EBC consensus Through the best slides from the first 6 meetings.

A Cordis sponsored symposia

The 7th EBC meeting

Lisbon October 14-15 2011

Bifurcations: Clinical aspects

European Bifurcation Club

EBC

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Meetings so far.....

1. 2005 Bordeaux (30. of September)
2. 2006 Rome (30. of Septemeber)
3. 2007 Valencia (29. of September)
4. 2008 Prague (26-27. of September)
5. 2009 Berlin (16-17. of October)
6. 2010 Budapest (22-23. of October)
7. 2011 Lisbon (14-15. of October)

EBC 2005

- Idea Formulated 2004
- Originated from Bordeaux/ICPS
- Based on success of Japanese CTO club
- A “think-tank” of cardiologists with a particular interest in bifurcations
- A non-political, independent and informal club, promoting open discussion, exchange of ideas and development of collaborative research
- A place to make friends.....

Consensus so far.....

"A bifurcation coronary lesion is a lesion occurring at, or adjacent to, a significant division of a major epicardial coronary artery. These lesions remain complex for the interventionist"

Editorial, Eurointervention 2010;6: 34-38

The tower of Babel

Pieter Bruegel the Elder (1563)

The Confusion of Languages

According to the biblical account, a united humanity of the generations following the great flood, speaking a single language and migrating from the east, came to the land of Shinar, where they resolved to build a city with a tower "with its top in the heavens...lest we be scattered abroad upon the face of the Earth." God came down to see what they did and said: "They are one people and have one language, and nothing will be withhold from them which they purpose to do." So God said, "Come, let us go down and confound their speech." And so God scattered them upon the face of the Earth, and confused their languages, and they left off building the city, which was called Babel "because God there confounded the language of all the Earth."(Genesis 11:5-8).

MEDINA classification

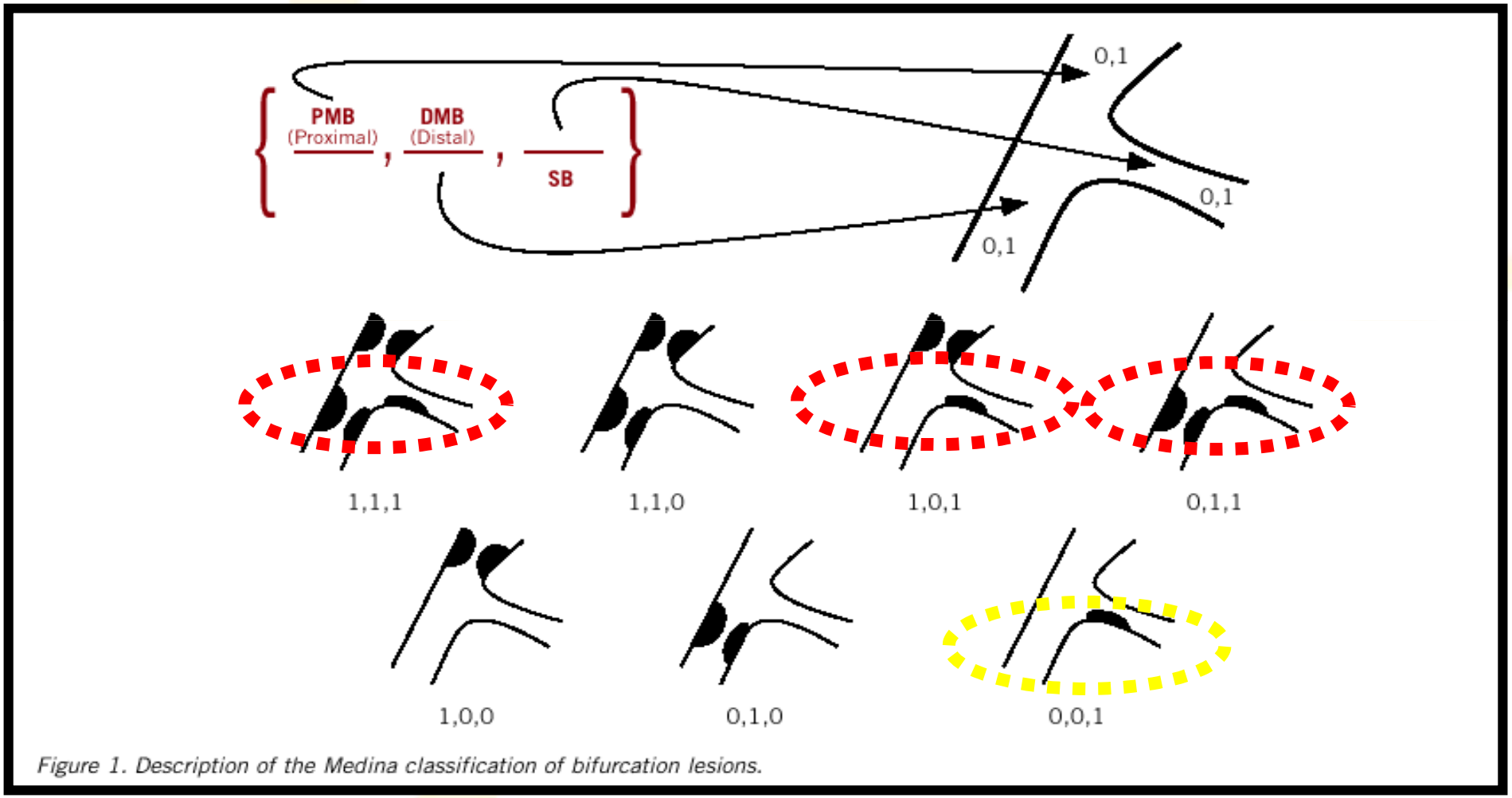
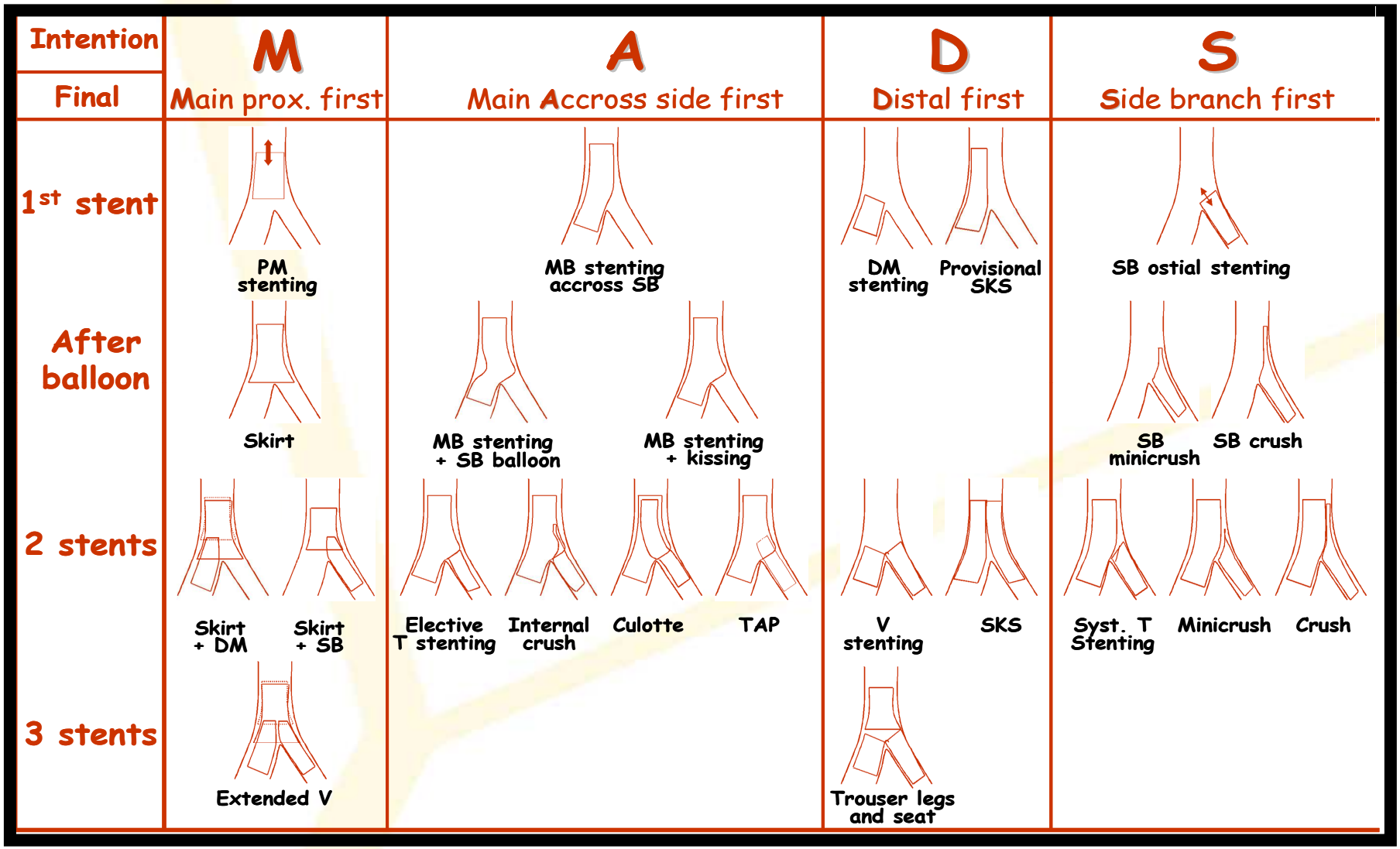


Figure 1. Description of the Medina classification of bifurcation lesions.

Rev. Esp. Cardiol. 2006;59(2):183-4

Proposed by Yves Louvard and named MADS by Ran Kornowski



Catheter Cardiovasc Interv: 2008;71(7):981-2

So what have we acieved.....

"The EBC annual meetings remains compact and dedicated to a single topic. As such, the meetings are able to bring together clinicians, engineers and physicists for detailed discussions. The consensus statements from the meetings reflect that unique opportunity."

Editorial, Eurointervention 2010;6: 34-38

“Simpler is better”
Provisional stenting of side branch

“…beginning by stenting the main vessel across the side branch, and then allowing techniques like provisional T, elective T stenting, classical Culotte ...It is also the strategy for the most frequently used dedicated stents (Petal, Minvasys, Frontier, Invatec...)”

Y Louvard 2008

Supported by BBC 1 and Nordic 1 and advocated by EBC

Simple or Complex Stenting for Bifurcation Coronary Lesions

A Patient-Level Pooled-Analysis of the Nordic Bifurcation Study and the British Bifurcation Coronary Study

Miles W. Behan, DM, MRCP; Niels R. Holm, MD; Nicholas P. Curzen, PhD, FRCP; Andrejs Erglis, MD; Rodney H. Stables, MD, FRCP; Adam J. de Belder, MD, FRCP; Matti Niemelä, MD; Nina Cooter, MSc; Derek P. Chew, MPH, FRACP; Terje K. Steigen, MD; Keith G. Oldroyd, MD, FRCP; Jan S. Jensen, MD; Jens Flensted Lassen, MD; Leif Thuesen, MD; David Hildick-Smith, MD, FRCP

Background—Controversy persists regarding the correct strategy for bifurcation lesions. Therefore, we combined the patient-level data from 2 large trials with similar methodology: the NORDIC Bifurcation Study (NORDIC I) and the British Bifurcation Coronary Study (BBC ONE).

Methods and Results—Both randomized trials compared simple (provisional T-stenting) versus complex techniques, using drug-eluting stents. In the simple group (n=457), 129 patients had final kissing balloon dilatation in addition to main vessel stenting, and 16 had T-stenting. In the complex group (n=456), 272 underwent crush, 118 culotte, and 59 T-stenting techniques. A composite end point at 9 months of all-cause death, myocardial infarction, and target vessel revascularization occurred in 10.1% of the simple versus 17.3% of the complex group (hazard ratio 1.84 [95% confidence interval 1.28 to 2.66], P=0.001). Procedure duration, contrast, and x-ray dose favored the simple approach. Subgroup analysis revealed similar composite end point results for true bifurcations (n=657, simple 9.2% versus complex 17.3%; hazard ratio 1.90 [95% confidence interval 1.22 to 2.94], P=0.004), wide-angled bifurcations >60 to 70° (n=217, simple 9.6% versus complex 15.7%; hazard ratio 1.67 [95% confidence interval 0.78 to 3.62], P=0.186), large (≥2.75 mm) diameter side branches (n=281, simple 10.4% versus complex 20.7%; hazard ratio 2.42 [95% confidence interval 1.22 to 4.80], P=0.011), longer length (>5 mm) ostial side branch lesions (n=464, simple 12.1% versus complex 19.1%; hazard ratio 1.71 [95% confidence interval 1.05 to 2.77], P=0.029), or equivalent sized vessels (side branch <0.25 mm smaller than main vessel) (n=108, simple 12.0% versus complex 15.5%; hazard ratio 1.35 [95% confidence interval 0.48 to 3.70], P=0.57).

Conclusions—For bifurcation lesions, a provisional single-stent approach is superior to systematic dual stenting techniques in terms of safety and efficacy. A complex approach does not appear to be beneficial in more anatomically complicated lesions.

Clinical Trial Registration—URL: http://www.clinicaltrials.gov. Unique identifier: NCT 00376571 and NCT 00351260.

***(Circ Cardiovasc Interv.* 2011;4:57-64.)**

Patient level meta analysis of BBC1 & NORDIC 1

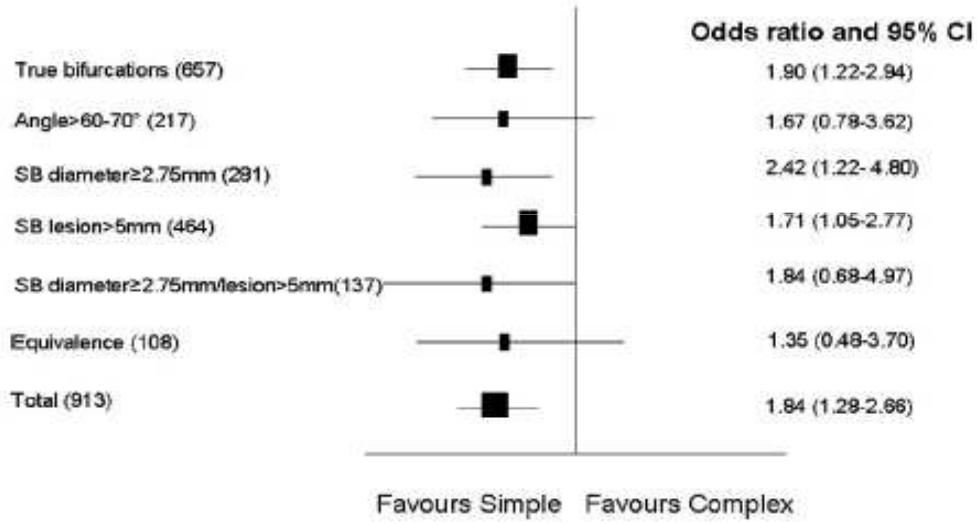
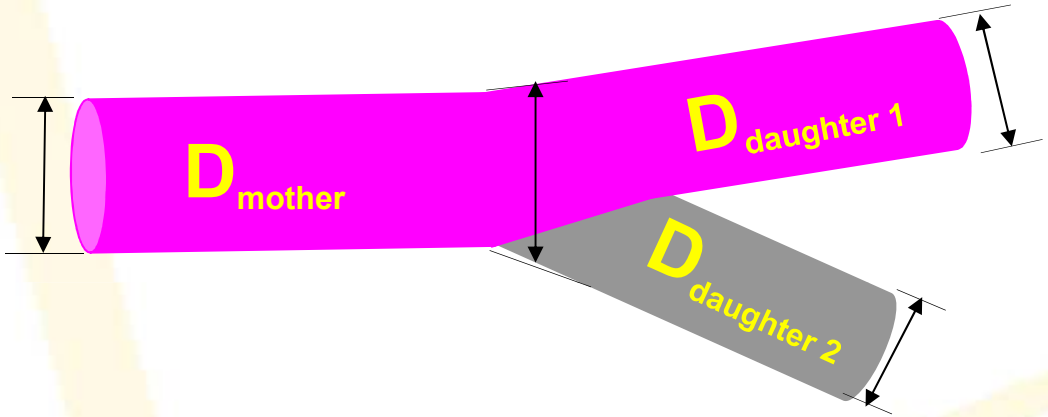


Figure 2. Odds ratio plot of the primary outcome for individual subgroups. Equivalence indicates that the SB is <0.25 mm smaller than the MV. Size of data markers indicates the number of patients in that subgroup. SB indicates side branch; MV, main vessle; CI, confidence interval.

Finet´s adaption of Murray´s law



On the design of the coronary arterial tree:
a generalization of Murray's law

$$D_{mother} = \mathbf{0.67} * (D_{daughter\ 1} + D_{daughter\ 2})$$

Implications of Murrays law

Consensus 2009:

- In single stent techniques, the primary stent should be sized according to the distal main vessel diameter”

- Post dilatation, or kissing balloon inflations, are required to optimise the proximal main vessel stent diameter

Value of kissing inflations in simple stenting

Consensus 2009:

- When using a single stent technique, in the absence of kissing balloon inflations, the proximal main vessel stent should be postdilated to an appropriate diameter.
- Kissing balloon inflation, or pressure wire interrogation, should be used when an angiographically significant (>75%) side branch lesion remains after main branch stenting
- Stent balloon inflation duration of 30 seconds minimum is encouraged.

POT, the proximal optimisation technique (devised by O. Darremont)

Consensus 2009:

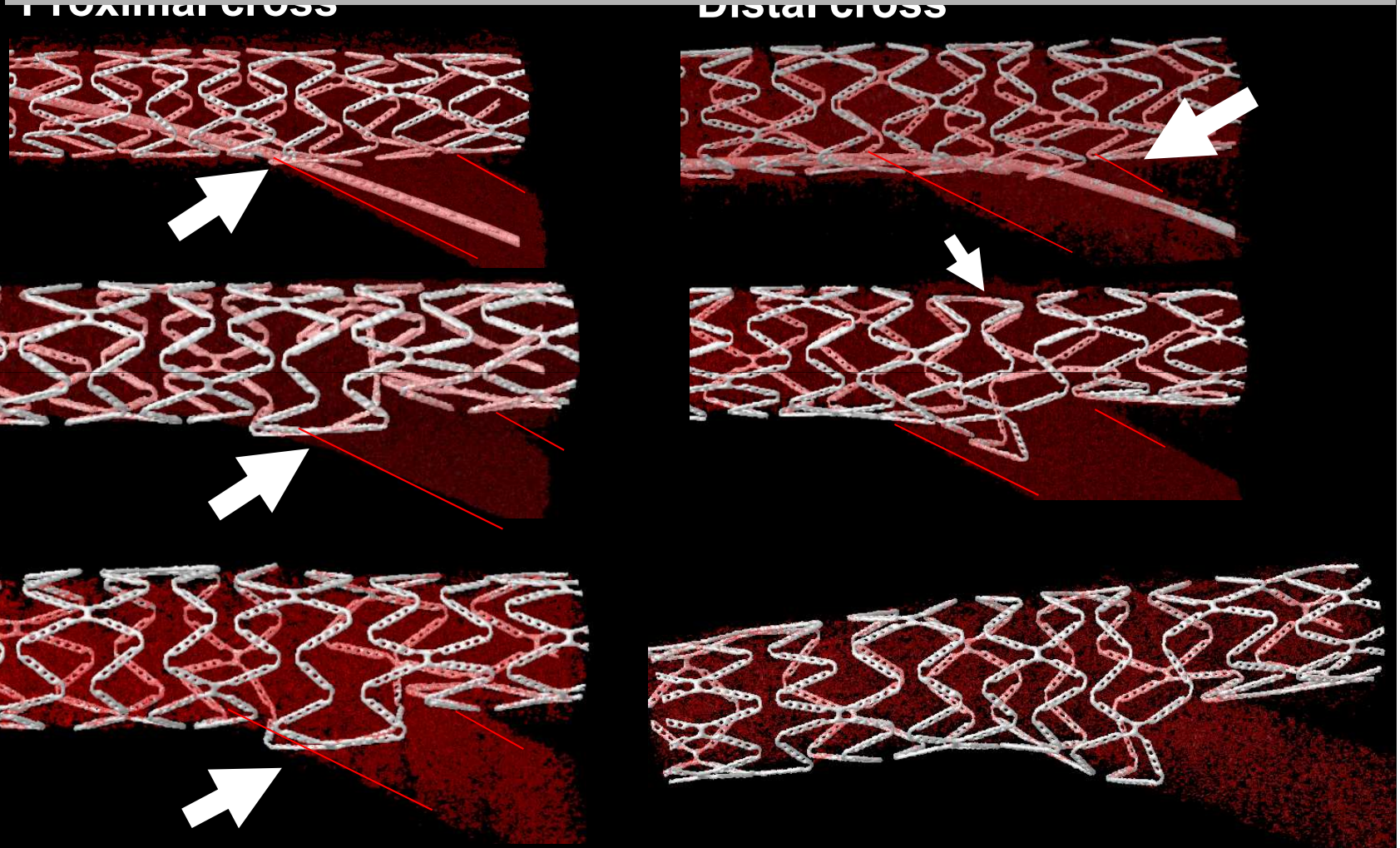
- The POT technique should be used in any case of difficulty recrossing into a side branch with either a wire or balloon.

Stent distortion after kissing balloon in single stent techniques

Consensus 2009:

- When rewiring a side branch, efforts should be made to cross the main vessel stent distally, thereby ensuring stent coverage of the ostium of the side branch.

Stenting MV across the SB. Distal wire cross creates better SB scaffolding than prox crossing



The dilemma in the provisional side branch stenting in Bifurcation lesions

"Life can only be understood backwards;

but it must be lived forwards.“

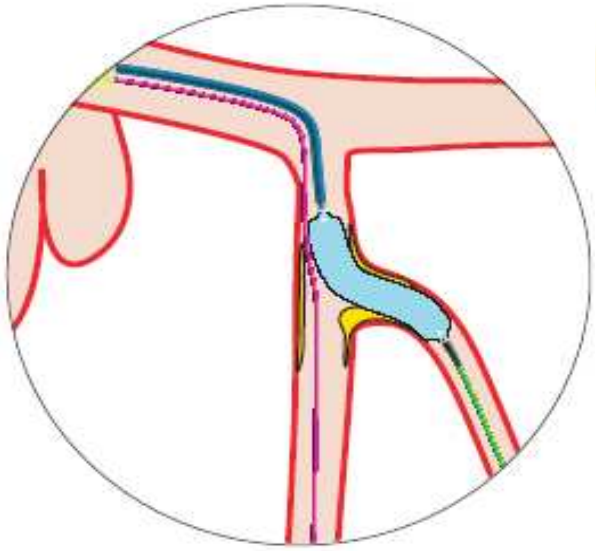
Søren Kirkegaard

How to do a Provisional Stenting

Consensus 2008

Should we predilate the SB?

- **No**
- *Yes, if calcified lesion*
- *Yes, if long lesion (on SB)*



Consensus 2008

- *"Carina shift" not "plaque shift"*
- *No need for routine SB predilatation unless lesion in the SB is long and/or severely calcified*

When to use two stents

Consensus 2009:

- Current evidence suggests that optimal two-stent technique does not predict a significant higher rate of stent thrombosis.
- Bifurcations with angulation of > 60 degrees between the daughter vessels should be approached with single stent strategies where possible

One or two stents for coronary bifurcation lesions?

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EBC Consensus 2010:

- Side branch diameter and length can both be used visually as surrogates for volume of muscle at risk.
- Large side branches with ostial disease extending >5mm from the carina are likely to require two stents.
- Side branches whose access is particularly challenging should be secured by stenting once accessed.

Eurointervention;2011 vol 6 (supplement J): 61-64

How to use two stents

Consensus 2009:

- Provisional T stenting remains the gold standard technique for most bifurcations.
- Dedicated bifurcation stent systems remain limited but are likely ultimately to prevail.
- When two stents are required, the culotte technique, when appropriate, offers some advantages over crush stenting.
- Kissing balloon inflations for carina reconstruction is mandatory in two stent techniques.
- High pressure proximal inflation using a short noncompliant balloon should be considered for correction of proximal stent distortion after kissing balloon inflation.

Consensus 2010 from the EBC

Stent distortion after kissing balloons in two stent techniques

The same principles of distal rewiring of the side branch apply to the use of two stents techniques. However, the reconstruction of the carina by the use of kissing balloon inflation in two stent techniques often results in distortion of the proximal part of the stents. This effect is most pronounced when there are differences in the diameter between the side branch and the main branch. Experience from OCT guided post dilatation in two stent techniques suggest that final proximal high pressure balloon inflation can correct proximal distortion.

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...And what will the future bring ??

- Will new evidence published since last year change the current EBC consensus?
- Will presentations during this meeting change the current EBC consensus

- **And what about Left Main Stenting:**
- Two stent techniques ?
- Provisional Stenting ?
- Dedicated bifurcation devices ?

There are still so much to discuss.....