



Single-stent with Kissing Balloon for Bifurcations

# European Consensus for Single Stenting

*12:30 PM - 12:45 PM*

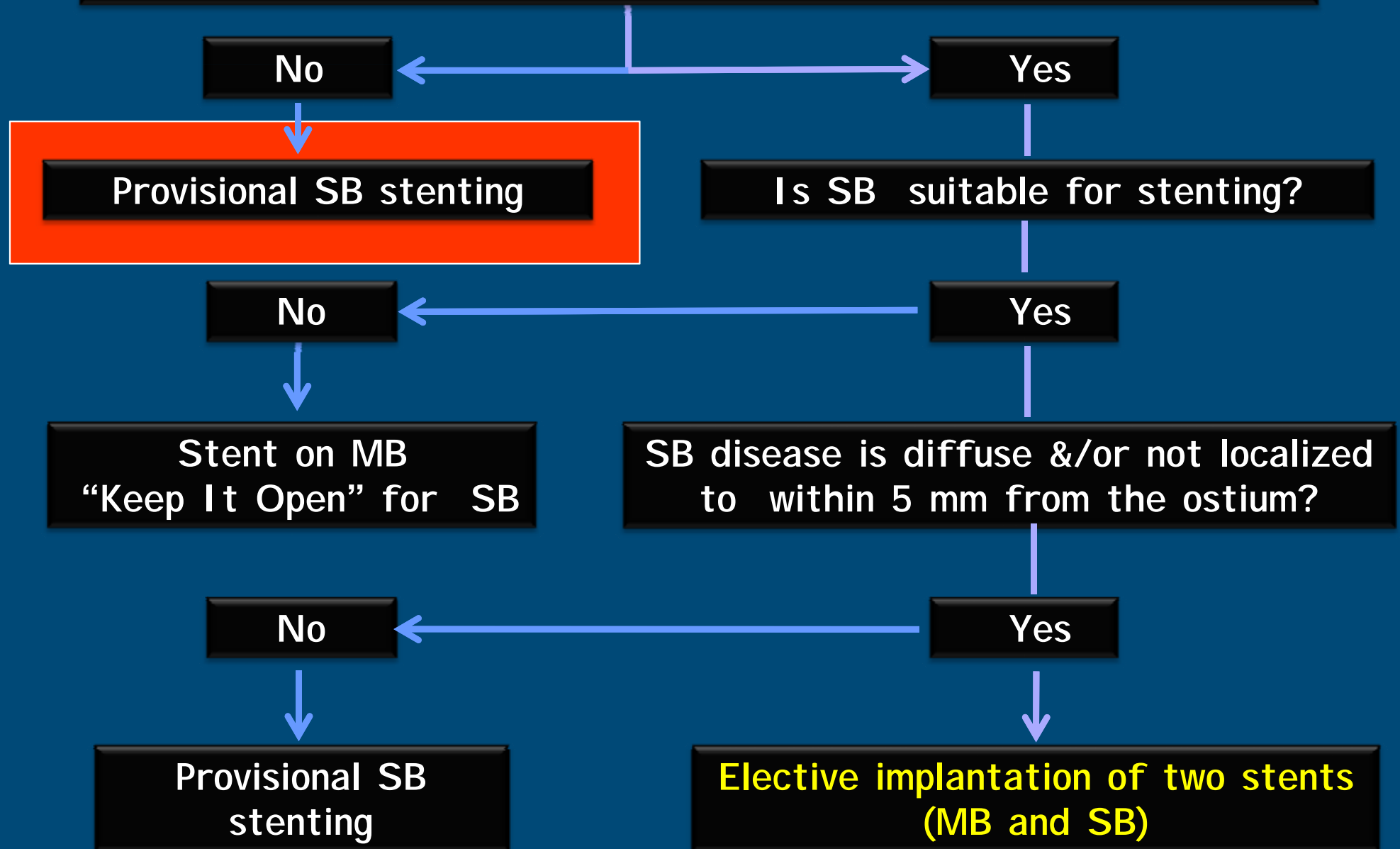
*Alaide Chieffo, MD*

*San Raffaele Scientific Institute, Milan,  
Italy*



# True Bifurcation

(significant stenosis on the main and side branches)





# Provisional

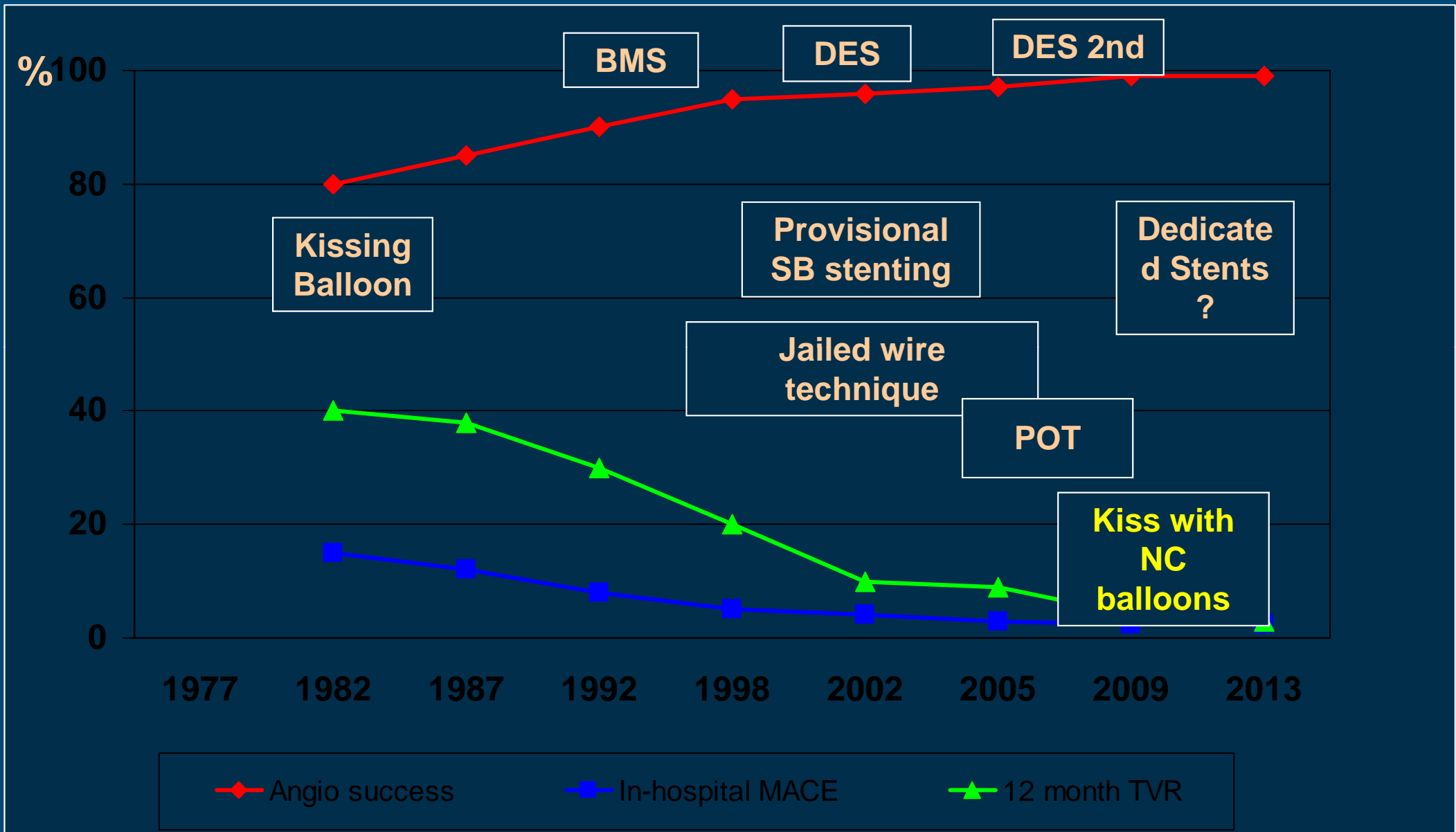
When SB has minimal disease or only at the ostium AND when *SB is suitable for stenting*

- *6 Fr guiding catheter*
  1. Wire both branches
  2. Dilate MB and SB if needed
  3. Stent MB leaving a wire in the SB
  4. Re-wire SB and then remove jailed wire
  5. Kissing balloon inflation
  6. Stent SB only if suboptimal result (TAP, reverse crush, culotte)





# History of bifurcation treatment





## Kiss, what for?

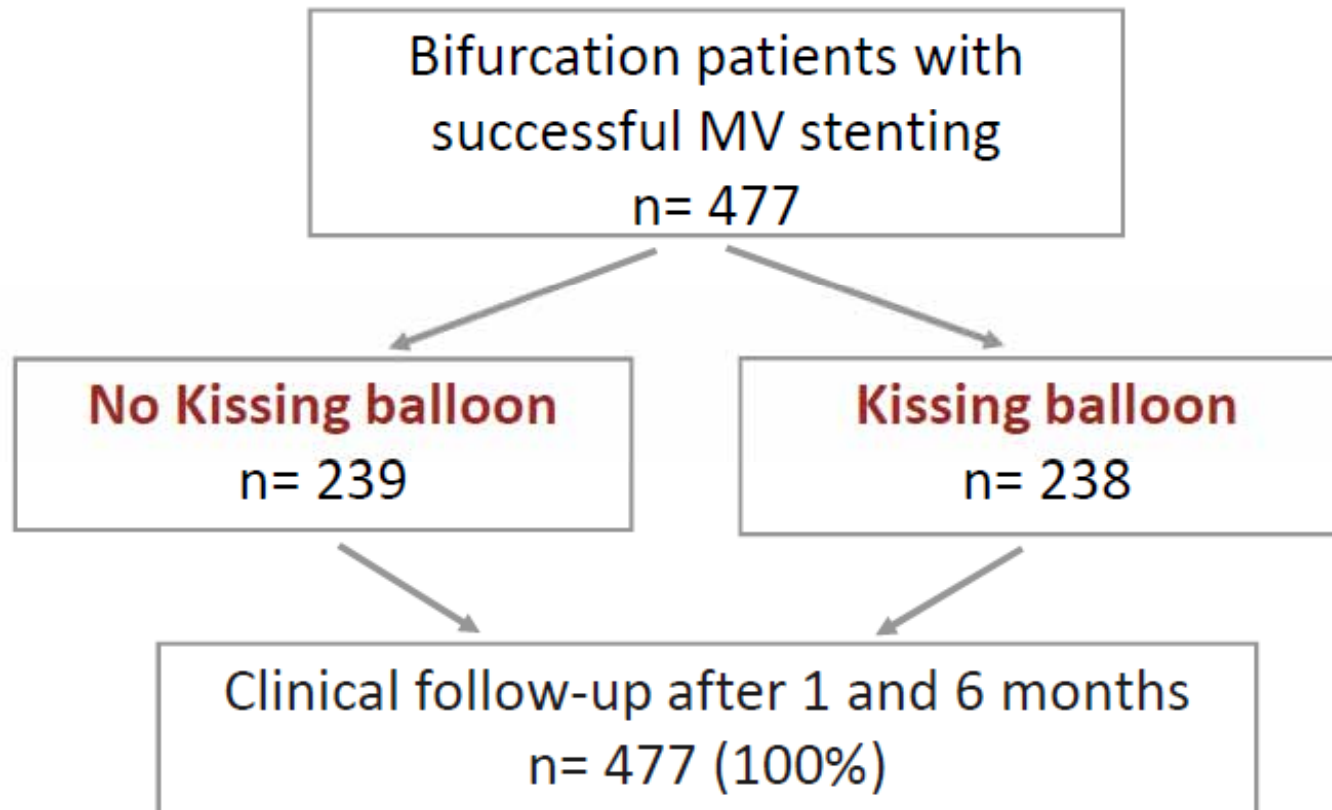
- To correct a **poor result** in SB
  - TIMI flow < 3, EKG, Pain...
  - carena / plaque shift
  - previous stenosis
  - to prepare a SB
- When SB result / flow are good :
  - to improve side branch access
  - to **remove the jail strut**
  - to relocate the flow divider
  - Correct stent deformation after side ballooning

**No evidence of clinical benefit**



# NORDIC III

## Randomization



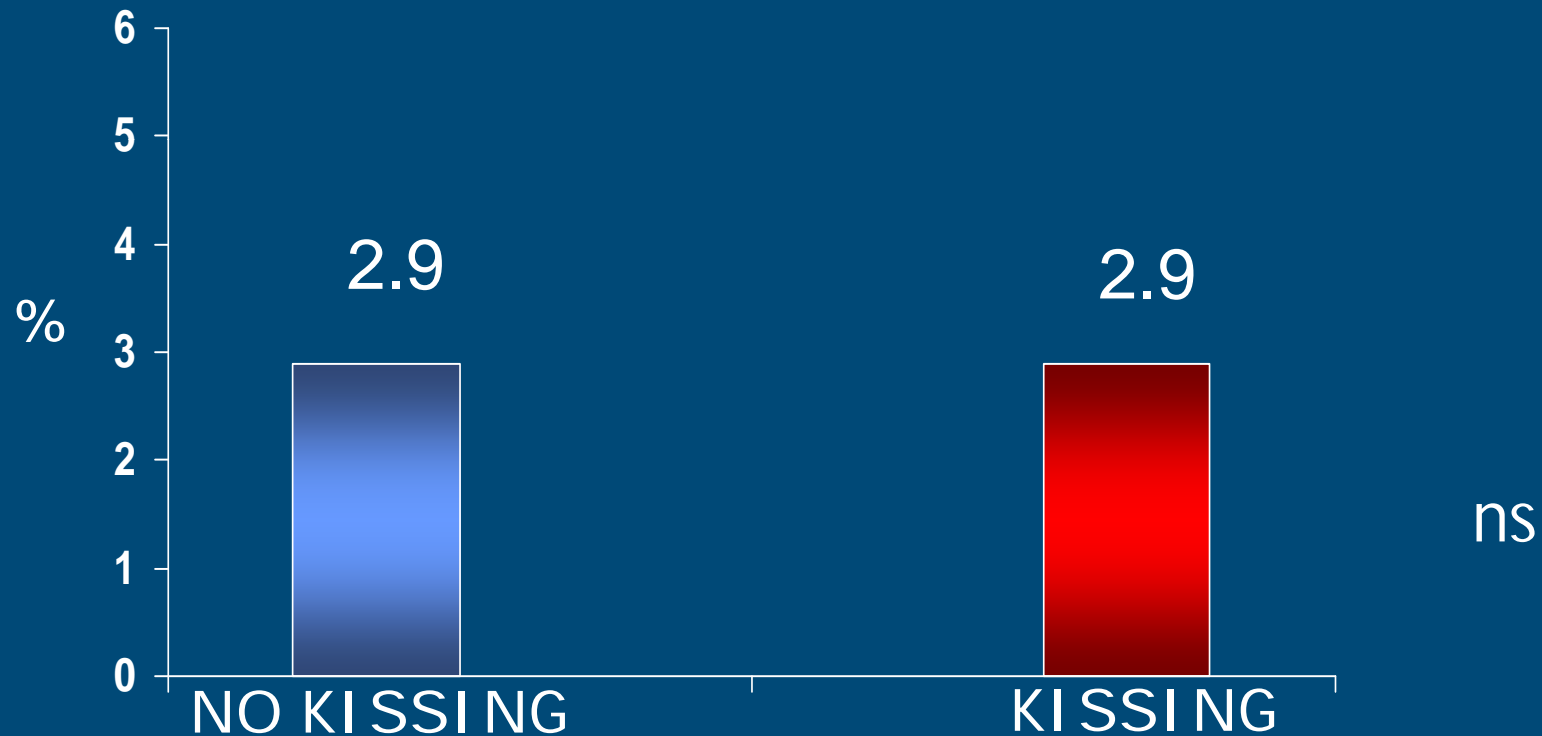


# NORDIC 3

## RCT on FKB vs no FKB in **All** Bifurcations

Only 50 % of the cases had a True Bifurcation Lesion!!

Primary end point  
MACE at 6 months



Niemela et al Circulation 2011 (123): 79-86

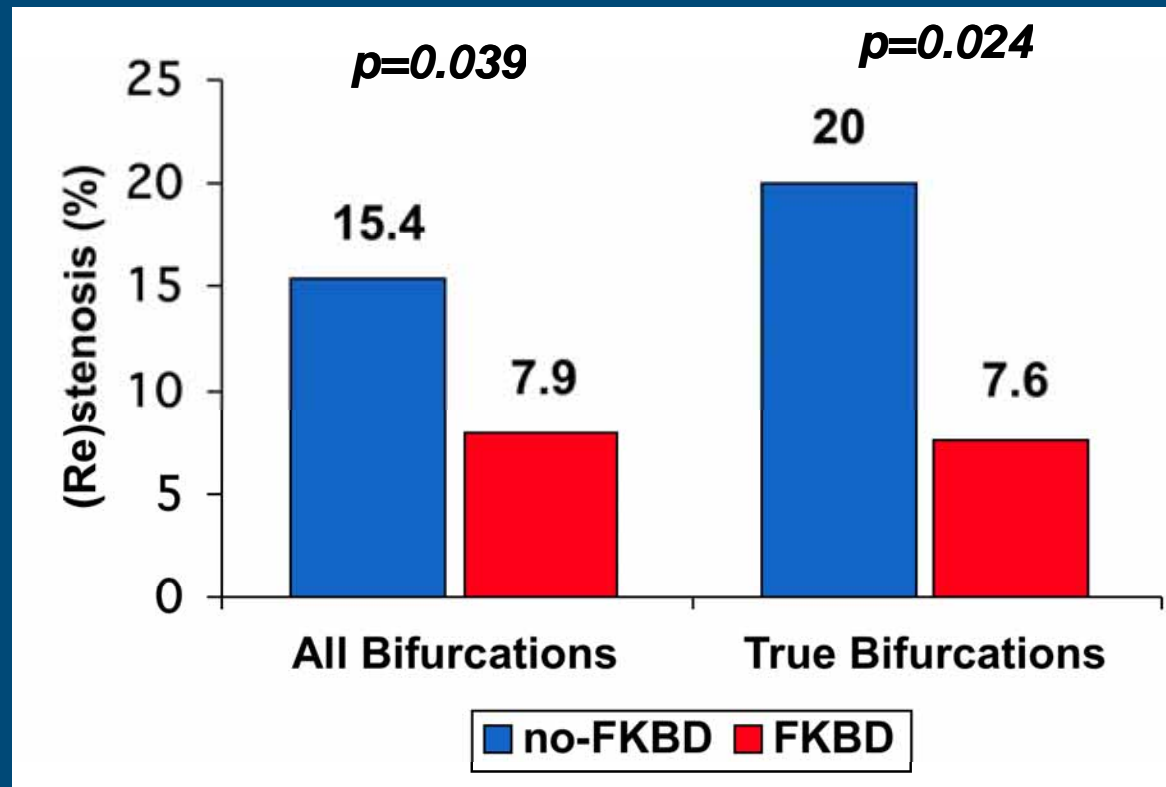


# NORDIC III

## Secondary end point

Side Branch (SB) Binary (Re)stenosis after 8 months

Medina 1,0,1 - 0,1,1 - 1,1,1

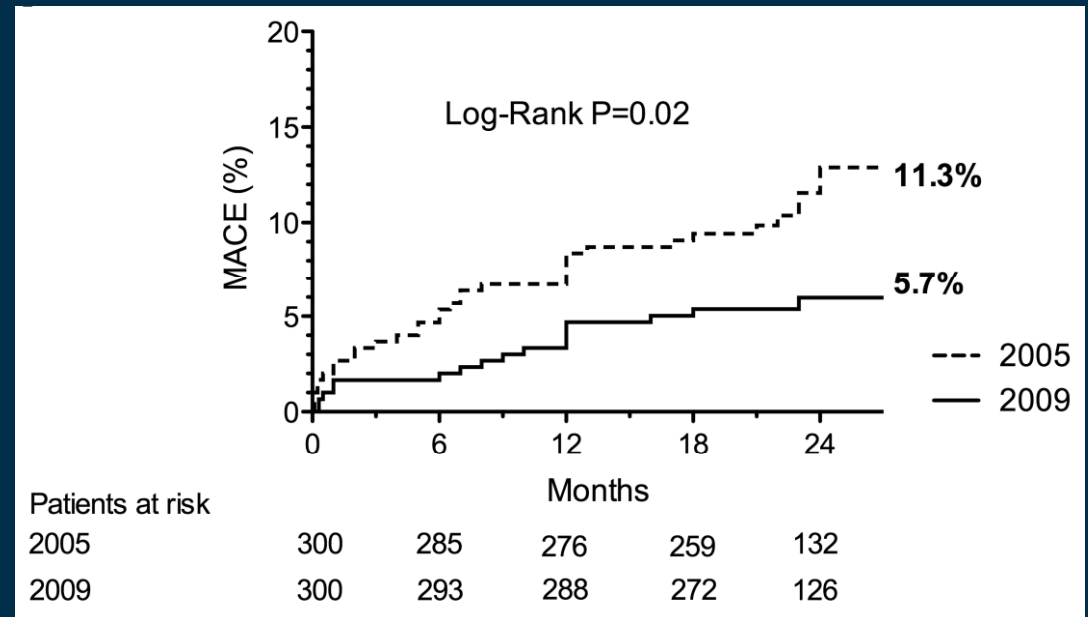




# Evidence of improving procedural and clinical outcomes with contemporary techniques

600 bifurcation lesions, 1-stent strategy (ITT), same operators

	2005 (n=300)	2009 (n=300)	p Value
6 F guide	97.3	97.0	0.99
IVUS (%)	9.3	6.0	0.13
Rotablator (%)	0.7	3.3	0.04
MB Stent type (%)			
Cypher	52.5	31.0	<0.0001
Taxus	47.5	11.0	<0.0001
Xience V	0	47.0	<0.0001
Other DES	0	11.0	<0.0001
POT (%)	0	36.3	<0.0001
Final kissing balloons (%)	93.3	91.7	0.54
Non-compliant balloons %)	0	81.3	<0.0001
MB stent diameter (mm)	3.1±0.4	3.0±0.4	0.002
MB stent length (mm)	20.6±6.6	22.7±7.2	0.0002
Side-branch stent (%)	22.3	9.0	<0.0001



Mylotte DM, EuroIntervention 2012



# Kissing With NC Balloons

## Don't kiss too big (non-compliant balloons)

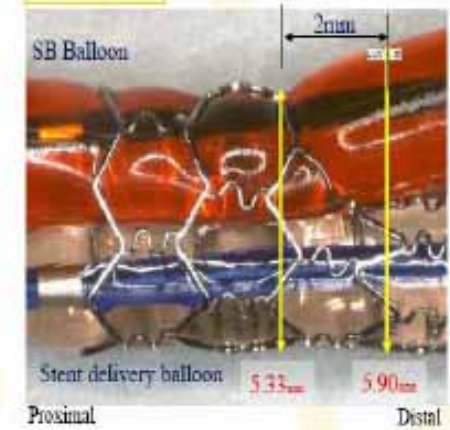
1 year	n=99
Target lesion revascularisation	3
Stent thrombosis	0
Myocardial infarction	0
Cardiac death	1
Non-cardiac death	2
Total MACE	4

Side Branch stent	6
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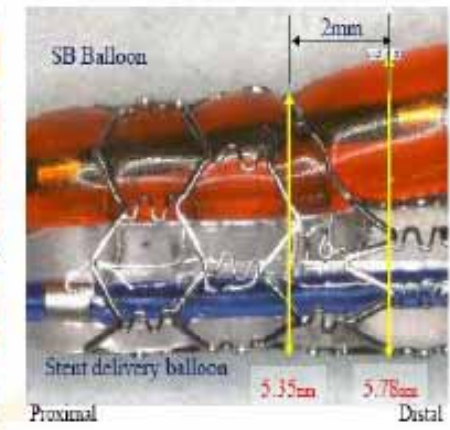


### Results

Cypher (J&J)



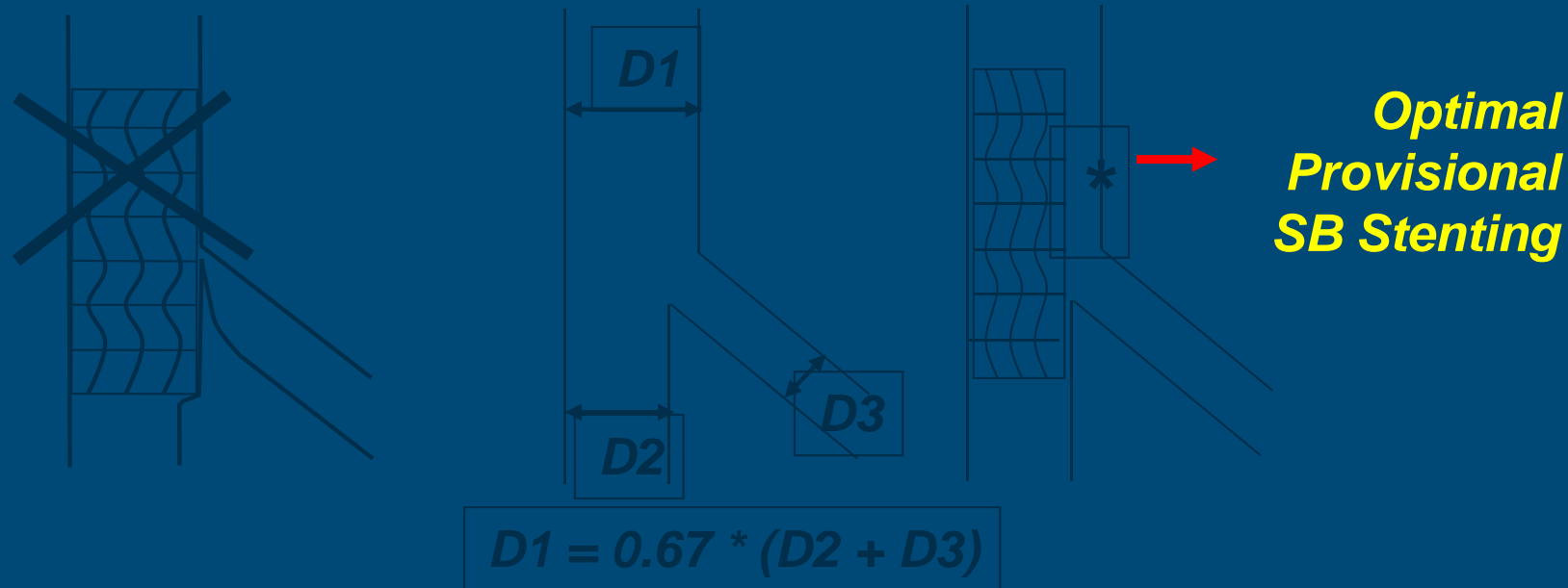
Semi-Compliant Balloon (Ryujin Plus, Terumo)



Non-Compliant Balloon (Hiryu, Terumo)



# The 3 Diameter Rule



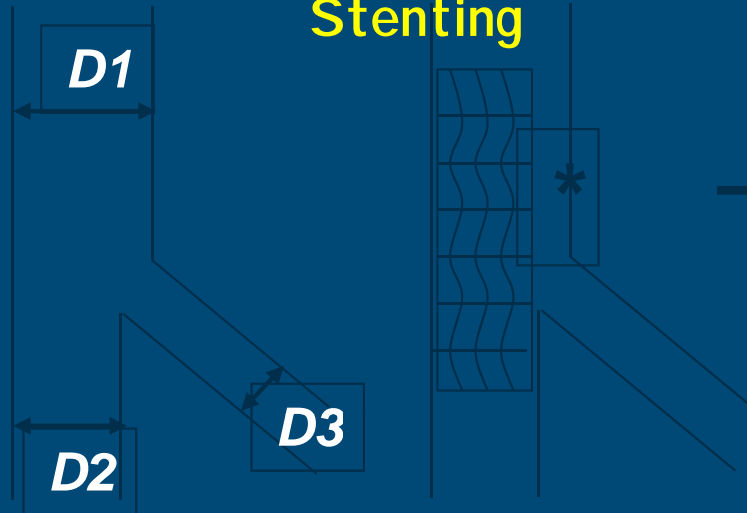
## Recommendations:

- In single stent techniques, the primary stent should be sized according to the distal main vessel diameter
- Postdilatation (POT), or kissing balloon inflations (FKB), are required to optimise the proximal main vessel stent diameter

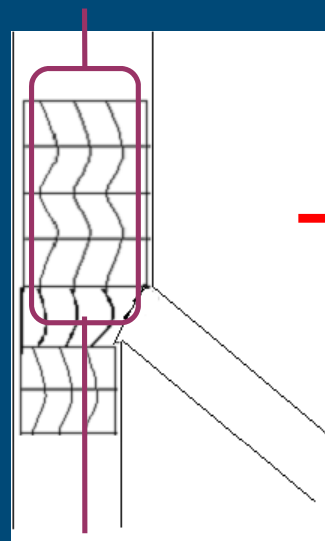


# Proximal Optimisation Technique (POT)

Optimal  
Provisional SB  
Stenting



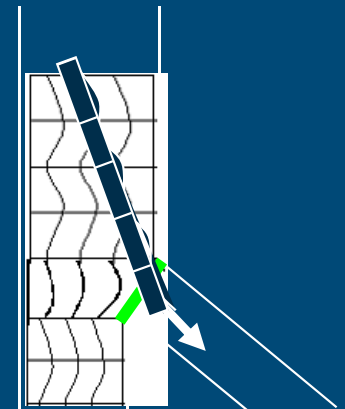
$$D1 = 0.67 * (D2 + D3)$$



POT



FKB



*Darremont, O from the  
6th EBC meeting 2010*

- Expansion of the stent at the carina, using a short oversized balloon
- Produces curved expansion of the stent into the bifurcation point and facilitates recrossing, distal recrossing, kissing inflations and ostial stent coverage of the side branch



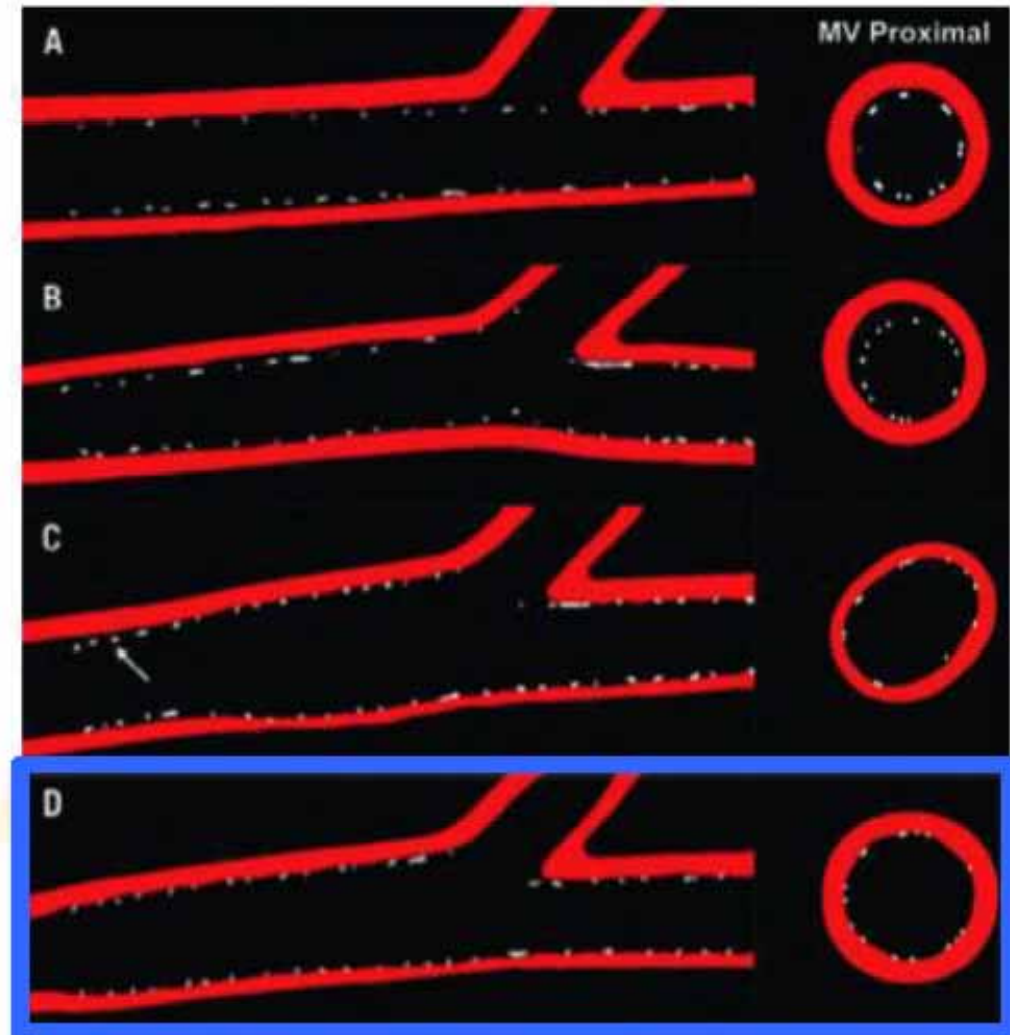
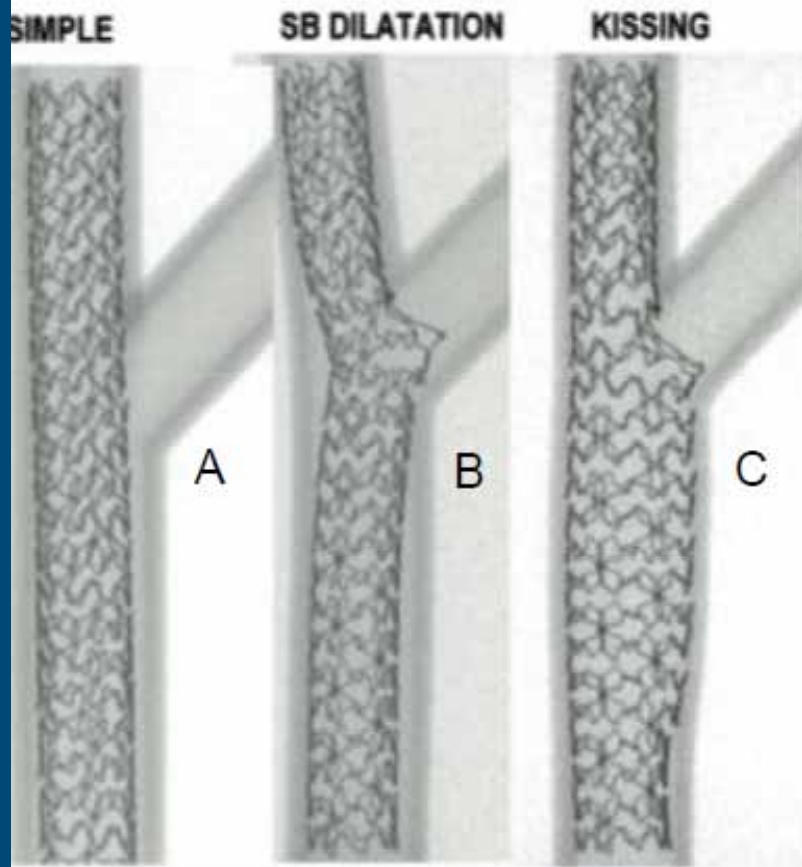
## Consensus from the 7<sup>th</sup> European Bifurcation Club meeting

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# Final POT?





# EBC Recommendations - POT

## First Recommendation:

the POT technique should be used  
in any case of difficulty recrossing into a side branch

## Second Recommendation:

- When using a single stent technique (in the absence of kissing balloon inflations) the proximal main vessel stent should be postdilated (POT) to an appropriate diameter



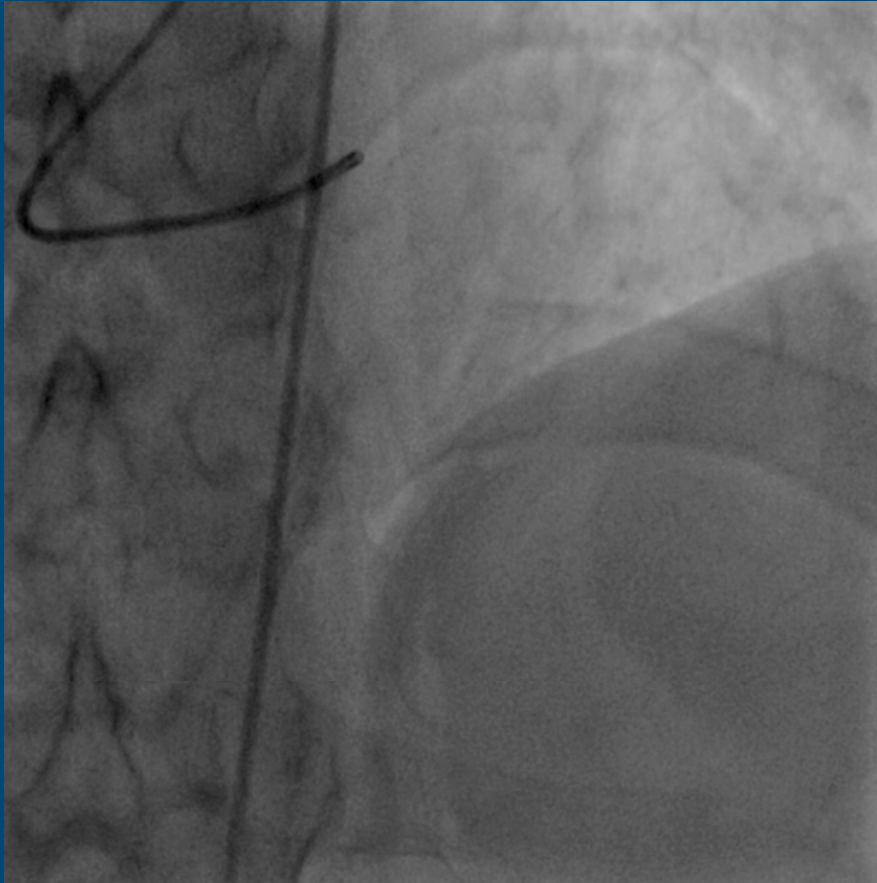
## Consensus from the 7<sup>th</sup> European Bifurcation Club meeting

POT technique has been recognized as first line technique when any trouble in SB wiring or balloon advancement is faced

Moreover it can be considered as possible essential step of the simple strategy

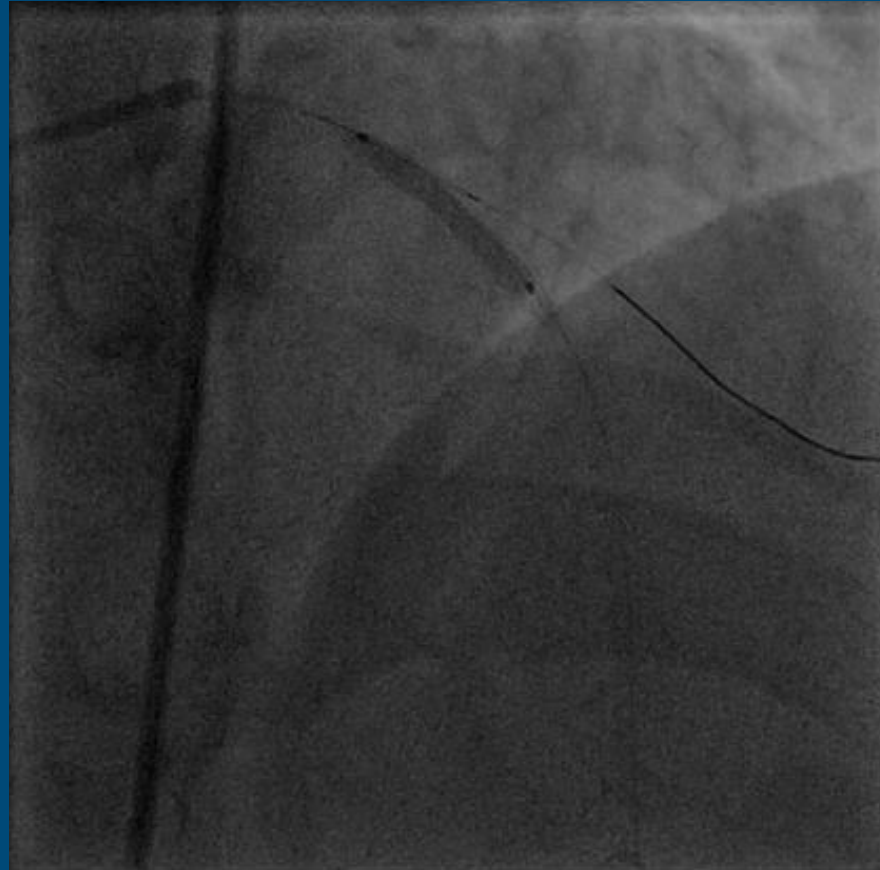


# Case 1. Provisional





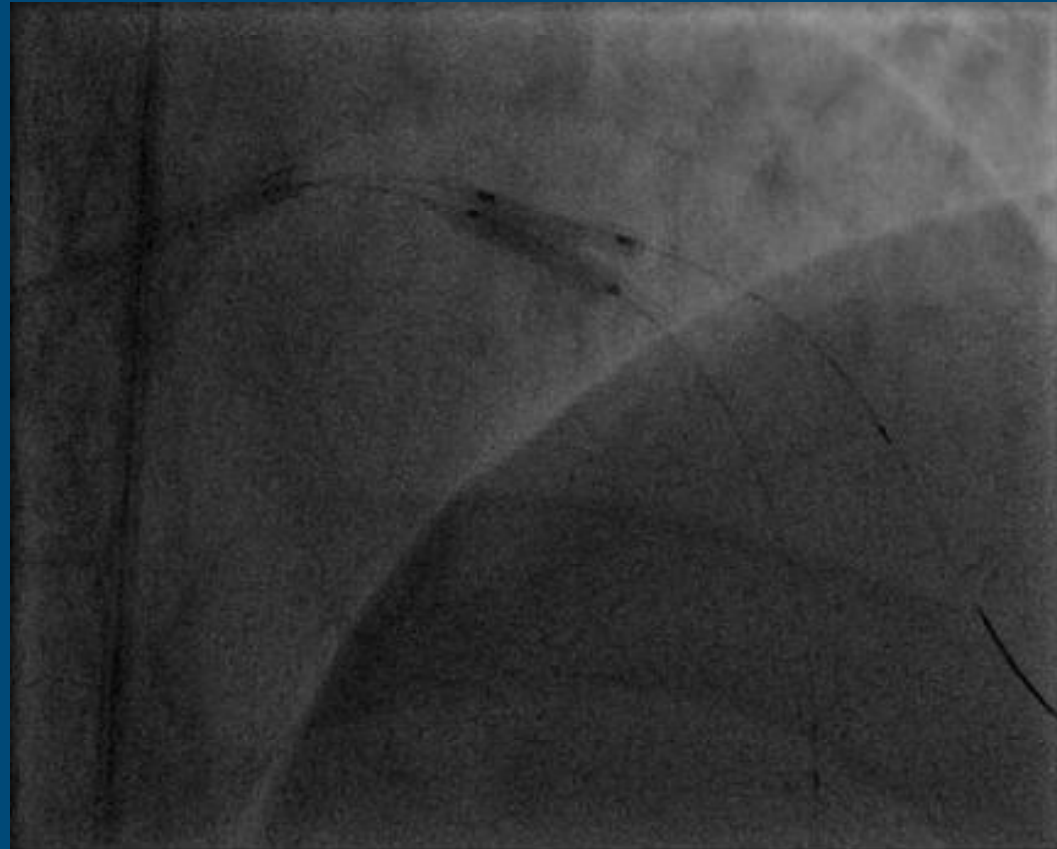
# Case 1. MB Stenting



BES 3.0 x 18 mm, atm 12

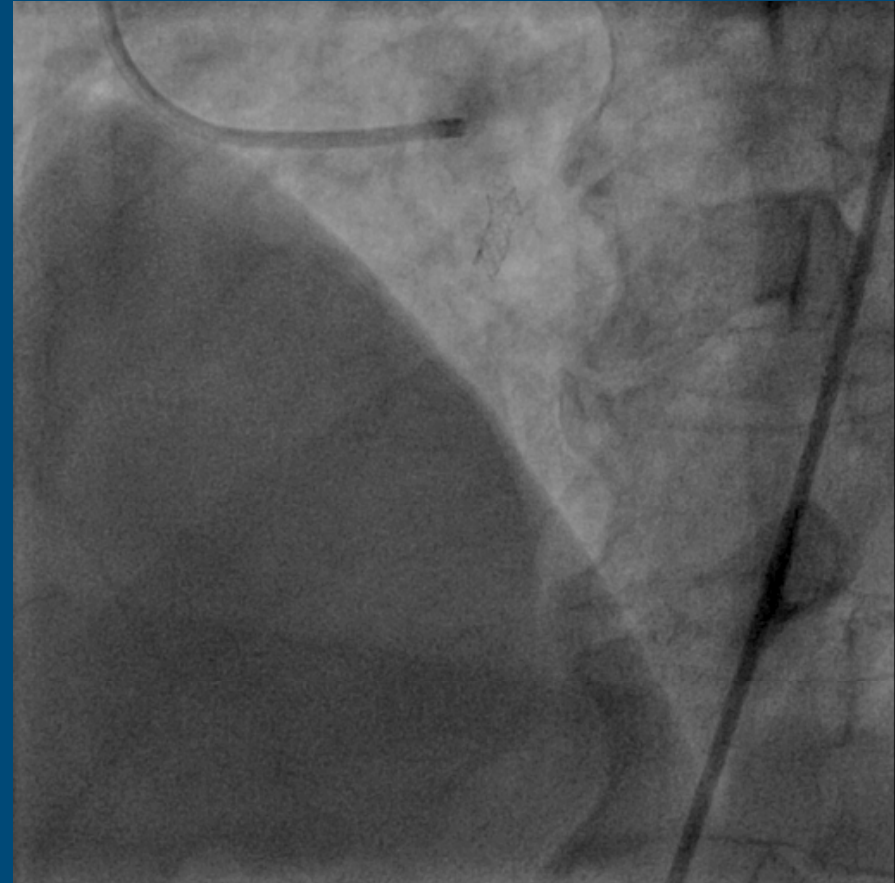
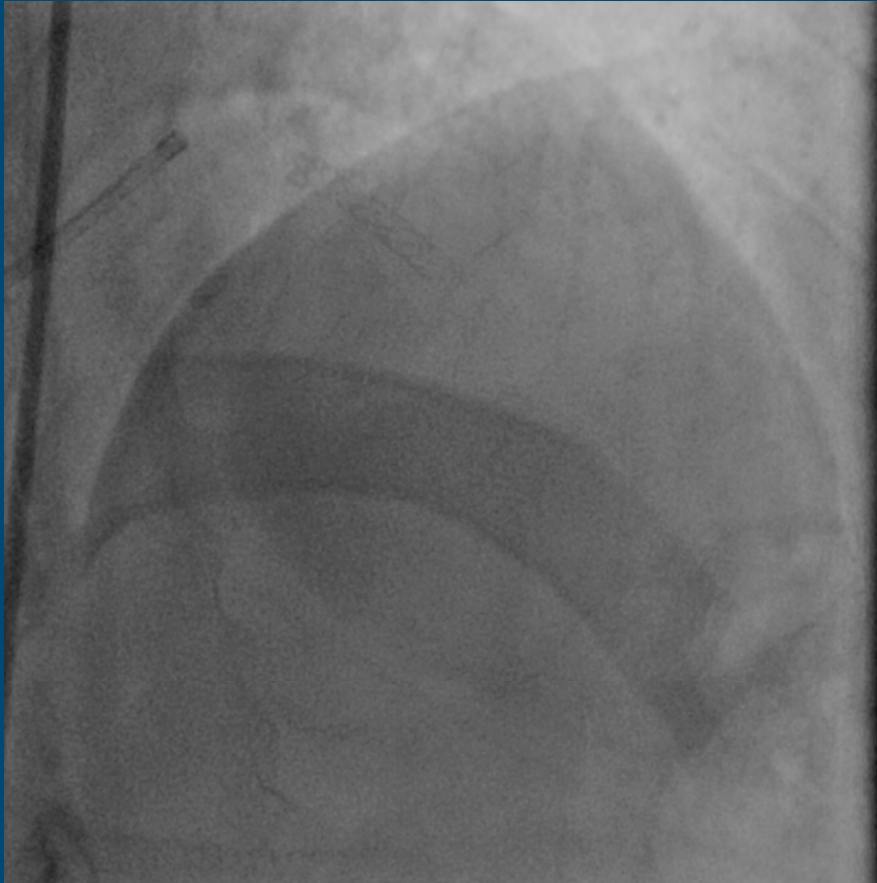


# Case 1. FKB



POBA with 2.5 x 12 mm on SB >>  
FKB (3.0 on MB and 2.5 on SB)

# Case 1. Final Angio



# Case 2. Provisional can be risky



Baseline

HSR



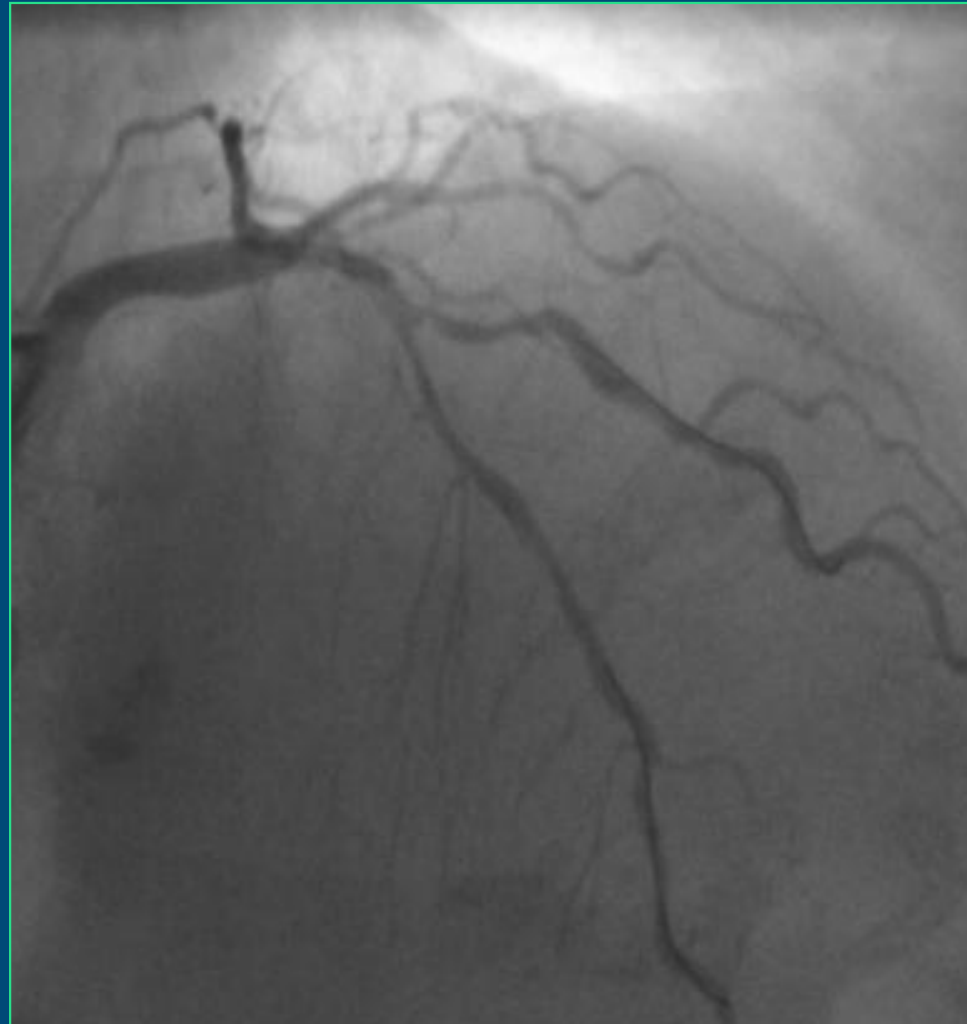
# Provisional can be risky



Predilatation



# Provisional can be risky

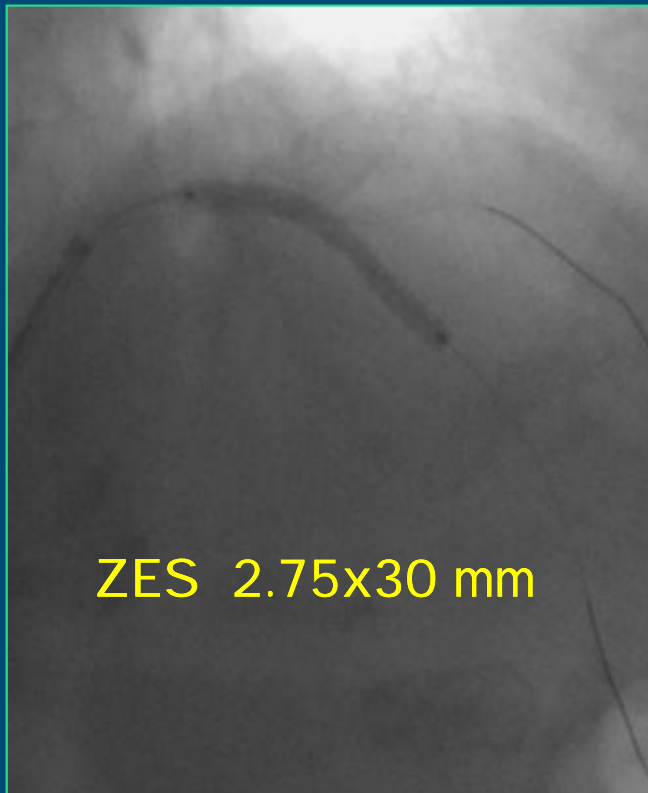


After predilatation

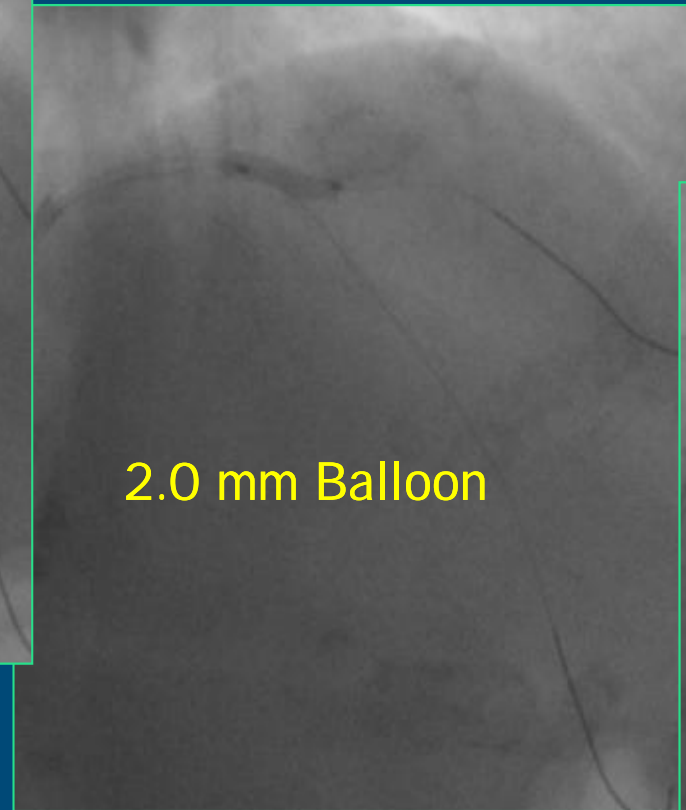
HSR



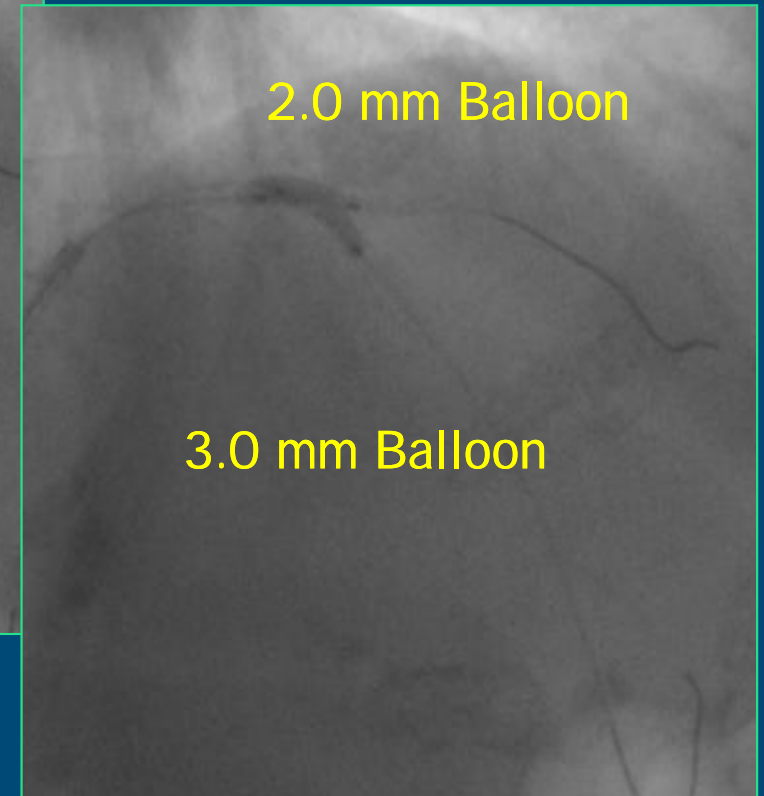
# Provisional can be risky



Stenting  
LAD



Dilatation to  
Ostial Diagonal

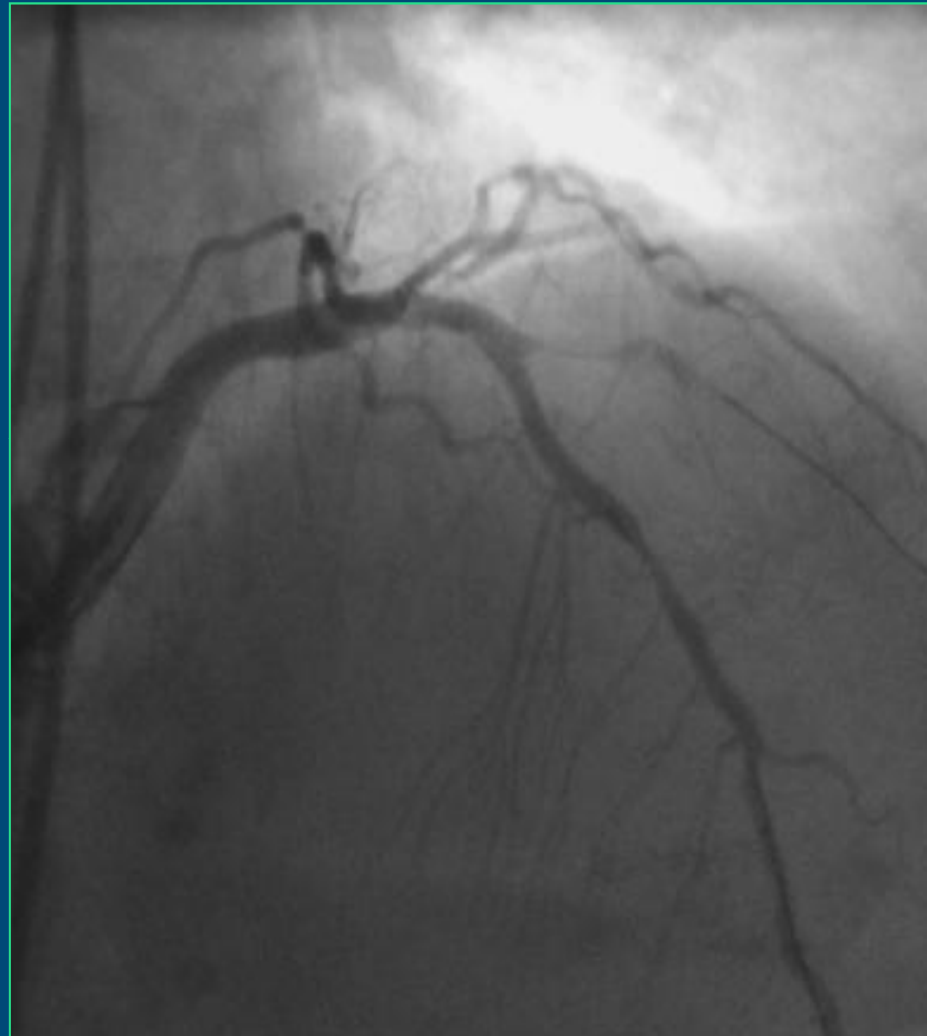


FKB





# Provisional can be risky

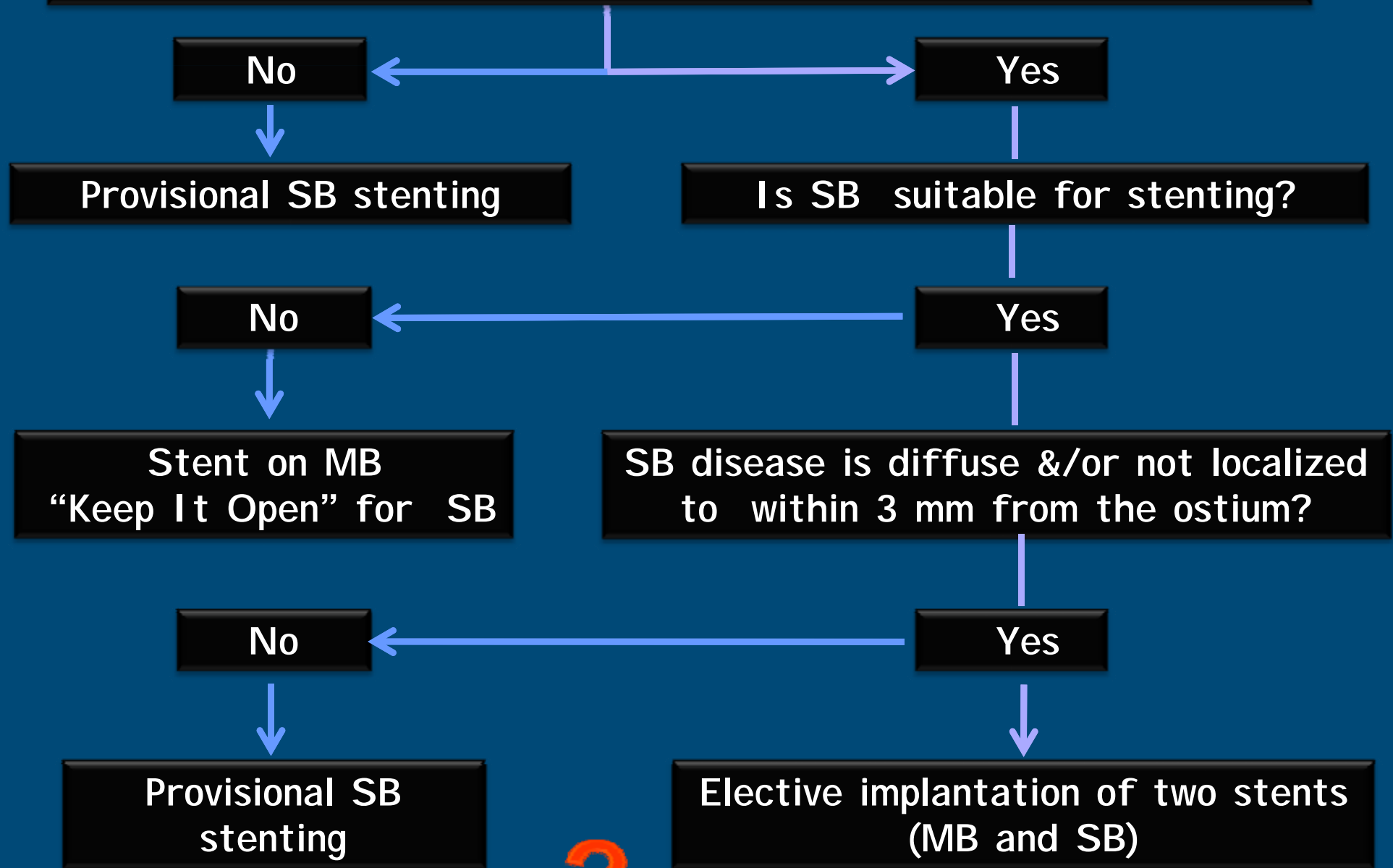


After Kissing – Severe haemodynamic compromise



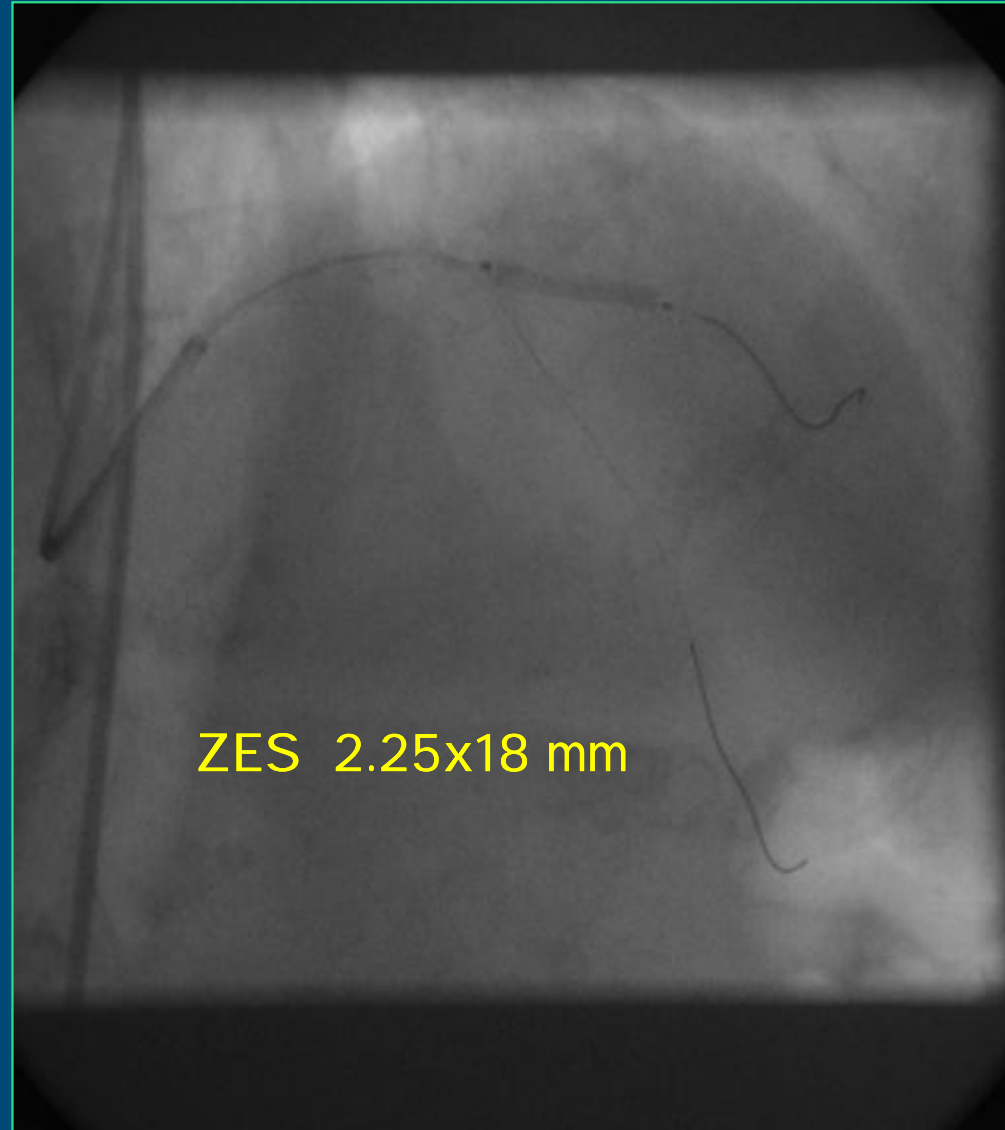
# True Bifurcation

(significant stenosis on the main and side branches)





# Provisional can be risky



TAP



# Provisional can be risky

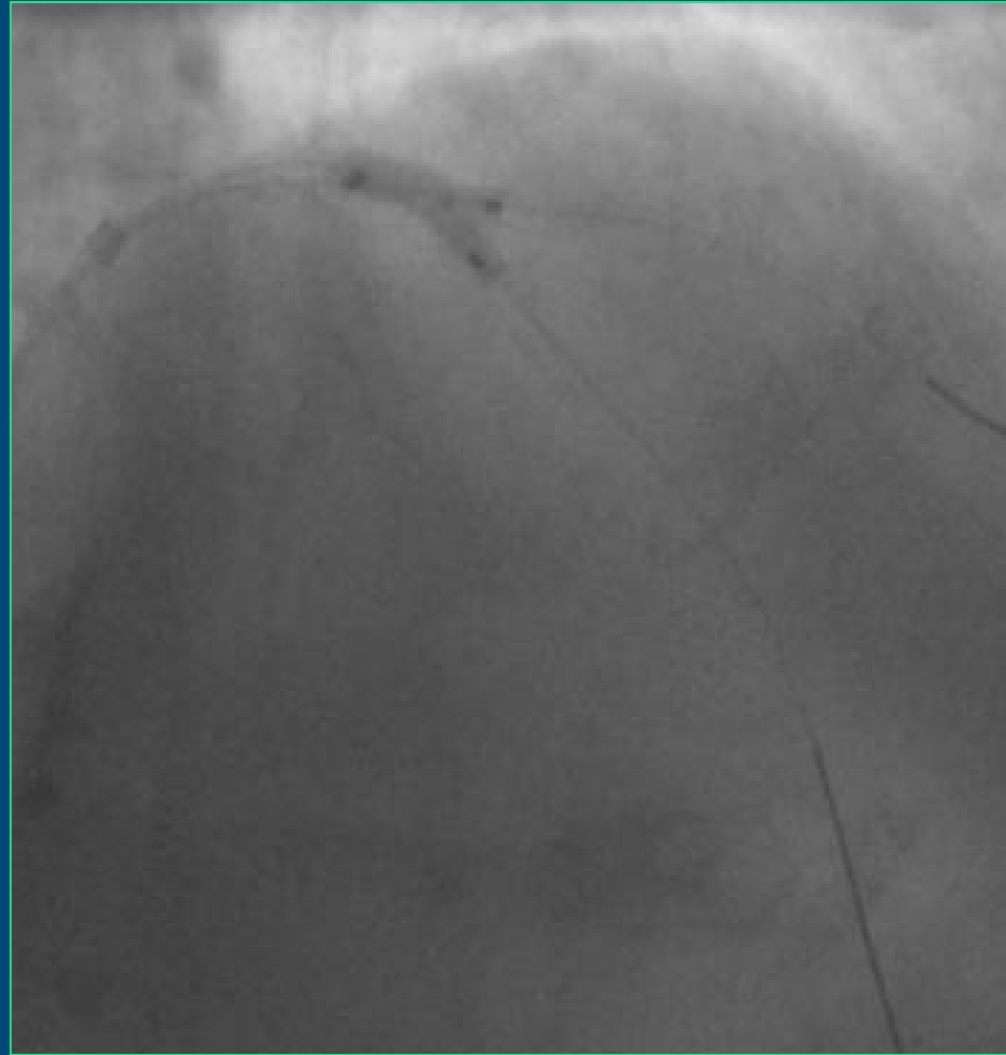


After Side-Branch  
Stenting

HSR



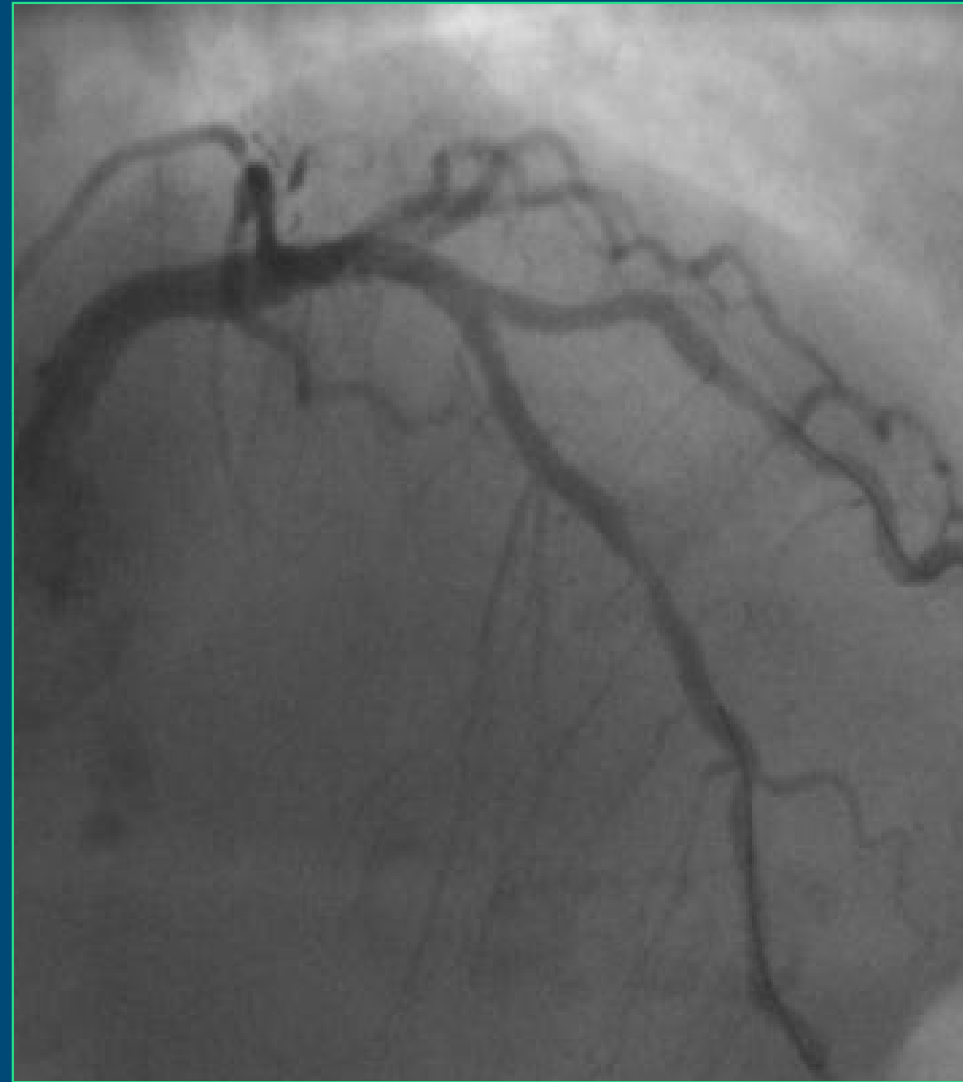
# Provisional can be risky



Kissing



# Provisional can be risky



Final Result



# Conclusions

- The provisional strategy (or KIO) is appropriate in the majority of true and non-true bifurcations
- About 30% of true bifurcations require a stent in both branches.
- FKB:
  - mandatory in 2-stent strategies
  - No clinical evidence in single-stent strategy (large SB? FFR?)
- POT:
  - Stent apposition, restore fractal anatomy, ↓ low WSS
  - No clinical evidence