

2 Stents techniques for non-LM bifurcation lesions

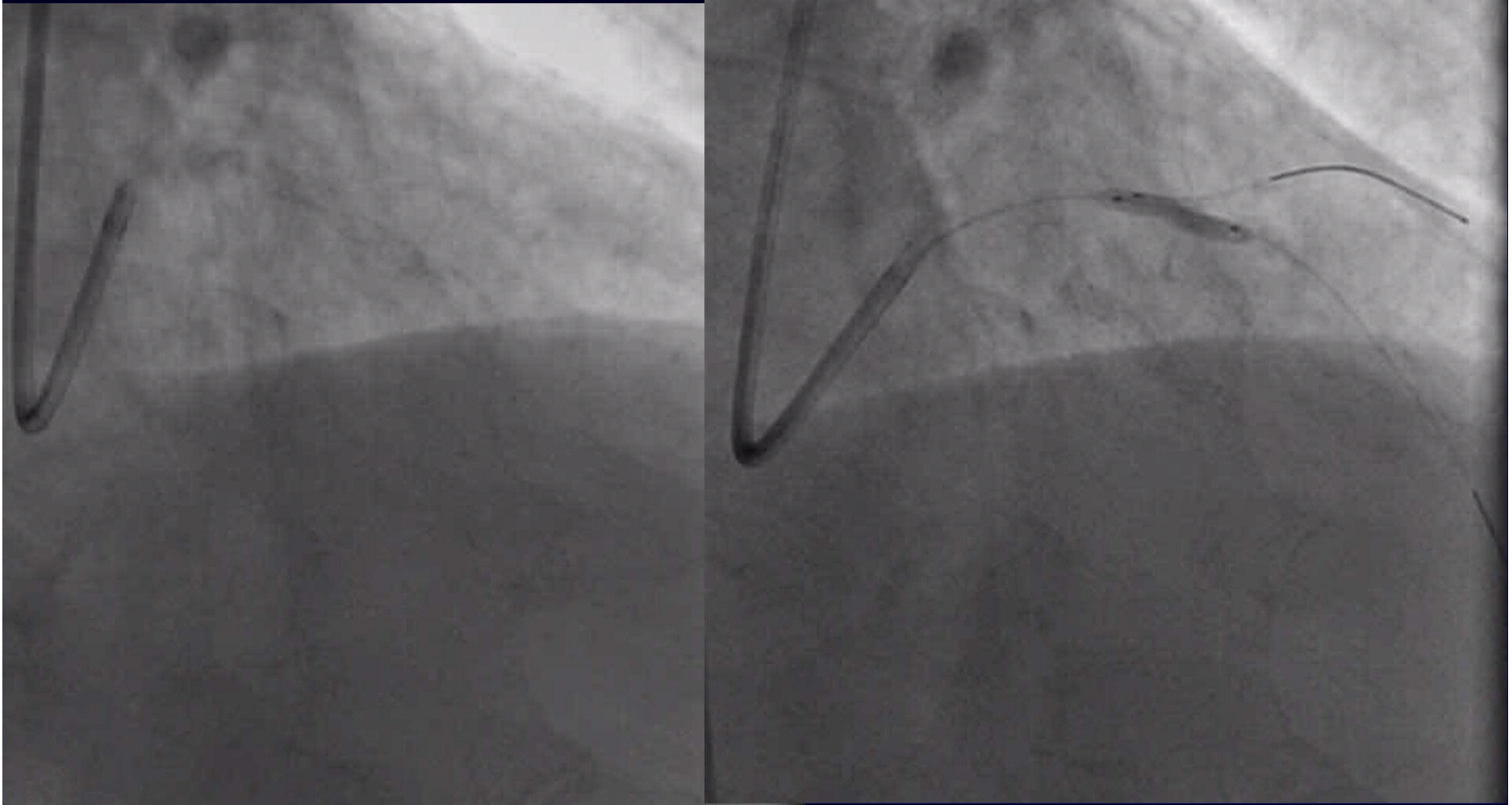
Donghoon Choi MD, PhD
Severance Cardiovascular Center, Yonsei
University College of Medicine



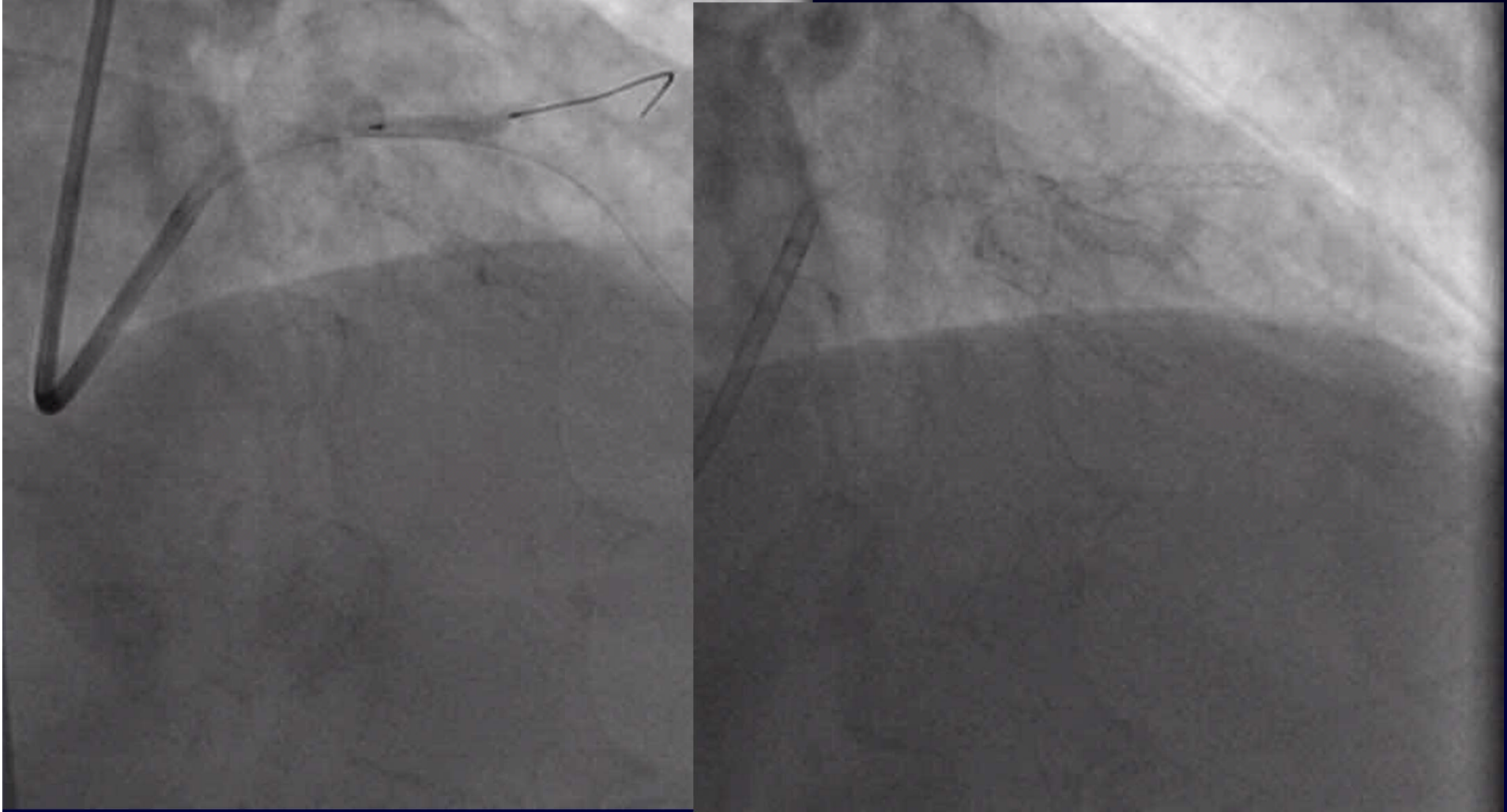
Case M/71

- C.C. Chest pain
- P/Hx DM(-), HTN(+)
STEMI (2010.12.7)-Big OM intervention
- ECG Sinus rhythm, 1st degree AV block (HR 63)
V4~6 T-wave inversion
- Echo EF 52%, RWMA; LCX territory
- Diagnosis Stable angina
HTN

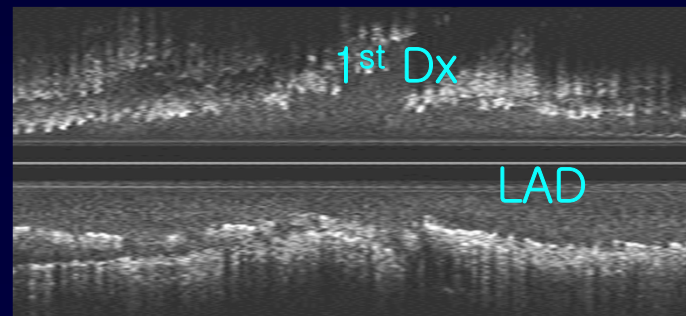
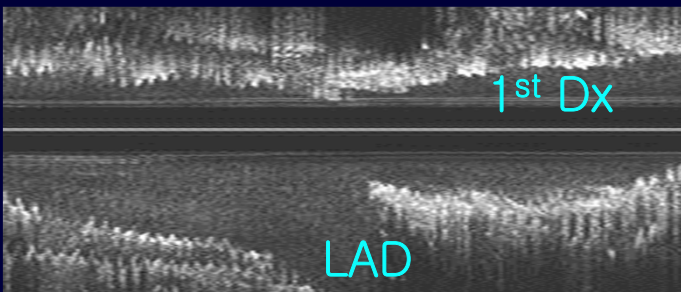
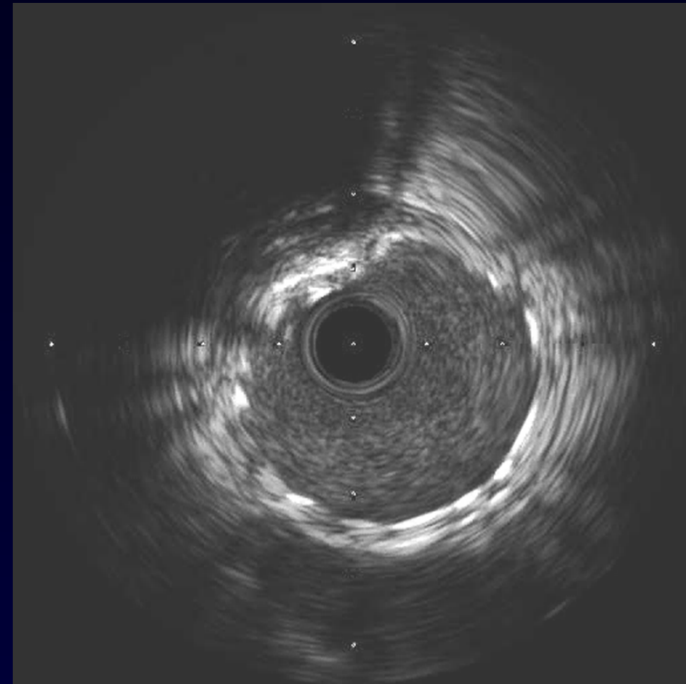
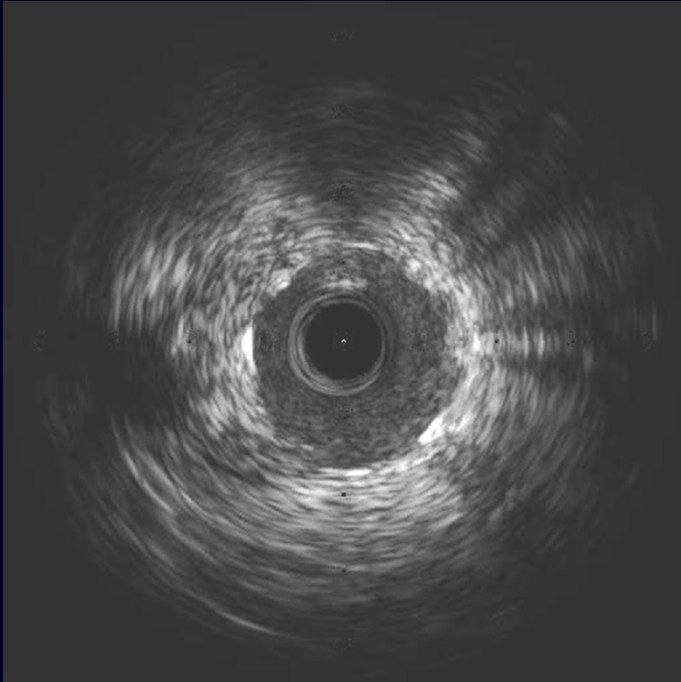
Bifurcation- 2 stent



Bifurcation- 2 stent



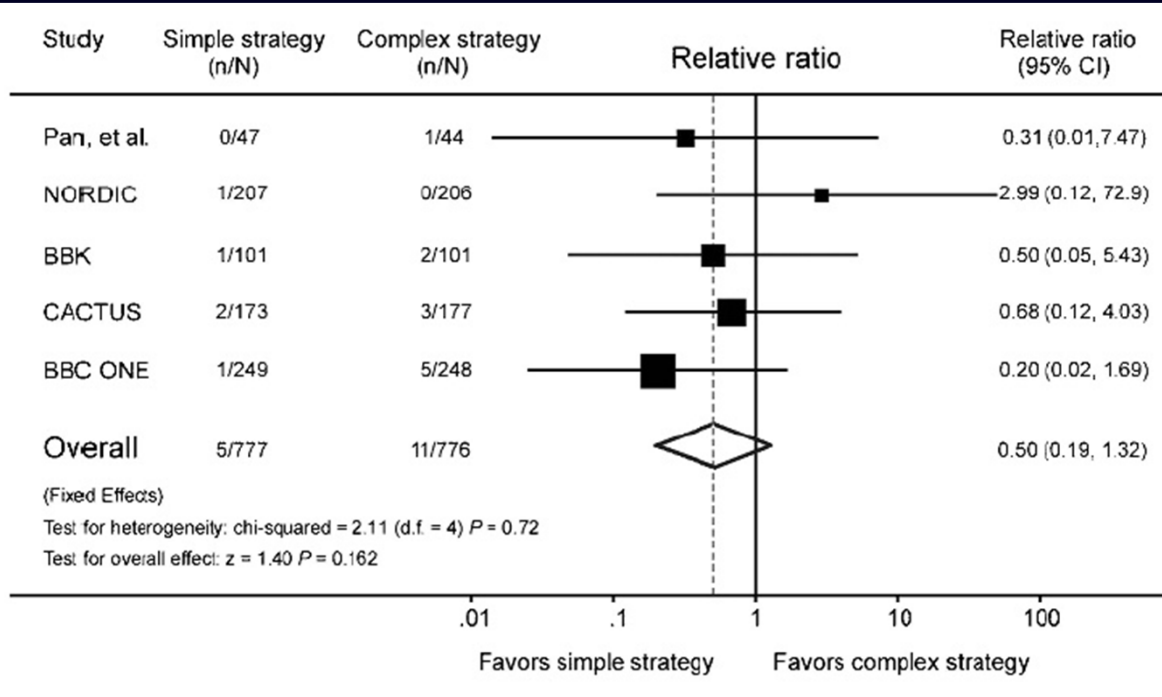
Post-IVUS



DES in coronary bifurcation lesion

1. In meta-analysis, the **simple strategy** was associated with **a lower risk of early MI** and **a similar rate of angiographic restenosis**
2. The simple strategy can be recommended as a preferred bifurcation stenting technique in the DES era.

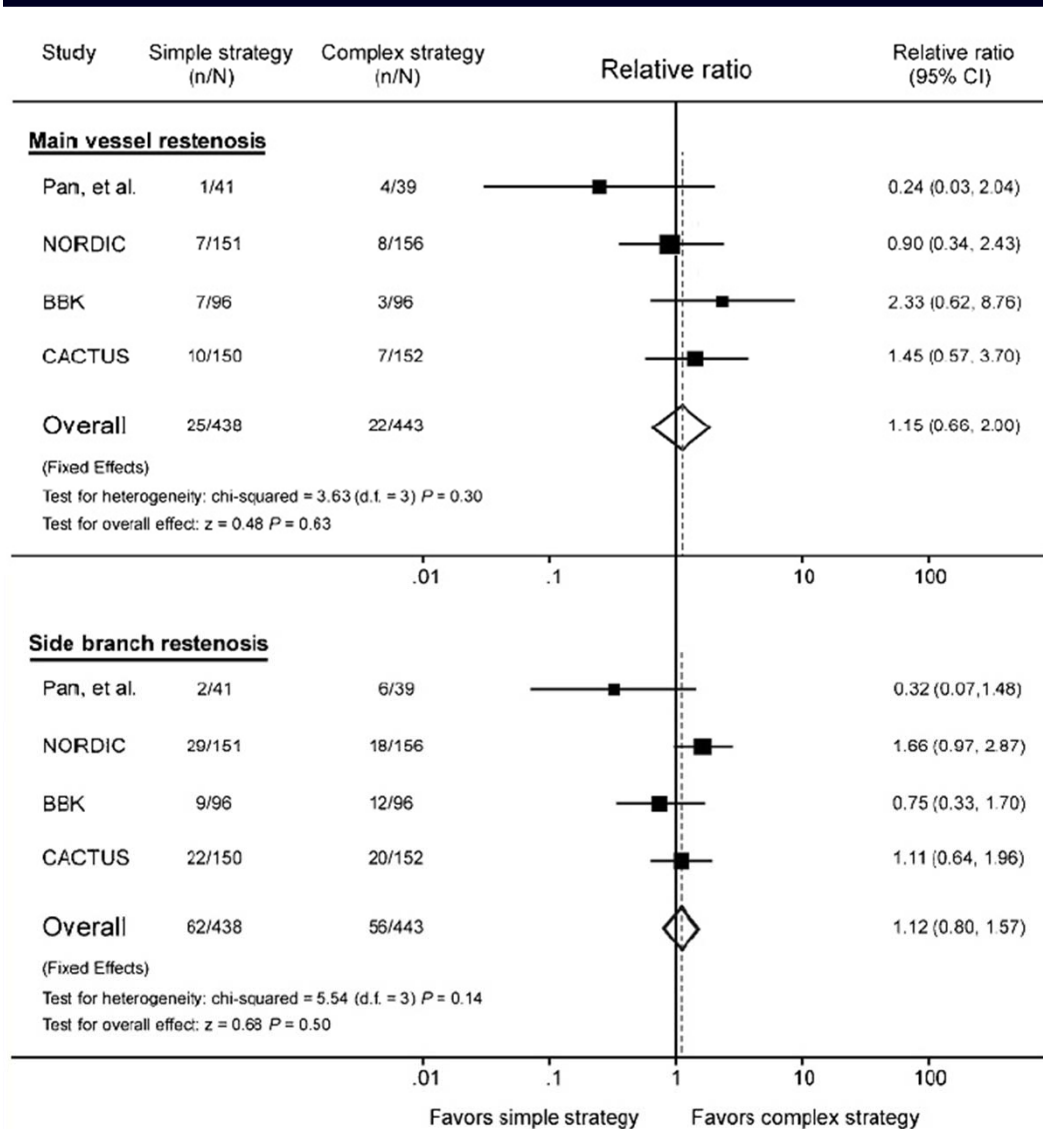
DES in coronary bifurcation lesion



There were no significant differences between the two different strategies

- Cardiac death, TLR, definite ST

DES in coronary bifurcation lesion



- The restenosis risk of MV and SB did not differ between the simple strategy group and the complex strategy group

- MV restenosis

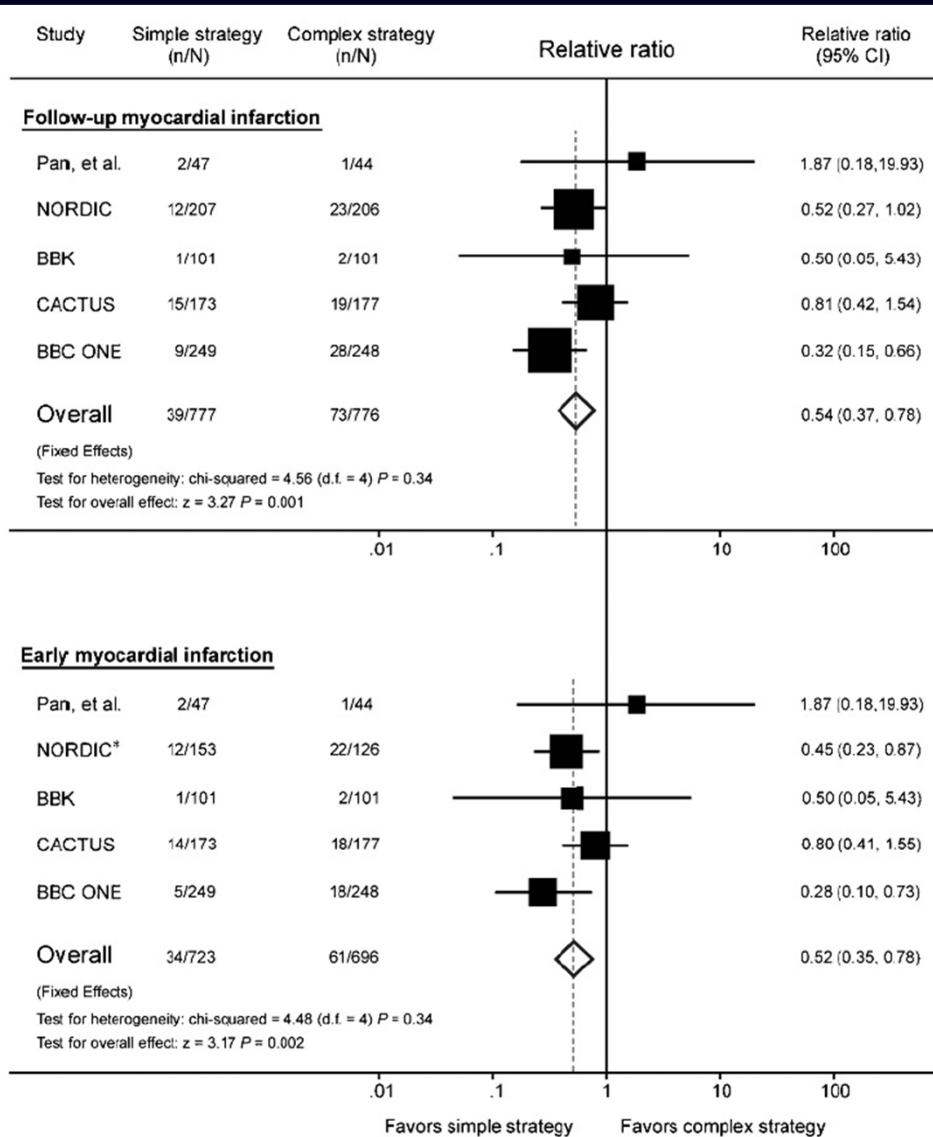
- RR 1.15, 95% CI 0.66 to 2.00, p=0.63

- SB restenosis

- RR 1.12, 95% CI 0.80 to 1.57, p=0.50

Heart 2009;95:1676–1681

DES in coronary bifurcation lesion



- F/U MI
 - RR: 0.54, 95% CI: 0.37 ~ 0.78, p=0.001)
- Early MI (in-hospital or 30-day)
 - RR 0.52, 95% CI 0.35 ~ 0.78, p=0.002

Heart 2009;95:1676–1681

1 stent vs. 2 stents

- Until recently, 2-stent technique has never been proved to be better than 1-stent technique.

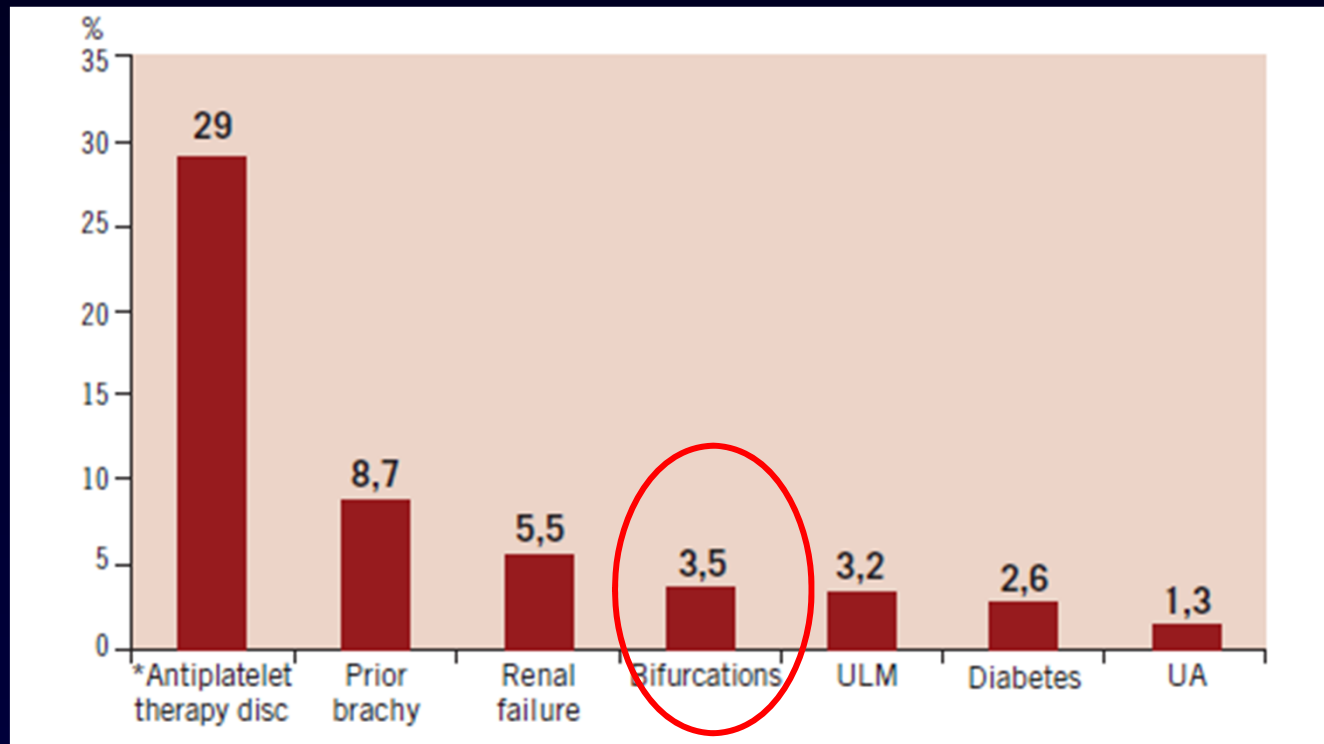
1 vs. 2-stent techniques

- Best treatment strategy in bifurcation lesions is provisional SB stenting where the MB is stented
- However, if the SB is large and has disease extending beyond the vessel ostium, 2 stents are usually needed, but there is no consensus on the best technique

1 vs. 2-stent techniques

- The impact of the stenting strategy for bifurcation lesion on ST remains unclear
 - Use of adjunctive IIb/IIIa glycoprotein inhibitor
 - Different 2 stent techniques
 - High pressure ballooning
 - Final kissing technique
 - IVUS guided optimal stenting

Incidence of ST of DES according to selected patients



- Incidence of ST of DES according to selected patients
- No significant difference in incidence of ST between 1 vs. 2 stent techniques

JAMA 2005; 293: 2126-2130

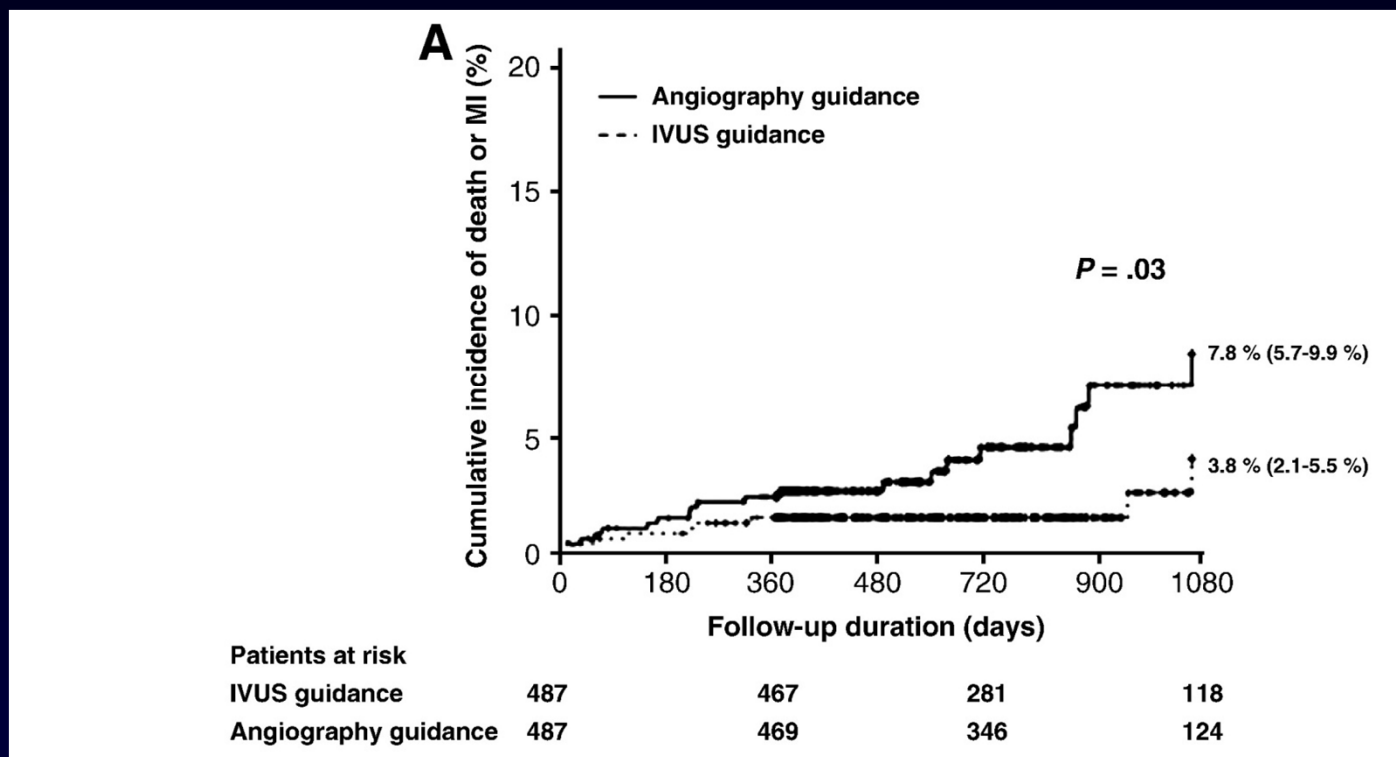
In a sub-analysis of the registries

- In a subanalysis of the j-Cypher registry¹
 - Prevalence of ST was **not different** between 1 and 2 stent techniques in non-left main subset
 - At 3 years, only 9 cases of ST after 2-stent technique in all cohort (5: LM, 4: non LM)
- T-stenting DES²
 - 10% need for repeat revascularization in 2 years
 - **Only 2.52% had ST**

1: Circulation 2009; 119:987-995

2.: JACC cardiovasc Interv. 2008; 51: 986-990

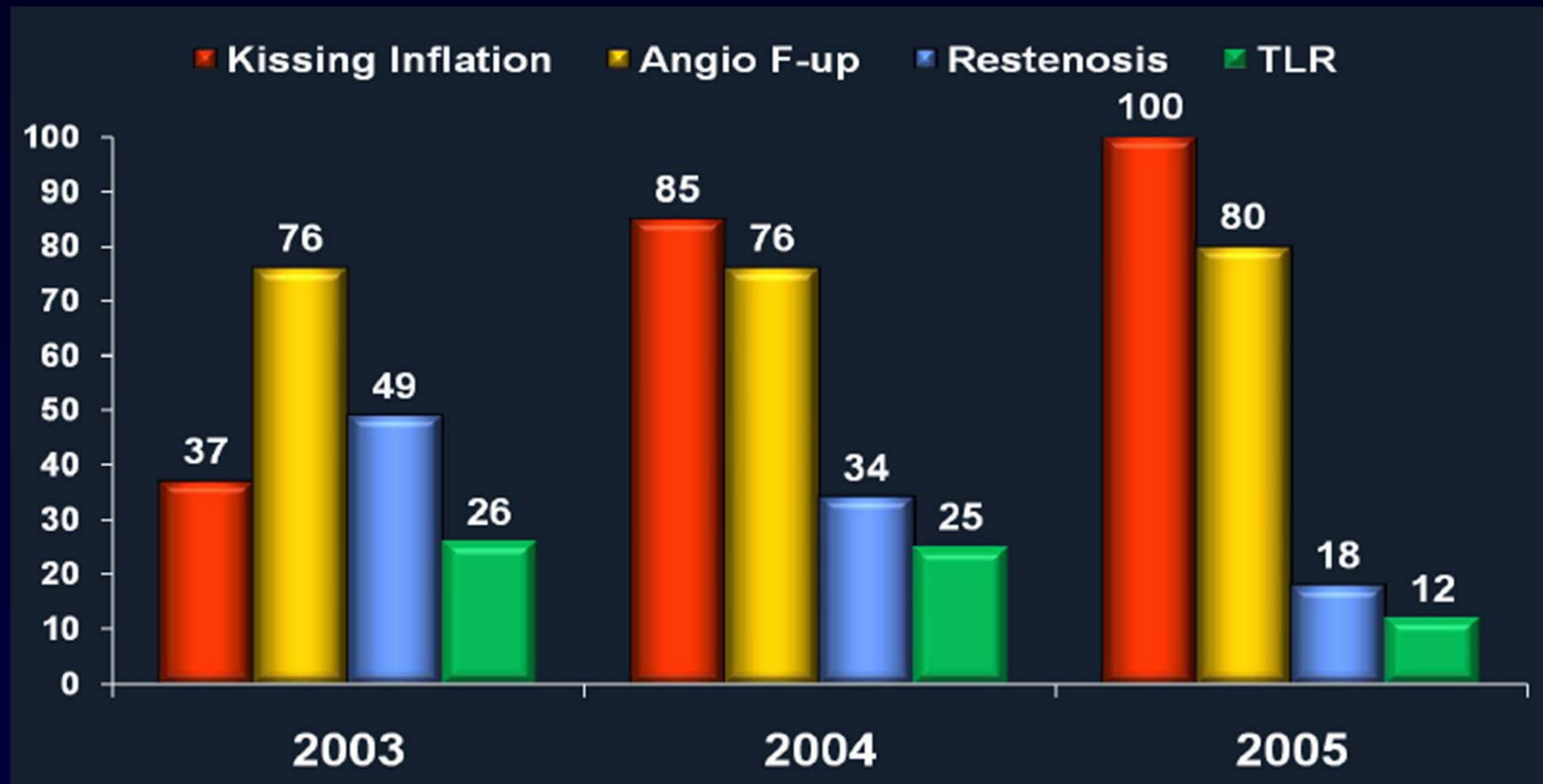
Impact of IVUS in bifurcation lesions, (COBIS)



IVUS guidance during DES implantation at bifurcation lesions may be helpful to improve long-term clinical outcomes by reducing the occurrence of death or myocardial infarction.

AHJ 2011, 161, 180~187

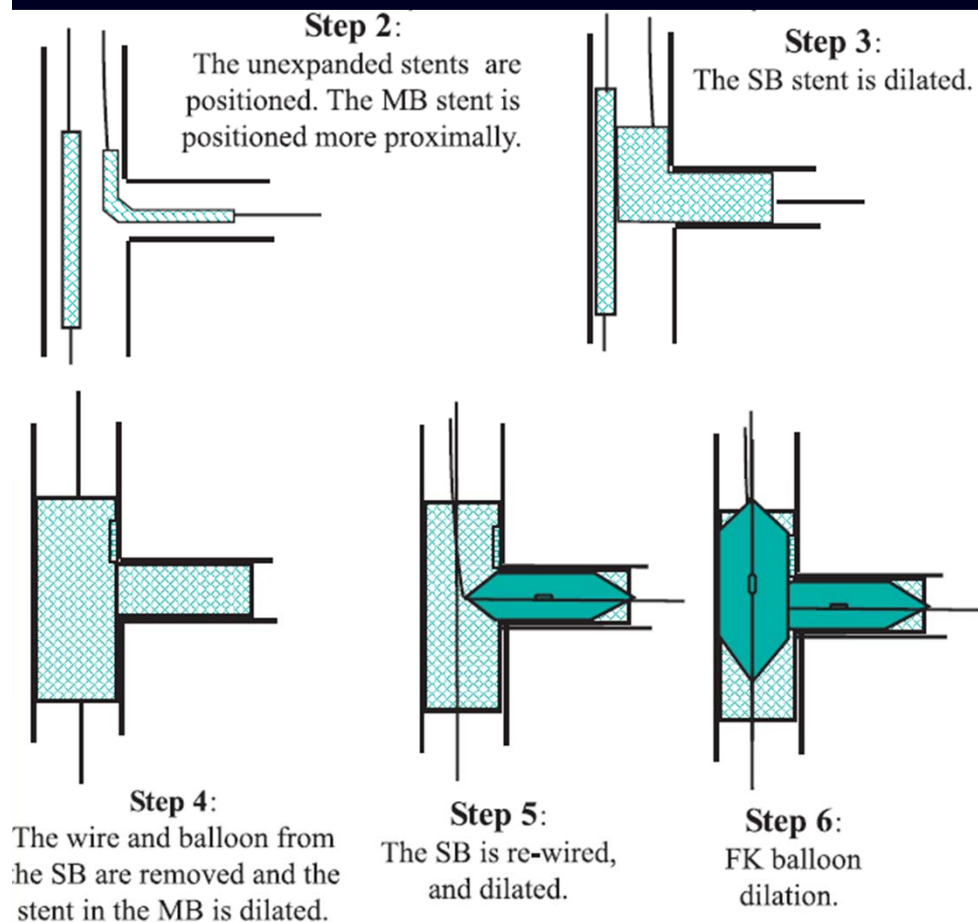
Optimal performance of 2 stent techniques important in reducing event rates



Antonio Colombo, TCT 2010

**Are there any differences
regarding ST between 2-stent
techniques?**

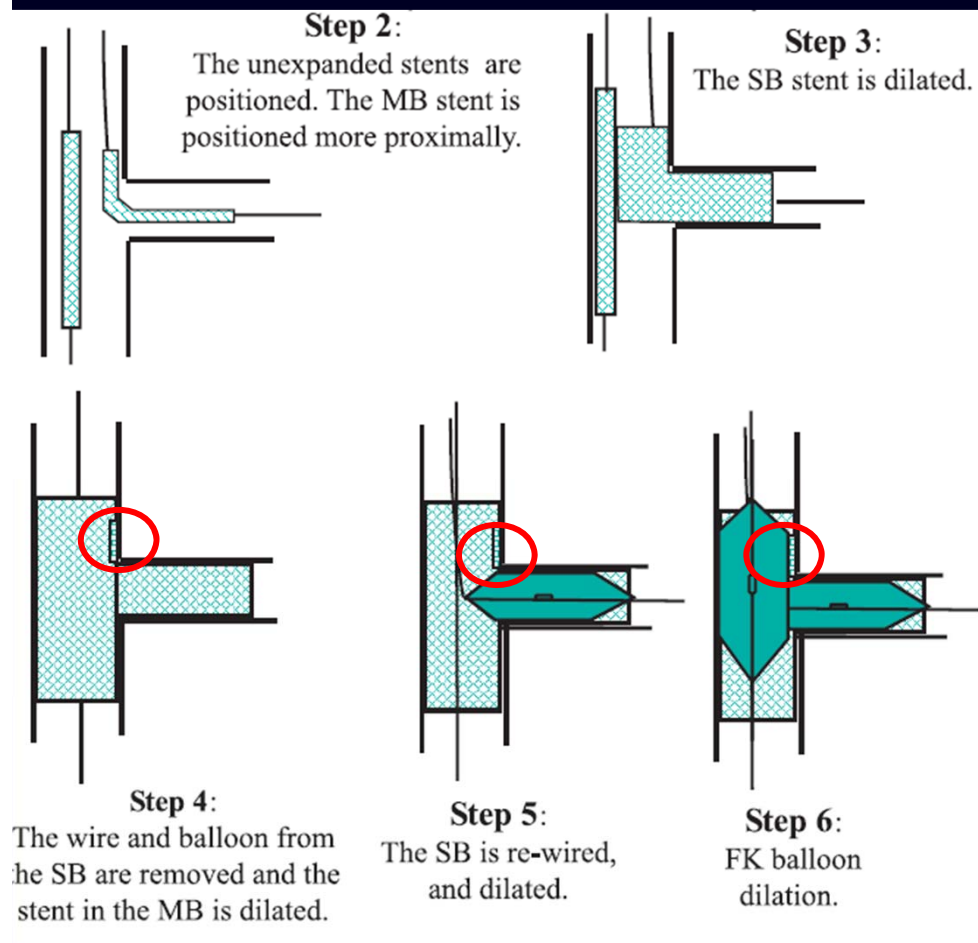
Classic Crushing Technique



- **Advantages**
 - Immediate patency of both branches is assured
 - Excellent coverage of the ostium of the SB
- **Disadvantages**
 - Need to re-crossing multiple struts

Hell J Cardiol 46: 188-198, 2005

Classic Crushing Technique

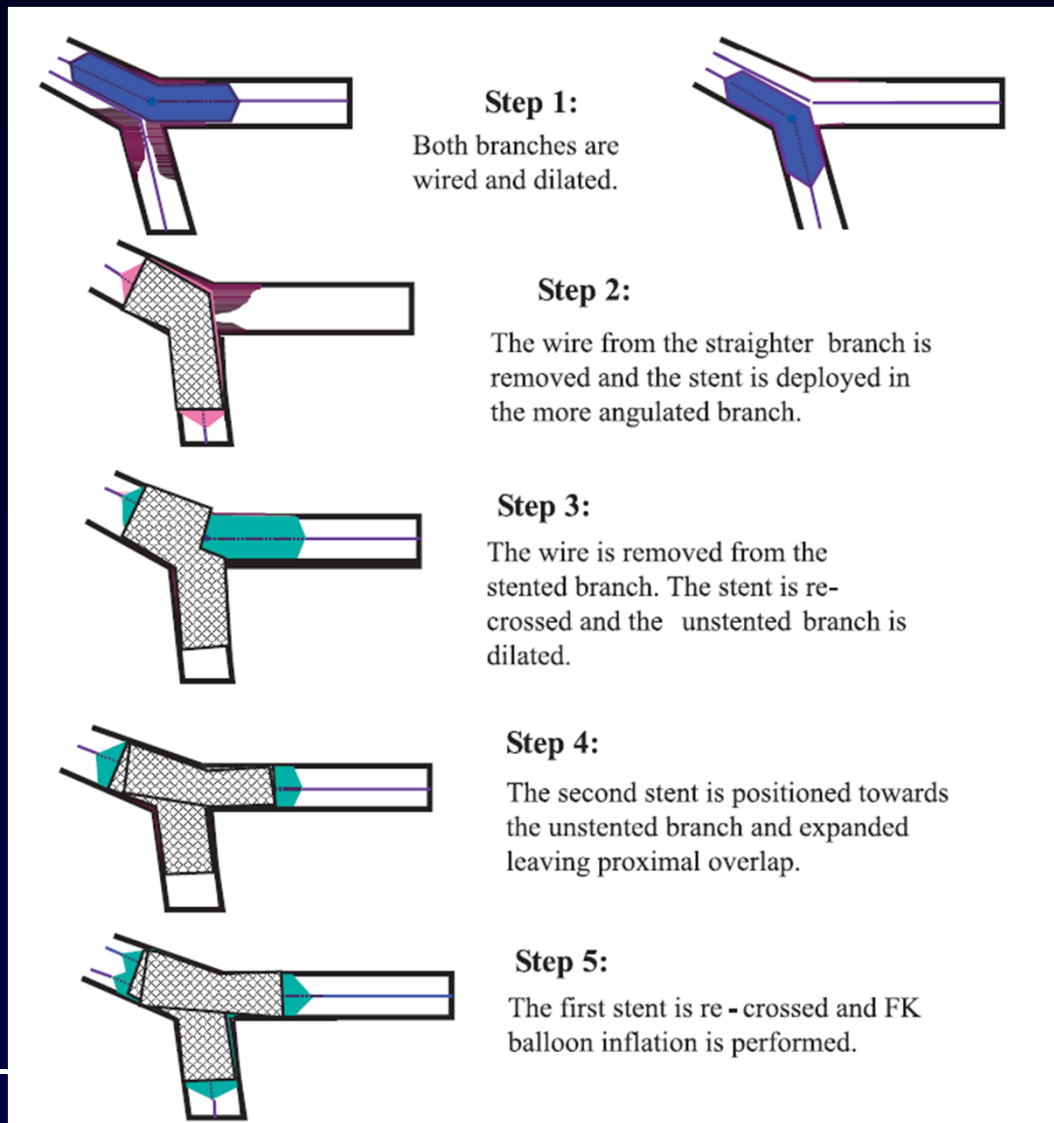


- ST at 9-months was more frequent¹
- Overlapping of DES is associated with reduced endothelialization²

1: JACC 2006;47:1949-1958

2: Circulation 2005;112:270-278

Culottes technique



Advantages

- Less laborious

Disadvantages

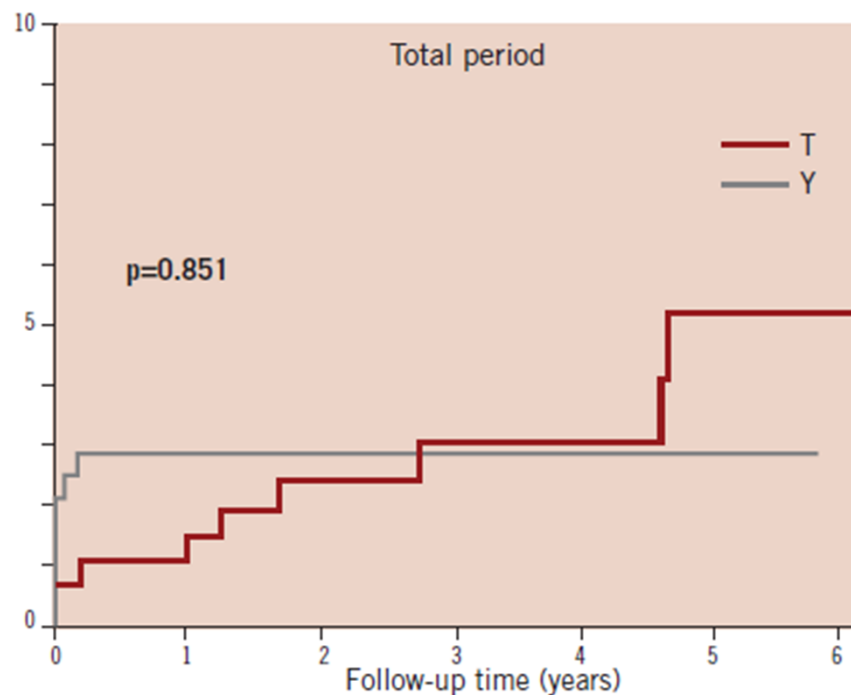
- Incomplete coverage of the os. of SB
- Need large guiding catheter

Hell J Cardiol 46: 188-198, 2005

T-stent vs. Culotte

Cumulative incidence curves of ST

Culotte:283 pt vs. T-stent: 285 pt

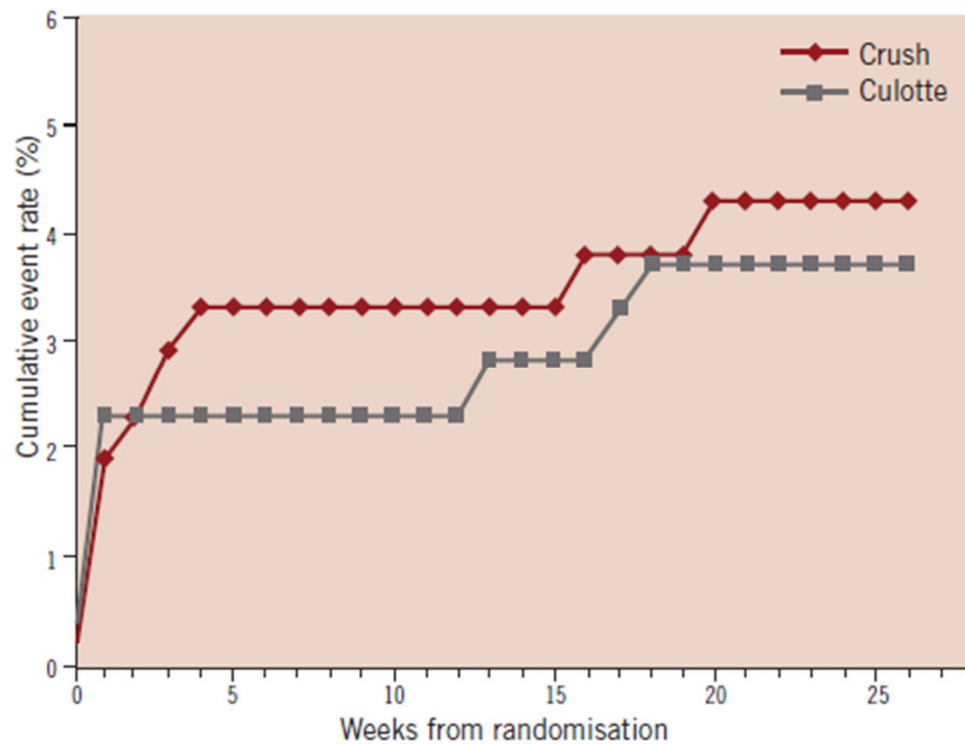


T stent	285	237	187	159	113	73	2
Culotte	283	209	158	109	44	12	0

- Kurashiki Central Hospital registry
 - No statistical difference
 - There seem to be different time courses of ST between techniques

Crush vs. Culotte

Cumulative MACE rate
(Cardiac death, MI, TLR, ST)
Log rank $P=0.87$



- No significant differences in major adverse cardiac event rates
 - crush 4.3%
 - culotte 3.7%
- In-segment restenosis at 8 months
 - 12.1% versus 6.6% ($P=0.10$)
- In-stent restenosis
 - 10.5% versus 4.5% ($P=0.046$) .

Crush vs. Culotte

- Similar and excellent clinical and angiographic results.
- Angiographically, there was a trend toward less in-segment restenosis and significantly reduced in-stent restenosis following culotte stenting.

Circulation: Cardiovascular interventions 2009;2:27-34

Recent long-term clinical data of Culottes technique

- 198 patients, 217 lesions
 - Intention to treat: 84.3%, Bail out: 15.7%,
Final three step kissing balloon: 100%
- 6 years clinical outcome
 - Total Cardiac death: 2.3%
 - TLR : 8.8%
 - TVR: 11.5%
 - ST: 0.4%
 - Overall MACE 14.3%

TCT 2010, Solomon et al

Recent long-term clinical data of Culottes technique

- Culottess stenting using a variety of DES and systematic three step kissing balloon was associated with favourable long term clinical outcome with low rate of MACE, TLR and very low risk of stent thrombosis
- New Culottes 'facilitating stents' such as Tryton may render the technique more widely appealing

TCT 2010, Solomon et al

Dedicated bifurcation stents

- Pre-formed MV stent with side ports
 - Antares, Invatec Twin-rail, Multi-Link Frontier, Nile Croco, Petal, SLK-view, StenTys, Ymed Side-Kick
- SB first
 - Sideguard, Tryton
- Conical stents
 - Axxess

Pre-formed MV stent with side ports

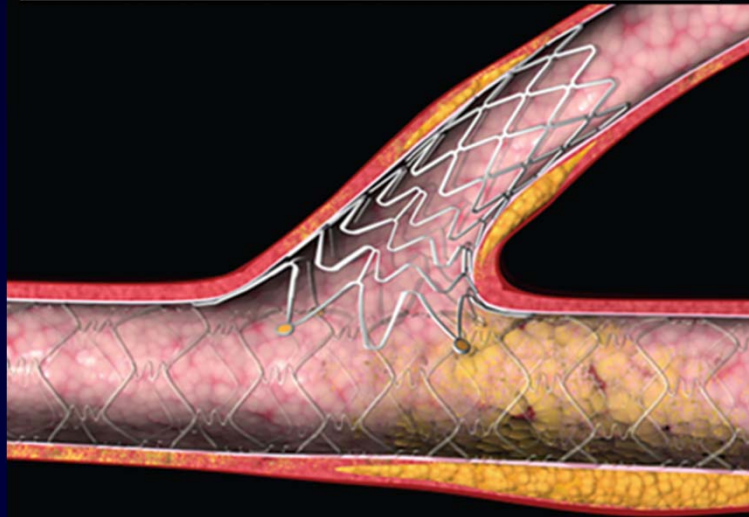
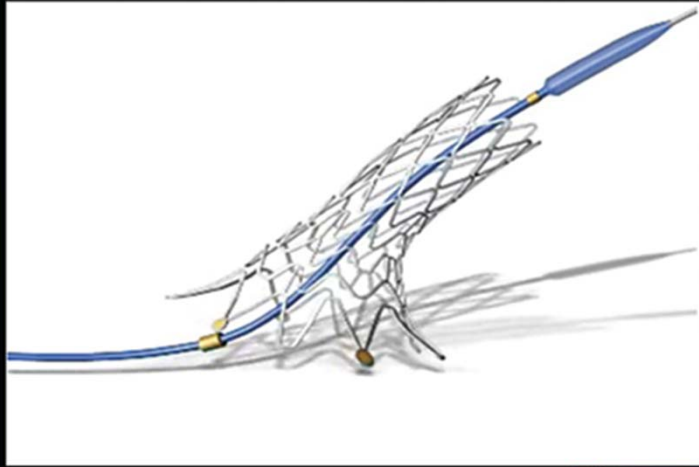


Invatec twin rail

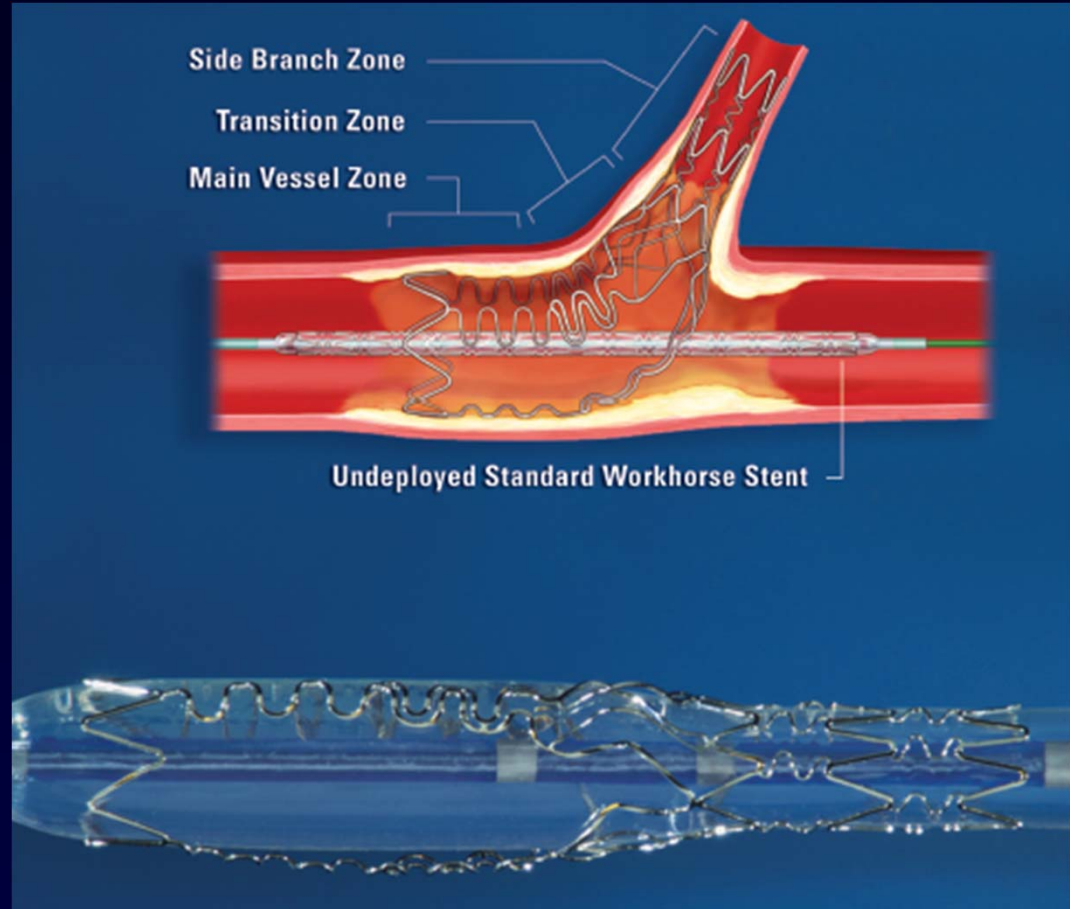


Nile CroCo

SB first

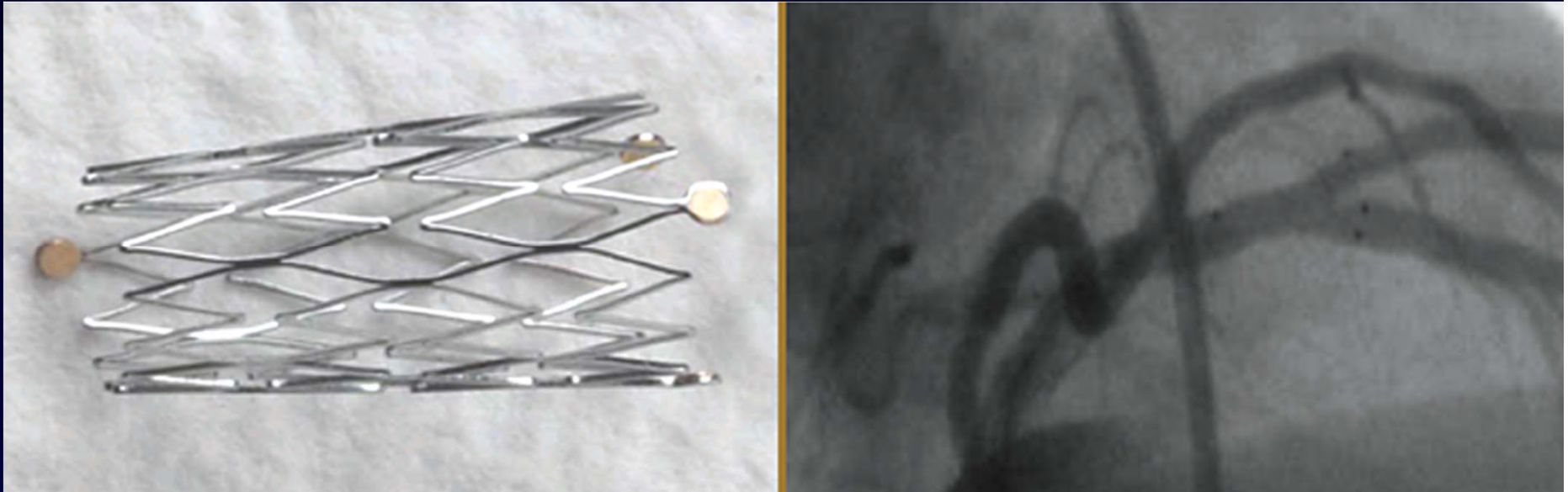


Sideguard



Tryton

Conical stents



Axxess Plus system

Conclusions

- 2 stent technique is essential, if the SB is large and has disease extending beyond the vessel ostium
- The impact of the stenting strategy on ST remains in 2 stent technique unclear, however optimal performance of 2 stent techniques important in reducing event rates
- The second generation dedicated bifurcation stents seem to be promising, however randomized trials against conventional DES are still lacking.

Thank you!!

