

Make-It-Simple! Learning Through Experience

0.0.1 Bifurcation PCI, Is Simple Enough?

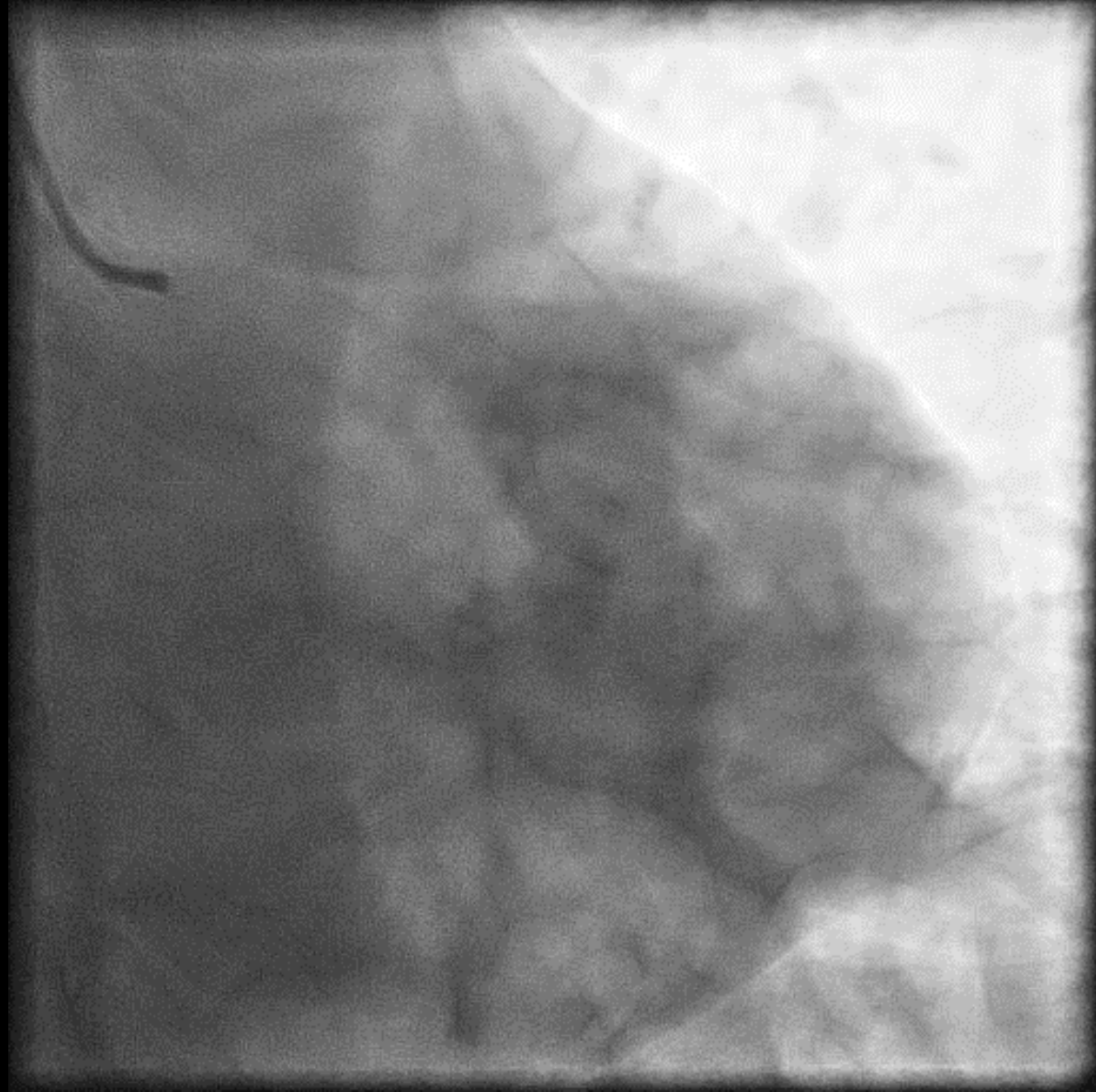
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Disclosure

Research grant: Abbott, Genoss, Merck (US), Amgen, ...

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0.0.1 Bifurcation PCI, Is Simple Enough?

- **How many 0.0.1 lesions are there?**
- **0.0.1 Bifurcation Lesions, Benign or Malignant?**
- **What are Unique Features of 0.0.1 Bifurcation Lesions?**
- **What are Treatment Option for 0.0.1 Bifurcation Lesions?**
- **Stent Strategy for 0.0.1 Bifurcation Lesions, 1 vs. 2-stent Strategy?**

1) How many 0.0.1 lesions are there?

Extended BIFURCAT Registry

COBIS II Registry (N=2,897)
NCT01642992

COBIS III Registry (N=2,648)
NCT03068494

RAIN Registry (N=2,889)
NCT03544294

8,434 Patients
with Bifurcation Lesion
Who Underwent PCI

Medina 1.1.1 (n=2,718)

Medina 1.0.1 (n=647)

Medina 0.1.1 (n=782)

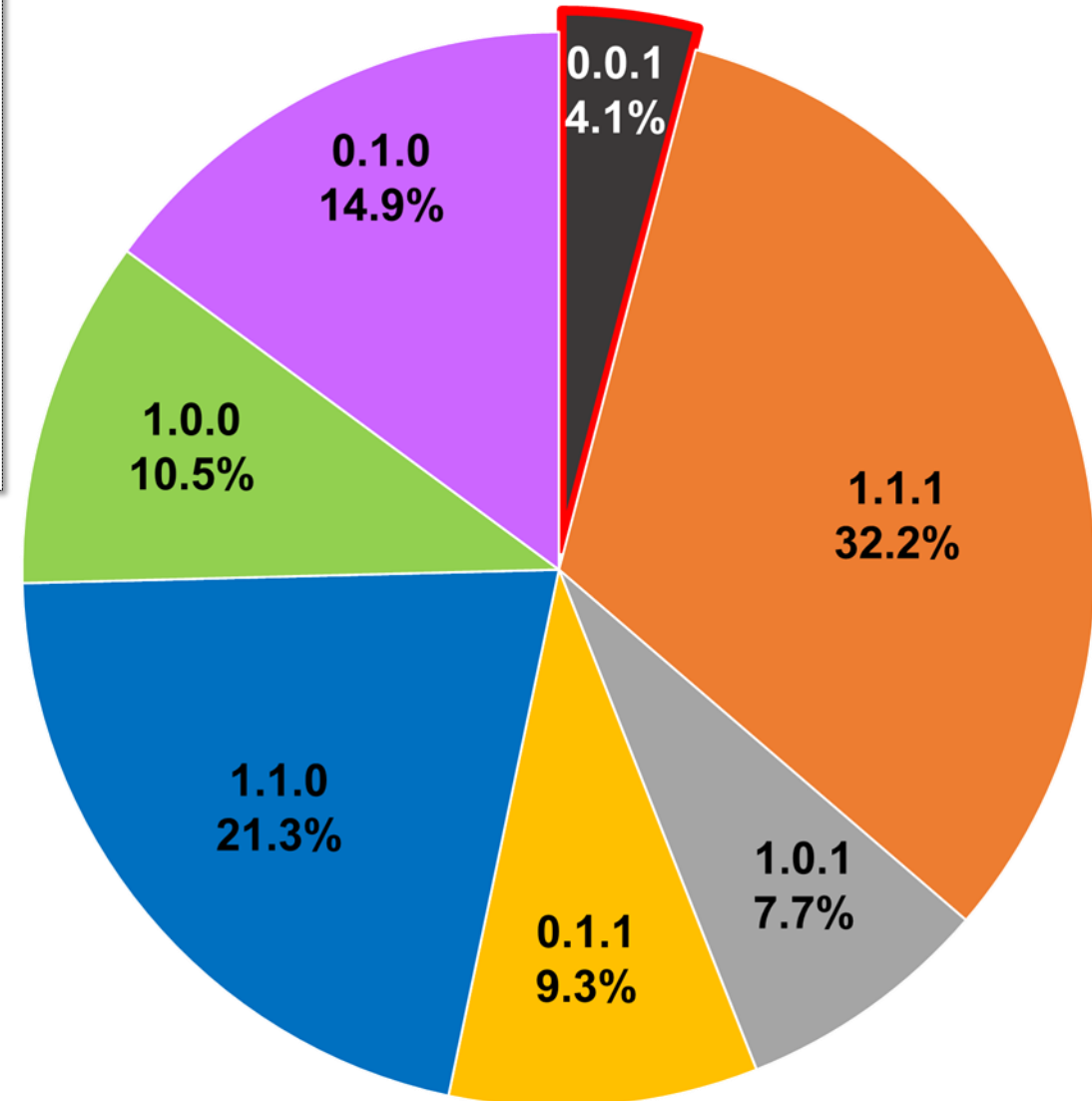
Medina 1.0.0 (n=890)

Medina 1.1.0 (n=1,793)

Medina 0.1.0 (n=1,259)

Medina 0.0.1 (n=345)

Medina Classification



2) 0.0.1 Bifurcation Lesions, Benign or Malignant?

COBIS II

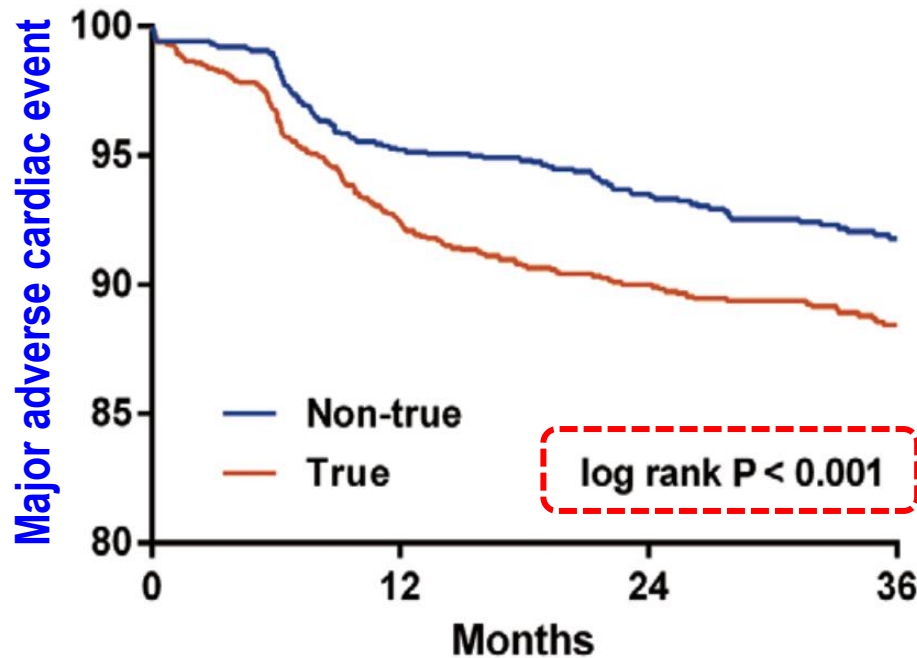
True (N=1,502, 51.8%)

1.1.1 0.1.1 1.0.1

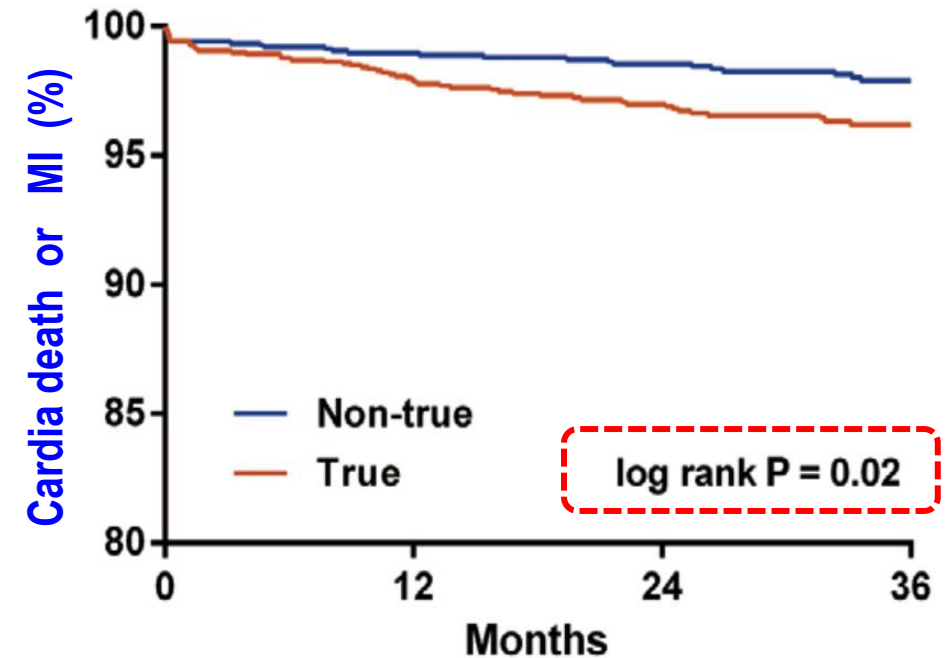


vs. Non-true (N=1,395, 48.2%)

vs. 1.1.0 0.1.0 1.0.0 0.0.1



Number at risk					
Non-true	1395	1229	1026	675	
True	1502	1264	1045	681	



Number at risk					
Non-true	1395	1275	1080	710	
True	1502	1340	1128	741	

2) 0.0.1 Bifurcation Lesions, Benign or Malignant?

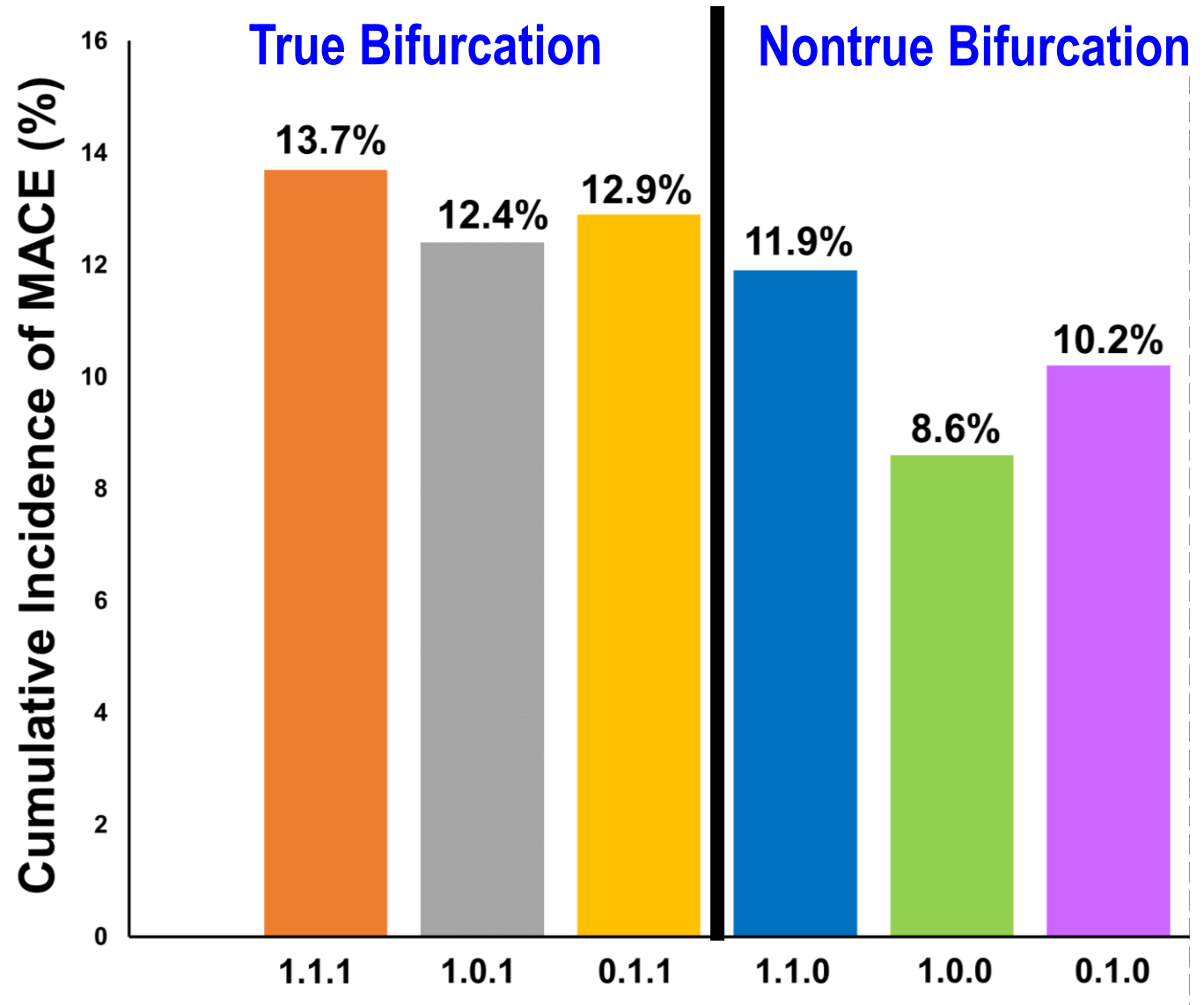
Extended BIFURCAT Registry

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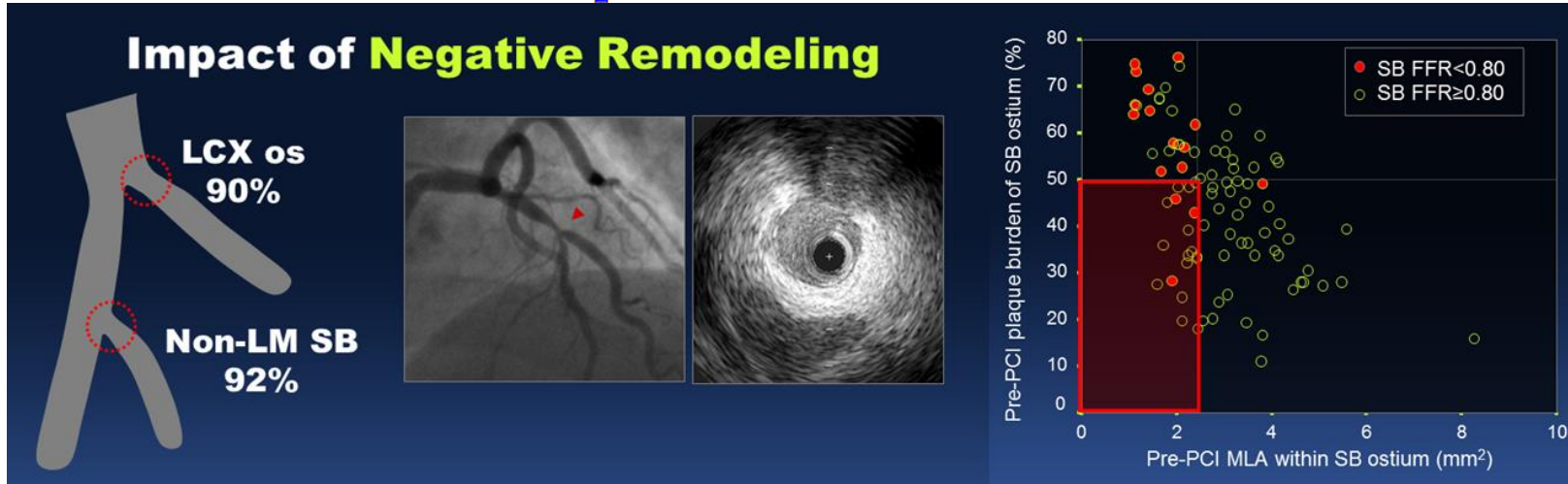
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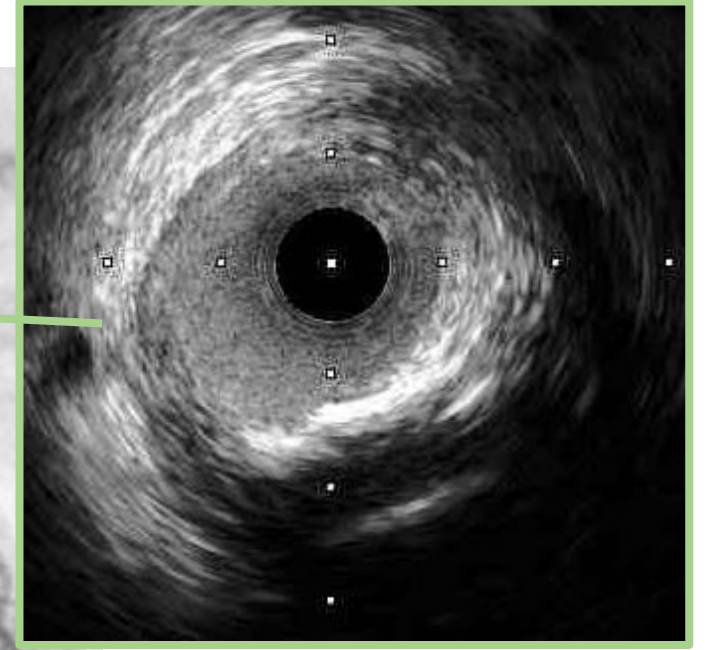
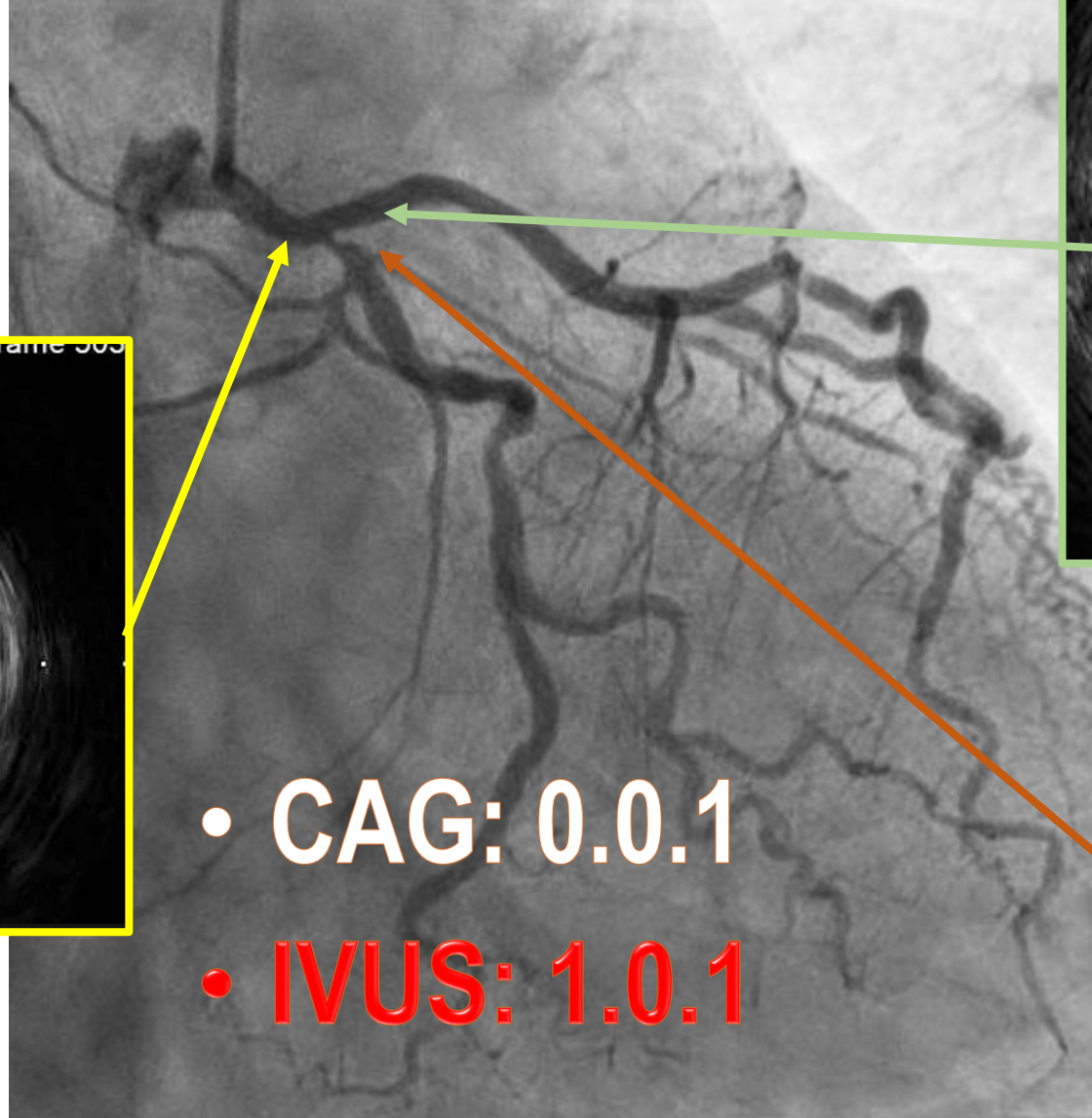


3) What are Unique Features of 0.0.1 Bifurcation Lesions?



If MLA is reduced not by significant plaque, but by **small vessel or negative remodeling**, 80% show normal FFR. *Kang SJ, et al. Catheter Cardiovasc Interv 2012 & 2013*

- **Negative remodeling → Recoil, lesser acute gain**
- **Risk of injury to the MV when treating the SB**
- **Smaller vessel size → Smaller stent → Risk of stent failure**
- **Angiographic 001 bifurcation lesion is not always true 001.**



- CAG: 0.0.1
- IVUS: 1.0.1

4) What are Treatment Option for 0.0.1 Bifurcation Lesions?

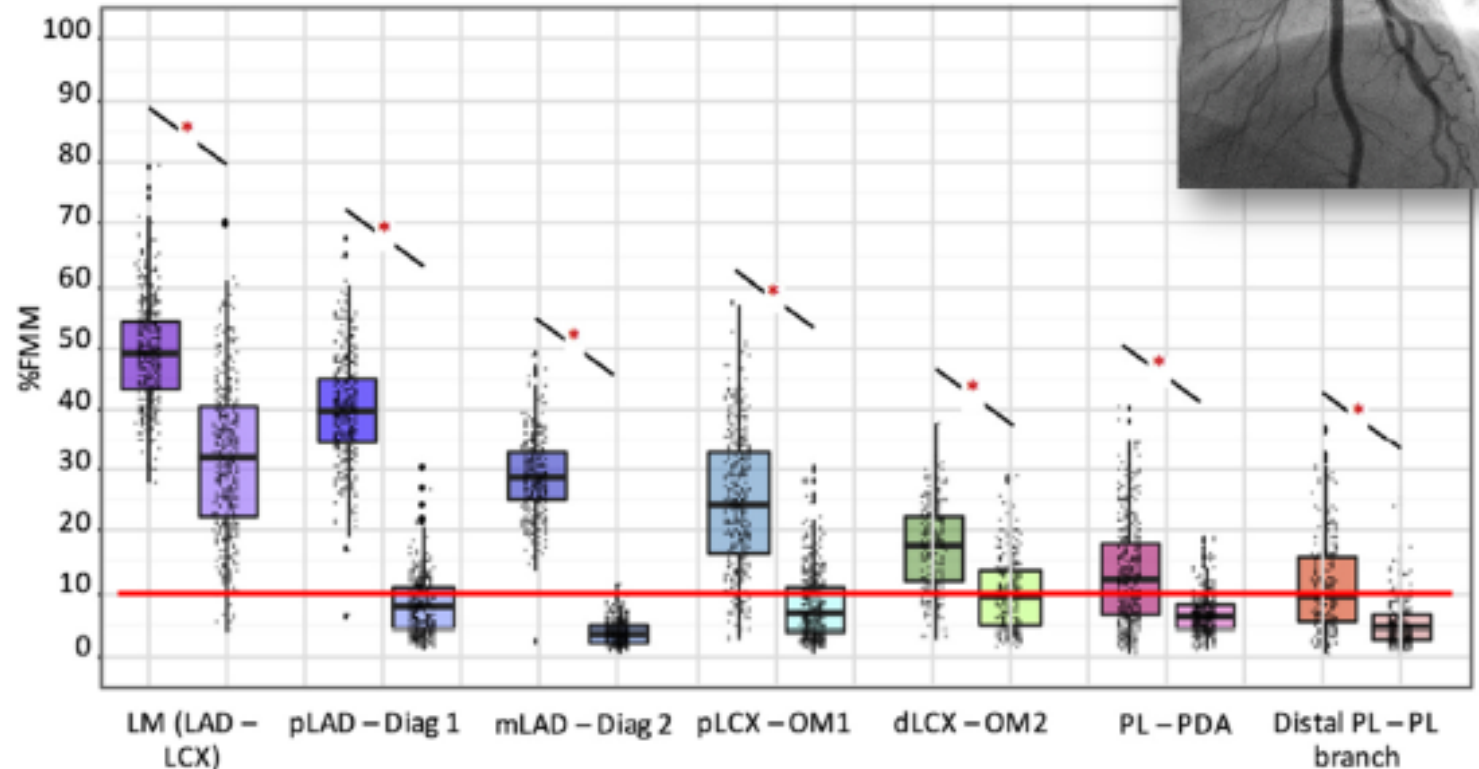
- **Medical treatment alone**
- **Balloon angioplasty (+Drug Coated Balloon treatment)**
- **Stent strategy**

4) What are Treatment Option for 0.0.1 Bifurcation Lesions?

- Medical treatment alone
- Balloon angioplasty (+D)
- Stent strategy

Myocardial Burden of Side Branch in Bifurcation

Lesser than 20% of side branch in nonLM bifurcation supply more than 10% of myocardium.



4) What are Treatment Option for 0.0.1 Bifurcation Lesions?

- Medical treatment alone
- **Balloon angioplasty (+Drug Coated Balloon treatment)**
- Stent strategy

Strong

1. Reduction in metal burdens
2. Preserving the native coronary bifurcation anatomy
3. Reduction the risk of thrombosis and the duration of DAPT

Weak

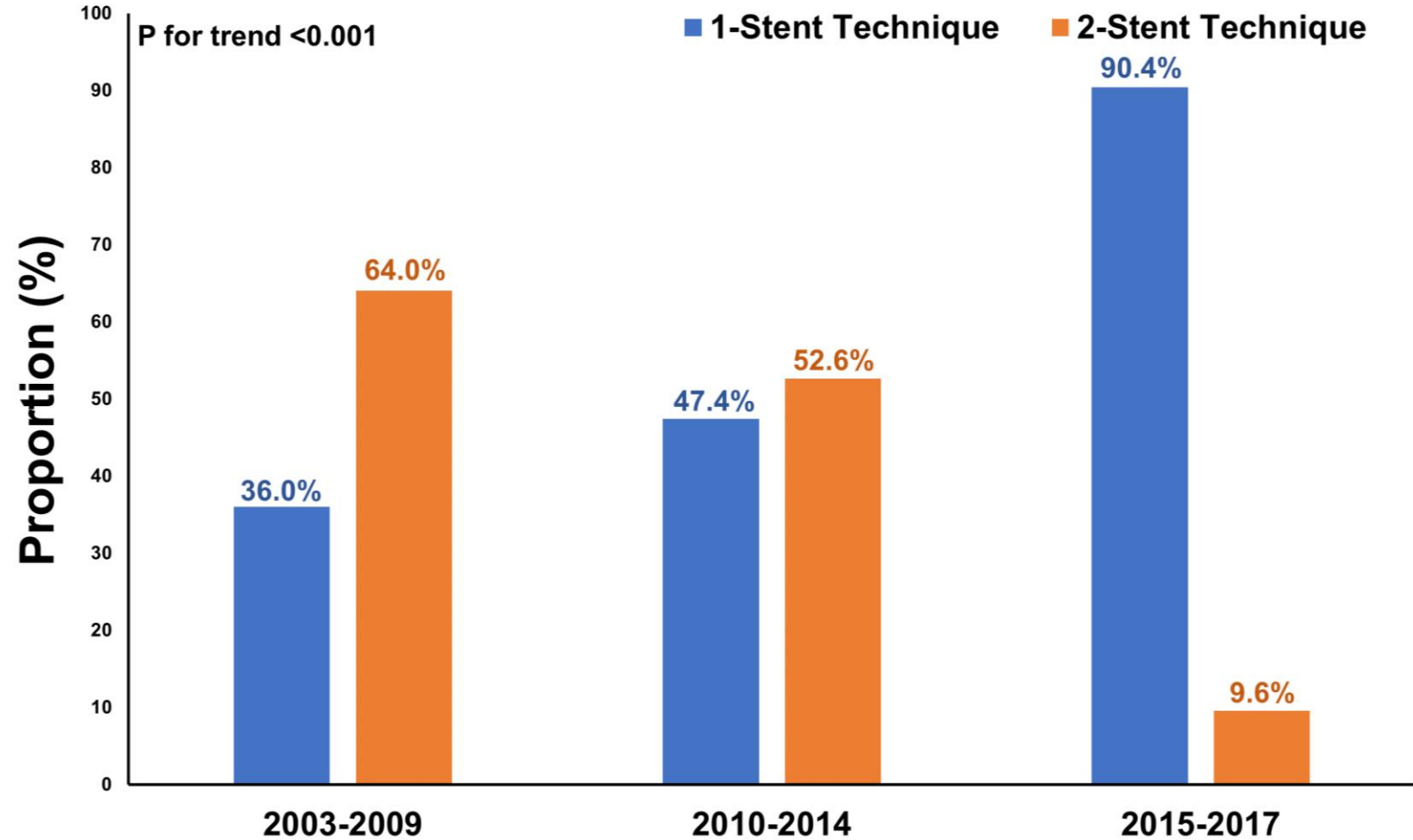
1. Risk of elastic recoil of SB ostium
2. Risk of coronary dissection to MV
3. Lack of large clinical data

5) Stent Strategy for 0.0.1 Bifurcation Lesions?



1 vs 2-stent technique

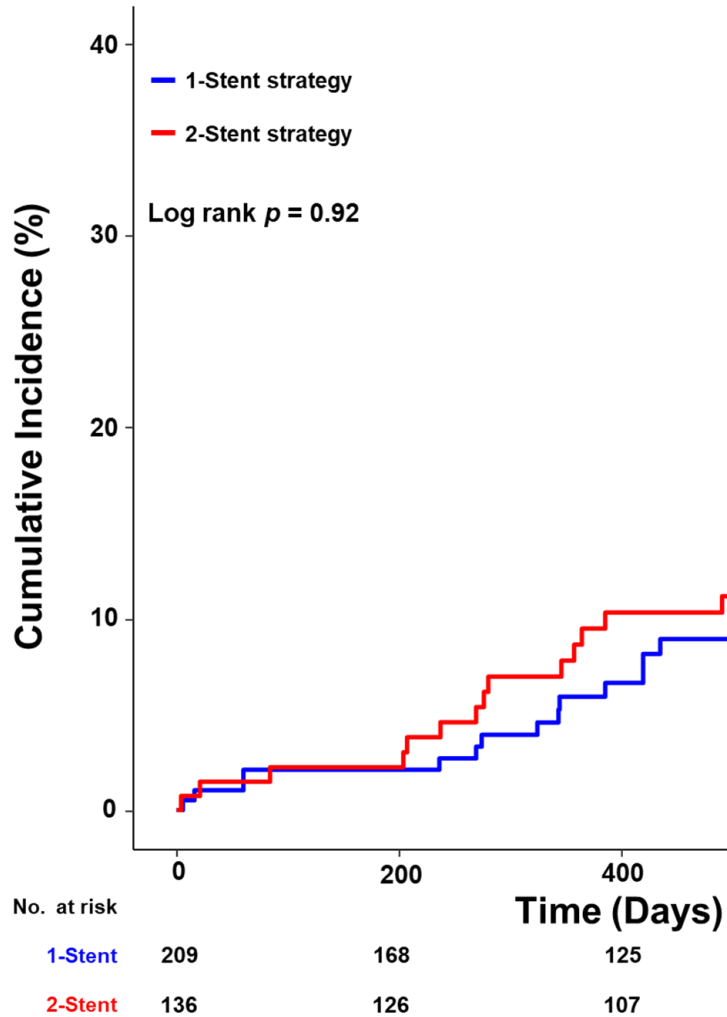
Trend of 001 Bifurcation Stent Strategy



Clinical and Procedural Characteristics

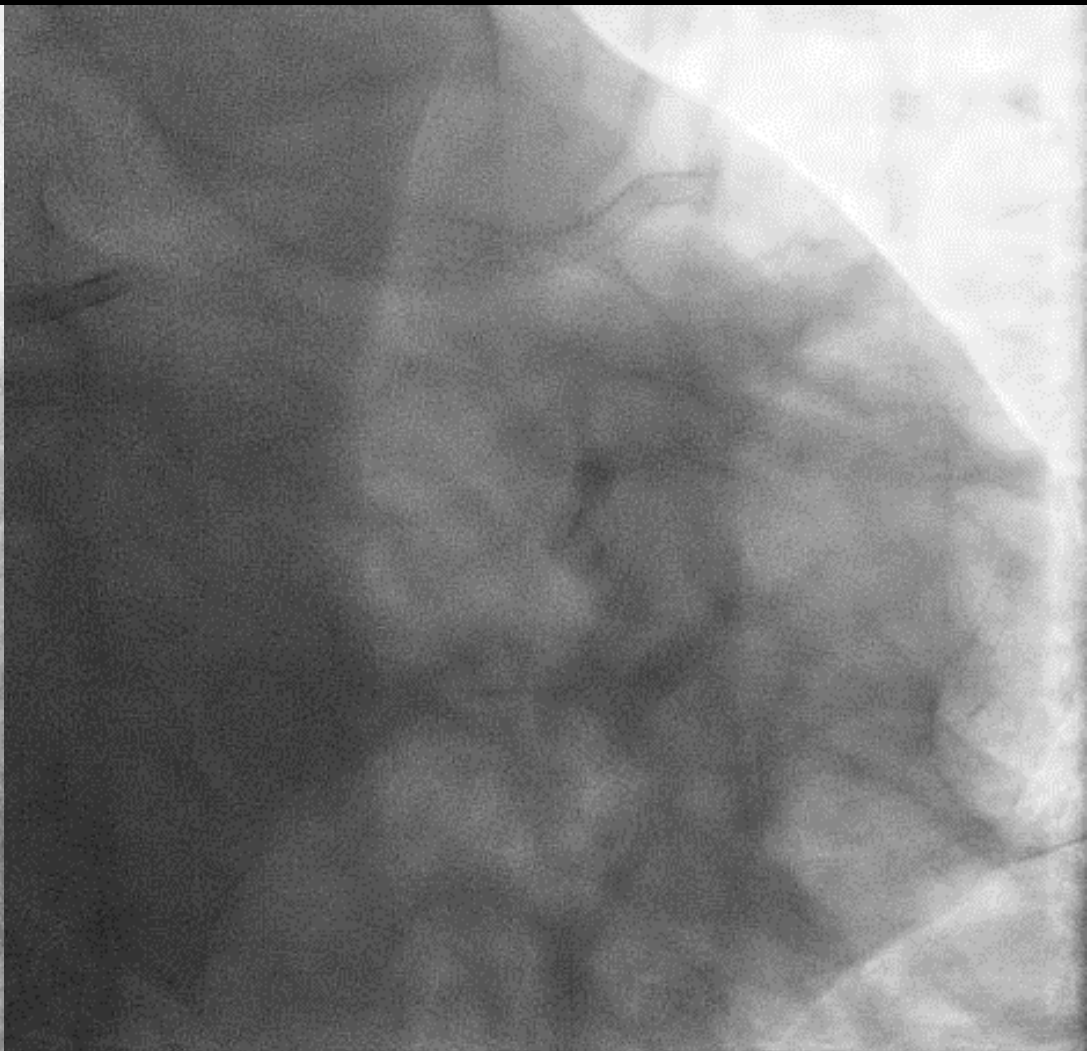
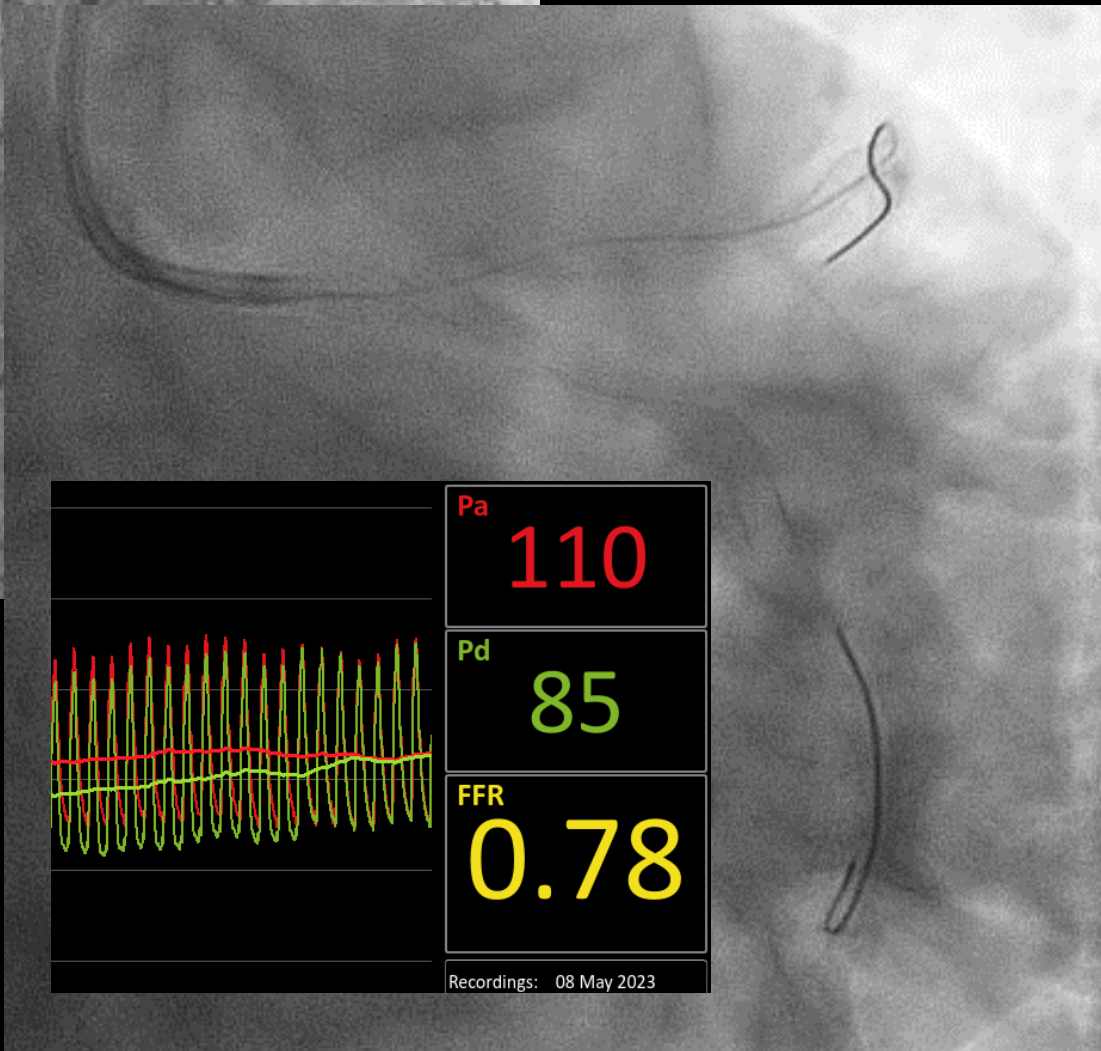
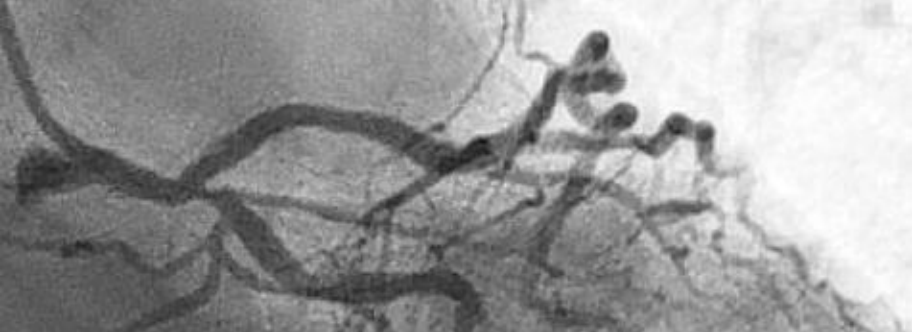
	1-Stent Strategy (n = 209)	2-Stent Strategy (n = 136)	P Value		1-Stent Strategy (n = 209)	2-Stent Strategy (n = 136)	P Value
Demographics				Treatment strategy			<0.001
Age, y	66.0 ± 9.9	64.3 ± 11.0	0.13	1-stent crossover	50 (23.9)	0 (0)	
Male	165 (78.9)						
Cardiovascular risk factors							
Hypertension	116 (55.5)			1-Stent Strategy (n = 86)	2-Stent Strategy (n = 123)	P Value	
Diabetes mellitus	77 (36.8)			Bifurcation angle	69.4 ± 20.0	65.8 ± 21.1	0.22
Current smoking	51 (24.4)			Before procedure			
Previous PCI	62 (29.7)			MV RD, mm	3.22 ± 0.51	3.16 ± 0.48	0.42
Previous myocardial infarction	23 (11.0)			SB RD, mm	2.74 ± 0.45	2.50 ± 0.42	<0.001
Previous coronary artery bypass grafting	3 (1.4)			MV MLD, mm	2.24 ± 0.63	1.82 ± 0.69	<0.001
Previous CVA	5 (5.8)			SB MLD, mm	0.79 ± 0.37	0.72 ± 0.38	0.21
Initial presentation				MV percent diameter stenosis, %	25.6 ± 18.1	42.0 ± 19.5	<0.001
Clinical presentation				SB percent diameter stenosis, %	73.0 ± 12.8	71.4 ± 14.0	0.42
Stable ischemic heart disease	109 (52.2)			MV lesion length, mm	2.86 ± 7.94	7.58 ± 15.50	0.004
Unstable angina or NSTEMI	92 (44.0)			SB lesion length, mm	10.85 ± 7.11	12.77 ± 9.50	0.10
STEMI	8 (3.8)			After procedure			
Lesion characteristics				MV RD, mm	3.24 ± 0.54	3.18 ± 0.52	0.41
Bifurcation location				SB RD, mm	2.78 ± 0.43	2.49 ± 0.48	<0.001
Left main	52 (24.9)			MV MLD, mm	2.48 ± 0.49	2.72 ± 0.50	0.001
LAD/diagonal	75 (35.9)			SB MLD, mm	2.19 ± 0.73	2.30 ± 0.53	0.22
LCX/OM	60 (28.7)			MV residual percent diameter stenosis, %	22.6 ± 14.5	14.4 ± 10.7	<0.001
RCA (PL/PDA)	17 (8.1)			SB residual percent diameter stenosis, %	22.5 ± 19.9	10.2 ± 13.5	<0.001
Unknown	5 (2.4)						
Severe calcification	24 (11.5)						

Primary End Point (Death+MI+TVR+Stent thrombosis)



	1-Stent	2-Stent		HR (95% CI)	P value	P value for interaction
Age ≥ 65 years	14/124 (16.2%)	11/75 (17.9%)		1.063 (0.482-2.344)	0.88	
Age <65 years	6/85 (11.2%)	6/61 (10.0%)		1.096 (0.352-3.411)	0.87	0.99
Male	16/165 (15.3%)	12/101 (12.9%)		0.910 (0.430-1.928)	0.81	0.48
Female	4/44 (11.5%)	5/35 (16.1%)		1.508 (0.404-5.624)	0.54	
Diabetes mellitus	10/77 (19.7%)	6/45 (15.6%)		0.844 (0.306-2.325)	0.74	0.58
Non-diabetes mellitus	10/132 (11.2%)	11/91 (13.1%)		1.251 (0.530-2.952)	0.61	
Acute Coronary Syndrome	5/100 (9.2%)	8/76 (11.4%)		1.588 (0.517-4.875)	0.42	0.40
Stable Ischemic Heart Disease	15/109 (18.7%)	9/60 (17.3%)		0.910 (0.398-2.081)	0.82	
Left Main Bifurcation	10/52 (21.0%)	11/67 (17.1%)		0.851 (0.361-2.003)	0.71	0.81
Non-Left Main Bifurcation	10/157 (10.6%)	6/69 (10.6%)		0.973 (0.352-2.690)	0.96	
Complex 0.0.1*	6/27 (22.5%)	7/43 (17.6%)		0.824 (0.276-2.445)	0.72	0.66
Non-Complex 0.0.1	5/59 (9.6%)	8/80 (10.6%)		1.152 (0.377-3.520)	0.81	
First-Generation DES	4/33 (12.5%)	7/60 (12.3%)		0.996 (0.292-3.403)	0.99	0.85
Second-Generation DES	16/176 (15.1%)	10/76 (14.9%)		1.138 (0.516-2.511)	0.75	
Performing FKB	13/145 (14.4%)	12/120 (11.3%)		0.801 (0.364-1.761)	0.58	0.08
Not Performing FKB	7/64 (13.7%)	5/16 (31.3%)		2.723 (0.864-8.583)	0.09	
Use of Intravascular Imaging	8/96 (15.2%)	8/72 (12.6%)		0.906 (0.339-2.423)	0.84	0.77
No Use of Intravascular Imaging	12/113 (13.9%)	9/64 (15.3%)		1.165 (0.491-2.768)	0.73	
COBIS II	6/41 (16.3%)	7/73 (10.6%)		0.638 (0.214-1.899)	0.42	
COBIS III	5/45 (11.9%)	8/50 (16.7%)		1.541 (0.504-4.712)	0.45	0.74
RAIN	9/123 (13.8%)	2/13 (25.0%)		2.052 (0.443-9.505)	0.36	

0.1 1 10
Favor 2-Stent Strategy Favor 1-Stent Strategy



What we've found and what's supposed to be...

- Incidence of angiographic **0.0.1 bifurcation lesion** was rare (4.1%~).
- In recent years, there has been a tendency to **prefer 1-stent strategy**.
- Although there was no image data, angiographic 001 bifurcation lesion is **not always real 0.0.1 lesion**. Additional **intracoronary evaluation** (IVI or physiology) would be useful.
- Clinical **outcome after PCI** appear **unfavorable**. Therefore, we have to **take a higher risk than our thought**.
- It is imperative to **consider a variety of treatment modalities** when deciding on the **most appropriate approach** for each 0.0.1 bifurcation.