Optimizing Bifurcation, PCI current approach

**When to use two stents?**

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Disclosure Statement of Financial Interest

Within the past 12 months, I or my spouse/partner have had a financial interest/arrangement or affiliation with the organization(s) listed below.

**Affiliation/Financial Relationship**
- Consulting Fees/Honoraria

**Company**
- Philips Volcano
- Abbott Vascular
- Terumo
- MSD
- Astra Zeneca
- Siemens
- Bracco
- Balton
The European Bifurcation Club (EBC)
Established 2004

Percutaneous coronary intervention for coronary bifurcation disease: consensus from the first 10 years of the European Bifurcation Club meetings

Provisional stenting technique
How to obtain the optimal result?

EBC consensus:

- Kissing balloon inflations may be used when an angiographically significant (>75% DS or TIMI flow <3) ostial SB lesion remains after MV stenting.
Two stent techniques for coronary bifurcations

T / TAP

CULOTTE

DK-CRUSH


Simple or complex strategy for coronary bifurcations?

The EBC TWO Study (European Bifurcation Coronary TWO)
A Randomized Comparison of Provisional T-Stenting Versus a Systematic 2 Stent Culotte Strategy in Large Caliber True Bifurcations

Death, MI, TVR at 12 month

Simple or complex strategy for coronary bifurcations?

5-year survival from patient-level pooled analysis of the Nordic Bifurcation Study and the British Bifurcation Coronary Study

![Graph showing 5-year all-cause mortality comparison between one-stent and two-stent techniques.](image)


Simple or complex strategy for coronary bifurcations?

Meta-analysis of randomised trials

Primary outcome of interest

All-cause mortality

![Graph showing meta-analysis of randomised trials.](image)

Simple or complex strategy for coronary bifurcations?
Meta-analysis of randomised trials

Secondary outcomes of interest
MACE, TLR, Myocardial infarction, Stent trombosis

Primary outcome of interest
All-cause mortality
(Sensitivity analysis – trials with reported follow-up ≥ 3 years)

Simple or complex strategy for coronary bifurcations?

Meta-analysis of randomised trials

Secondary outcomes of interest
MACE, TLR, Myocardial infarction, Stent trombosis
(Sensitivity analysis – trials with reported follow-up ≥ 3 years)

Simple or complex strategy for coronary bifurcations?

**1st and 2nd generation stents**

<table>
<thead>
<tr>
<th></th>
<th>1st gen. stent</th>
<th>2nd gen. stent</th>
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<tbody>
<tr>
<td>24m MACE</td>
<td>13.1%</td>
<td>11.9%</td>
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<tr>
<td>First 225 patients</td>
<td>10.0%</td>
<td>9.5%</td>
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<tr>
<td>Last 225 patients</td>
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**Percutaneous coronary intervention for the left main stem and other bifurcation lesions: 12th consensus document from the European Bifurcation Club**

Provisional stenting approach - summary
The provisional side branch (SB) stenting strategy is currently considered the “standard” approach for treatment of the vast majority of bifurcation lesions

Provisional stenting approach - POT

Provisional stenting approach - side branch treatment

When?
- SB treatment is indicated if the ostium is pinched or the flow is limited after POT.
- If SB treatment is required, rewire and dilate the SB and finalise with KBI and POT.
- SB stenting is indicated if the SB is occluded, dissected, or has limited flow despite KBI.

Provisional stenting - side branch treatment

- Bail-out SB stenting after MB stenting is performed with T-stenting, TAP or culotte.
- Implantation technique is selected according to angulations, reference size differences and operator capabilities.
- Always perform final KBI followed by POT in two-stent techniques.


Elective two-stent strategy

- A planned two-stent technique may be indicated for bifurcations with long SB lesions, difficult SB access or high risk of SB compromise.
- Vessel anatomy, vessel sizes, a need for stenting the SB first and operator proficiency affect the choice of strategy.
- Recommended techniques include reverse provisional stenting, T-stenting, culotte and DK-crush.
- POT is recommended and ensures optimal stent expansion in both the MB and SB.
- Always finalise a double stent procedure with KBI, followed by POT.

Elective two-stent strategy


Case Presentation – Left Main PCI with LVAD Support

DK-CRUSH technique

482 patients from 26 centers in 5 countries with true distal LM bifurcation lesions (Medina 1,1,1 or 0,1,1),

Randomised to Provisional Stenting (n=242) or DK crush stenting (n=240),

The primary endpoint was the 1-year composite rate of target lesion failure (TLF): cardiac death, target vessel myocardial infarction, or clinically driven target lesion revascularization.

Routine 13-month angiographic follow-up was scheduled after ascertainment of the primary endpoint.
Primary outcome of interest

**Target Lesion Failure**
(cardiac death, target vessel myocardial infarction, or clinically driven TLR)

Compared with Provisional Stenting, DK crush resulted in lower rates of:
- target vessel myocardial infarction (2.9% vs. 0.4%; p=0.03),
- definite or probable stent thrombosis (3.3% vs. 0.4%; p=0.02),
- clinically driven target lesion revascularization (7.9% vs. 3.8%; p=0.06),
- angiographic restenosis within the LM complex (14.6% vs. 7.1%; p=0.10)

There was no significant difference in cardiac death between the groups.
Take-home message

Coronary Bifurcation PCI in 2018:

- **KEEP IT SIMPLE!!!**

- The provisional side branch stenting strategy is currently considered the “standard” approach for treatment of the vast majority of bifurcation lesions, including distal Left Main bifurcation.

- Bail-out side branch stenting after main vessel stenting is indicated if the side branch is occluded, dissected, or has limited flow despite KBI.

- A planned two-stent technique may be indicated for bifurcations with long side branch lesions, difficult side branch access or high risk of side branch compromise.

- Further studies are needed to identify Left Main bifurcation lesions likely to respond most favorably to intervention using the 2-stent DK crush technique.
Thank you for your attention!

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