

**CONTEMPORARY APPROACH TO  
CORONARY BIFURCATION LESION  
TREATMENT**

JACC JOURNAL

DR RAJAT GANDHI

# INTRODUCTION

- 20% OF ALL PCI .
- CHALLENGING PROCEDURE.
- LOWER PROCEDURAL SUCESS RATE.
- LONG TERM ADVERSE CARDIAC EVENTS.
- PROVISIONAL SIDE BRANCH STENTING .

# ANATOMY OF BIFURCATION

- CORONARY VESSEL BRANCHES INTO ASYMETRICAL AND SMALLER BIFURCATION.
- PROXIMAL MAIN BRANCH DIAMETER = DIAMETER OF DM + DIAMETER OF SB.
- BIF IS VULNERABLE TO ATHEROSCLEROSIS.
- HIGH ENDOTHELIAL SHEAR STRESS AT CARINA.
- ABSENCE OF PLAQUE AT CARINA.

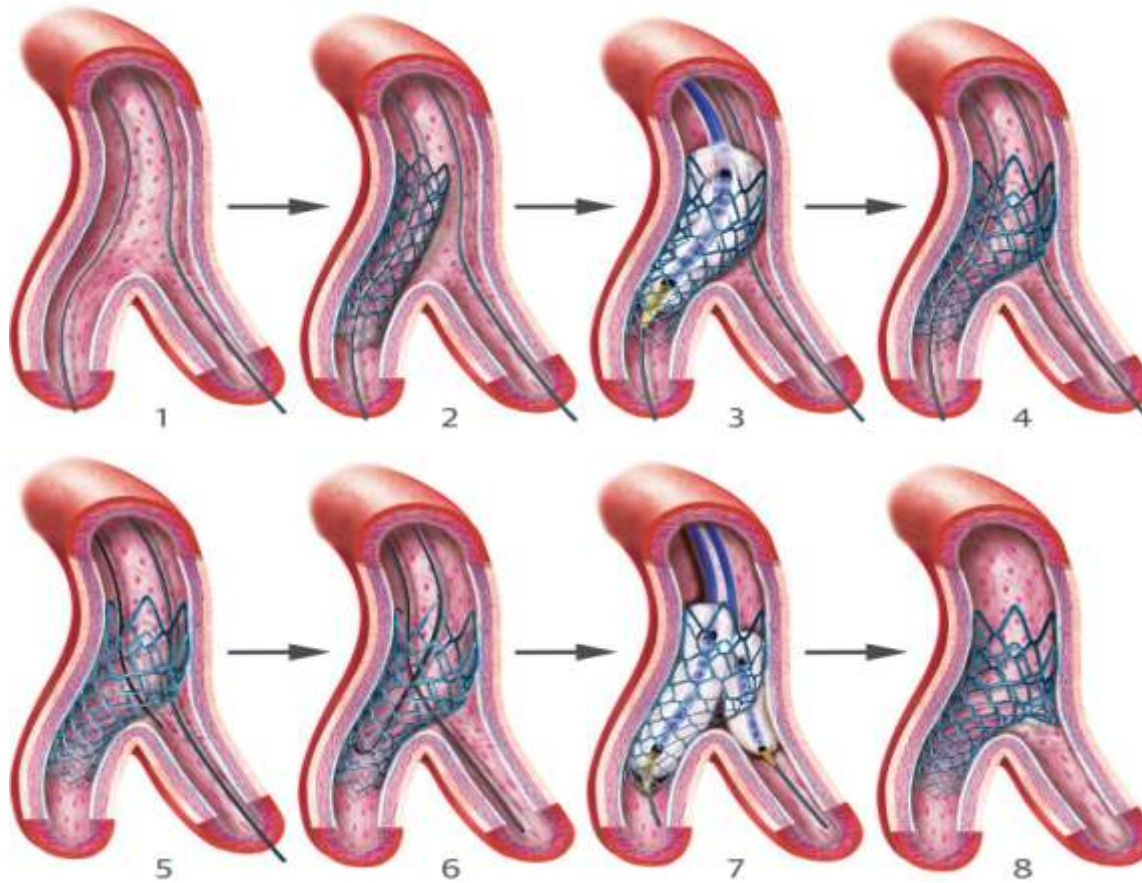
# SIDE BRANCH CHARACTERISTICS

- OSTIUM DIAMETER.
- SIZE OF SIDE BRANCH.
- MYOCARDIAL SUPPLY.
- LESION IN SIDE BRANCH.
- ANGLE OF SIDE BRANCH.

# CLASSIFICATION OF BIFURCATION

- LOCATION OF LESION.
- BIFURCATION ANGLES.
- CALCIFICATION.
- LESION LENGTH.
- FUNCTIONAL SIGNIFICANCE OF LESION.
- IVUS / FFR CHARACTERISTICS.

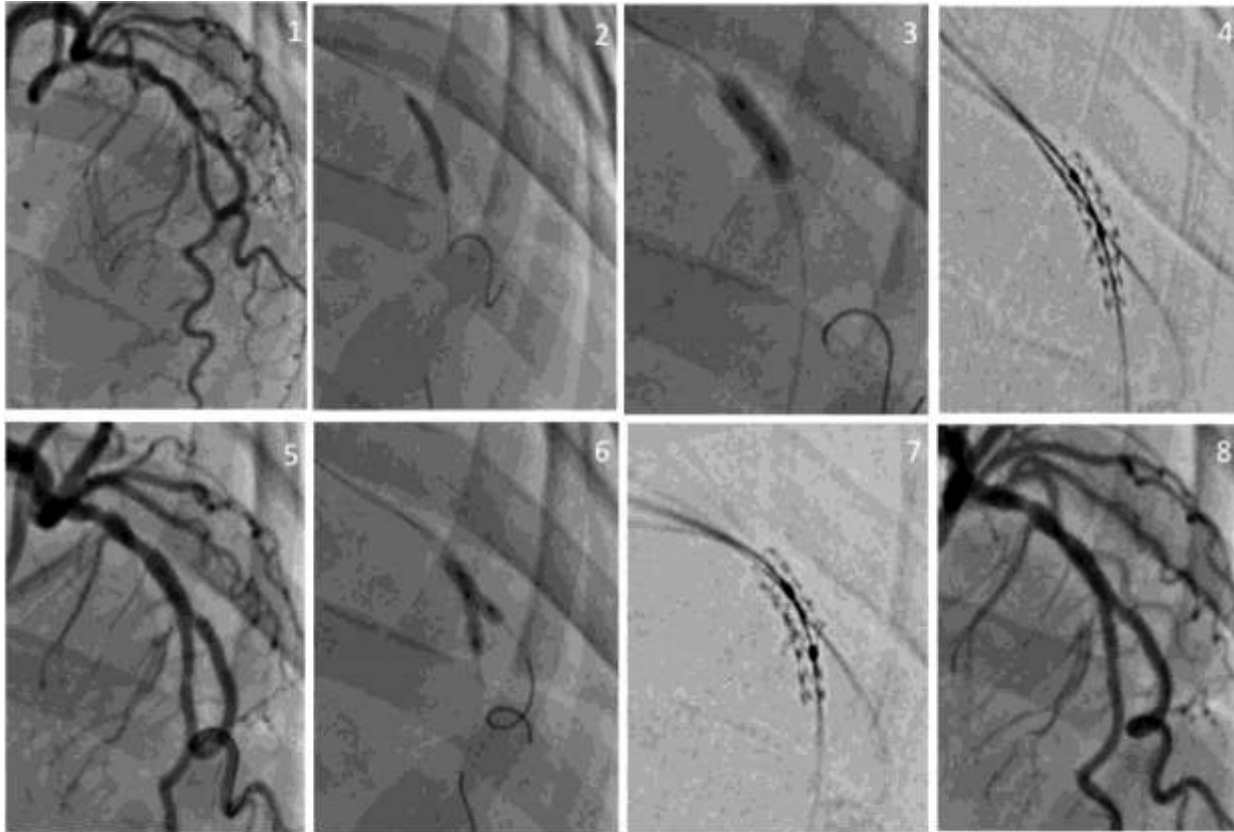
# PROVISIONAL STENTING



# PROVISIONAL SB STENTING STRATEGY

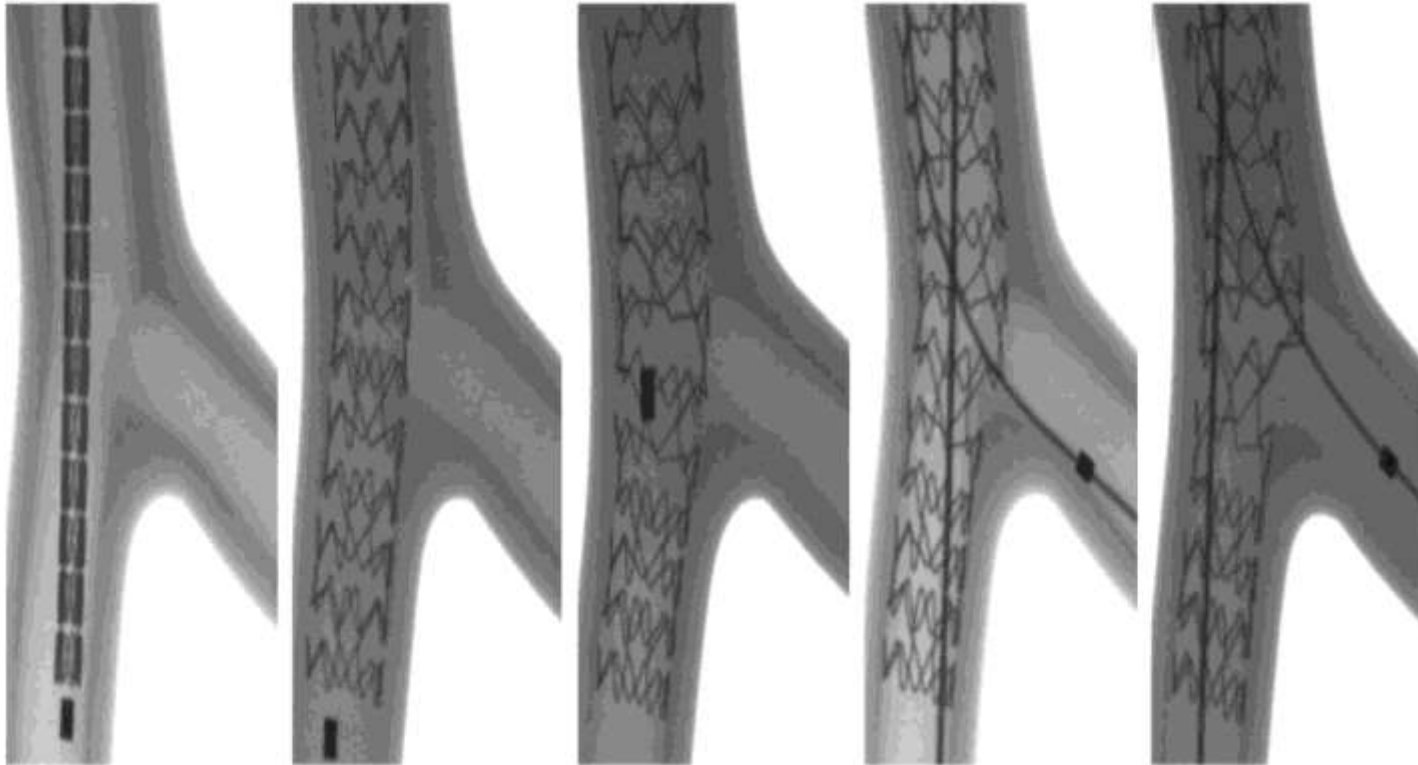
- MAIN AND SIDE BRANCH WIRING .
- PREDILATION.
- STENTING MB.
- POT TECHNIQUE.
- GUIDE WIRE EXCHANGE TECHNIQUE.

# PROVISIONAL APPROACH



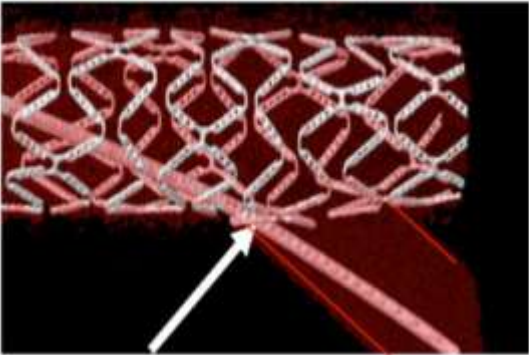


# PROVISIONAL OPTIMIZATION TECHNIQUE

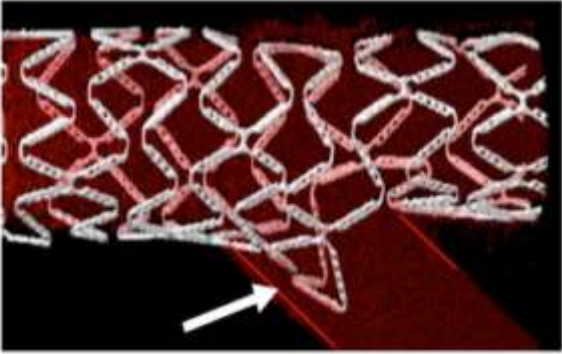
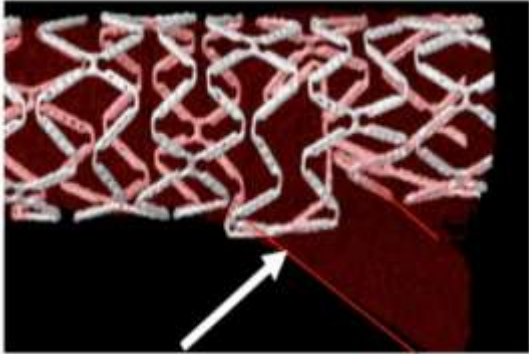
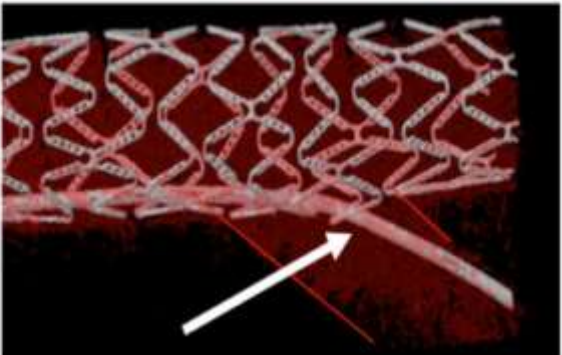


# PROXIMAL VERSUS DISTAL CROSSING

Proximal crossing









Distal crossing



# STENT EXPANSION CHART

**DES Designs Overexpansion**

Balloon Max Size						
	Synergy	Xpedition	Res. Onyx	Ultimaster	BioMatrix A	Orsiro
4.0	2.25 Small vessel (8 crowns, 2-4 connectors) Expansion: 3.6mm	Small vessel (6 crowns, 3 connectors) Expansion: 4.1mm	Small vessel workhorse (6.5 crowns, 2 connectors) Expansion: 3.3mm	Small vessel (8 crowns, 2 connectors) Expansion: 4.3mm	Small vessel (6 crowns, 2 connectors) Expansion: 4.1mm	Small vessel (6 crowns, 3 connectors) Expansion: 4.0mm
	2.50 Expansion: 3.6mm		Medium vessel workhorse (8.5 crowns, 2 connectors) Expansion: 4.4mm			
5.0	2.75					
	3.00 Workhorse (8 crowns, 2-4 connectors) Expansion: 4.2mm					
6.0	3.50 Expansion: 4.2mm	Large vessel (9 crowns, 3 connectors) Expansion: 5.6mm	Large vessel (9.5 crowns, 2.5 connectors) Expansion: 5.6mm	Large vessel (8 crowns, 2 connectors) Expansion: 5.8mm	Large vessel (9 crowns, 3 connectors) Expansion: 5.9mm	Large vessel (8 crowns, 3 connectors) Expansion: 5.3mm
	4.00 Large vessel (10 crowns, 2-5 connectors) Exp: 5.7mm					
	4.50		Extra-Large vessel (10.5 crowns, 2.5 connectors) Expansion: 6.0mm			
5.00						

➤ Expansion : inner stent MLD excluding struts  
 ➤ Max balloon size : Maverick 6.0mm at 14 ATM

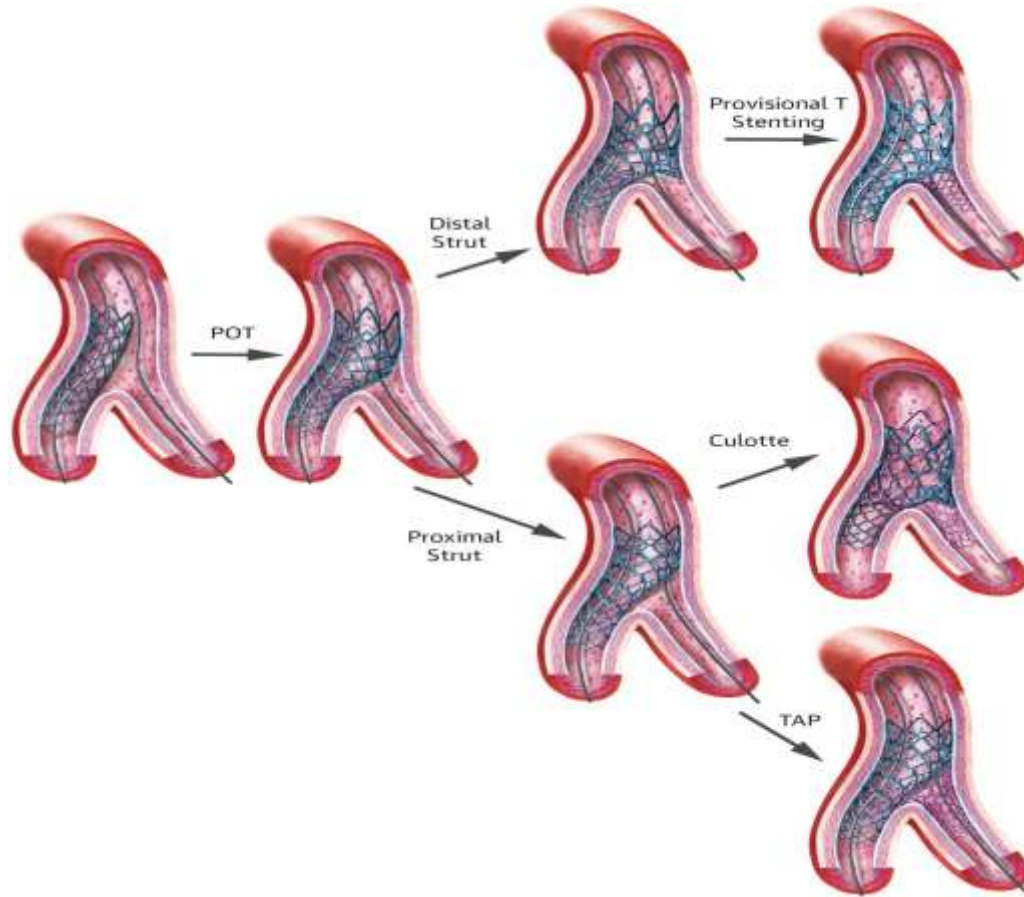
# STENTING OF SIDE BRANCH

- DISSECTION OF SIDE BRANCH.
- DISEASED VESSEL.
- SLOW FLOW IN SIDE BRANCH.
- ANGINA .
- ECG CHANGES.
- MIGRATION OF THROMBUS.

# STENT TECHNIQUE IN BIFURCATION

- T STENTING .
- TAP TECHNIQUE .
- CULOTTE.

# STENT TECHNIQUE IN BIFURCATION



# TECHNICAL CHALLENGES

- UNABLE TO WIRE SIDE BRANCH .
- DIFFICULT SIDE BRANCH REWIRING .
- FAILURE TO ADVANCE BALLOON.

# DRUG COATED BALLOON FOR SB

- EMERGED AS POSSIBLE ALTERNATIVE ,
- LACK OF DISTORTION OF ORIGINAL ANATOMY,
- MINIMISATION OF STRUT DEFORMATION,
- DECREASE IN DURATION OF ANTIPLATELET THERAPY,
- DES WAS FOUND TO HAVE BETTER RESULTS,



# TWO STENTS TECHNIQUE

- SB > 2.5MM,
- >5MM LESION BEYOND OSTIUM,
- SB IS STENTED FIRST IS PREFERRED CHOICE ,
- T,TAP AND DOUBLE KISSING IS RESERVED FOR LM STENTING.
- T STENTING IS REQUIRED WHEN T SHAPED ORIGIN OF SB,
- TAP STENTING WHEN THERE IS INVERTED Y SHAPED ORIGIN OF SB,

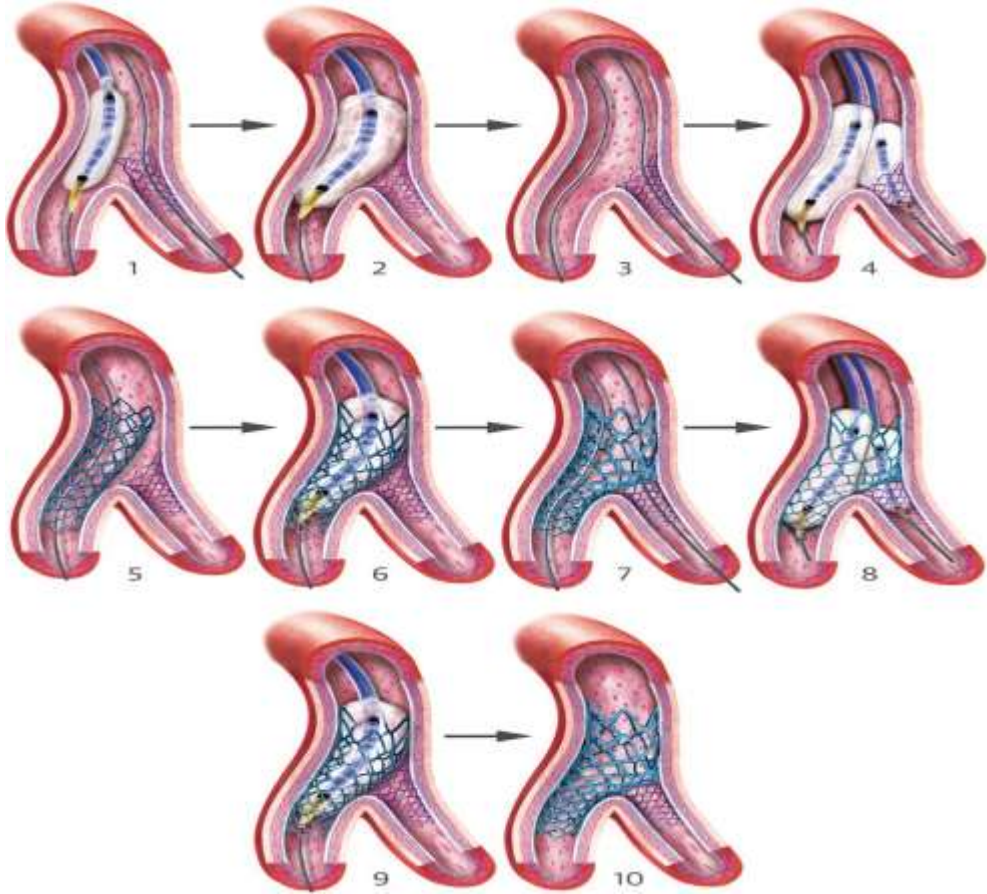
# TWO STENT TECHNIQUES

- NEOCARINA IS CREATED BY SB STRUTS,
- WIDER PROTRUSION OF SB STRUTS IN SIDE THE MV,
- KBI IS FINAL STEP,
- ACUTE SB ANGLES ARE ASSOCIATED WITH LONGER, OVAL SHAPED OSTIUM,

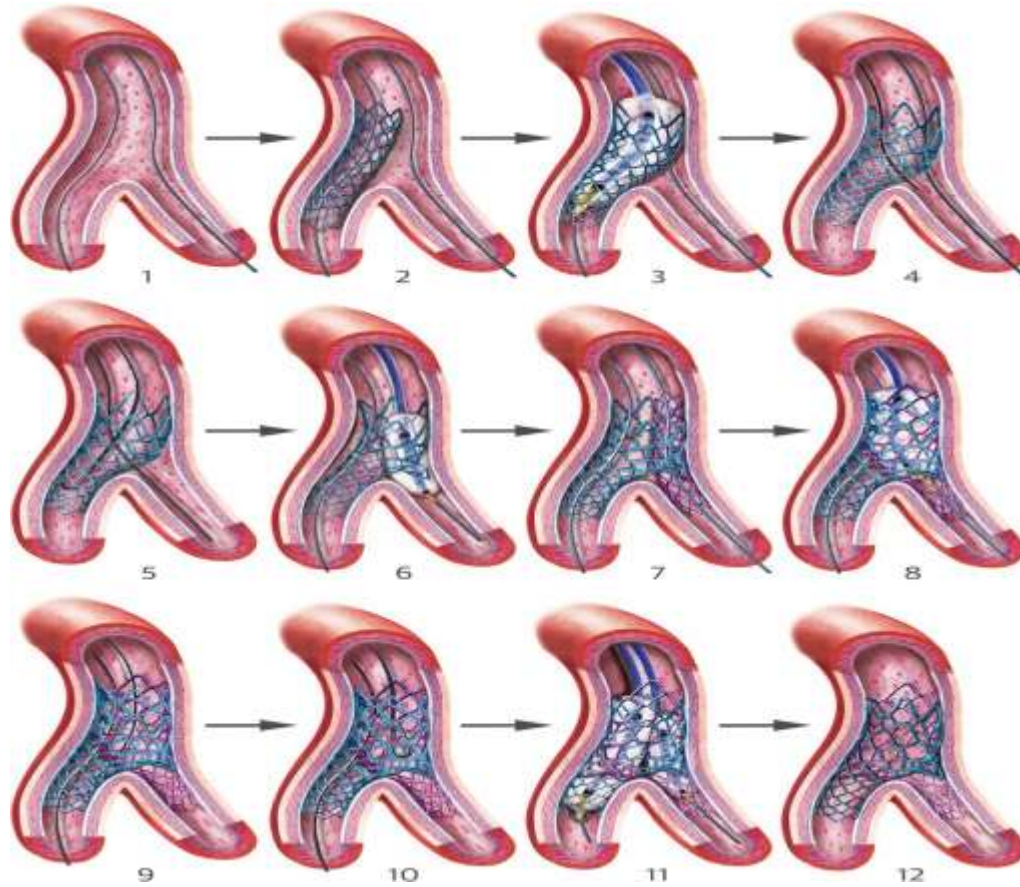
# TWO STENTS TECHNIQUE

- DOUBLE KISSING CRUSH TECHNIQUE,
- CULOTTE TECHNIQUE,

# DOUBLE KISSING CRUSH TECHNIQUE



# CULOTTE TECHNIQUE



# BIFURCATION STENTING WITH BIORESORBABLE SCAFFOLD

- STRUT THICKNESS,
- RESTORING PATENCY IN SB,

# DEDICATED BIFURCATION STENTS

- BALLOON EXPANDABLE BMS,
- TRYTON STENT,
- NON INFERIOR TO PROVISIONAL STRATEGY,

# LM BIFURCATION

- 70% OF THE MYOCARDIUM,
- CIRCUMFLEX ARTERY OCCLUSION ,
- PM ARTERY DIAMETER IS 4-5MM,
- TRIFURCATION ARE SEEN IN 10 TO 15%,
- DIFFUSE LM DISEASE,

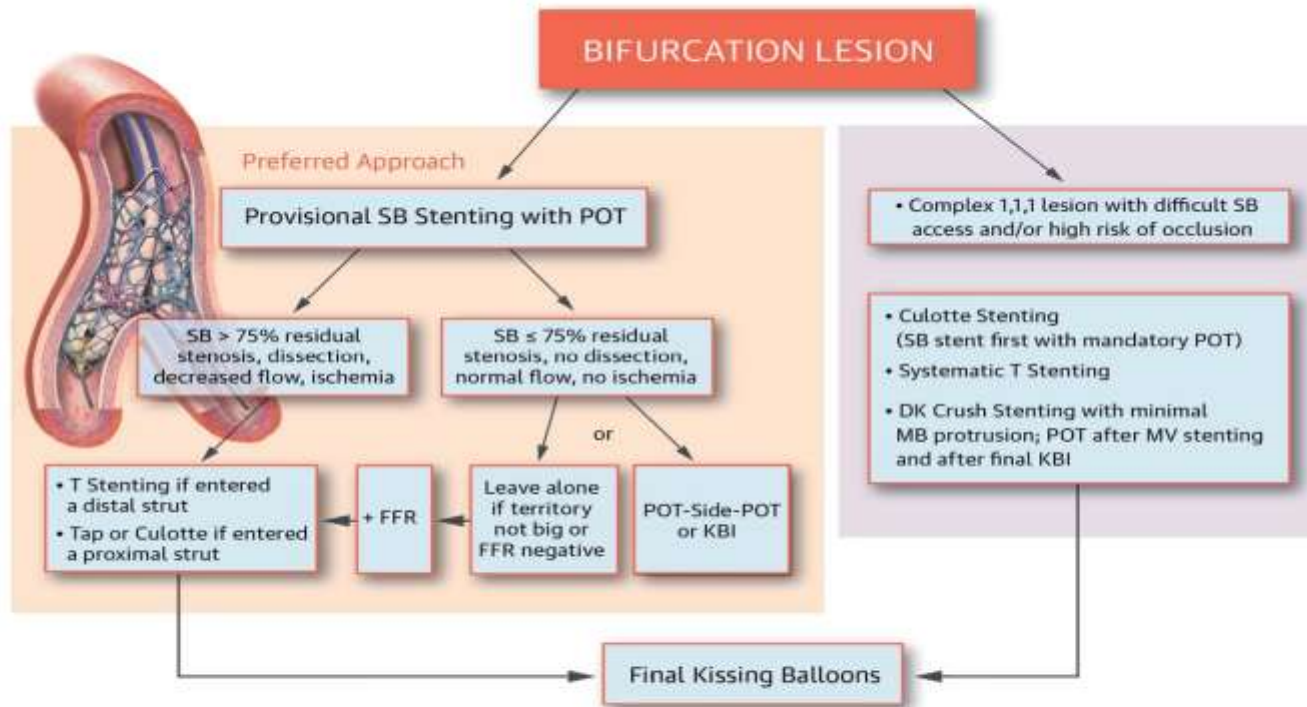


# IMAGING

- IVUS, OCT CAN PROVIDE ESSENTIAL DETAILS FOR BIF LESIONS,
- PLAQUE CONFIGURATION,
- STENT EXPANSION,
- EDGE DISSECTION,
- STENT MALAPPOSITION,
- RECROSSING INTO JAILED SIDE BRANCH ,

# APPROACH TO BIF LESIONS

## CENTRAL ILLUSTRATION: Simplified Approach to Treatment of Bifurcation Lesions



\* Imaging encouraged in all bifurcation stenting, especially with LM stenting

Sawaya, F.J. et al. J Am Coll Cardiol Intv. 2016;9(18):1861-78.

# CONCLUSION

- PROVISIONAL SB STENTING SHOULD BE DEFAULT APPROACH .
- LOW RISK OF FAILURE AND COMPLICATIONS.
- POT TECHNIQUE .
- IF SB NEED STENTING THAN T STENTING, TAP OR CULLOTTE TECHNIQUE CAN BE USED.
- IF SB IS COMPLEX LESION THAN TWO STENT TECHNIQUE.

**THANK YOU.**