

**2021 Clinical Data and Consensus
Documents
Updates on Bifurcation PCI
techniques :what are new?**

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Oxford, UK**

Disclosure Statement of Financial Interest

Affiliation/Financial Relationship

- Institutional Grant/Research Support
- Consulting Fees/Honoraria

Company

- Boston Scientific
- Boston Scientific, Medtronic, Abbott Vascular, Philips Volcano, Miracor

2020/21 “the Pandemic years”

2020/21 “the Pandemic years”



Like this steam engine
nothing stops progress in bifurcation stenting

2020/21 “the Pandemic year”

European Bifurcation club

Virtual meeting 22/3 October 2020

15th Consensus : Eurointervention Nov 2020 | 10.4244/EIJ-D-20-00169

White paper stenting technique : CCI 2020 96 (3) 1067-9

Asia Pacific bifurcation club

1st Consensus statement : EuroIntervention 2020;16:e706-e714

Left main & bifurcation summit Nov 20:Prof Chen

New clubs 2020

SCAI Bifurcation club : Dr Dangas

Latin America bifurcation club (LATAM) : Dr Uribe

American Bifurcation club : Dr Rab



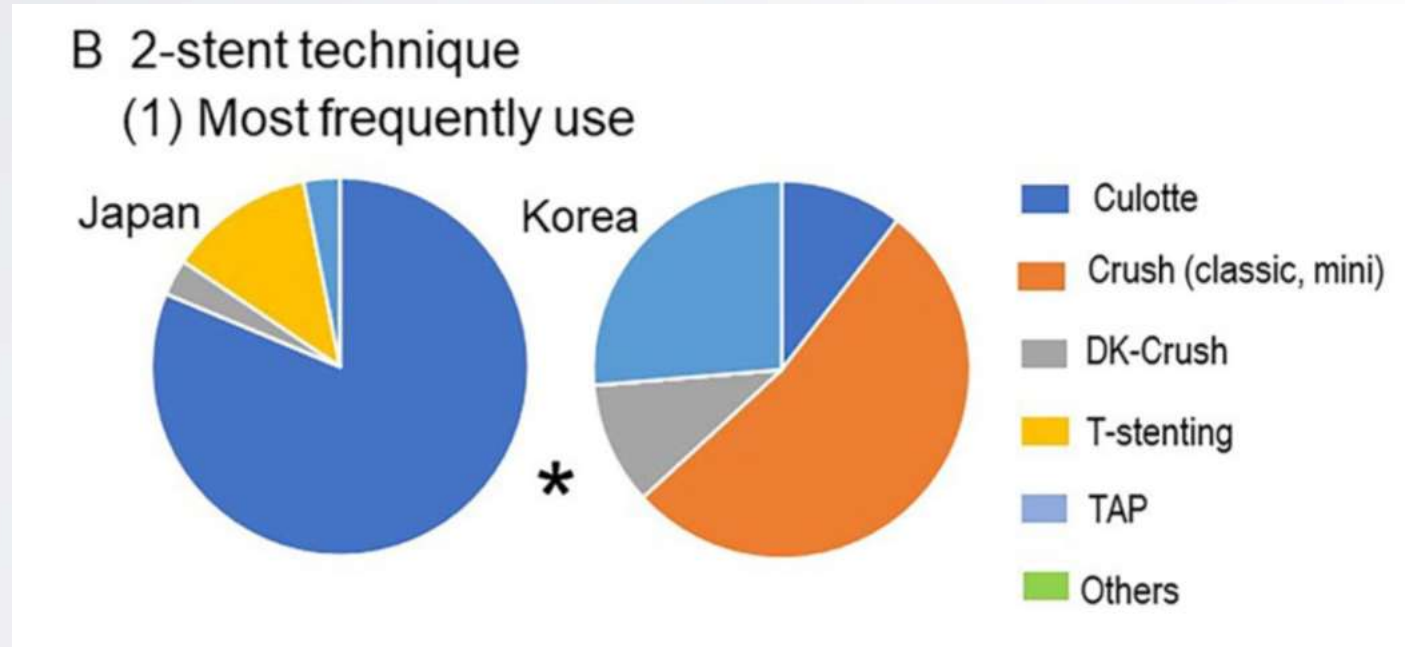
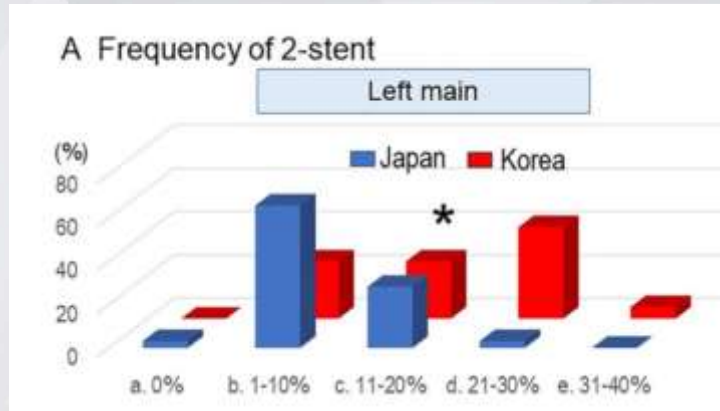
Updates – what is new ??

- Review of practice – Korea and Japan
- Progress on the *definition* of a complex bifurcation that requires 2 stents UPFRONT
- Technical focus on
 - The side branch ostium during 2 stent approach
 - The positioning of the POT balloon
- Optimised sequence(s) for Culotte and DK crush

Variation in bifurcation practice remains

Difference in basic concept of coronary bifurcation intervention between Korea and Japan. Insight from questionnaire in experts of Korean and Japanese bifurcation clubs

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Cardiovascular Intervention and Therapeutics
<https://doi.org/10.1007/s12928-020-00742-7>

Percutaneous coronary intervention for bifurcation coronary lesions: the 15th consensus document from the European Bifurcation Club

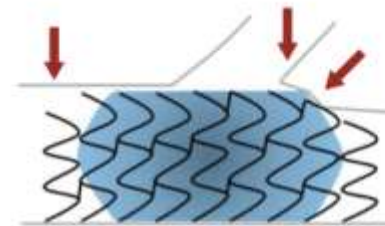


Francesco Burzotta^{1*}, MD, PhD; Jens Flensted Lassen², MD, PhD; Thierry Lefèvre³, MD; Adrian P. Banning⁴, MD, PhD; Yiannis S. Chatzizisis⁵, MD, PhD; Thomas W. Johnson⁶, MD; Mirosław Ferenc⁷, MD, PhD; Sudhir Rathore⁸, MD; Remo Albiero⁹, MD; Manuel Pan¹⁰, MD, PhD; Olivier Darremont¹¹, MD; David Hildick-Smith¹², MD; Alaide Chieffo¹³, MD; Marco Zimarino¹⁴, MD, PhD; Yves Louvard³, MD; Goran Stankovic¹⁵, MD, PhD

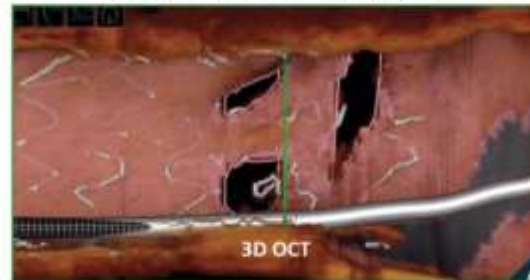
Advances in PCI simulations



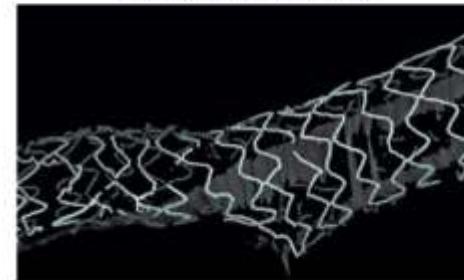
Refinements for bifurcation techniques



Recognition of novel imperfections



Efficacy of best practices



Visual summary. 15th consensus document from the European Bifurcation Club.

Complexity of a bifurcation

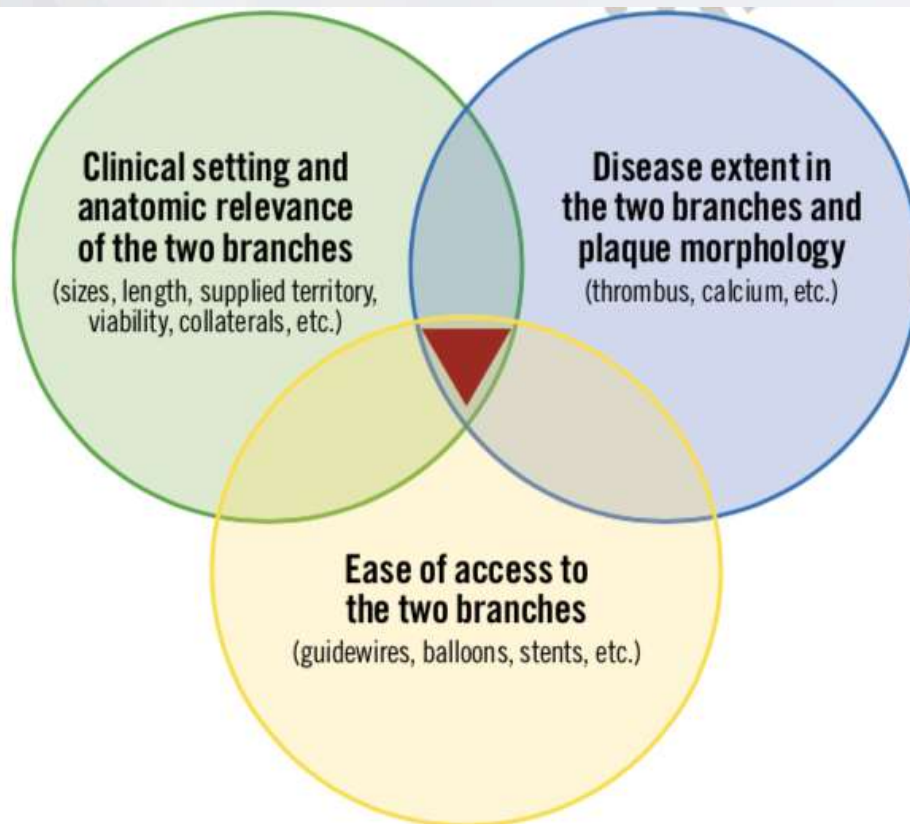


Figure 2. *Main determinants of bifurcation PCI complexity.*

Complex 2 stent bifurcation

Multicentre, randomized comparison of two-stent and provisional stenting techniques in patients with complex coronary bifurcation lesions: the DEFINITION II trial

649 patients
47 centres

Up front 2 stent vs provisional

90% left main or LAD

77% DK crush

Table 1. Definition criteria for a complex coronary bifurcation.

Major criteria

For left main bifurcation (Major 1)

- SB lesion length ≥ 10 mm, and
- SB diameter stenosis $\geq 70\%$

For non-left main bifurcation (Major 2)

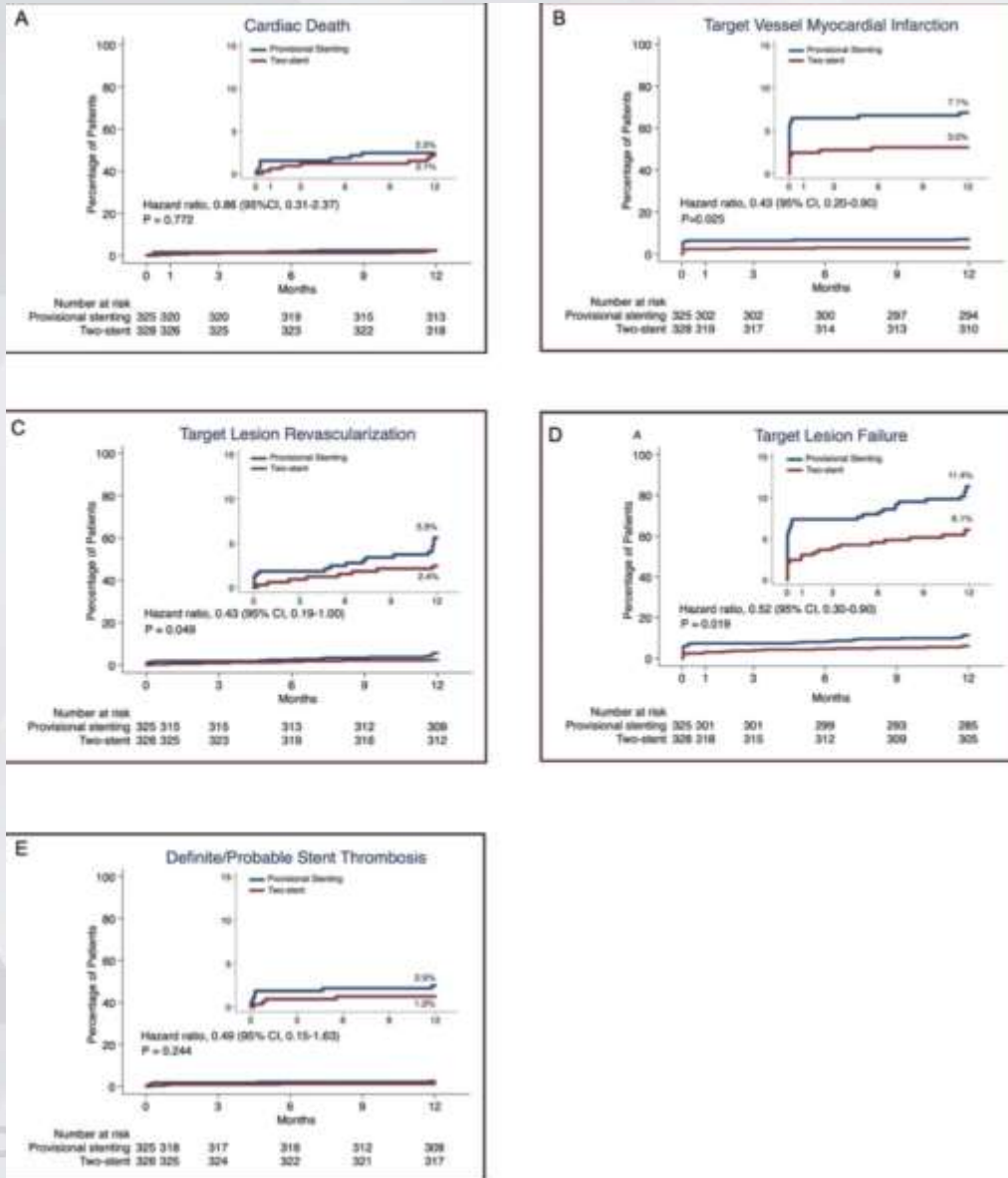
- SB lesion length ≥ 10 mm, and
- SB diameter stenosis $\geq 90\%$

Minor criteria

- > mild calcification
- Multiple lesions
- Bifurcation angle $< 45^\circ$ or $> 70^\circ$
- MV-RVD < 2.5 mm
- MV lesion length ≥ 25 mm
- Thrombus-containing lesions

A complex bifurcation is defined as either two major criteria or one major criterion with two minor criteria fulfilled.

Complex 2 stent bifurcation



European Heart Journal (2020) 0, 1–14
 European Society of Cardiology doi:10.1093/eurheartj/ehaa543

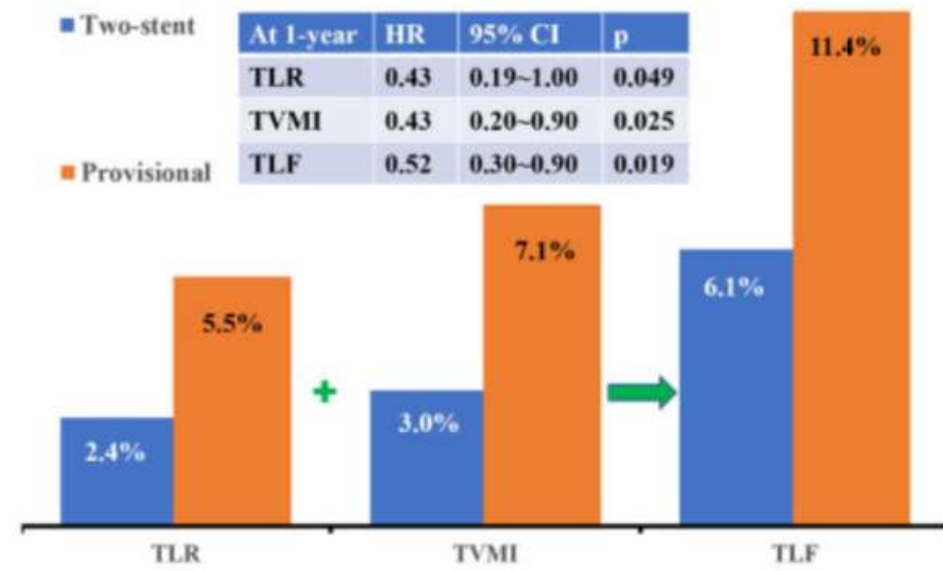
CLINICAL RESEARCH
 Interventional cardiology

Multicentre, randomized comparison of two-stent and provisional stenting techniques in patients with complex coronary bifurcation lesions: the DEFINITION II trial

■ Two-stent

| | At 1-year | HR | 95% CI | p |
|------|-----------|------|-----------|-------|
| TLR | | 0.43 | 0.19–1.00 | 0.049 |
| TVMI | | 0.43 | 0.20–0.90 | 0.025 |
| TLF | | 0.52 | 0.30–0.90 | 0.019 |

■ Provisional



Complex 2 stent bifurcation?

JACC: CARDIOVASCULAR INTERVENTIONS
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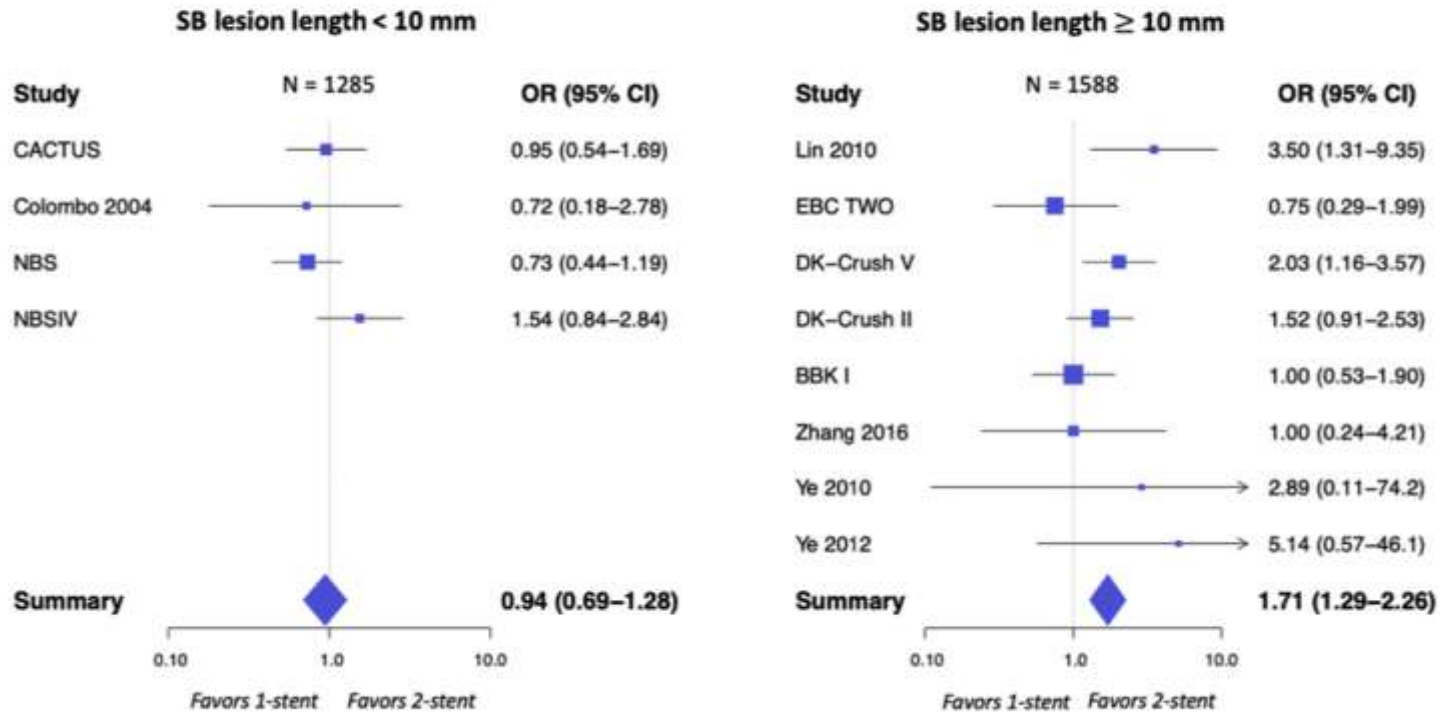
VOL. 13, NO. 12, 2020

Clinical Outcomes Following Coronary Bifurcation PCI Techniques



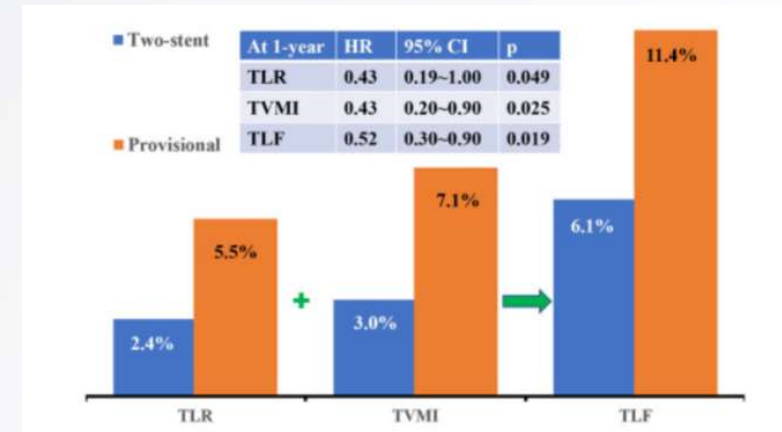
A Systematic Review and Network Meta-Analysis Comprising 5,711 Patients

FIGURE 4 Pairwise Meta-Analysis of the Outcome of MACE Between 1- and 2-Stent Bifurcation PCI Strategies Stratified According to SB Lesion Length



Complex 2 stent bifurcation

- So a complex left main bifurcation has
 - a Circumflex lesion length of > 10mm
 - with a stenosis of >70%
- And needs your best 2 stent approach



Optimising the side branch ostium during a 2 stent approach

Comprehensive Intravascular Ultrasound Assessment of Stent Area and Its Impact on Restenosis and Adverse Cardiac Events in 403 Patients With Unprotected Left Main Disease

Soo-Jin Kang, MD, PhD; Jung-Min Ahn, MD; Haegyun Song, MD; Won-Jang Kim, MD; Jong-Young Lee, MD; Duk-Woo Park, MD, PhD; Sung-Cheol Yun, PhD; Seung-Wan Lee, MD, PhD; Young-Hak Kim, MD, PhD; Cheol Whan Lee, MD, PhD; Gary S. Mintz, MD; Seong-Wook Park, MD, PhD; Seung-Jung Park, MD, PhD

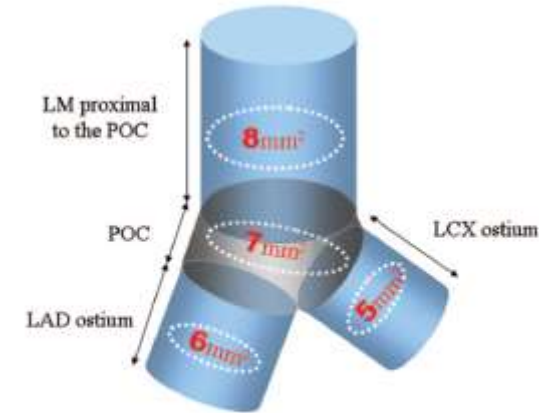
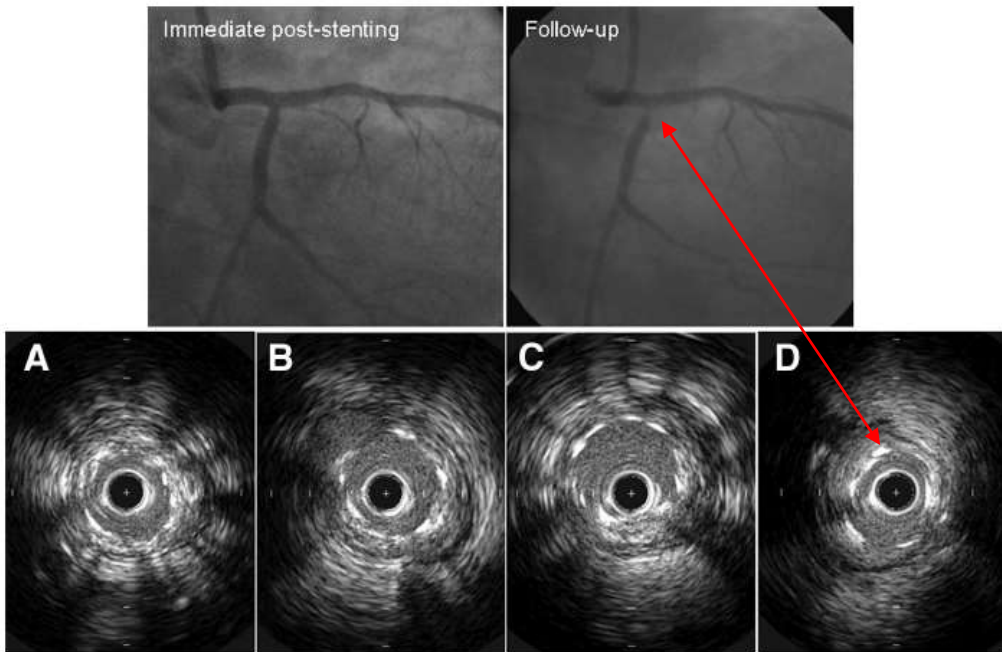


Figure 4. Minimal stent area (MSA) cutoff values for the prediction of angiographic in-stent restenosis (ISR) on a segmental basis. LM indicates left main artery; POC, polygon of confluence; LAD, left anterior descending artery; LCX, left circumflex artery.

Smaller MLA predicts restenosis

Underexpansion independent predictor of 2yr need for revascularisation

Optimising the side branch ostium during a 2 stent approach (left main)

Optimal SB ostium result has 3 phases

- Lesion preparation
 - Left main – plaque modification – Rotablation/lithotripsy
- Optimised 2 stent delivery technique
- Post stent dilation after imaging including kissing and POT
 - Within the left main bifurcation this can be difficult

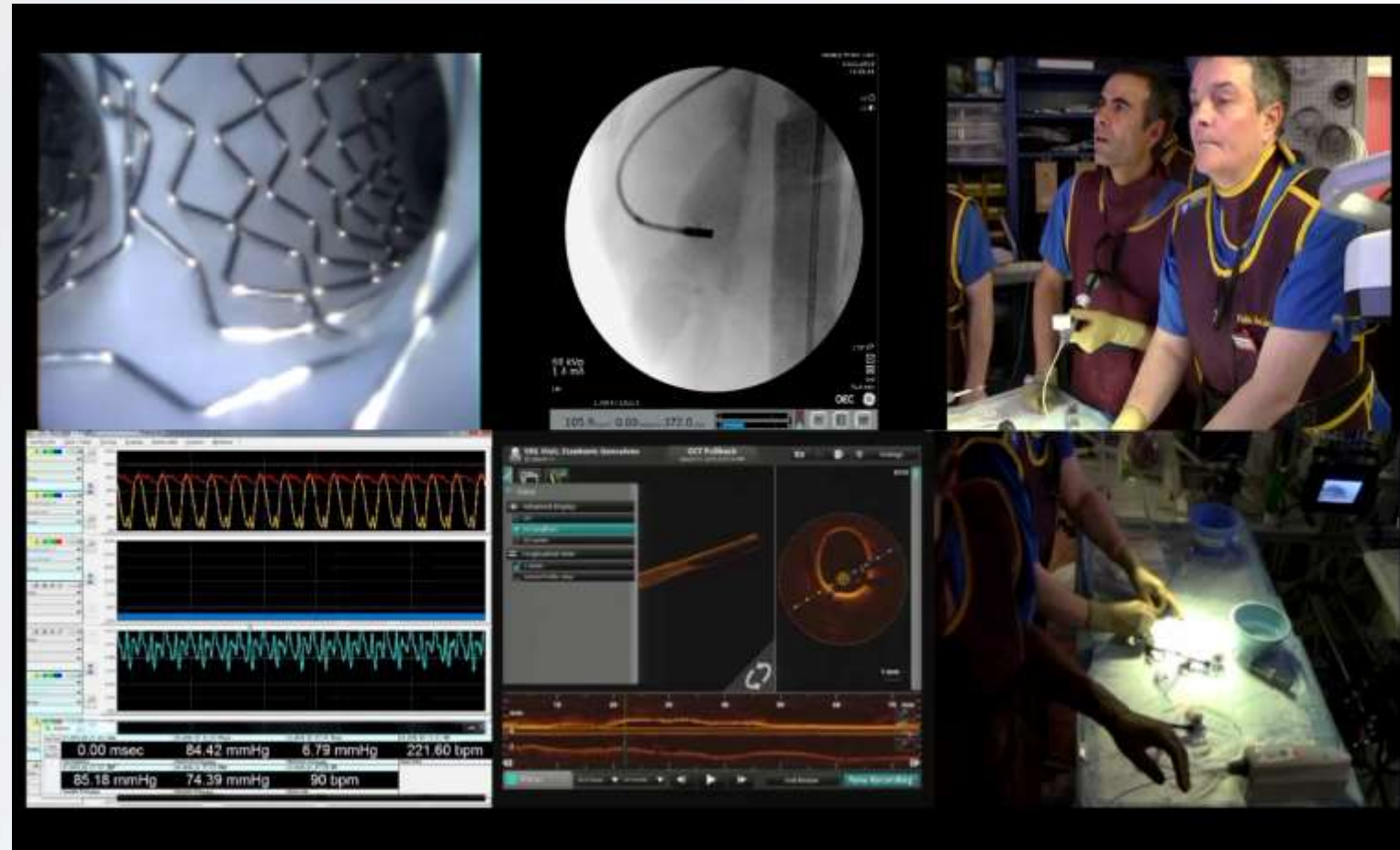
Optimising the side branch ostium during a 2 stent approach (left main)

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Bifurcation Stenting in a Reanimated Swine Heart: Prof Stankovic

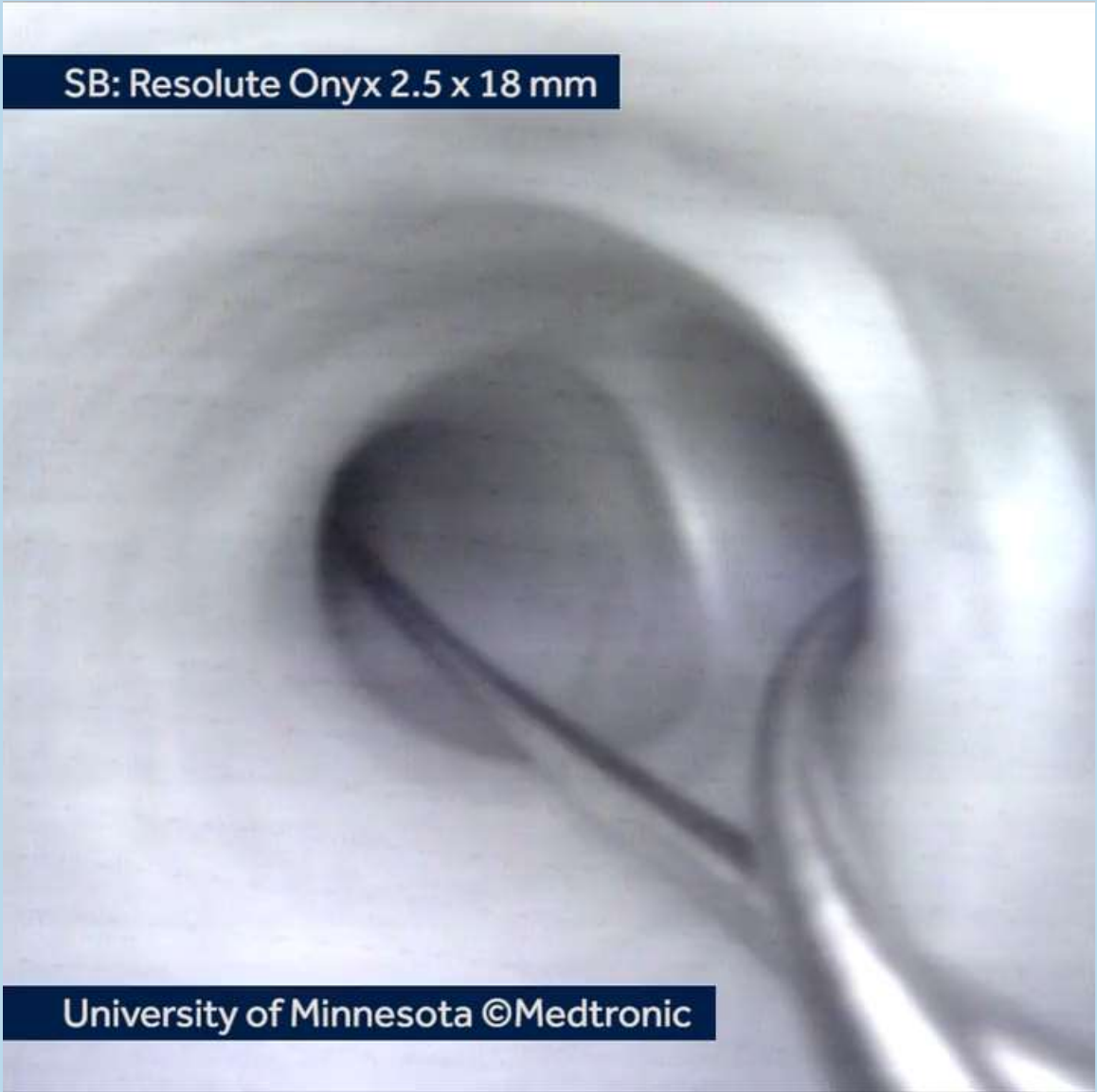
THE VISIBLE HEART® LAB A POWERFUL SET OF TOOLS FOR STUDYING PROCEDURAL CHARACTERISTICS

- Since 2012 collaboration between EBC, Medtronic & University of Minnesota;
- Functional perfused beating heart at physiological pressure;
- Multi-modality imaging allows for detailed studies of stent-artery interactions;



OCT, Fluoroscopy, Videoscopes; March 11, 2019

Visible heart to refine DK-Crush technique

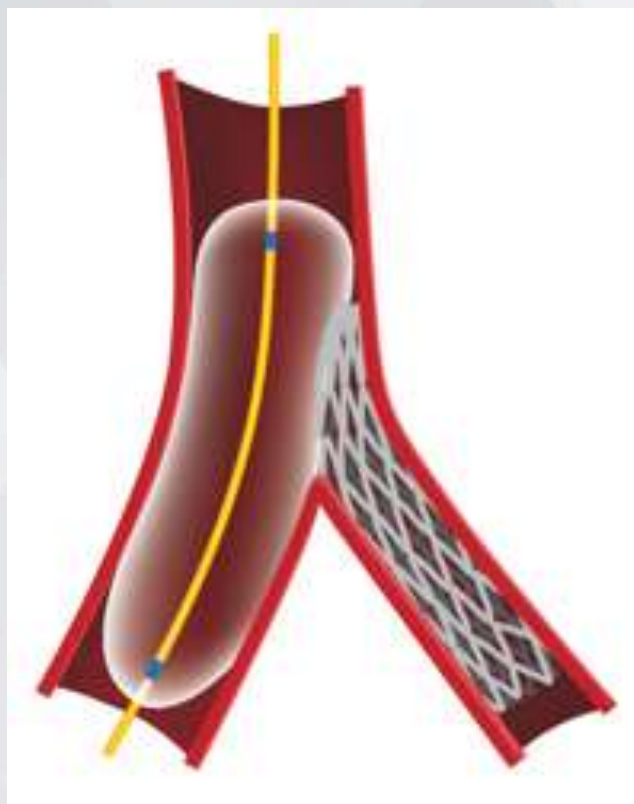


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LIC201912443ML 05/19

MULTIPLE INFLATIONS TO ENSURE COMPLETE CRUSH



Crush: SC Balloon 3.5 x 12 mm



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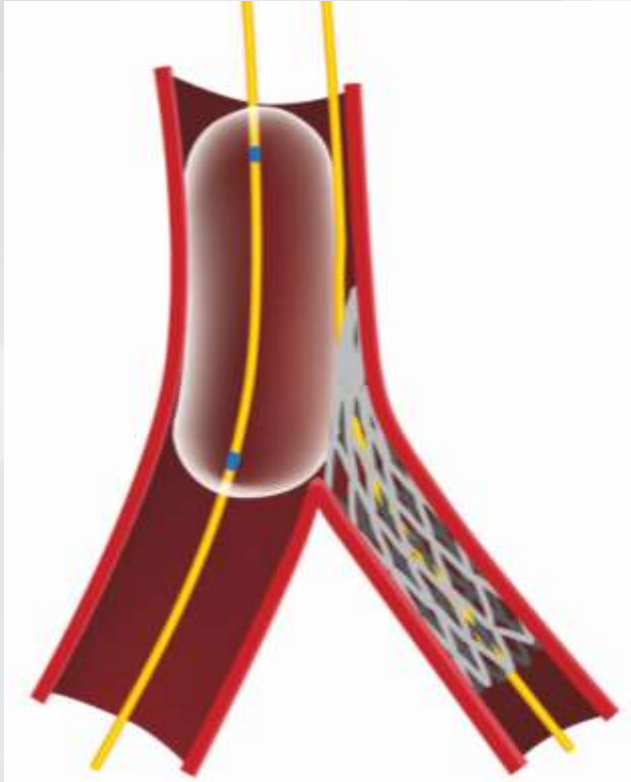
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TCTAP 2021 VIRTUAL

LIC201912443ML 05/19

MULTIPLE INFLATIONS TO ENSURE COMPLETE CRUSH

AND THEN 2nd POT w larger balloon



Crush: SC Balloon 3.5 x 12 mm



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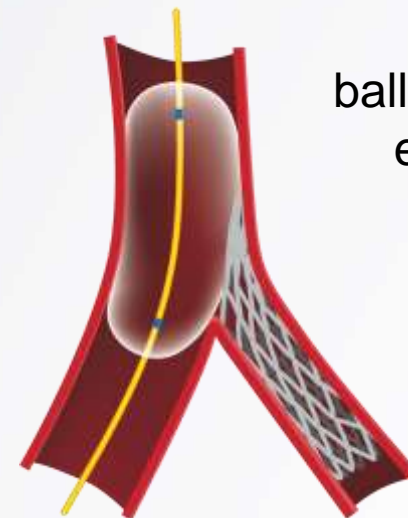
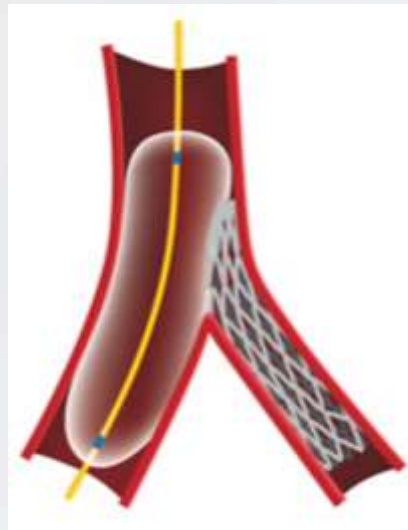
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LIC201912443ML 05/19

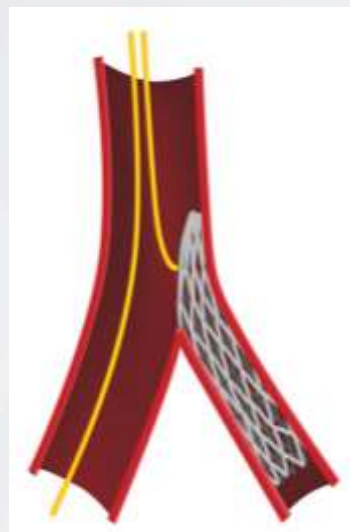
DK CRUSH STEP BY STEP



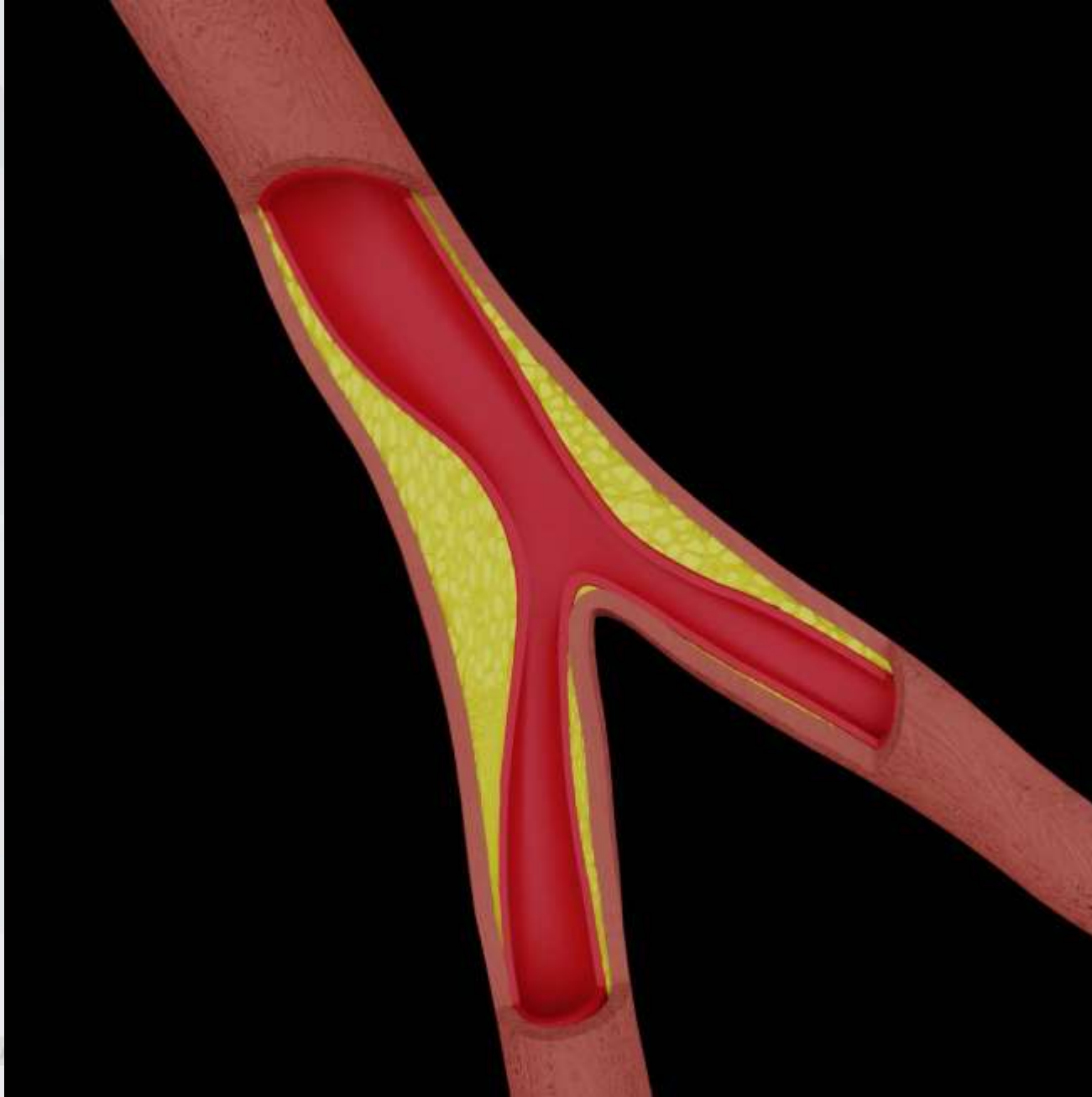
High pressure inflation
Side branch ostium



Make sure this
POT
balloon is big
enough



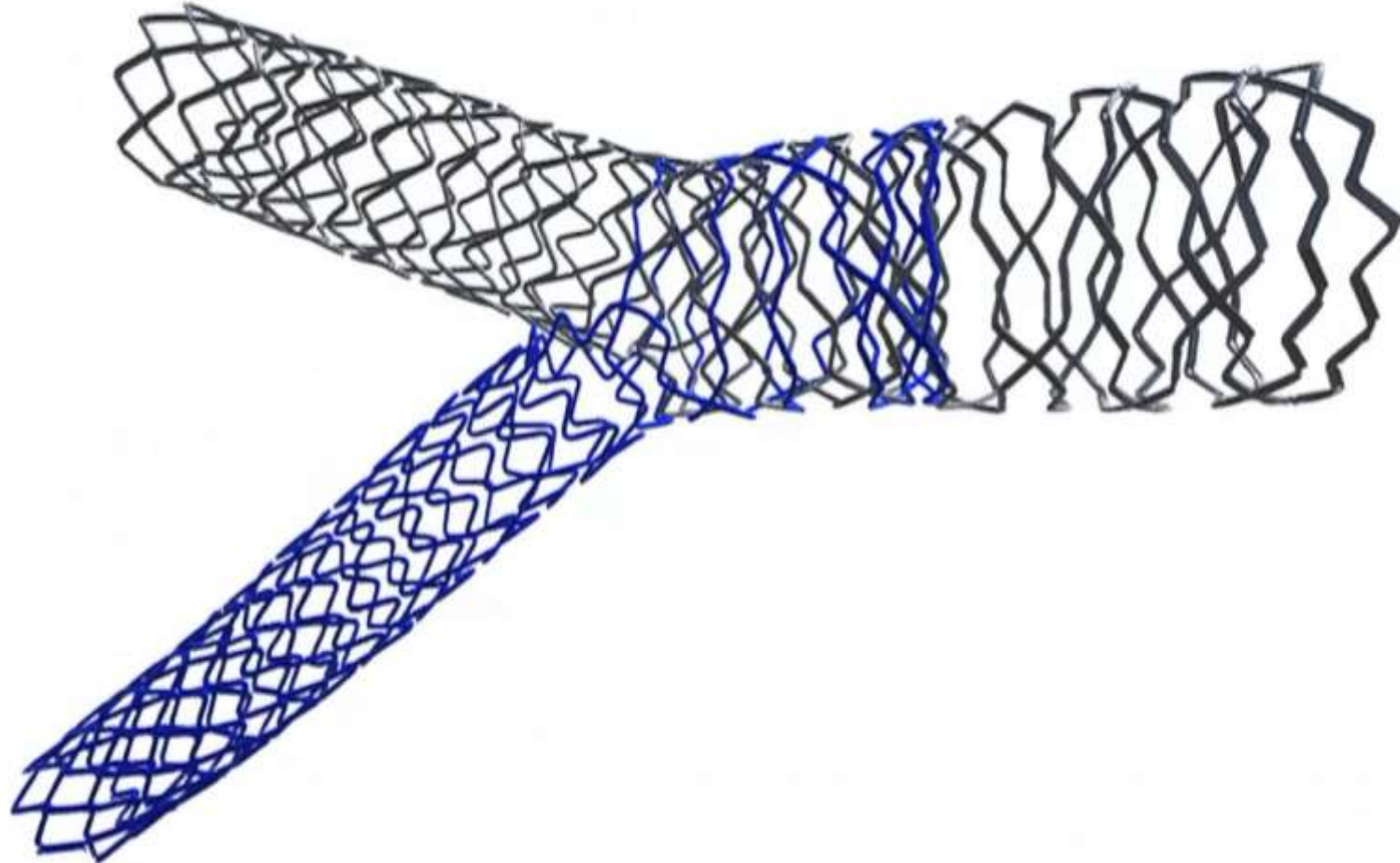
DK-Crush Stenting: Step-by-Step



G. Stankovic, Z. Mehmedbegovic



Culotte-stenting



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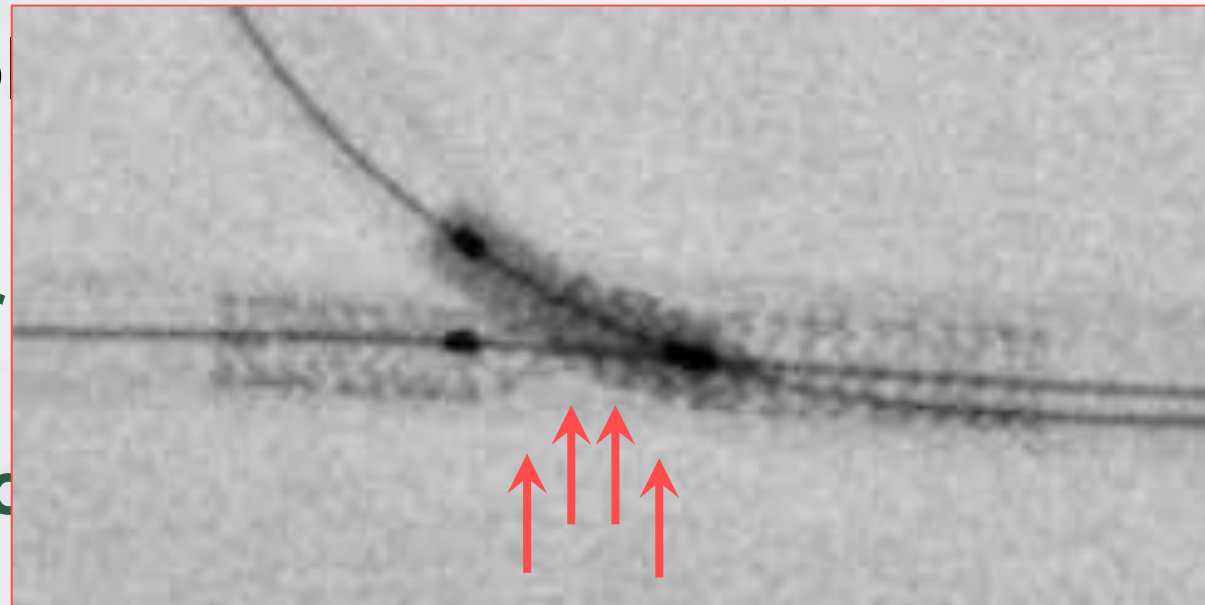
The problem...

Any dilation in the non-stented daughter-branch causes deformation of the stent

The so

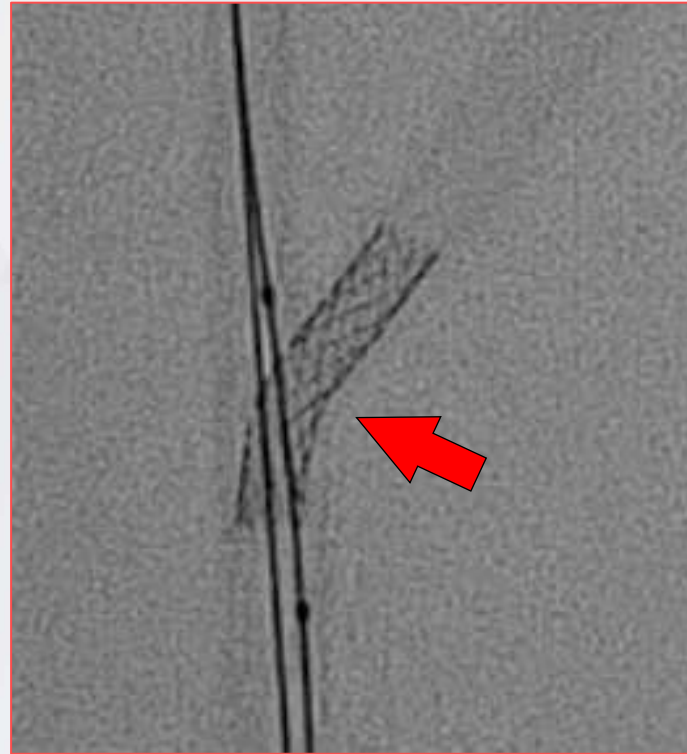
Deform

dilatic



g balloon

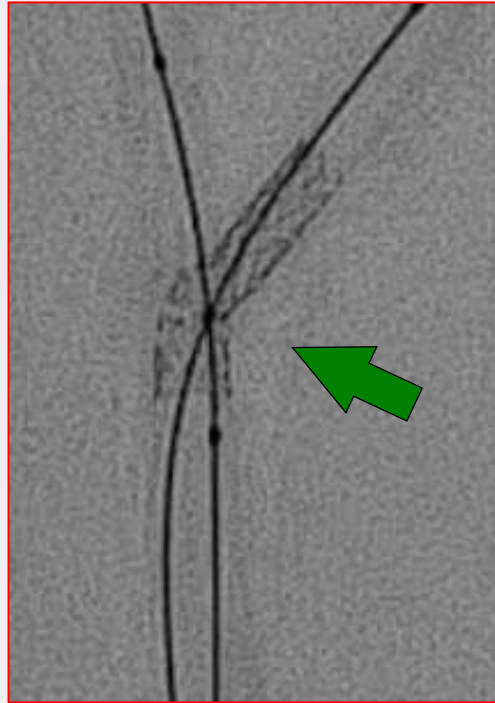
This issue exists during Culotte, as well...



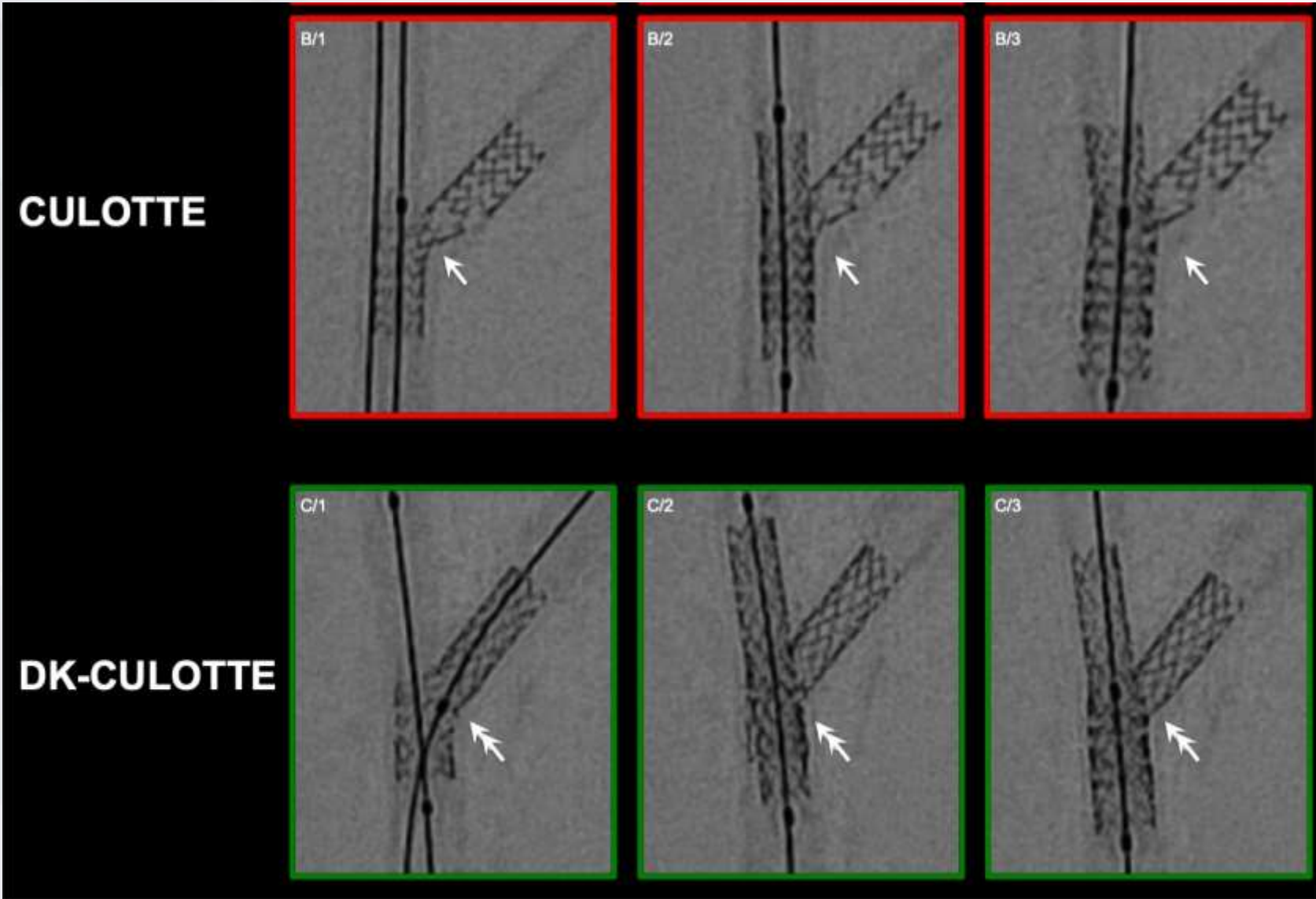
Final kissing will correct this issue....

...if rewired accurately

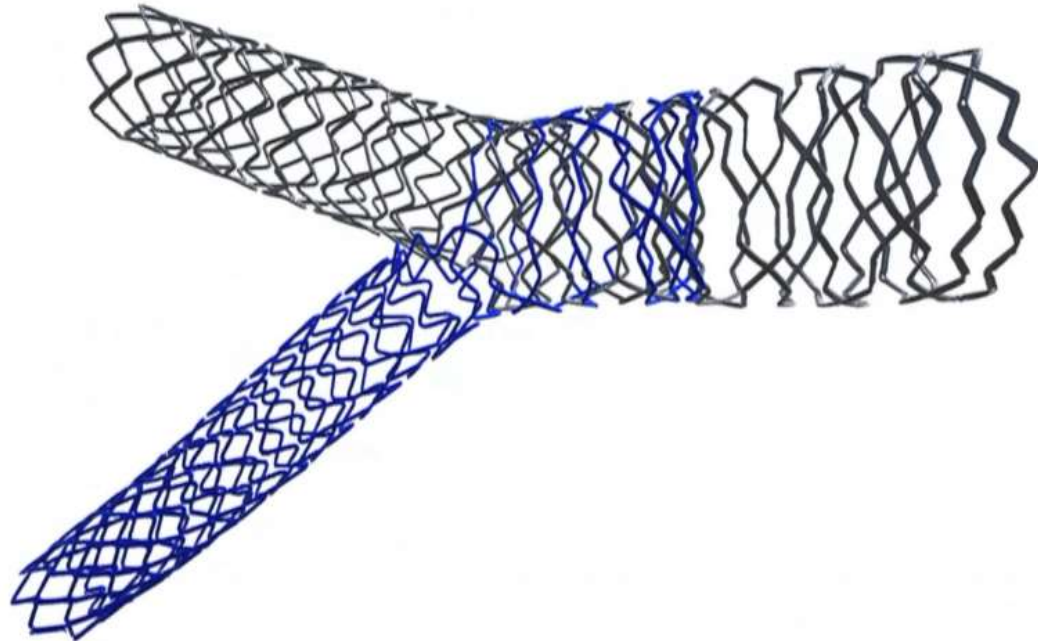
What we have learnt from DK-Crush makes a difference during Culotte, as well...



In-bench evaluation – SB access after MB



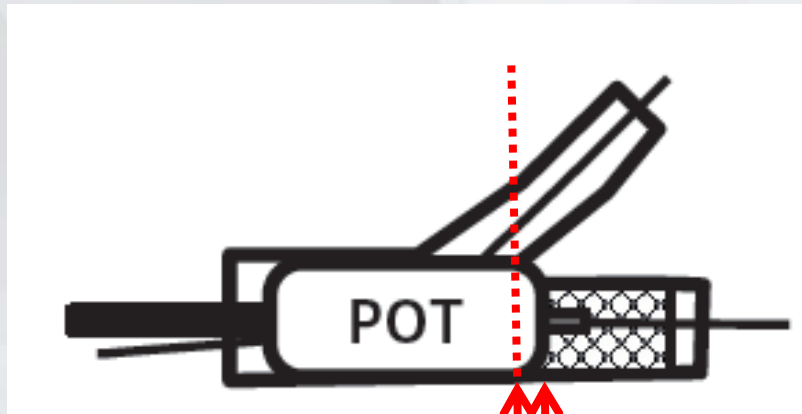
DK culotte can be considered



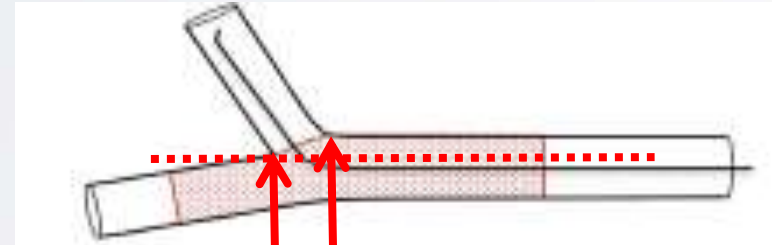
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Where should a final POT balloon be placed?

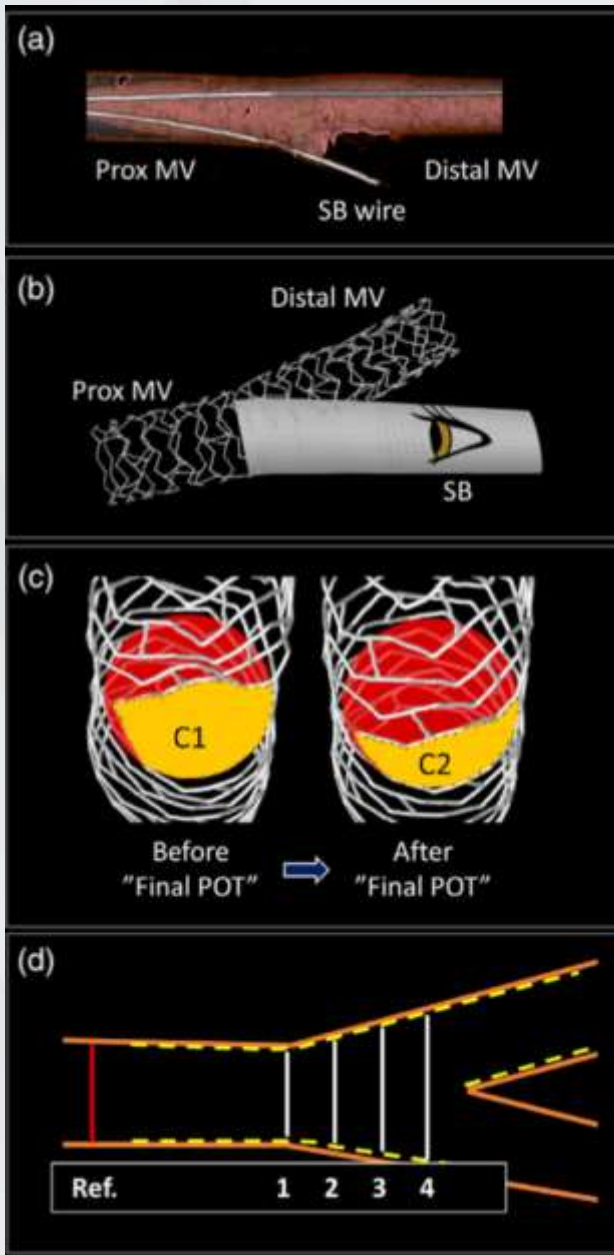
(if we cant decide on a cartoon –
what chance in the real life – 3D with cardiac motion??)



Is this is POT is too
DEEP



Because these
diameters have to be
different??

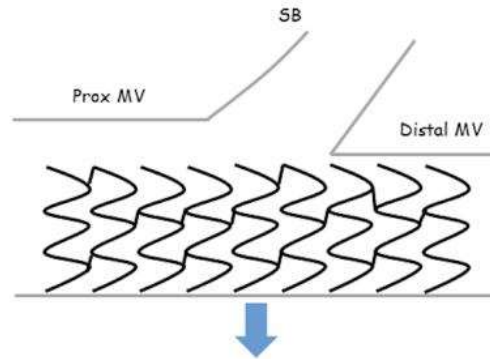


Critical aspects of balloon position during final proximal optimization technique (POT) in coronary bifurcation stenting

Lene N. Andreasen MS¹ | Niels R. Holm MD¹ | Bruce Webber MHSc² |
John A. Ormiston MBChB²

Proximal wire cross results in
reducing SB orifice with final POT

Catheter Cardiovasc Interv. 2020;96:31–39.



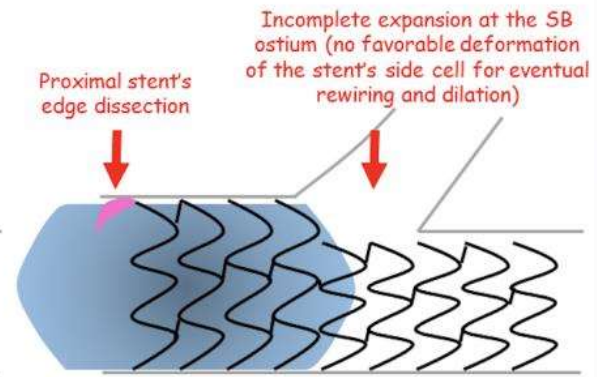
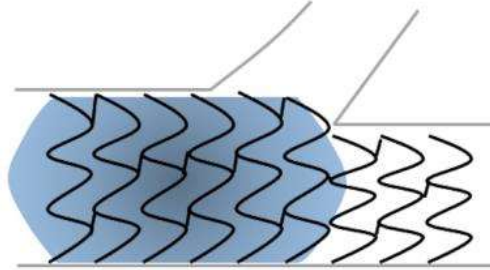
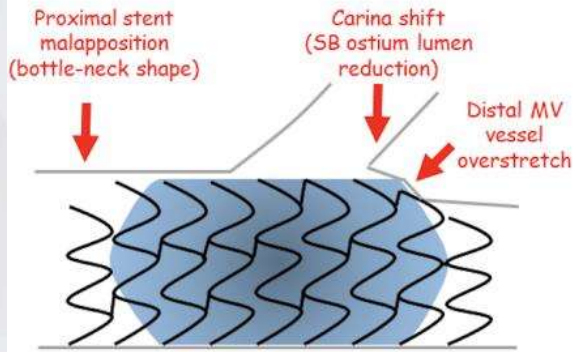
Provisional with crossover stenting (stent size selected according to distal MV)

POT WITH BALLOON SIZED 1:1 ACCORDING TO PROXIMAL MV

Imperfect balloon position
(too distal)

Perfect balloon position
(immediately proximal to carina and reaching the proximal stent edge)

Imperfect balloon position
(too proximal)



Conclusion / Take-home Messages

- Despite COVID-19 progress in optimising outcomes after bifurcation stenting is relentless
- Considerable variation in practices persist
 - – reflecting *what we don't know*
- Complex left main bifurcation can be recognized and needs 2 stents
a Circumflex lesion length of > 10mm with a stenosis of >70%
- Optimised sequences for 2 stent techniques offer potential advantages
- EBC-2 Provisional vs 2 stent in LB bifurcation
 - Reports EuroPCR 2021
- OPTIMAL RCT of IVUS guidance in left main PCI commenced 2020
 - Spain, UK and Italy PI's Banning and Testa