

Stent Summit 2005 Bifurcation Lesions

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Bifurcation Lesions

- Side branch protection and stenting

- Not all side branches are created equal !
- While many side branches are protected during procedure for true bifurcation lesion, considerations for strategy to be employed during stenting is dependent on:

- Lesion

How important is the branch !

- Lesion severity (Plaque burden) and location of lesion



**Essentially,
the question in bifurcation stenting is
- one or two stents ?**



Stenting bifurcation lesions - Lessons from BMS studies

- **Simpler is better !**
 - **Stent the main vessel in all cases, with provisional stenting for side branch**
 - **Placing 2 stents is not better than one**
- **Stent design and stenting techniques do matter**

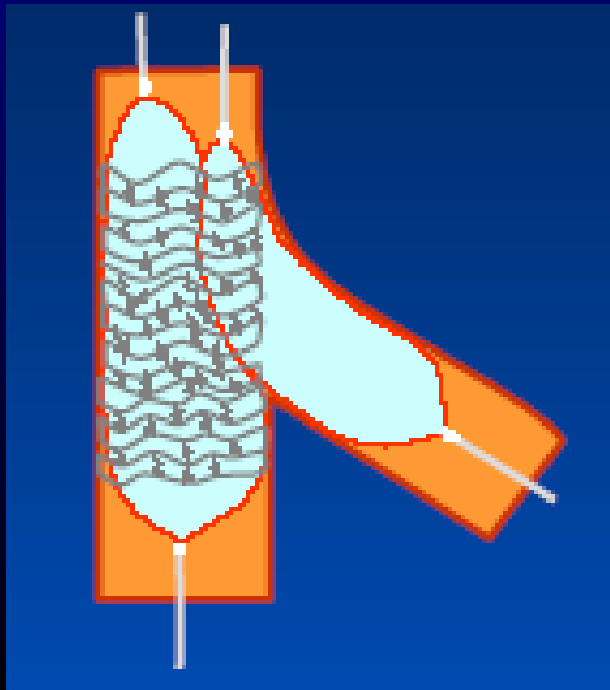


Suwaldi et al (JACC 2000; 35: 929-36), Yamashita et al (JACC 2000; 35: 1145-51),

Sheihal et al (Am J Cardiol 2000; 85: 1141-4), S. Carrier et al (EHJ 2001; 22 (Suppl): 348)



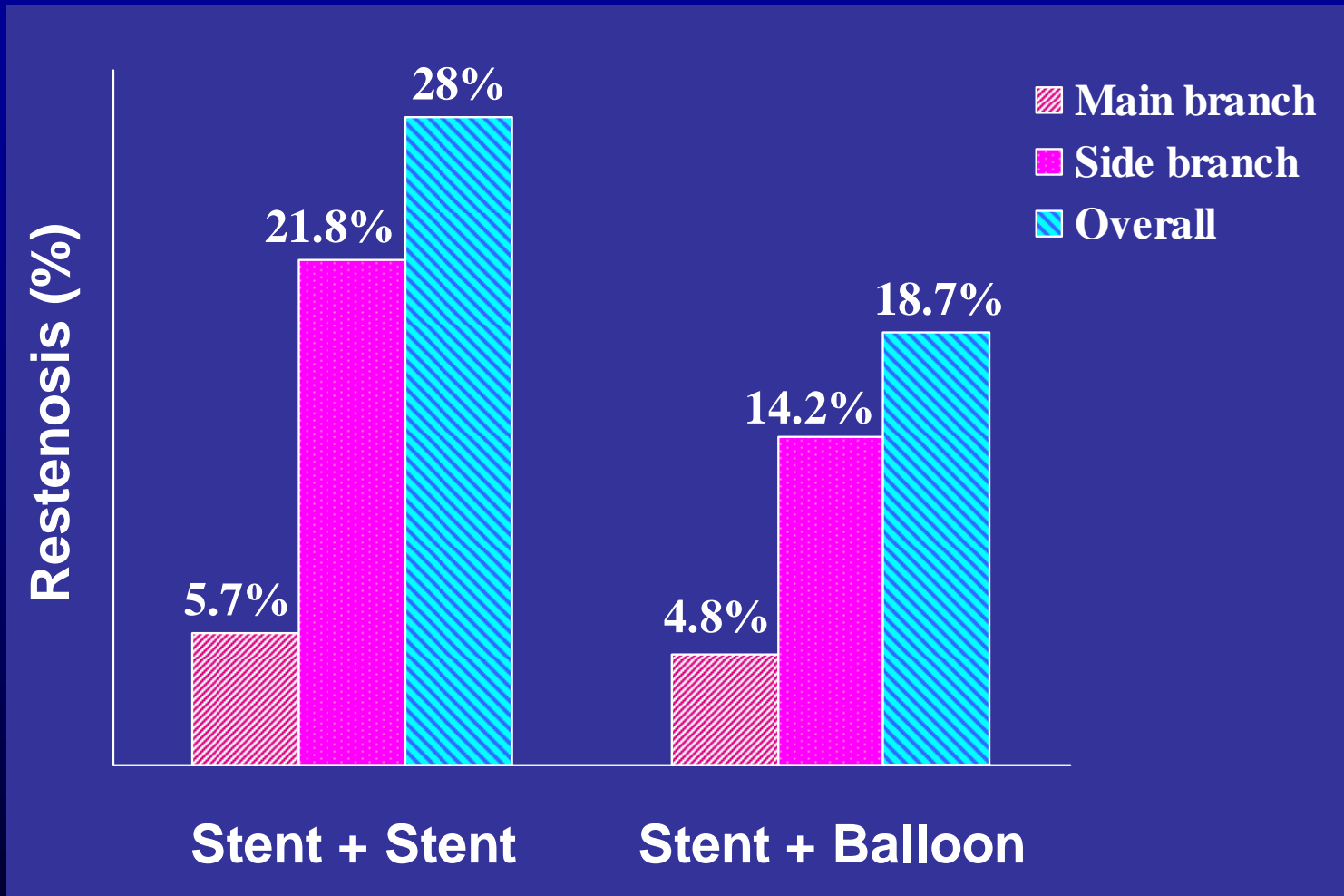
*Kiss before saying
good-bye !*



DES in bifurcation stenting



Cypher Bifurcation Stenting

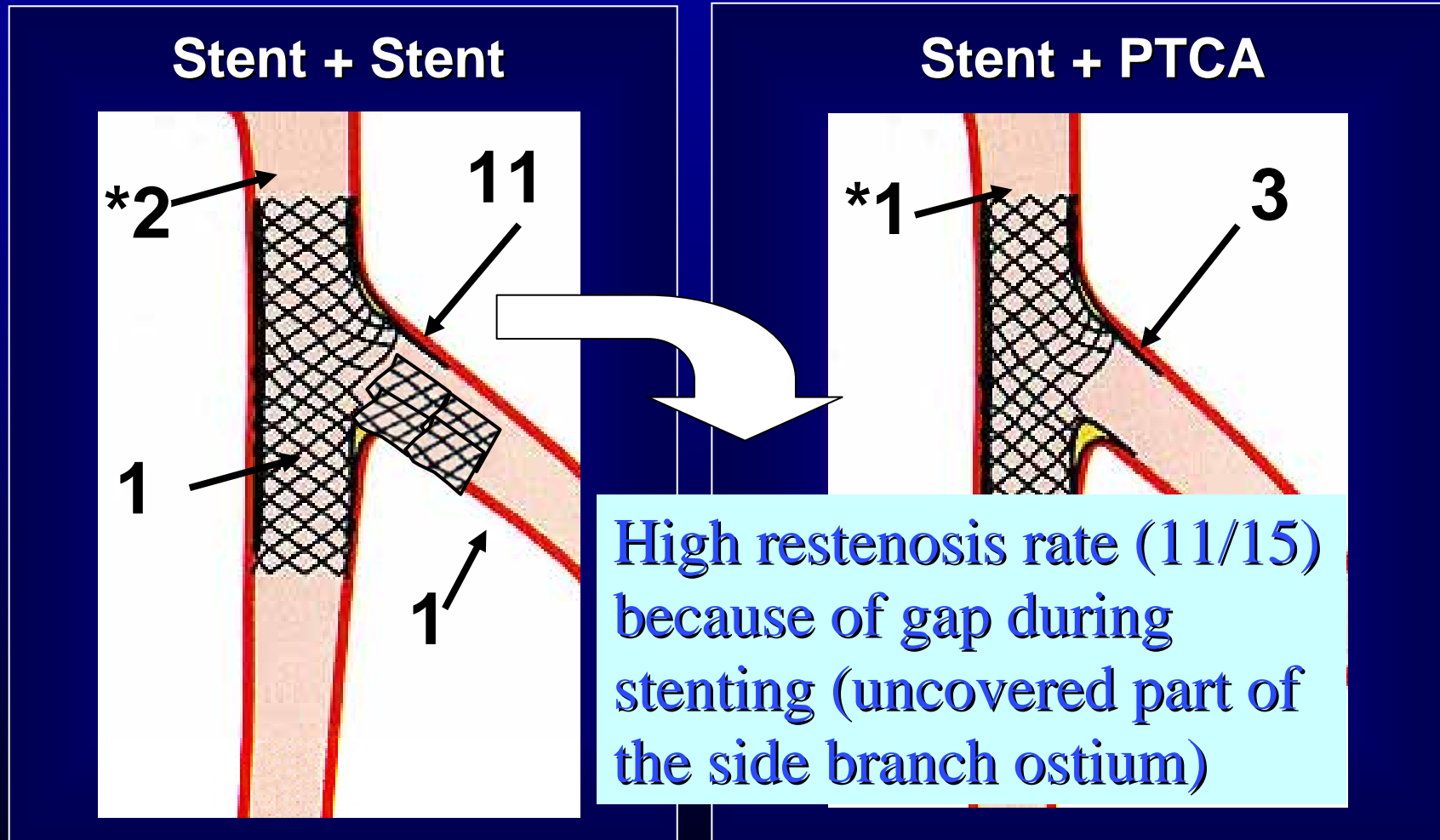


* High cross-over rate from Stent + Balloon to Stent + Stent group (22/43, 51%)



Cypher™ Bifurcation Feasibility Study

Site of Restenosis (17 cases)



* Two cases with restenosis in both main and side branch

My take from the study

- When bifurcation lesions can be treated with main vessel DES-stenting alone, the restenosis rate for main vessel is single digit, and side branch restenosis rate is in low teens
- We may not get good enough result for the side branch using provisional stenting in about half the patients
- Kissing balloon dilatation (disruption of DES stent architecture) does not lead to increase restenosis rate
- The high incidence of restenosis of bifurcation lesion using T-stenting is due to “geographic miss” of side branch ostium during stenting



**The “default” strategy for bifurcation lesions
for most interventionists is**

Provisional Stenting

- **stenting of main vessel with kissing balloon
inflation to the side branch**

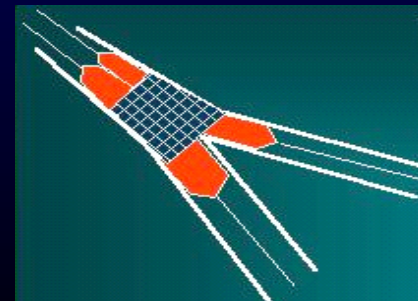
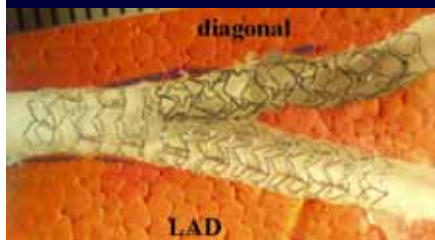
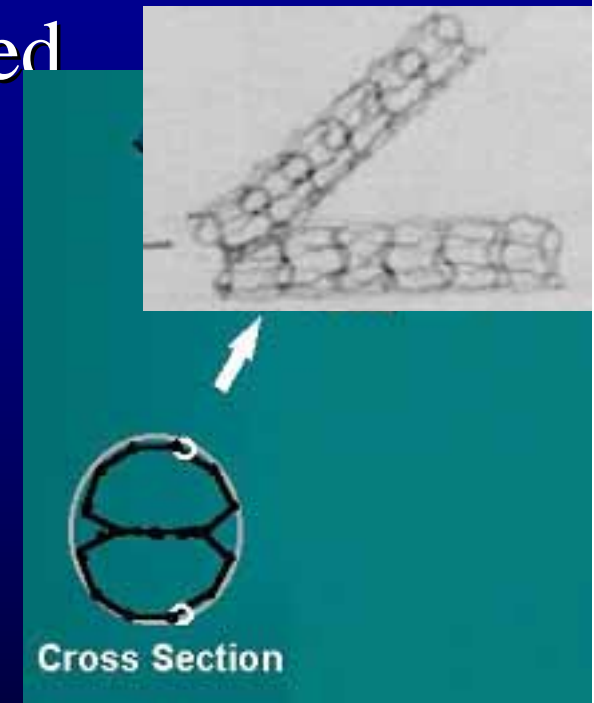




Alternatively, some chooses to systematically use two stents



- Many techniques have been described
 - T-stenting / Modified T-stenting
 - Crushing / Reverse-Crushing
 - “Culotte” stenting (Y-stenting)
 - V-stenting (“Kissing stents”)
 - Skirt stenting



DES Bifurcation Stent Crushing - Restenosis rate

	SIRIUS Bifur. (n=85)	Milan Experience (n=65)	RESEARCH (n=199)
Restenosis rate (%)	19	19.6 (no ks) 9.2 (ks)	12.5
Main br.	5.7	4 (K) 8 (NK)	9
Side br.	14.8	17 (K) 42 (NK)	14
TLR/TVR (%)	10.5	18.6% 29 (NK) 7 (K)	7



Multiple DESs for bifurcation lesions

- Will safety be an issue ?**

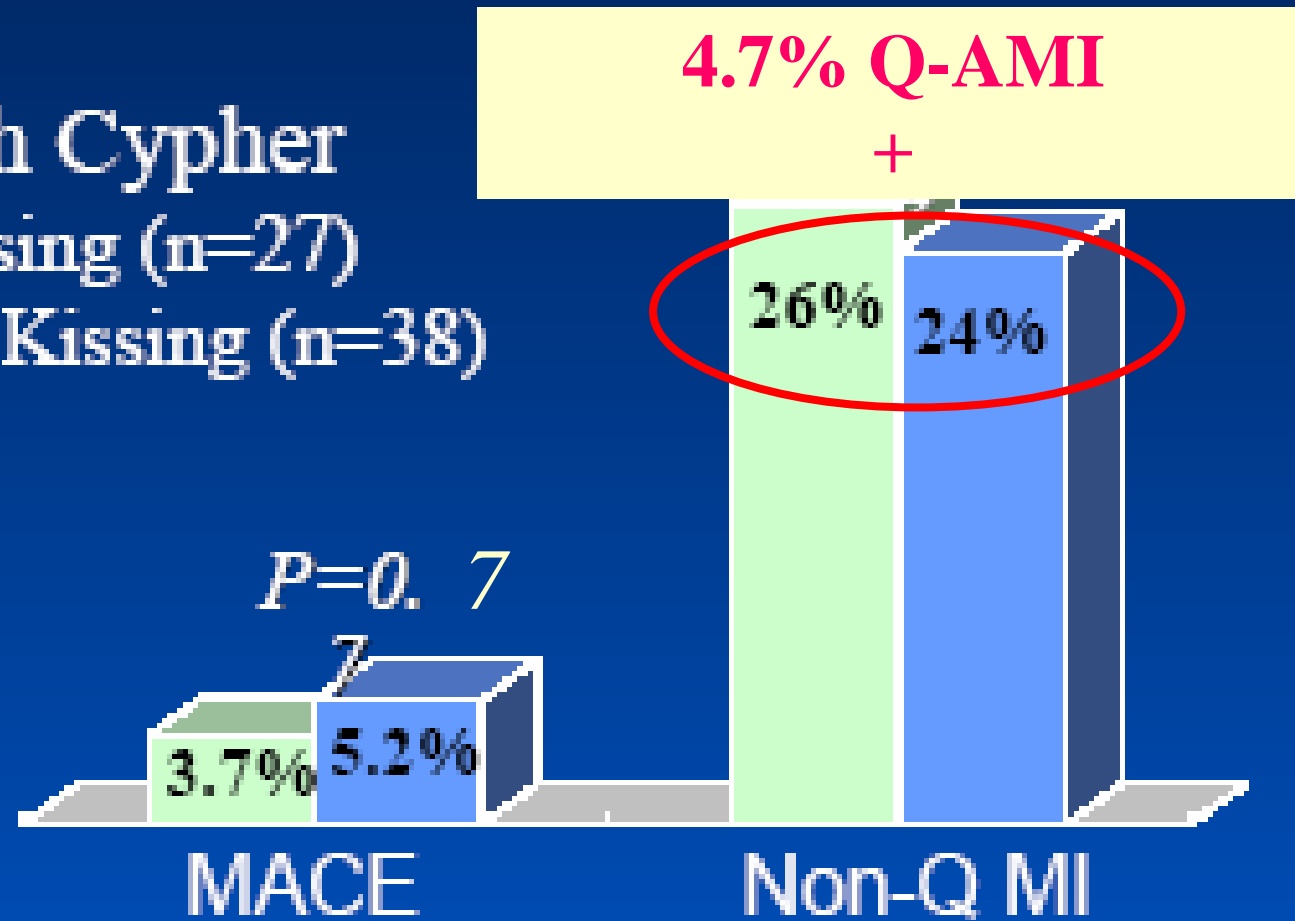


Final Kissing Necessary during Crushing with DES?

In-Hospital Clinical Outcome

Crush with Cypher

- Final Kissing (n=27)
- No Final Kissing (n=38)



Stent thrombosis with Stent Crushing

Milan	3.2 %
Lenox Hill	1.9 %
RESEARCH	2.5 %



Dedicated Bifurcation Stents

- The currently available stents are not designed to treat bifurcation lesions
- Because of this, many different stenting techniques are developed (improvisation), mainly to deal with ostial side branch recoil / lesion, or plaque shift as a result of “snow-plow” effect
- Very often side branch problem following main branch stenting is limited to the ostium only



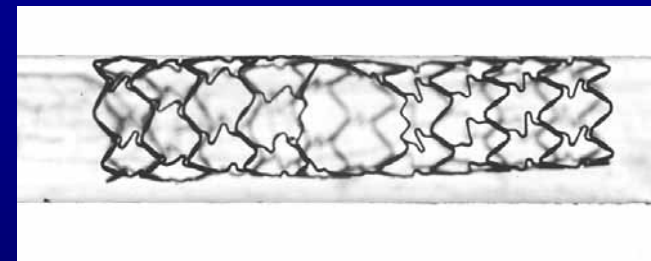
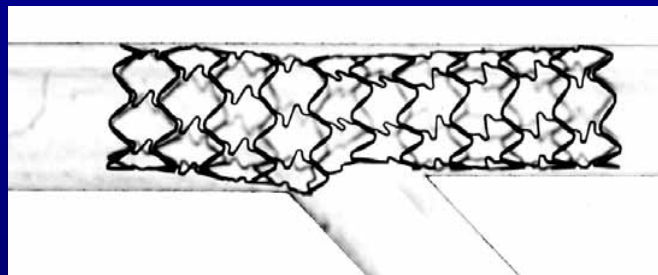
Early Experience with dedicated bifurcation stents - 6 months TLR

- AST SLK-View stent
 - ASAN Medical Centre (2004) 45%
- Guidant Frontier stent
 - Lefevre (TCT 2003) 13%
 - NUH 16.7%

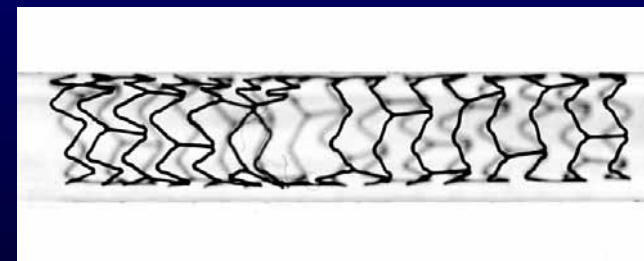
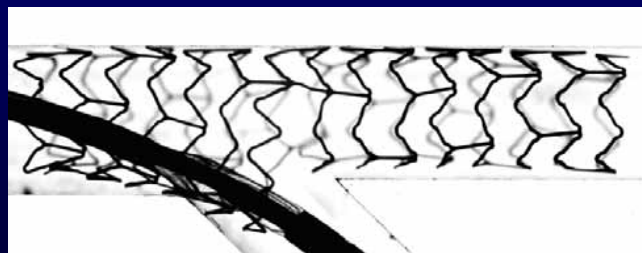


Dedicated Bifurcation Stents

**AST
SLK**



Frontier

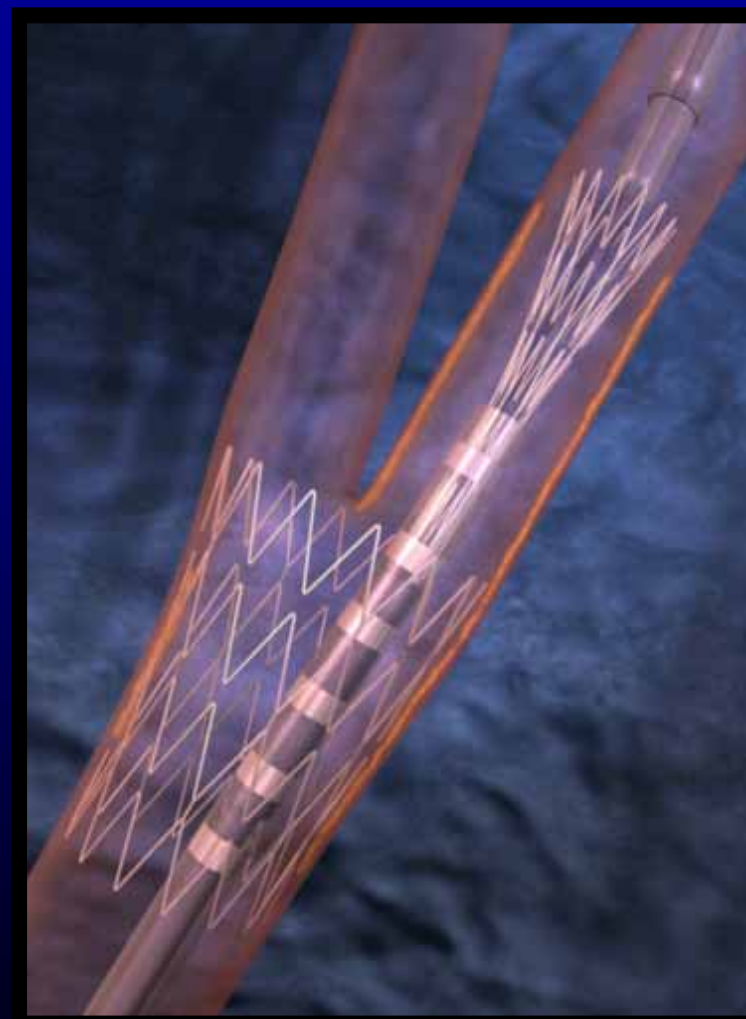


**We need drug-coated,
dedicated bifurcation stents !**



The AXCESS PLUS Trial

DEVAX Inc.



Proposed Approach to Bifurcation Lesions with DES in 2004

Side branch has ostial disease

Yes

No

Sizable side branch

- **Accept sub-optimal SB result**
- **Modified-T, Culotte, Reverse- or Mini- Crush stenting, followed by KB inflation**

Side branch is < 2.5 mm

- **Main vessel stenting with provisional side branch stenting, followed by kissing balloon inflation if needed**



Proposed Approach to Bifurcation Lesions with DES in 2004

Side branch has ostial disease

Sizable side branch (eg > 2.5mm)

- Balloon or Cutting balloon to main / side branch. Stent main vessel only, followed by KBT. Stent side branch only if necessary
- If two stents are deemed necessary – Culotte vs Crushing vs V-stenting vs T-stenting, followed by KB inflation

▪ Dedicated bifurcation stents

Side branch is < 2.5 mm

- Main branch stenting with provisional side branch stenting, followed by kissing balloon inflation

No

