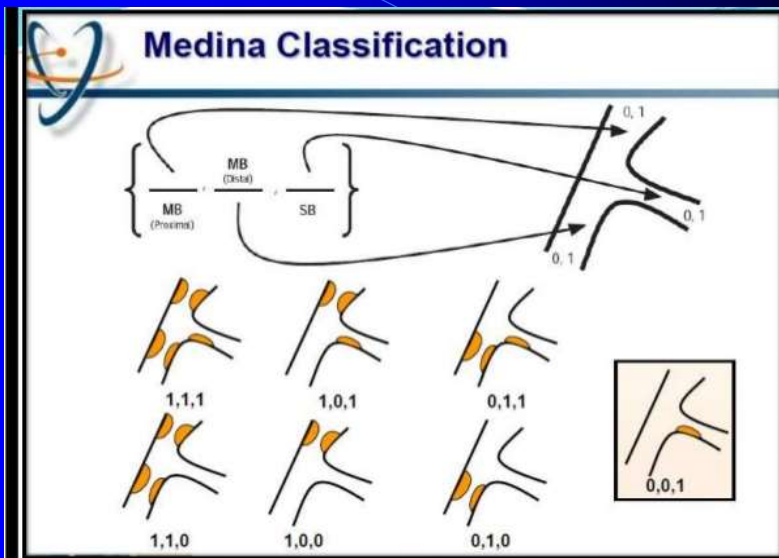
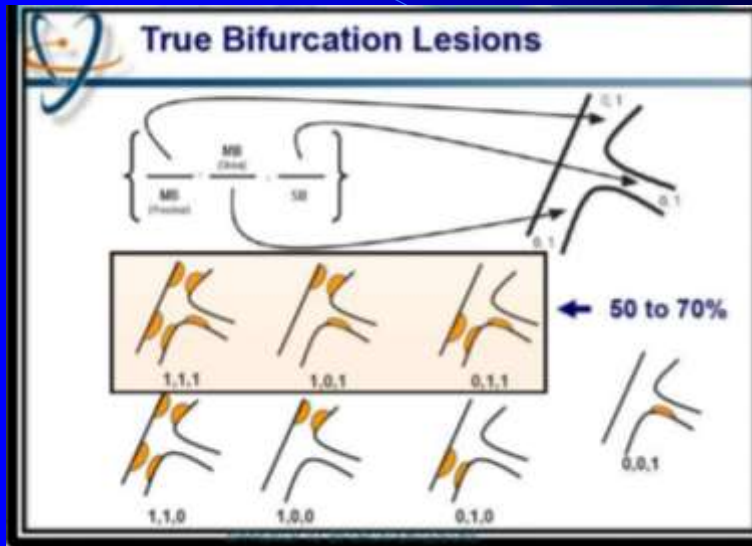


Classification of bifurcation lesions

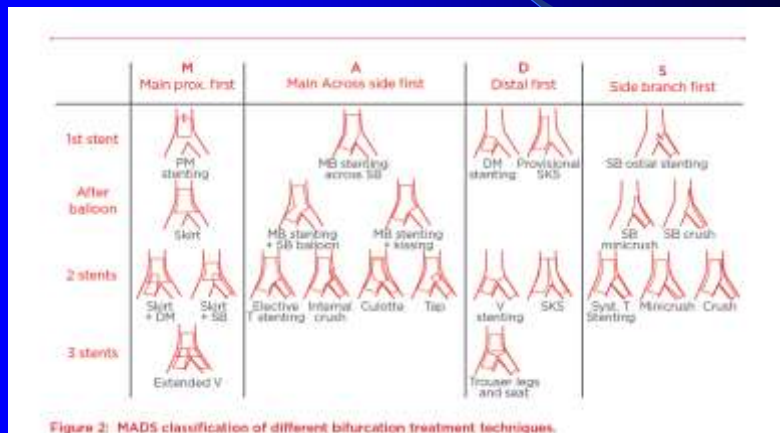
Sanborn	Type I	Type II	Type III	Type IV	Type V		
Safian	Type IA	Type IB	Type IIA	Type IIB	Type IIIA	Type IIIB	Type IV
Duke	Type A	Type B	Type C	Type D	Type E	Type F	
Lefevre	Type 1	Type 2	Type 3	Type 4	Type 4a	Type 4b	
Medina	1,1,1	1,1,0	1,0,1	0,1,1	0,1,0	0,0,1	1,0,0
Movahed	BL2V	BS2T	BL1mT	BS1mV	BS1sT	BL1sV	

APPROACH TO BIFURCATION LESIONS





Management of bifurcation lesions



Stenting of bifurcation lesions

1- Provisional ●

MV stenting ±SB angioplasty

(Provisional) T stenting TAP, reverse internal crush, reverse culotte

2- Elective (Culotte, Crush, reverse crush, T, TAP, V stenting, SKS, DK crush(stent SB, inflation MV, first Kissing, stent MV, rewiring and FKB. POT).

How to choose among the various ●
techniques? ●

- Bifurcation anatomy: (Angle (T or Y), ●
severity of the ostial SB stenosis, extent of
disease in the MV proximal to carina ●

- **Operator experience** ●

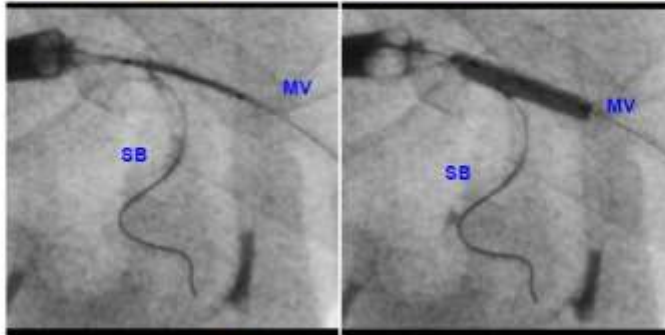
How to perform the procedure? ●



TAP BENCH TEST: angio



Step 1: stenting on MV with jailed guidewire on SB



TAP BENCH TEST: angio



Step 2: Kissing on MV and SB after rewiring of the SB
(according to Provisional T-stenting strategy)



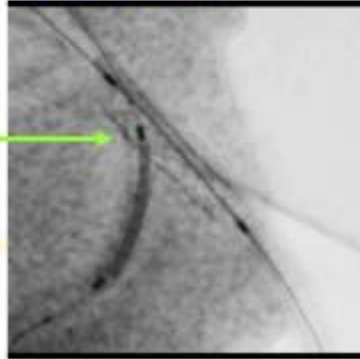


TAP BENCH TEST: angio



Step 3: Stent placement on the SB with uninflated balloon on MV ready for final kissing balloons

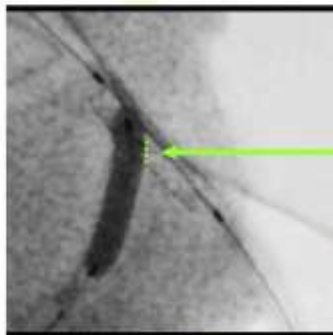
SB stent positioning is adjusted to ensure full coverage of the ostium by placing the proximal stent edge at the level of the proximal ostium border



TAP BENCH TEST: angio



Step 4: Stent inflation on the SB with uninflated balloon on MV ready for final kissing balloons



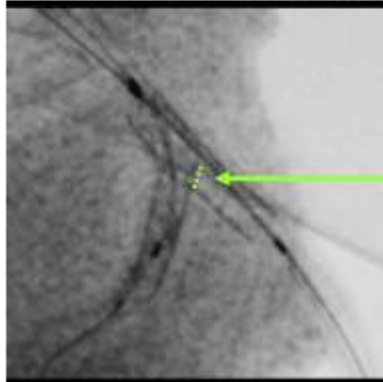
The stent of the SB protrudes within the MV lumen only at the distal edge of SB ostium



TAP BENCH TEST: angio



Step 5: The SB stent balloon is slightly pulled within the MV to perform kissing balloons inflation



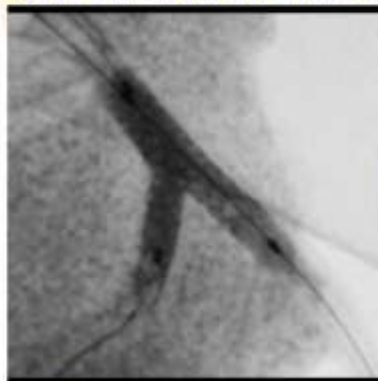
The stent of the SB protrudes within the MV only at the distal edge of SB ostium

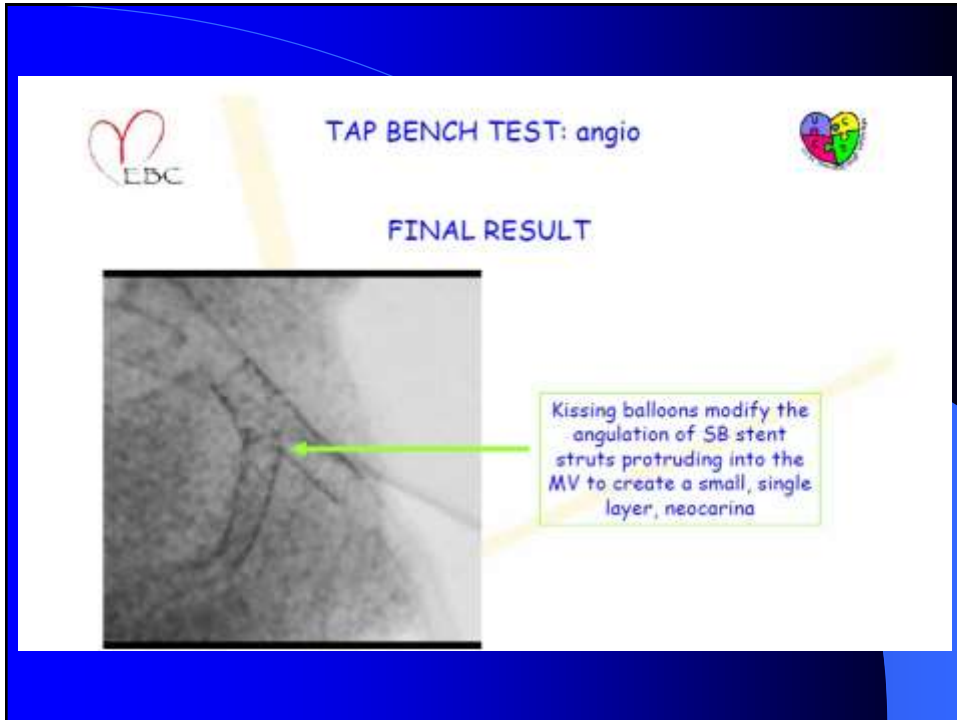


TAP BENCH TEST: angio



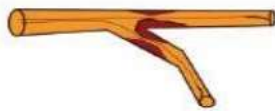
Step 6: Final kissing balloons of the bifurcation with the SB stent balloon and the MV balloon





The culotte technique

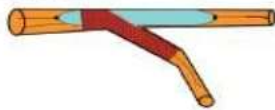
1. Wire both branches and predilate if needed.



2. Leave the wire in the straighter branch (MB) and deploy a stent in the more angulated branch (SB).



3. Rewire the unstented branch and dilate the stent struts to unjail the branch (MB).



4. Place a second stent into the unstented branch (MB) and expand the stent leaving some proximal overlap.

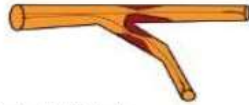


5. Re-cross the 2nd stent's (MB) struts into the 1st stent (SB) with a wire and perform kissing balloon inflation.



The crush technique

1. Wire both branches and predilate if needed.



2. Advance the 2 stents. MB stent positioned proximally. SB stent will protrude only minimally into MB.



3. Deploy the SB stent.



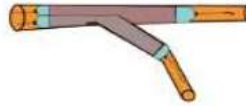
4. Check for optimal result in the SB and then remove balloon and wire from SB. Deploy the MB stent crushing the MB stent.



5. Rewire the SB and perform high pressure dilatation.



6. Perform final kissing balloon inflation.



Step crush

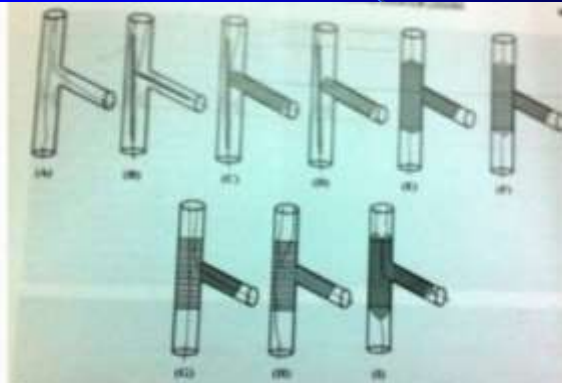
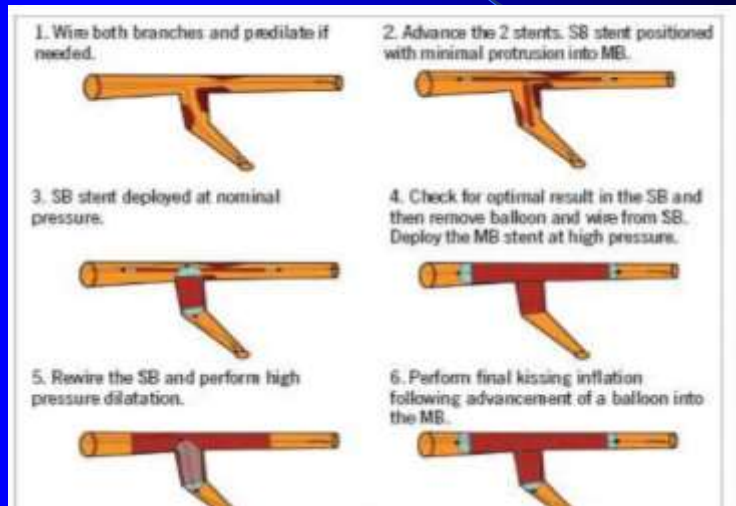


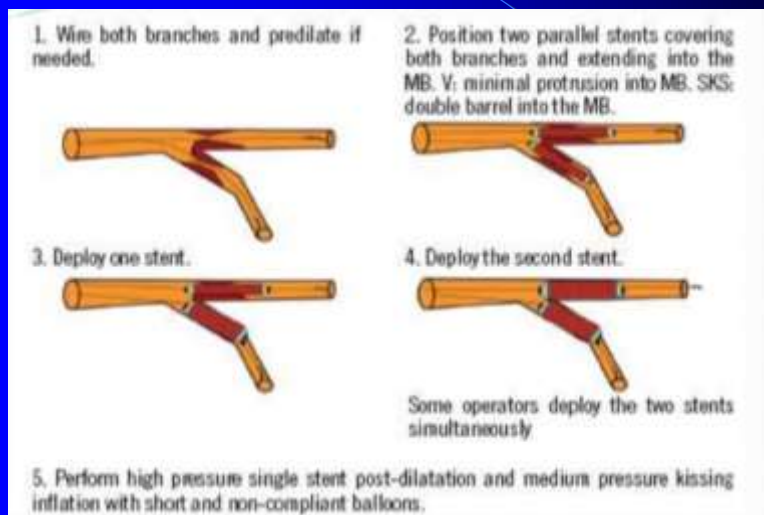
Figure 18 Diagram of the step crush stent technique. MB, main branch; SB, side branch; LA, left anterior descending artery.

The final result is basically similar to the one obtained with the "standard crush" technique, with the only difference being that each stent is advanced and deployed separately so that a 6 F guide may be used.

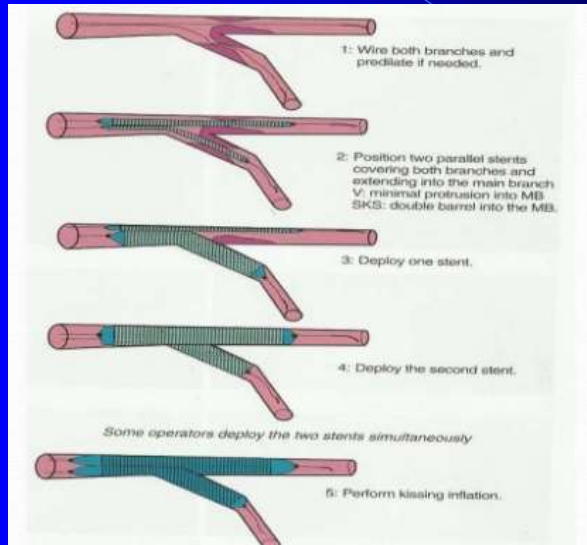
Modified T technique



V technique



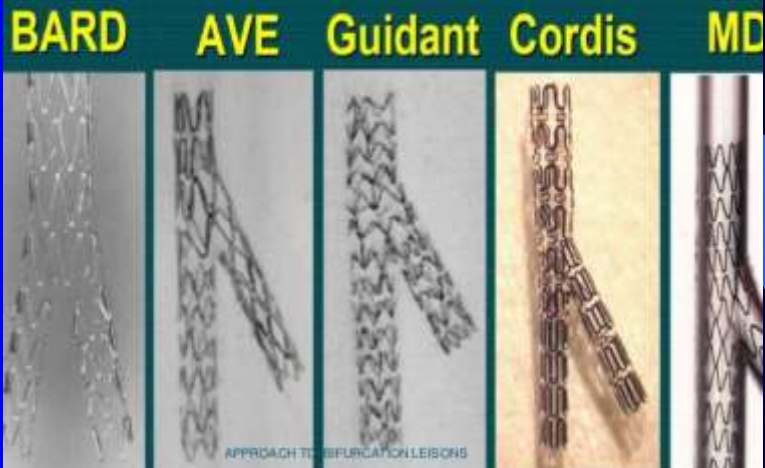
SKS technique



Dedicated Bifurcation Stents

- Complete bifurcation “Y” stents
- Sidebranch access MB stents
- Sidebranch stents
- Specialty designs (e.g. for LM disease)

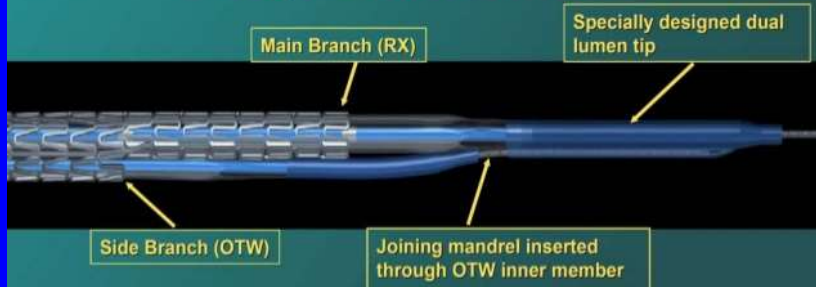
Complete Bifurcation "Y" Stents



Sidebranch Access MB Stents

- ABT Frontier
- Invatec Twinrail
- Minvasys Nile
- BSC Petal
- Ymed Sidekick
- Trireme Medical (TMI)
- StentYs

ABT Frontier Design Characteristics



- *Single-Tip Delivery* to avoid wire wrap
- *Two Wires* maintain access across both branches
- *Kissing Balloon Deployment* to minimize plaque shift
- *Provisional T-Stent* approach maintains options for additional treatment

Invatec Twin-Rail Design Summary



• *Stent Platform*

- Closed Cell design
- Variable Stent Geometry
- Adequate scaffolding of main vessel and side branch ostium

Stent Delivery System

- Double balloon design SDS
 - Main vessel balloon \varnothing 3.0mm and 3.5mm
 - Side branch balloon \varnothing 1.5mm
- Double RX design
- 6 F Guiding catheter compatible



Dedicated Bifurcation Stents

- Complete bifurcation “Y” stents
- Sidebranch access MB stents
- **Sidebranch stents**
- Specialty designs (e.g. for LM disease)

Capella Sideguard *Ostium Protection Device*



- The Cappella Sideguard's trumpet-shaped design helps the stent conform to the ostium, allowing for complete stent-to-wall apposition.
- Its short length, self-expandable nitinol system and low-profile delivery system allow greater navigability even in very tortuous anatomy.
- It is currently a BMS, but the next generation will be DES.

Dedicated Bifurcation Stents

- Complete bifurcation “Y” stents
- Sidebranch access MB stents
- Sidebranch stents
- **Specialty designs (e.g. for LM disease)**

The Devax AXXESS system

Specialty design e.g. left main disease

AXXESS PLUS Concept

- The Axxess Plus stent is implanted at the level of the carina
- A successful implant will span the ostia of both branching vessels, indicated by the presence of one marker in each branch vessel



- Stents for the branch vessels are selected to match the length and diameter of the LAD and LCX

Imaging in bifurcation lesion

- Before procedure •

MSCT: Angle, plaque, calcification, type of wires, •
pre dilation.

- During procedure: •

3D angio •

IVUS (bifurcation anatomy, stent optimization, wires problems

OCT •

FFR •

Take home message

PCI of bifurcation lesion is technically
challenging so keep it simple

