

How Are Left Main and non Left Main Bifurcations Unique: Insights from Imaging

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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

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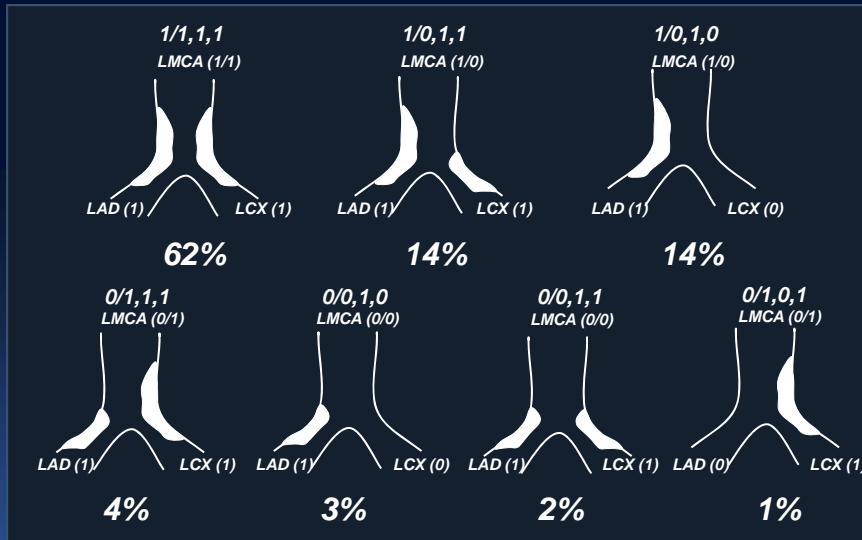
Speaker Fee

Company
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Plaque Distribution by IVUS (n=140)



In 90% plaque extends from LMCA-LAD

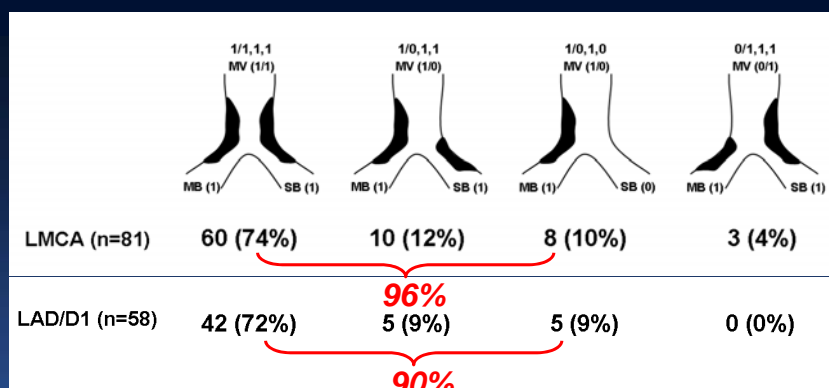
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Oviedo C et al. Circ Cardiovasc Interv 2010;3:105-12.

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Plaque Distribution LMCA vs LAD/D1

Inclusion: angiographically significant bifurcation disease

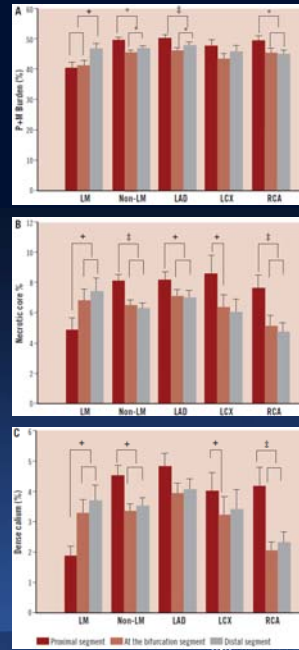
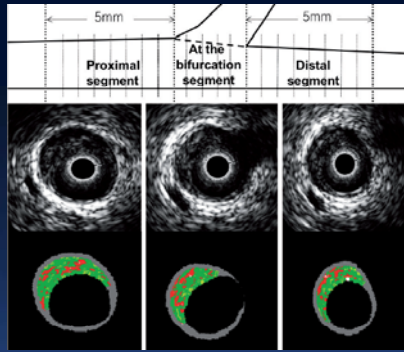


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Plaque Composition in 256 Bifurcations



Han SH et al. Eurointervention 2010;6:313-320.

Plaque Composition in Each Vessel

Necrotic Core (NC) & Dense Calcium (DC)

%NC and %DC were greater in the LAD (15.7%, 8.8%) than in the LM (11.8%, 4.5%) or LCX (10.9%, 4.5%) - $p=0.002$ & $p=0.0004$, respectively.

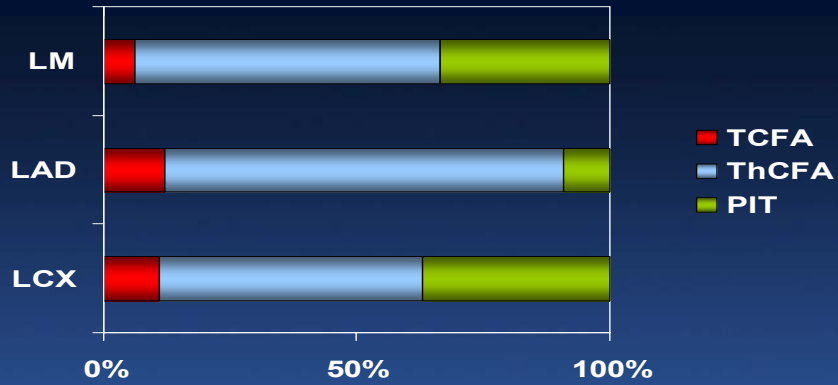


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Plaque Phenotype in Each Vessel

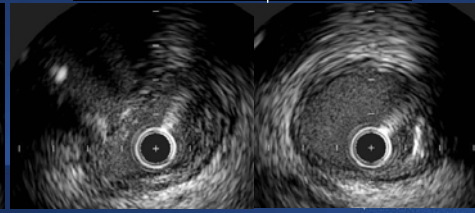
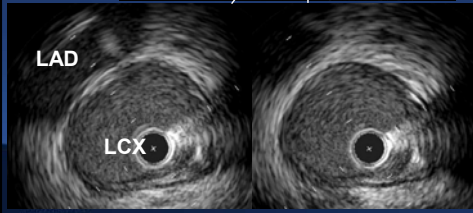
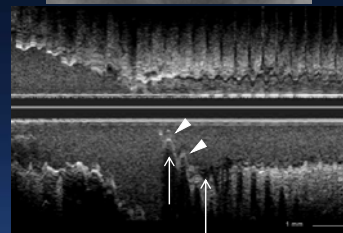
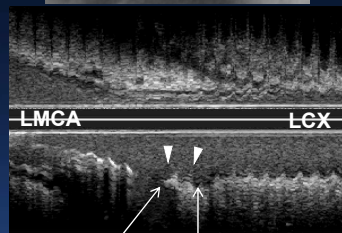
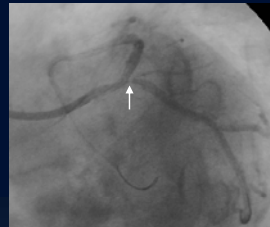
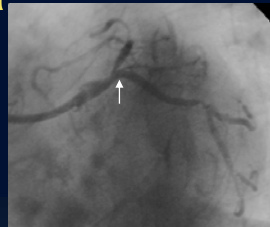
The distribution by vessel of the 168 eccentric plaques differed according to plaque type ($p=0.035$)



Carina Shift

Pre -PCI

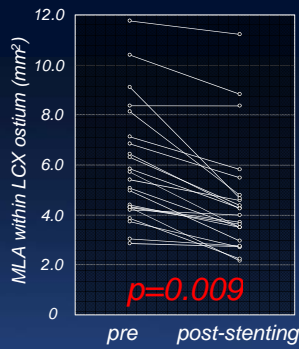
Final



Carina Shift (n=23, LCX DS<50%)

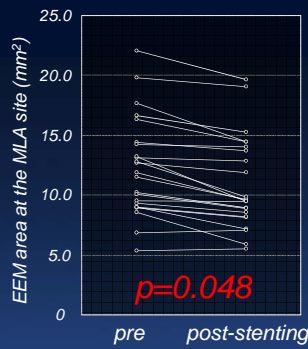
MLA within LCX ostium

5.4mm² → 4.0mm²



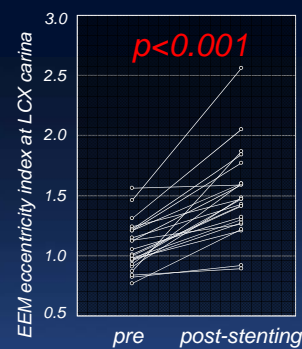
EEM area at MLA

11.8mm² → 9.6mm²



EEM eccentricity

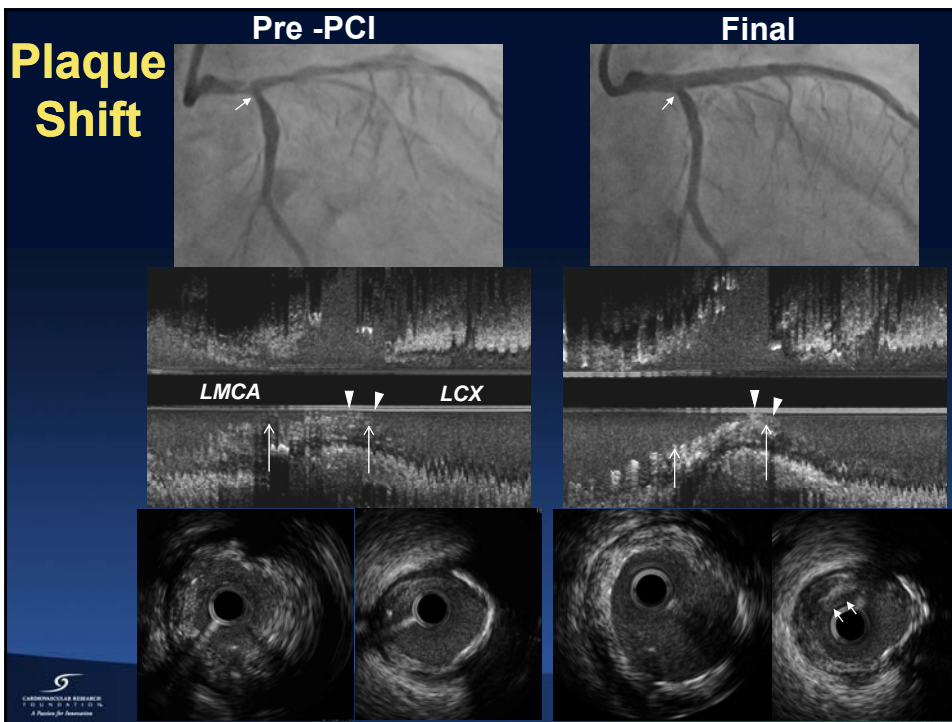
1.22 → 1.47



78% showed a >10% reduction of MLA within LCX ostium after cross-over stenting

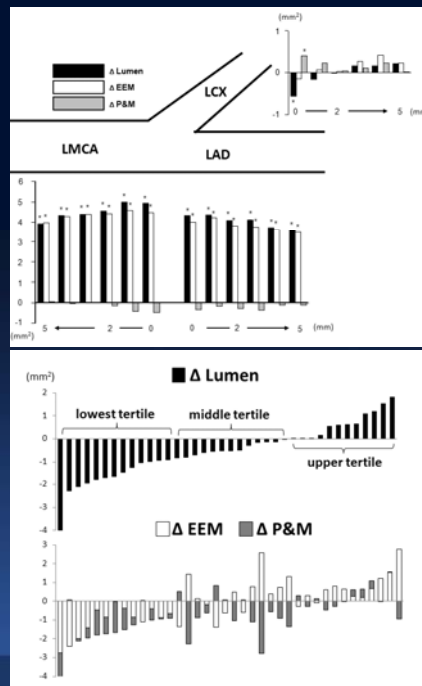


Kang et al. *Circulation Cardiovasc Interv* 2011;4:355-61



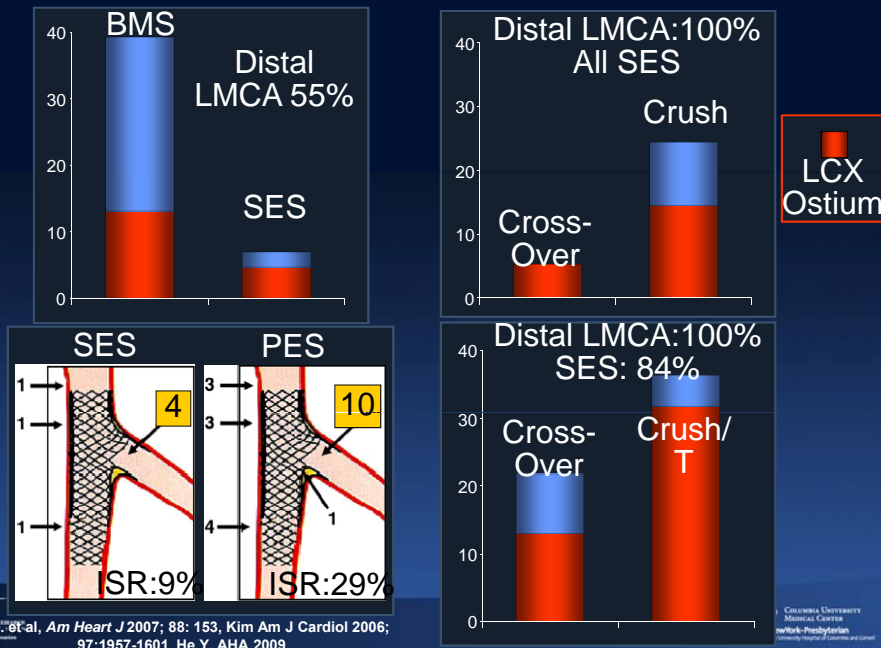
Carina & Plaque Shift - 38 Pre & Post 3D Comparison -

1. Narrow LAD/LCX Angle
2. Less Plaque Burden at LCX Ostium
3. 60% of Lumen Decrease Due to Carina Shift

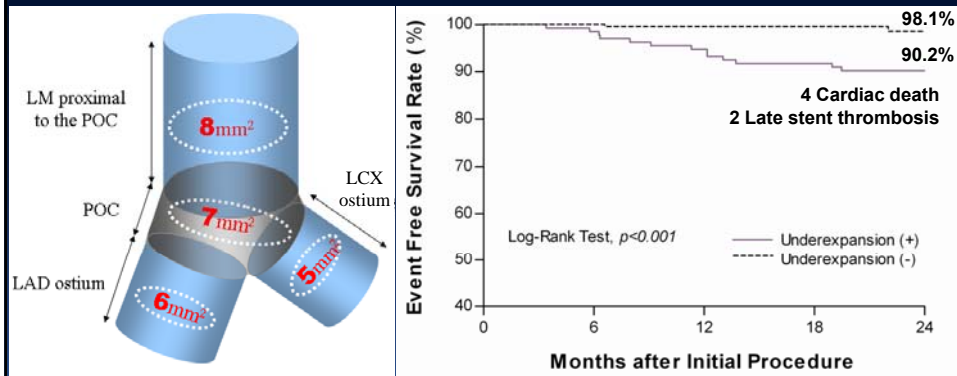


Xiu & Choi et al @ CRF

Location of Restenosis after LMCA Stenting



Criteria for stent underexpansion at the distal LMCA bifurcation (n=403)

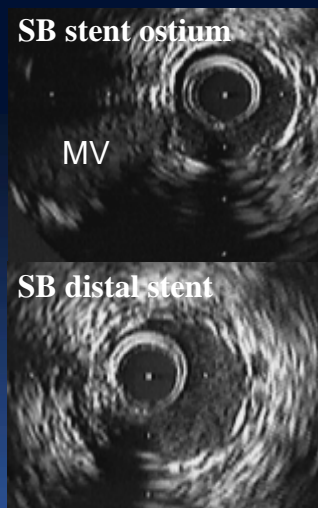
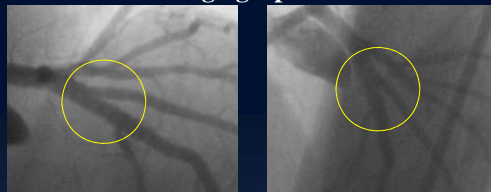


Kang et al. *Circulation Cardiovasc Interv* 2011; 4:562-569



SB Stent Underexpansion After Crush

Final angiographic result



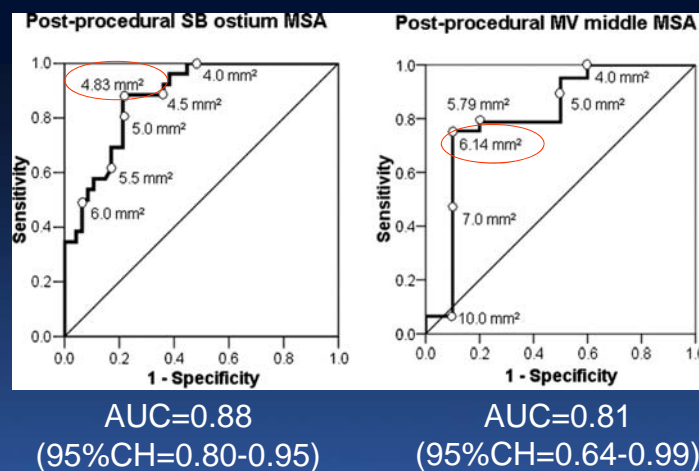
	MV	SB	P
MSA, mm ²	6.5 ± 1.7	3.9 ± 1.0	<0.0001
Stent expansion, %	92.1 ± 16.6	79.9 ± 12.3	0.02
MSA < 4 mm ²	10% (2/20)	55% (11/20)	0.007
MSA < 5 mm ²	20% (4/20)	90% (18/20)	<0.0001



Costa et al. *J Am Coll Cardiol*. 2005;46:599-605



The Optimal Cutoff Value of Post-Procedural MSA to Predict a Follow-up MLA $\geq 4\text{mm}^2$ After Bifurcator T-Stenting



Hahn et al. J Am Coll Cardiol 2009;54:110-7

Take Home Message

1. 90% of plaque distribution is LAD dominant in the LMCA, LAD/D1 bifurcation, no matter the angiographic appearance.
2. In LMCA bifurcations, advanced atherosclerosis (fibroatheroma, calcification) is more in the proximal LAD than LMCA or LCX. However, in non-LM bifurcation lesions, the proximal segment had more plaque than the distal segment.
3. In LMCA lesions, carina shift is related to the narrow angle of LAD/LCX and minimum plaque at LCX ostium.
4. The main difference between LMCA and LAD/D1 bifurcation are 1) size of vessel and 2) angle which may relate to different mechanism of lumen compromise at side branch ostium and acute outcome (=minimum lumen area).