

May 8, 2023 TCTAP2023 Meet the Experts over Breakfast
Left Main & Multi-Vessel Disease Revascularization

The Impact of Stent Reduction Strategy in LMT Bifurcation Lesion with DCA and DCB

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Disclosure

- The authors have **NO** financial conflicts of interest to disclose concerning the presentation.

Directional Coronary Atherectomy Overview and Mechanism

Proximal part at hand

Motor Drive Unit

NIPRO

Window of metal housing

Cutter segment

Balloon

Cutter

Nose corn

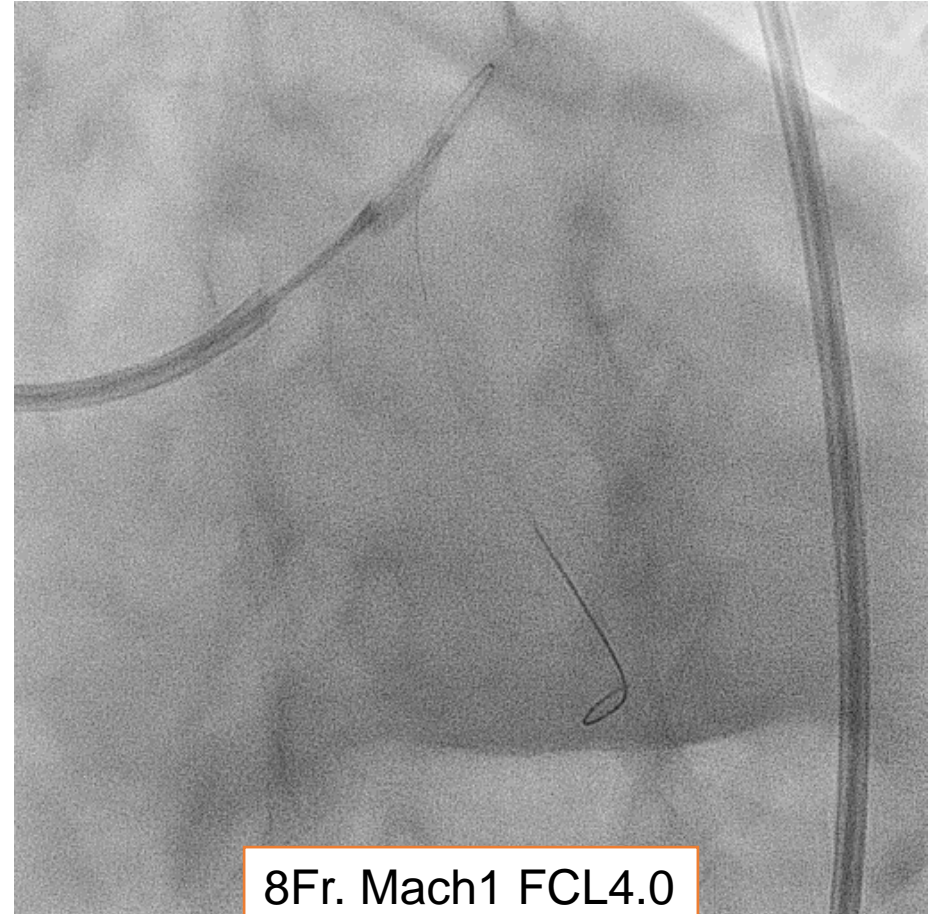
Balloon

Cutter

Adjust window direction, balloon inflation, start motor drive and advance rotating cutter to cut plaque

DCA basic procedure

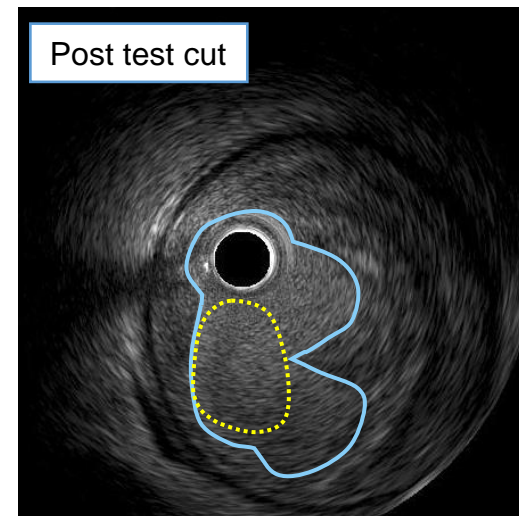
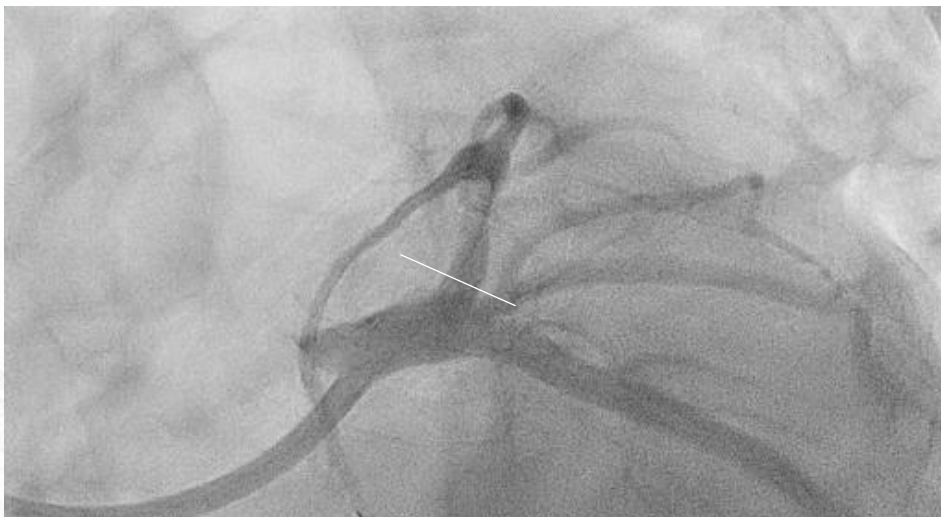
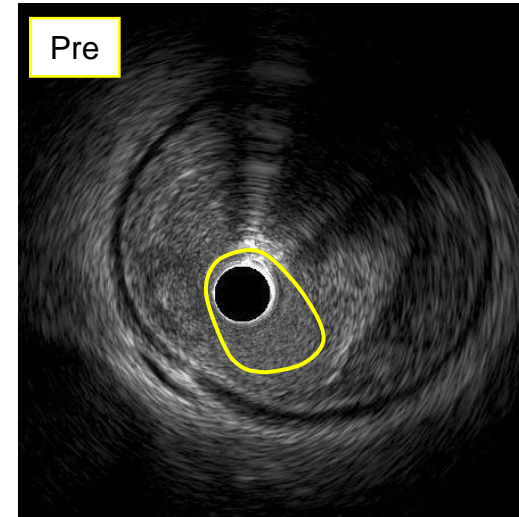
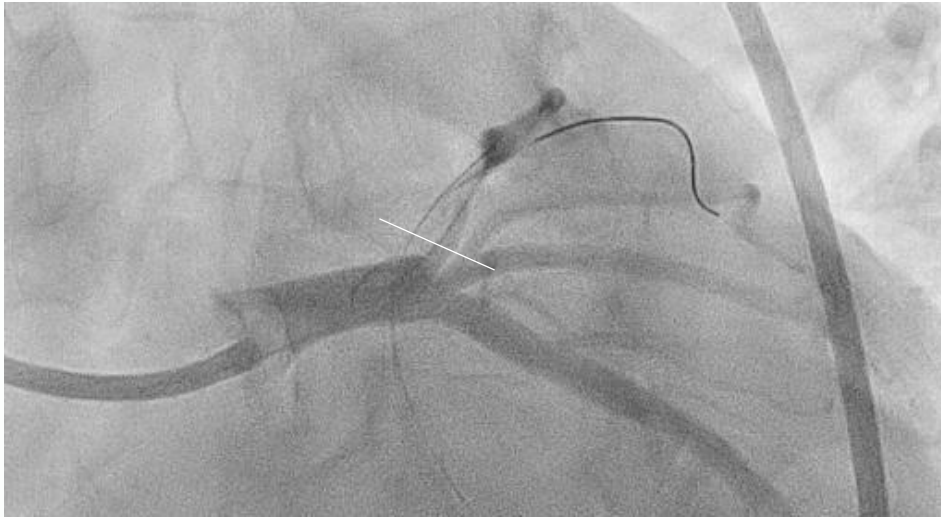
First step; test cut @1atm



8Fr. Mach1 FCL4.0
DCA: Atherocut (L)

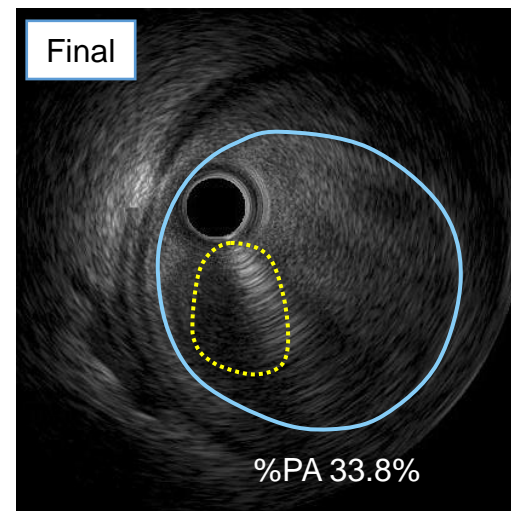
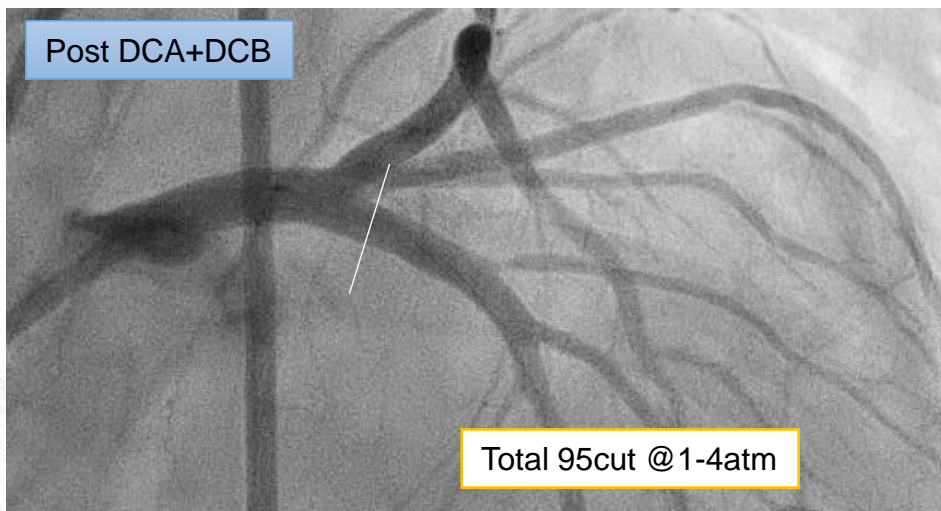
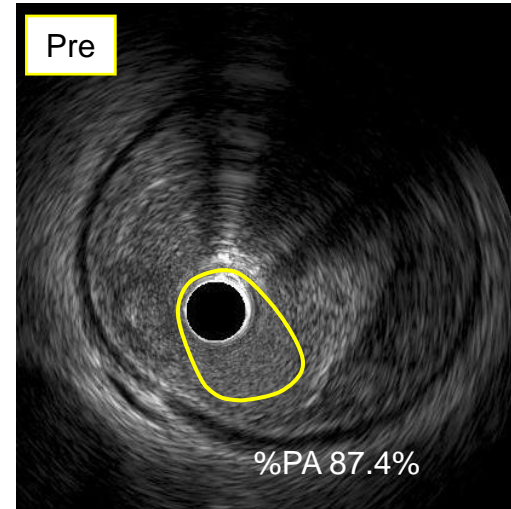
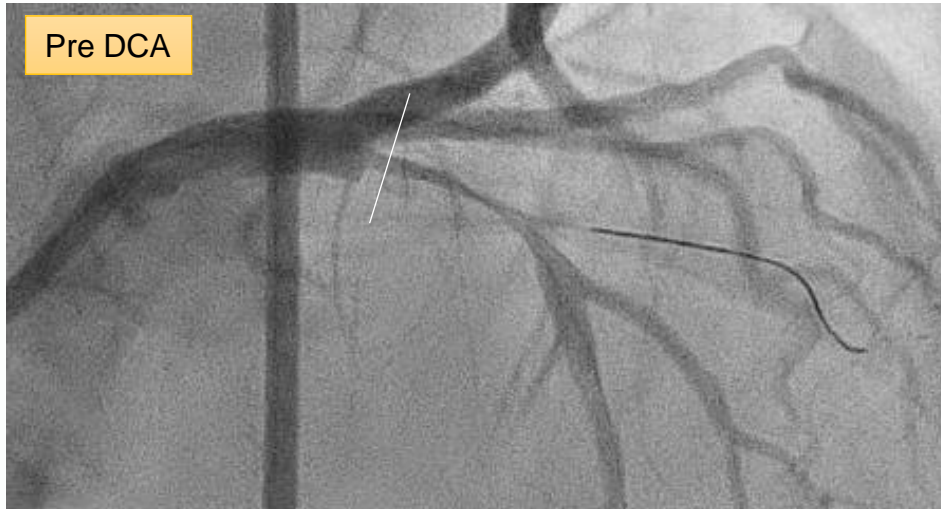
Test cut and check IVUS

First step; test cut @1atm



Repeat actual cut and check IVUS

Next step; gradual increasing pressure 2→3→4atm step by step



Our hospital data of DCA followed by DCB for LMT bifurcation lesion

More than 6-month follow up cases

n=24		n=24	
Diagnosis		Final procedure (LMT-LAD/LCX)	
Chronic coronary syndrome	17 (70.8%)	No stenting	
Acute coronary syndrome	7 (29.2%)	DCA+DCB / none	17 (70.8%)
Bifurcation type		none / DCA+DCB	1 (4.2%)
True bifurcation		DCA+DCB / DCA+DCB	2 (8.3%)
1,1,1	2 (8.3%)	Single stenting	
1,0,1	1 (4.2%)	DES / DCA+DCB	4 (16.7%)
0,1,1	2 (8.3%)	Clinical event	
0,0,1	1 (4.2%)	All cause death	1 (4.2%)
Non-true bifurcation		MI	0 (0%)
0,1,0	12 (50.0%)	ischemia driven TLR	1 (4.2%)
1,0,0	1 (4.2%)	TVR	4 (16.7%)
1,1,0	5 (21.8%)		

Our hospital data of DCA followed by DCB for LMT bifurcation lesion

More than 6-month follow up cases

QCA		n=24	IVUS		n=24
Pre procedure			Pre procedure		
Lesion length, mm		15.9±7.6	MLA, mm ²		2.9±1.8
RVD, mm		3.6±0.6	VA, mm ²		15.3±5.3
MLD, mm		1.2±0.5	PA, %		81.0±9.8
DS, %		66.3±14.3	Post procedure		
Post procedure			MLA, mm ²		10.5±2.9
RVD, mm		3.6±0.7	VA, mm ²		17.7±4.9
MLD, mm		3.1±0.6	PA, %		40.0±9.6
DS, %		14.3±11.3	Acute gain, mm ²		7.6±3.1
Acute gain, mm		1.8±0.8	OCT		n=24
6M-follow-up			Pre procedure		
RVD, mm		3.6±0.7	MLA, mm ²		2.2±1.3
MLD, mm		2.6±0.7	Post procedure		
DS, %		29.3±19.8	MLA, mm ²		8.9±2.8
Late lumen loss, mm		0.5±0.7	Acute gain, mm ²		6.8±2.8
			6M-follow-up		
			MLA, mm ²		6.8±3.3
			Late lumen loss, mm ²		2.2±2.5

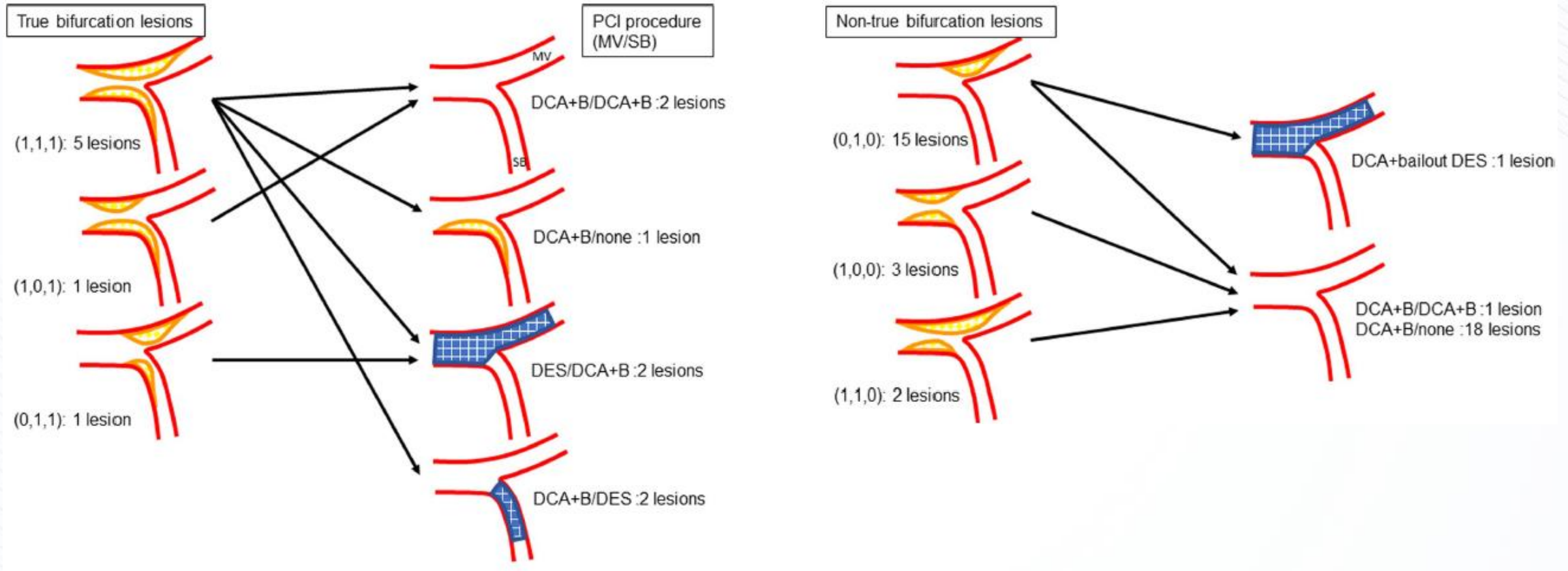
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DCA can reduce or avoid stent use.

For bifurcation lesions



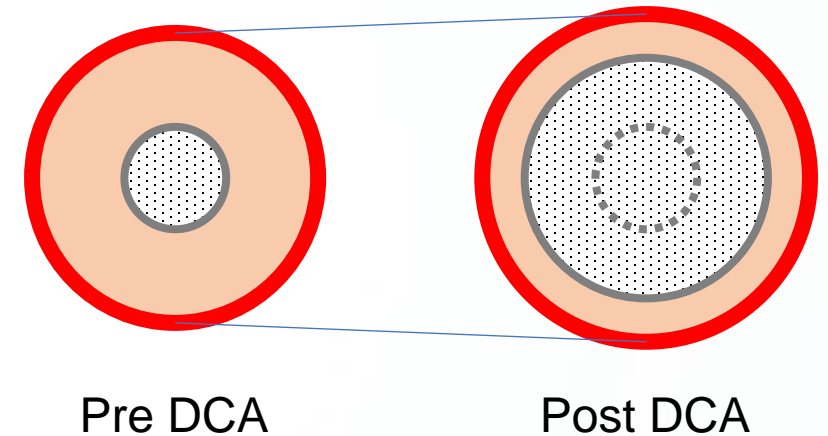
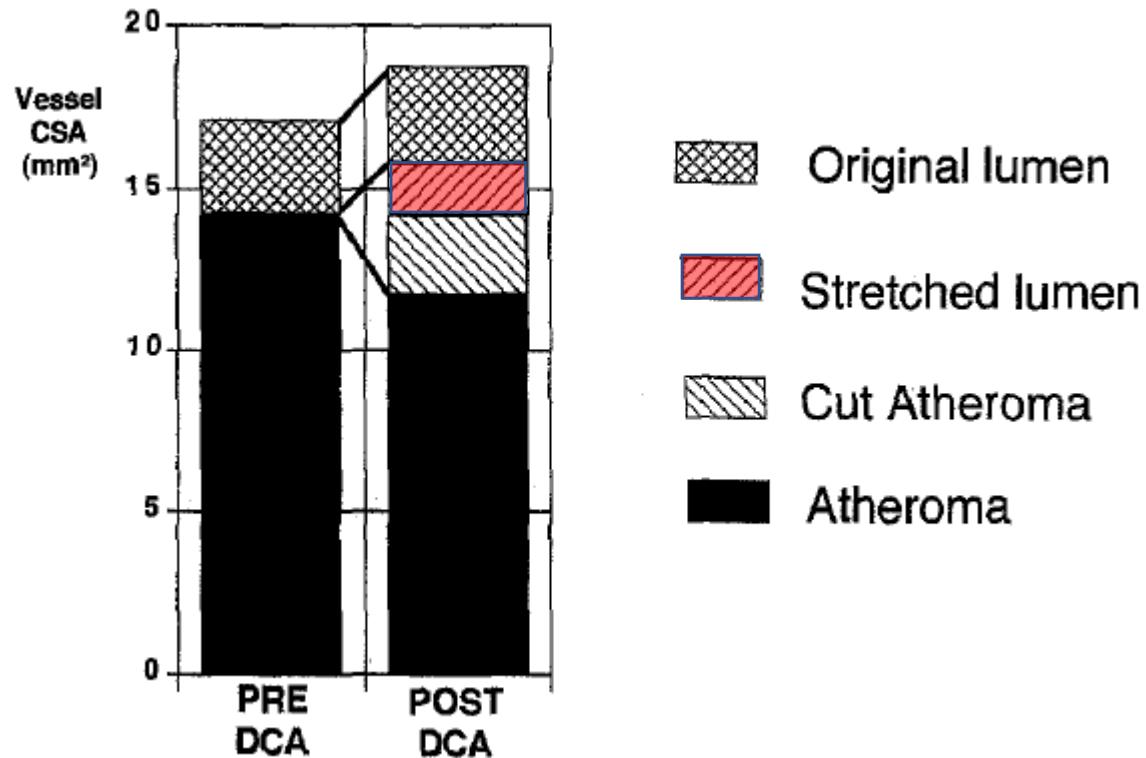
(Okutsu M, Nakamura S et al. Heart and Vessels 2021)

Conventional advantages of no stent strategy for LMT bifurcation

- Complete discontinuation of antiplatelet therapy
- Free from flow dynamics limitation by stent strut at LCX ostium
- Free from tissue bridging formation on stent strut at LCX ostium
- No carina shift
- No problem related to vessel size gap between LMT and LAD

Unique advantages of no stent strategy with DCA

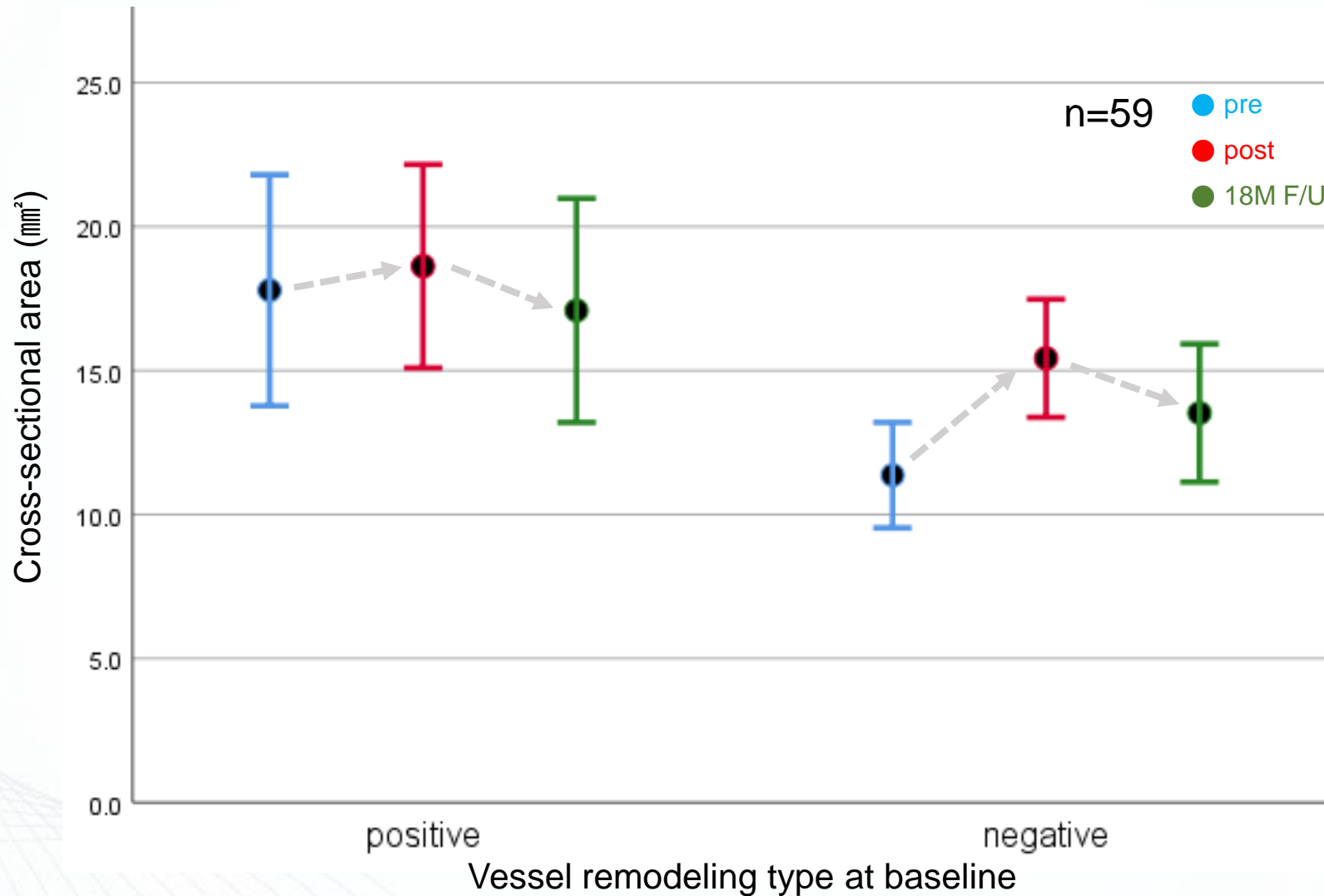
Vessel enlargement



(Shigeru Nakamura, et al. Am Heart J 1995)

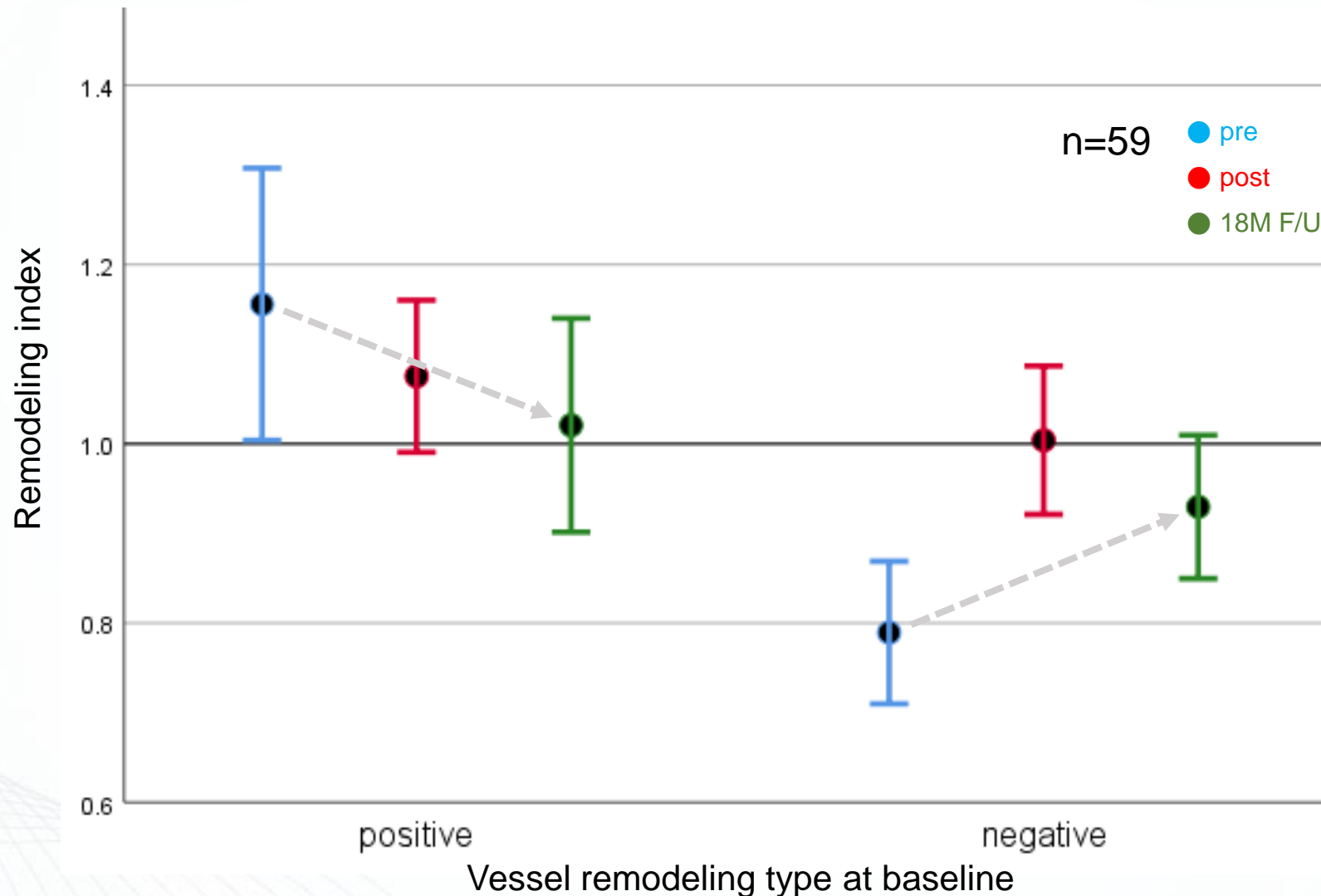
Vessel area change after DCA+DCB

Both positive and negative remodeling vessel increased in area once and then decreased.



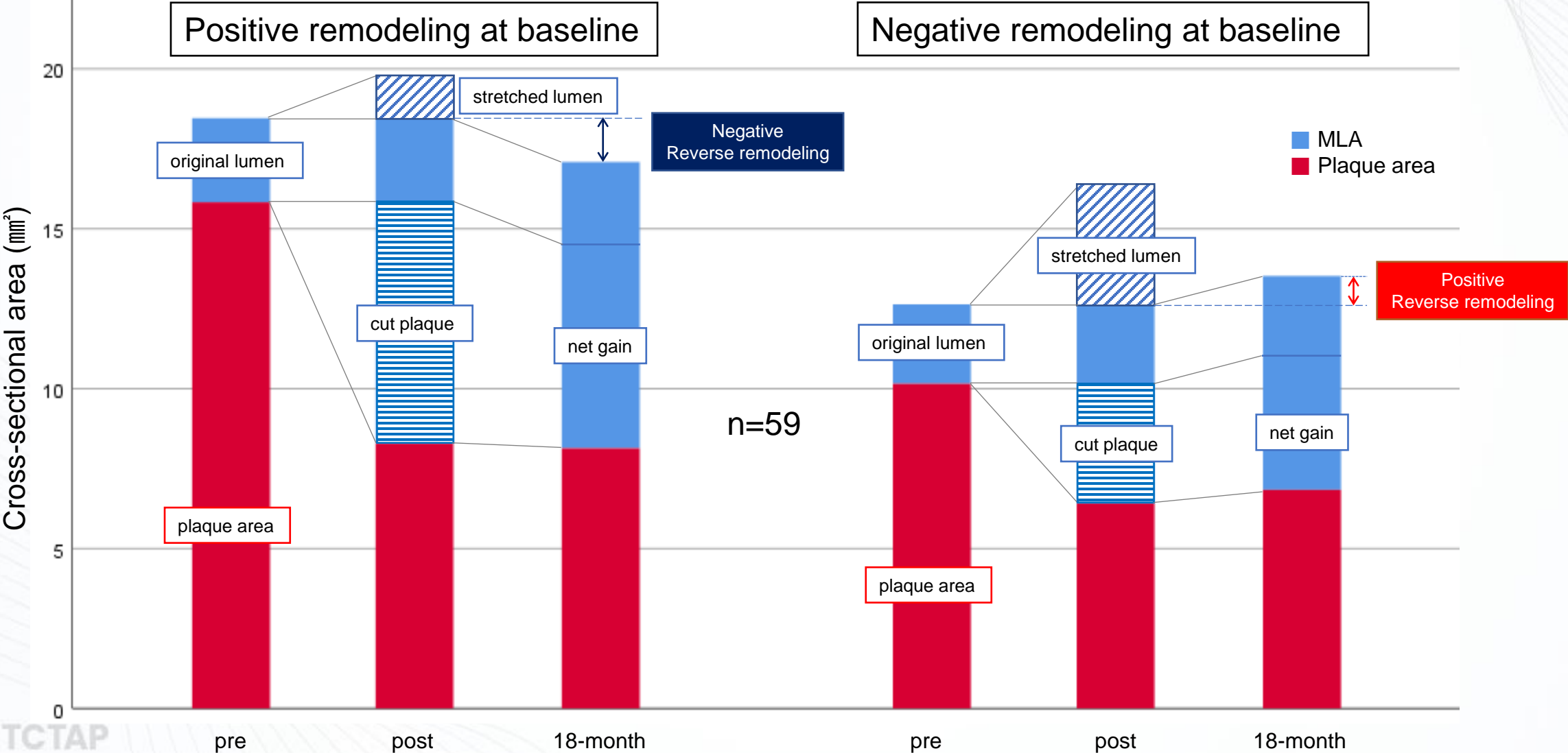
Vessel remodeling index after DCA+DCB

Both positive and negative remodeling lesions are returning to its original vessel size.



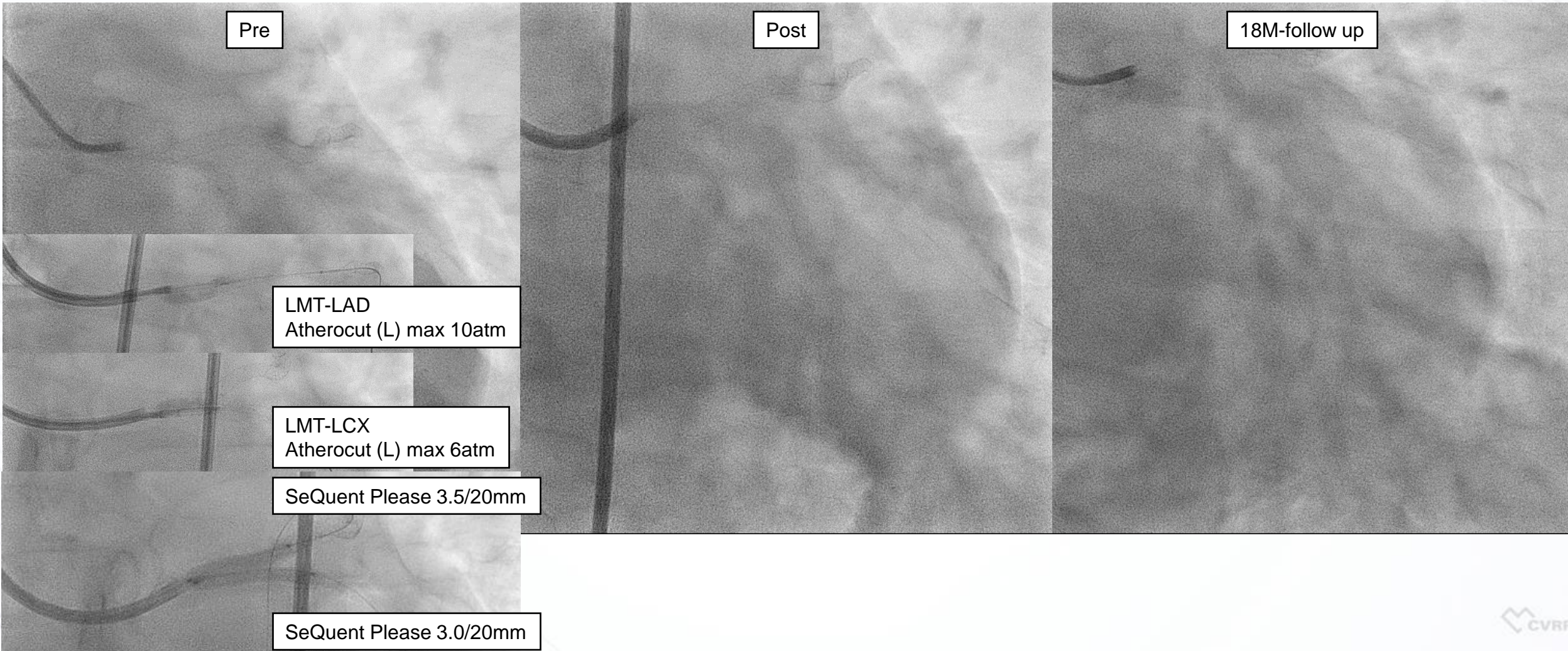
Reverse remodeling after DCA+DCB

IVUS cross sectional area



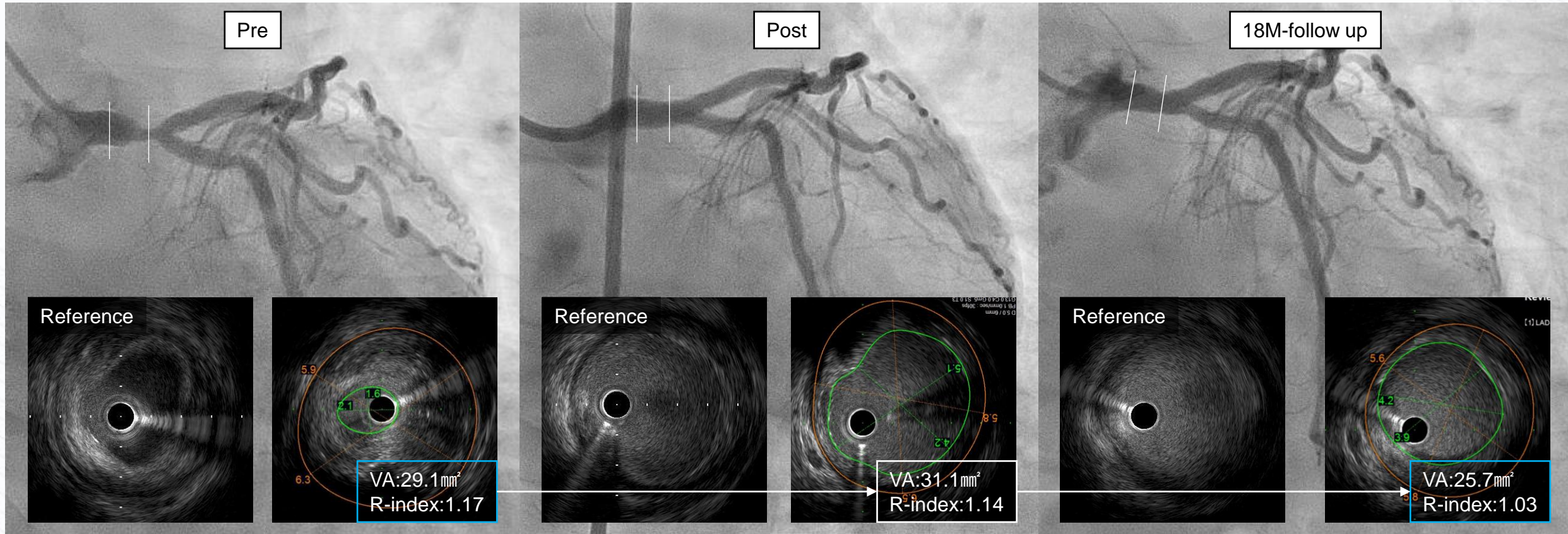
Vessel remodeling effect after DCA+DCB

Positive remodeling lesion at baseline



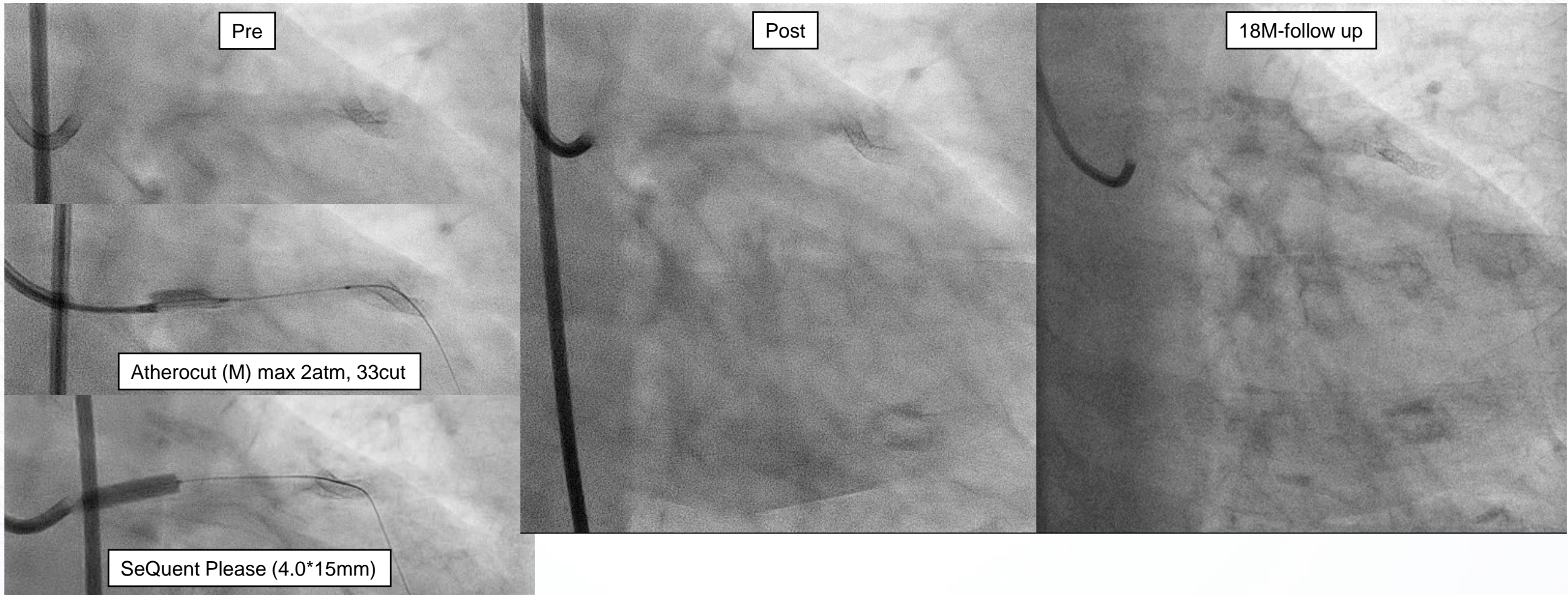
Vessel remodeling effect after DCA+DCB

Positive remodeling → Negative reverse remodeling



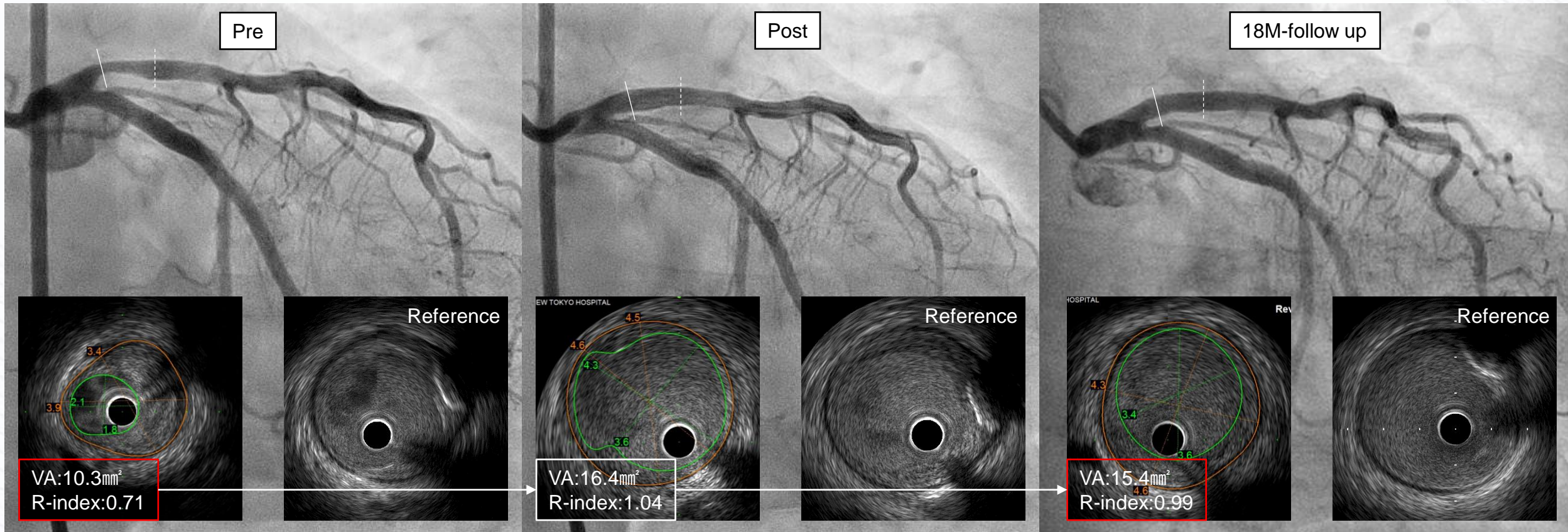
Vessel remodeling effect after DCA+DCB

Negative remodeling lesion at baseline

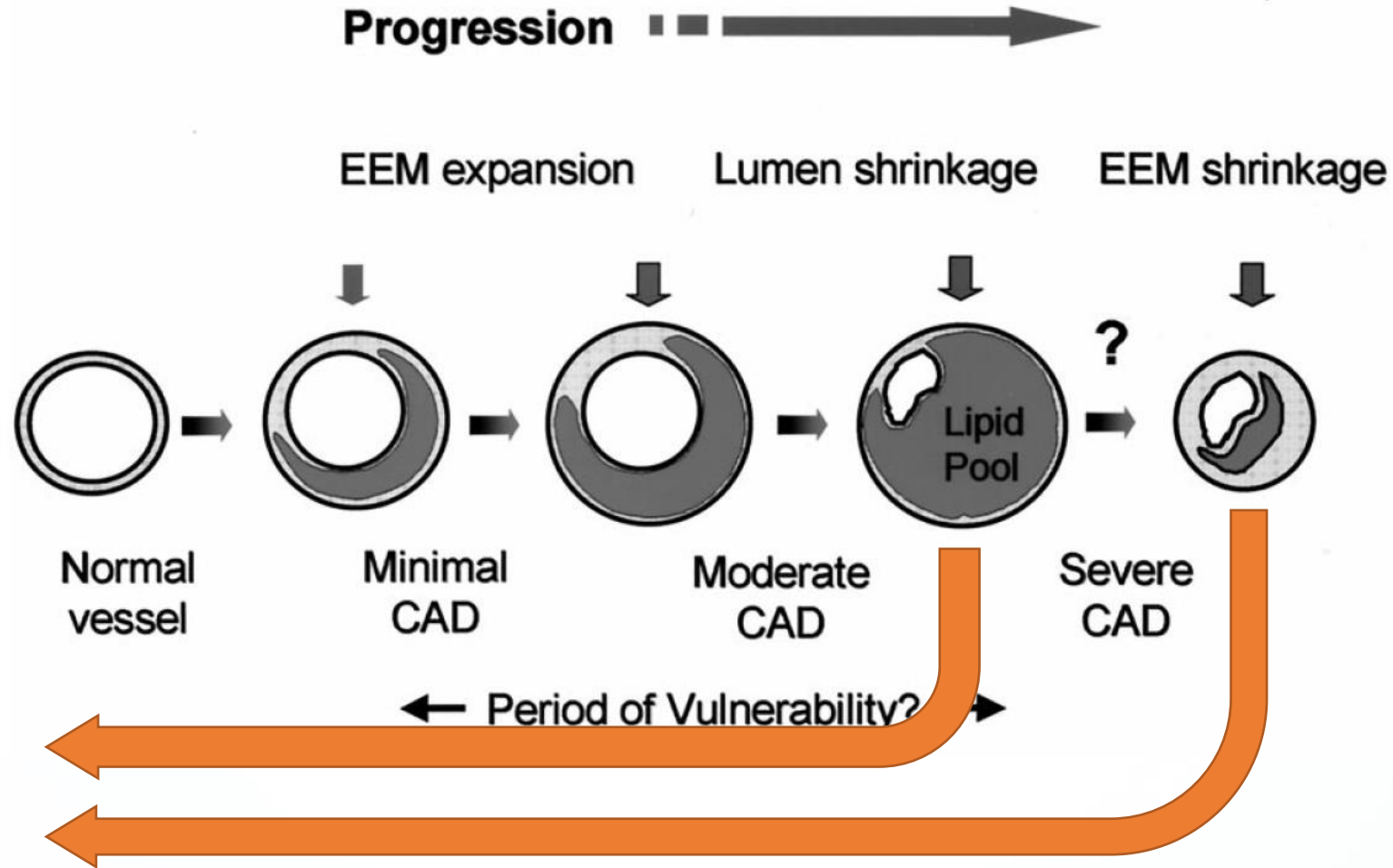


Vessel remodeling effect after DCA+DCB

Negative remodeling → Positive reverse remodeling



Can DCA rewind time?



(Schoenhagen et al. J Am Coll Cardiol 2001)

Conclusion

- DCA has one unique advantage of reverse remodeling towards normal vessel size in both positive and negative remodeling lesions at baseline.
- DCA might have the effect of winding back the advancing clock of the atherosclerosis.
- This phenomenon needs further verification of the effect for LMT lesions, but DCA+DCB strategy may be one additional option.

**BACK
TO
THE FUTURE**