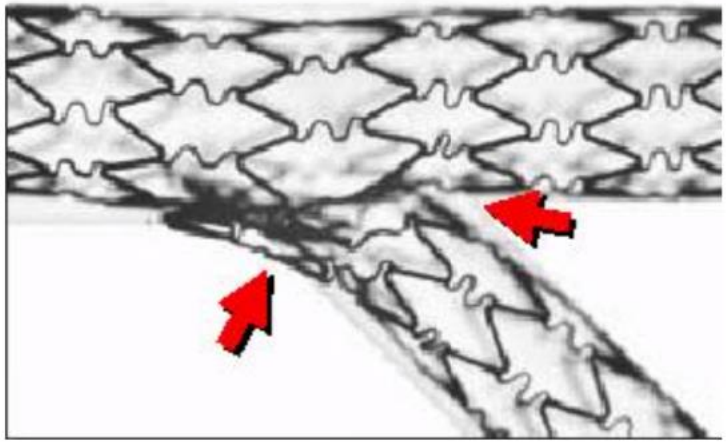
2 layers of stent separate side branch from the main branch…. can be difficult to re-wire!

The Evolution of Kissing

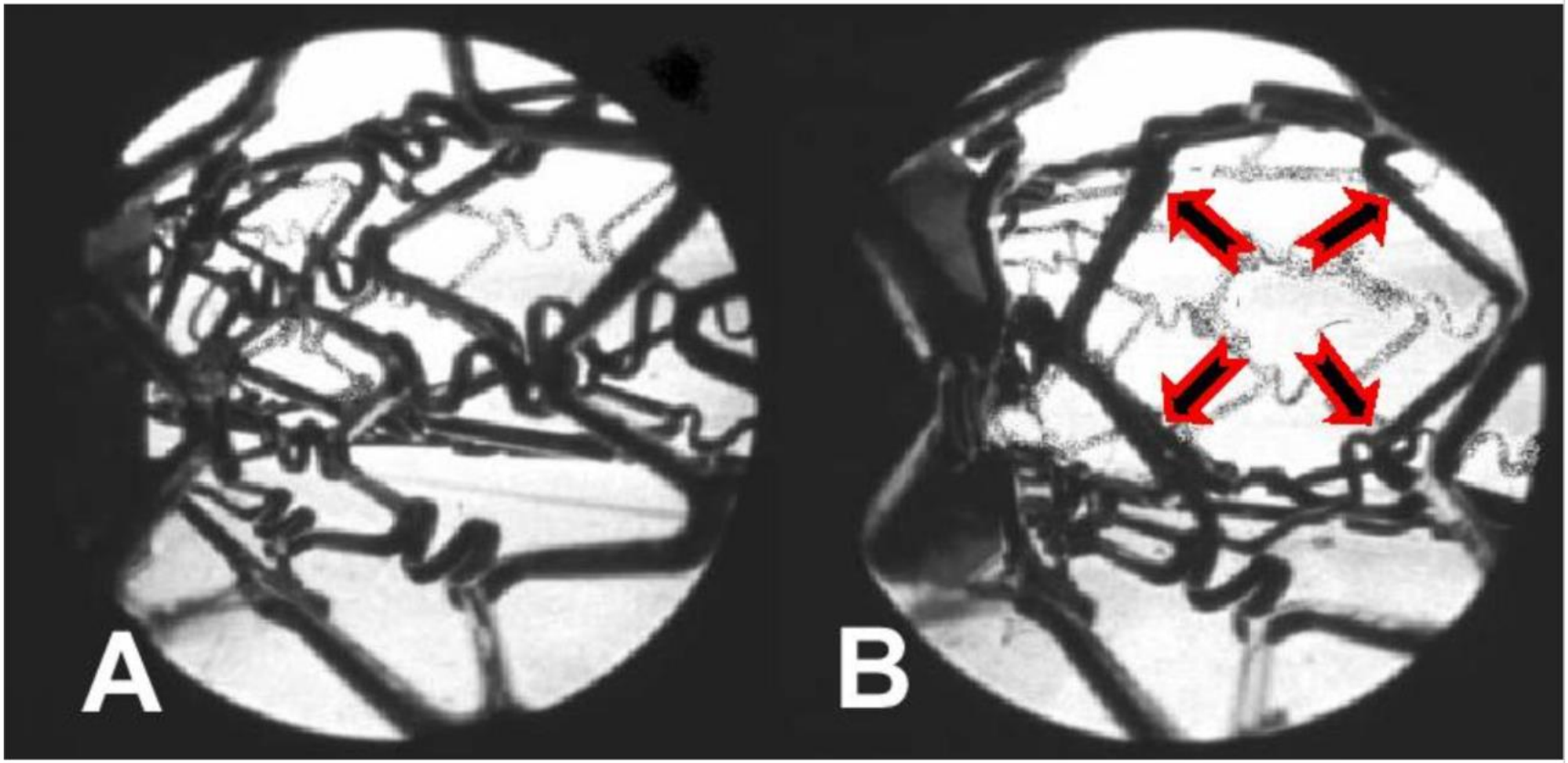


Before Kissing
Balloon Inflation

After Kissing
Balloon Inflation



The Evolution of Kissing



Single Stent Technique: Kissing Balloon Inflation?

Advantages:

- Better angiography
- Better FFR
- Easier when Redo LCx PCI

Disadvantages:

- More wires, MC, BC
- Complex
- Time consuming
- Radiation exposure
- Dissecting of LCx
- Hemodynamic compromise

Outcomes?

Kissing or Not?

Table 1. Recent coronary bifurcation studies comparing KBI vs. non-KBI treatment.

Study/first author	Study design	Stenting strategy	Patient numbers		Follow-up (months)	Cardiac death	Myocardial infarction	Target lesion revascularisation	Definite/ probable stent thrombosis	MACE	SB % diameter stenosis
			KBI	Non-KBI		(KBI vs. non-KBI)					
1. Provisional stenting											
THUEBIS[2]	RCT	Crossover	56	54	6	0% vs. 3.7%	3.6% vs. 1.9%	17.9% vs. 14.8%	3.6% vs. 1.9%	23.2% vs. 24.1%	37% vs. 32%
Nordic III[3]	RCT	Crossover	238	239	6	0.8% vs. 0%	0.4% vs. 1.3%	1.3% vs. 1.7%	0.4% vs. 0.4%	2.1% vs. 2.5%	25% vs. 30%*
COBIS[4]	Registry	Crossover	736	329	22	0.9% vs. 0.7%	0.6% vs. 1.3%	9.1% vs. 3.4%*	N.D.	10.0% vs. 4.9%*	N.D.
Yamawaki et al[5]	Registry	Crossover	132	124	36	0% vs. 0.1%	0% vs. 0%	12.3% vs. 5.1%	0% vs. 0%	14.6% vs. 6.9%	N.D.
2. Two-stenting											
Ge et al[6]	Observational	Crush	116	65	9	1.7% vs. 0%	10.3% vs. 13.9%	9.5% vs. 24.6%*	2.6% vs. 3.1%	19.8% vs. 38.5%*	24% vs. 38%*
Grundeken et al[7]	Registry	Culotte/Tryton	624	121	12	1.7% vs. 4.6%*	5.0% vs. 4.6%	4.7% vs. 2.9%	0.3% vs. 0.9%	N.D.	N.D.

*p<0.05. MACE: major adverse cardiac events; N.D: not described; RCT: randomised controlled trial

EuroIntervention 2015;11:V81-V85. DOI: 10.4244/EIJV11SVA18

Effect of Final Kissing Balloon Dilatation after One-stent Technique at Left-main Bifurcation: A Single Center Data

Zhan Gao[1], Bo Xu[1], Yue-Jin Yang[1], Shu-Bin Qiao[1], Yong-Jian Wu[1], Tao Chen[2], Liang Xu[1], Jin-Qing Yuan[1], Jue Chen[1], Xue-Wen Qin[1], Min Yao[1], Hai-Bo Liu[1], Shi-Jie You[1], Ye-Lin Zhao[1], Hong-Bing Yan[1], Ji-Lin Chen[1], Run-Lin Gao[1]

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Abstract

Background: Whether final kissing balloon (FKB) dilatation after one-stent implantation at left-main (LM) bifurcation site remains unclear. Therefore, this large sample and long-term follow-up study comparatively assessed the impact of FKB in patients with unprotected LM disease treated with one-stent strategy.

Methods: Total 1528 consecutive patients underwent LM percutaneous coronary intervention in one center from January 2004 to December 2010 were enrolled; among them, 790 patients treated with one drug-eluting stent crossover LM to left anterior descending (LAD) with FKB ($n = 230$) or no FKB ($n = 560$) were comparatively analyzed. Primary outcome was the rate of major adverse cardiovascular events, defined as a composite of death, myocardial infarction (MI) and target vessel revascularization (TVR).

Results: Overall, The prevalence of true bifurcation lesions, which included Medina classification (1,1,1), (1,0,1), or (0,1,1), was similar between-groups (non-FKB: 37.0% vs. FKB: 39.6%, $P = 0.49$). At mean 4 years follow-up, rates of major adverse cardiovascular events (non-FKB: 10.0% vs. FKB: 7.8%, $P = 0.33$), death, MI and TVR were not significantly different between-groups. In multivariate propensity-matched regression analysis, FKB was not an independent predictor of adverse outcomes.

Conclusions: For patients treated with one-stent crossover LM to LAD, clinical outcomes appear similar between FKB and non-FKB strategy.

Herz. 2019 Jun;44(4):354-362. doi: 10.1007/s00059-017-4647-1. Epub 2017 Nov 27.

Final kissing balloon inflation for coronary bifurcation lesions treated with single-stent technique : A meta-analysis.

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Abstract

BACKGROUND: The efficacy of final kissing balloon (FKB) inflation in one-stent techniques for bifurcation lesions is controversial. The goal of the present study was to investigate the impact of FKB on long-term clinical outcomes in one-stent strategies.

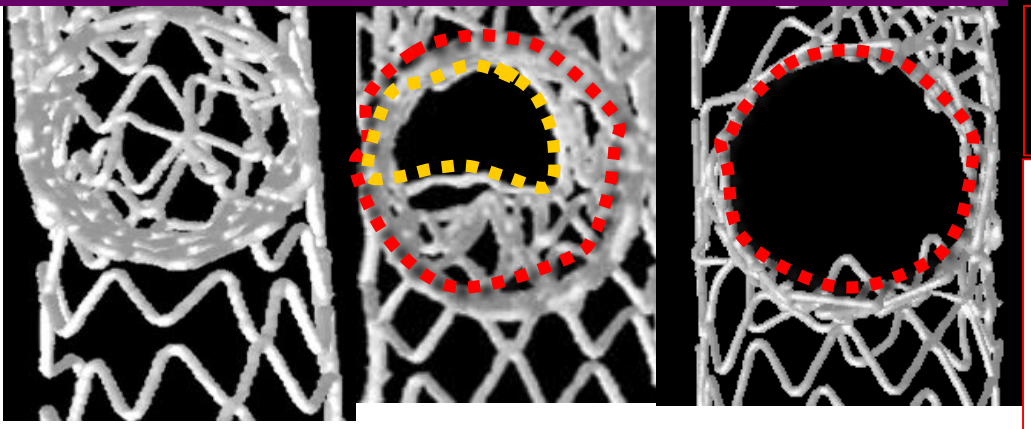
METHODS: A literature search of the PubMed, Embase, and Cochrane Library databases was undertaken through August 2017. The primary outcome was major adverse cardiac events (MACE), defined as the composite of cardiac death, myocardial infarction, and target lesion revascularization. Overall hazard ratios (HRs) and 95% confidence intervals (CIs) were calculated using the random-effects model.

RESULTS: Ten studies comprising 7364 patients treated with a one-stent technique were included in the analysis. Overall, FKB did not demonstrate a significant reduction in MACE compared with non-FKB in both randomized trials (HR: 1.13; 95% CI: 0.65-1.98) and observational studies (HR: 0.86; 95% CI: 0.61-1.20). The risk of cardiac death (HR: 0.89; 95% CI: 0.53-1.49), myocardial infarction (HR: 0.76; 95% CI: 0.53-1.09), and target lesion revascularization (HR: 0.96; 95% CI: 0.74-1.23) was also similar in both groups.

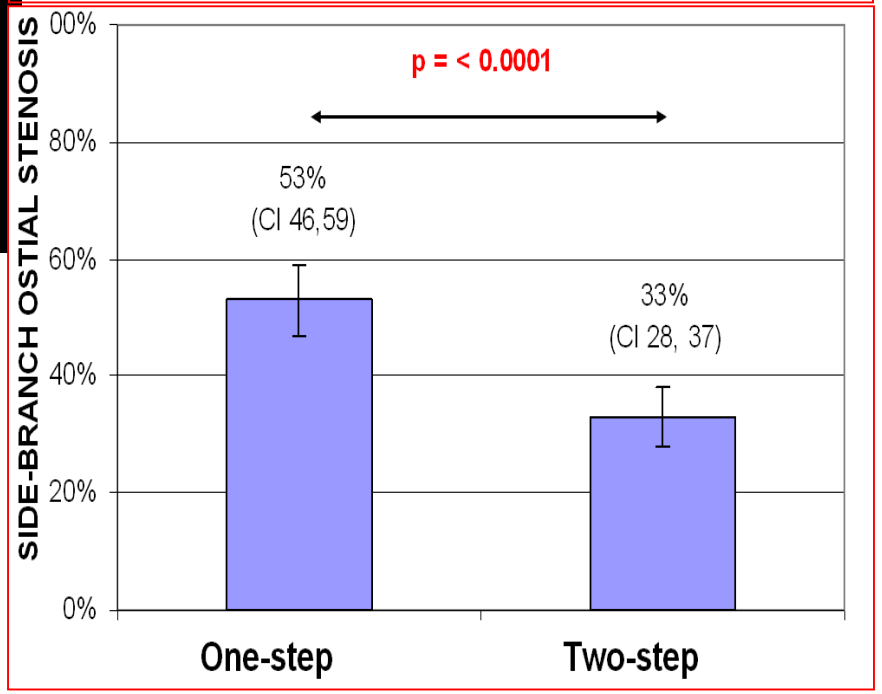
CONCLUSION: FKB may not be mandatory and a selective FKB strategy might be more justified in one-stent techniques for bifurcation lesions.

Two Stents Technique
Kissing Balloon Inflation: How?

No kissing	One-step kissing post-dilatation	Two-step kissing post-dilatation



SB ostial stenosis (%) with one step vs. two step kissing

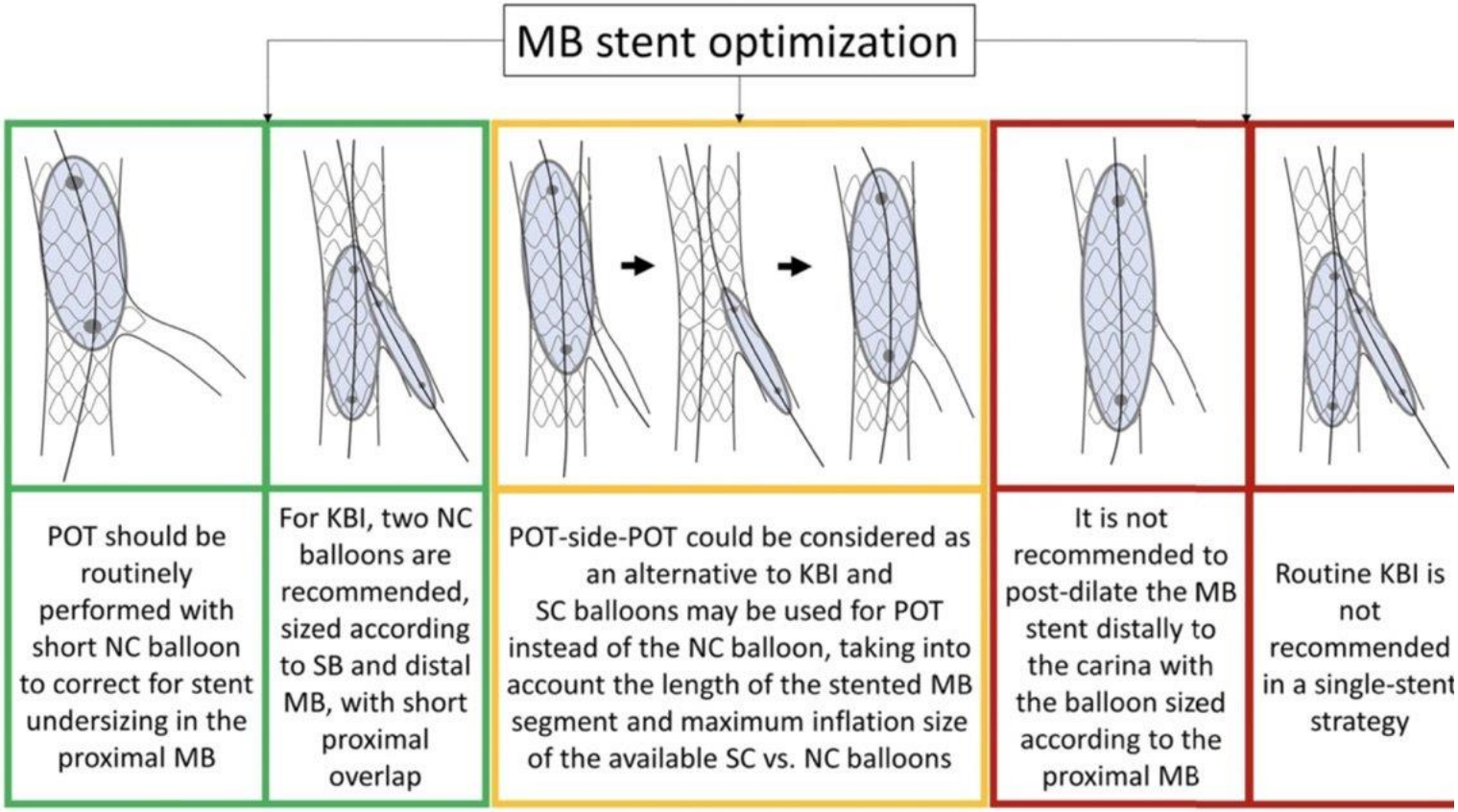


Two steps:

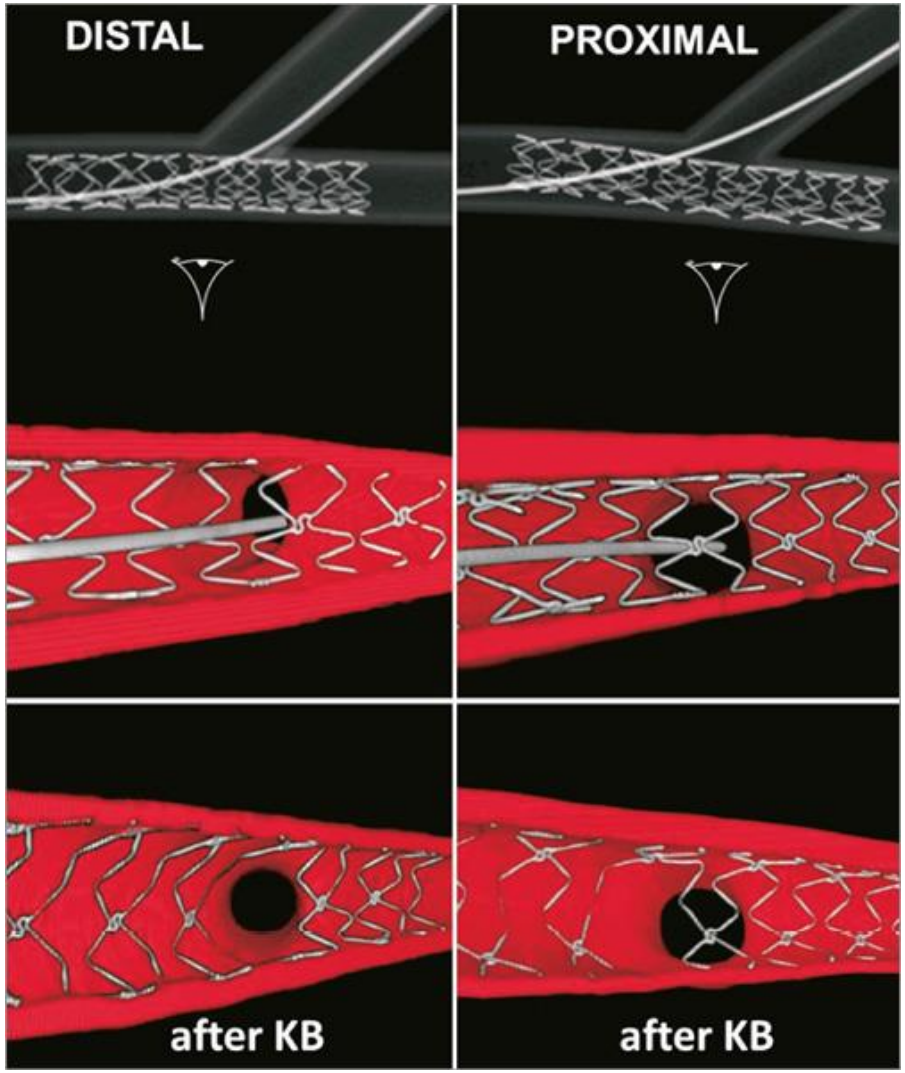
1) Inflate at high pressure only the SB balloon
2) Perform kissing inflation

Ormiston

One stent Technique
Kissing Balloon Inflation: How?

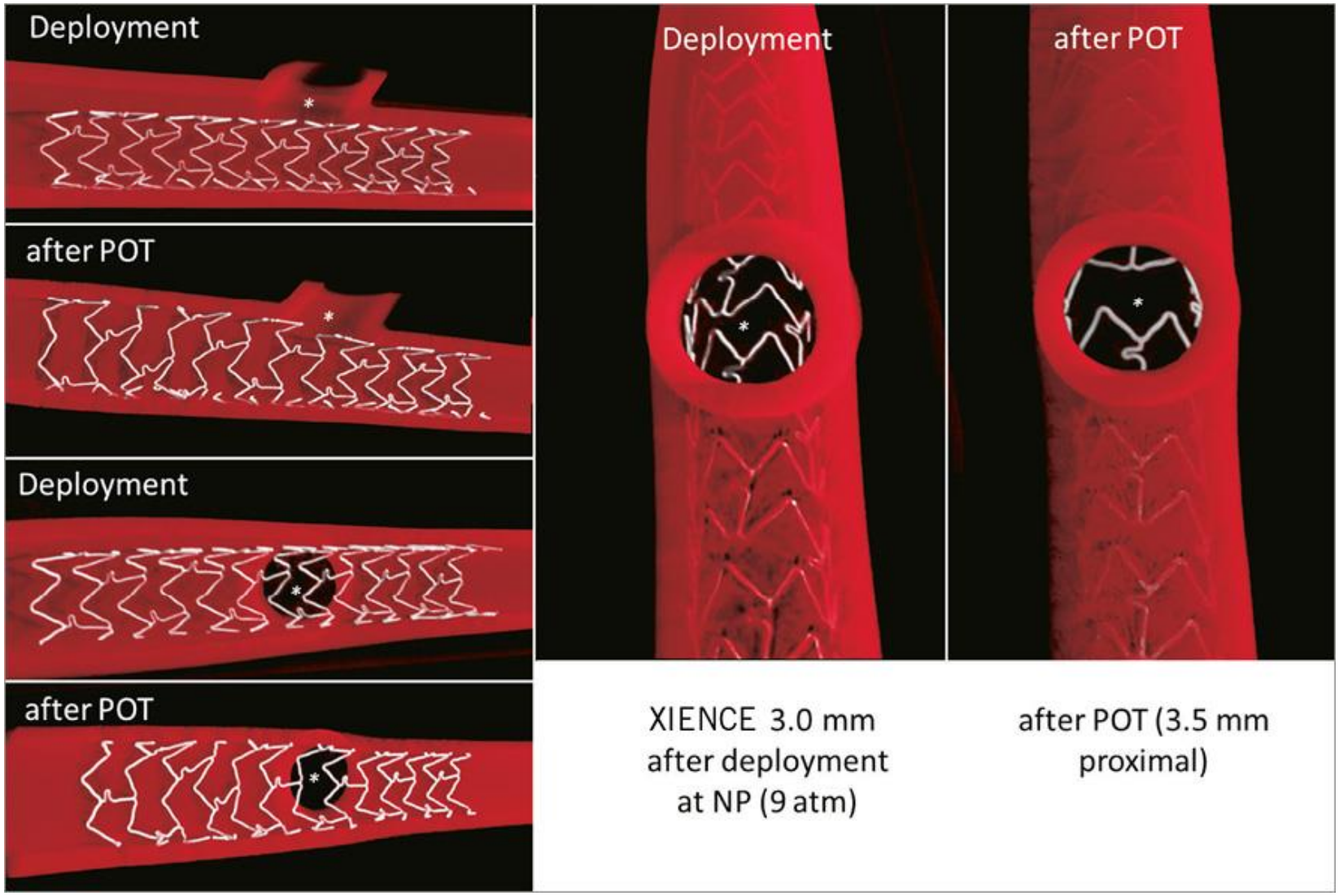


Impact of cell crossing location in stent optimisation



Yoshinobu Murasato et al. EuroIntervention 2015;11:V81-V85. DOI: 10.4244/EIJV11SVA18

Impact of the POT technique on stent apposition and SB access



Yoshinobu Murasato et al. EuroIntervention 2015;11:V81-V85. DOI: 10.4244/EIJV11SVA18

Semi or Non-Compliant BC for KBI?

- Two Stents Technique: NC Balloon is a must
- One Stent Technique:
  - LM-LAD: NC Balloon
  - LM-LCx:
    - Carina Shift: Semi Compliant BC
    - Plaque Shift: NC Balloon
    - Plaque Characteristics?
- POT: NC Balloon or Semi-compliant BC?

SB Compromise due to Carina shift

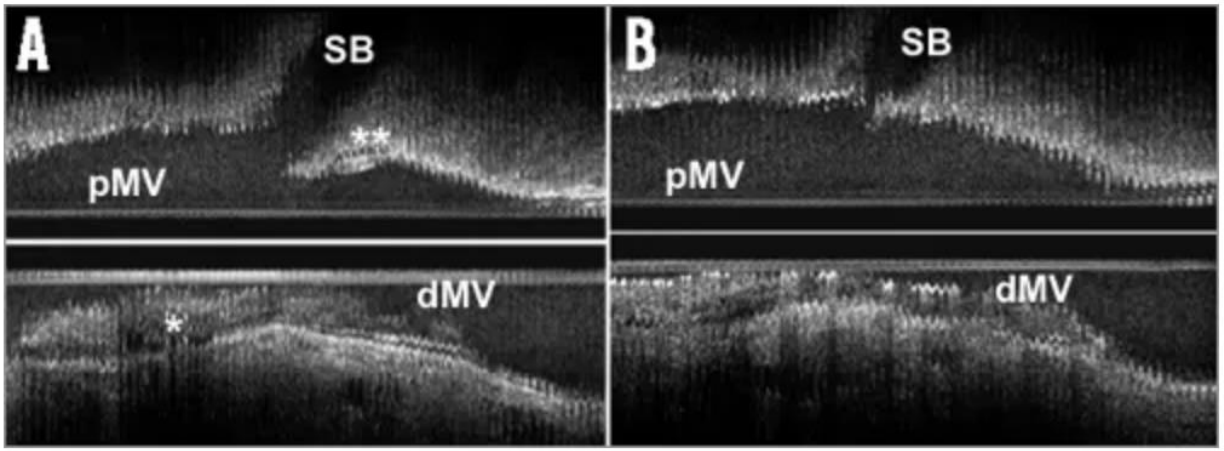
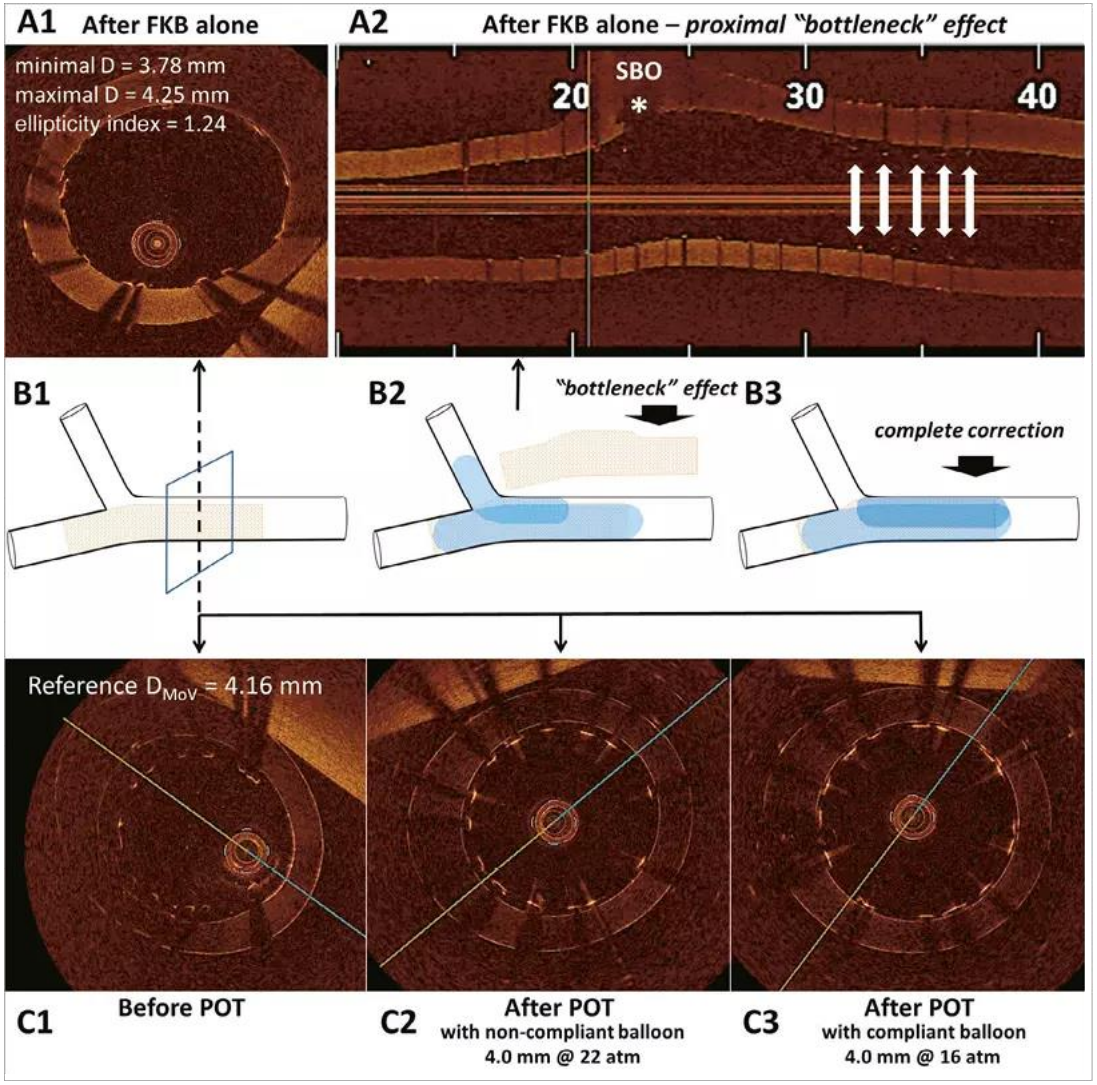


Figure 1. Plaque (*) and carina (**) morphology change before (A) and after (B) main vessel stenting. dMV: distal main vessel; pMV: proximal main vessel; SB: side branch (Intravascular image courtesy of B.K. Koo)

POT: NC Balloon or Semi – Compliant BC?



Yoshinobu Murasato et al. EuroIntervention 2015;11:V81-V85. DOI: 10.4244/EIJV11SVA18

How to avoid SB compromise?

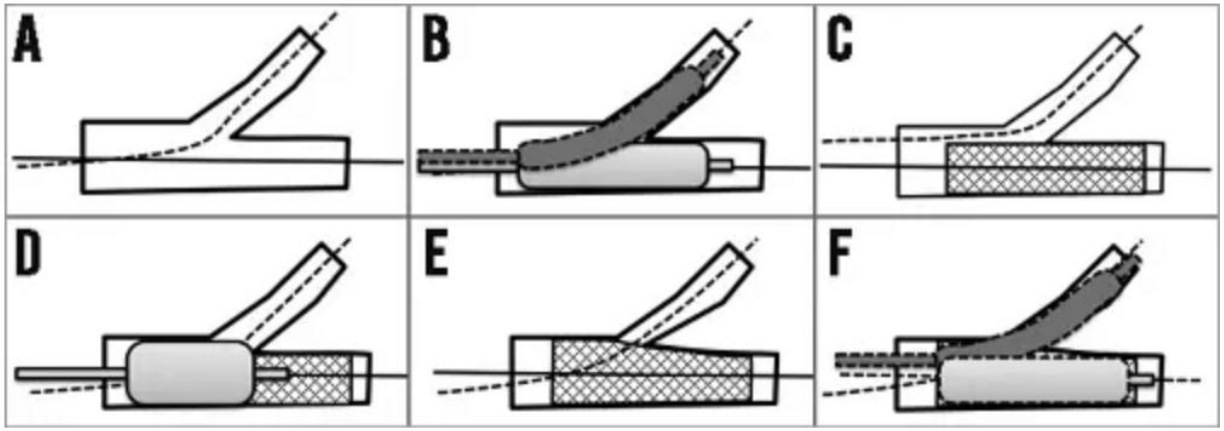


Figure 3. Procedures to optimise the provisional single-stent technique avoiding SB compromise. A) Start by wiring the MV and large SBs. B) Predilate the MV and the large SB with severe ostial stenosis, if indicated. C) Perform MV stenting with a size just optimal in relation to the distal main vessel, while avoiding stent overexpansion (distal optimisation). D) Perform the proximal optimisation technique which may help wiring the SB, and stent apposition in the proximal MV. E) & F) Rewire the SB followed by SB ballooning or stenting if further SB treatment is indicated.

EuroIntervention 2015;11:V75-V77. DOI: 10.4244/EIJV11SVA16

Conclusions (1)

- In most of the clinical trials of provisional coronary bifurcation stenting, final KBI has failed to provide significant clinical benefits except for the reduction of SB angiographic restenosis.
- These disappointing results may be attributed to non-uniform and oversized stent dilation induced by suboptimal KBI

Conclusions (2)

Before Kissing: must consider:

1. Patient risk: old age, reduced EF, AMI…
2. Imaging Guidance (IVUS, OCT)?
3. Operator's skill?

- Two stents technique: KBI is a must
- One stent technique: KBI is mandatory if you do it right with POT – KBI - POT

THANK YOU!