Optimal POT:

Insight from Japanese 3D OCT Bifurcation Registry

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On behalf of 3-D OCT Registry investigators

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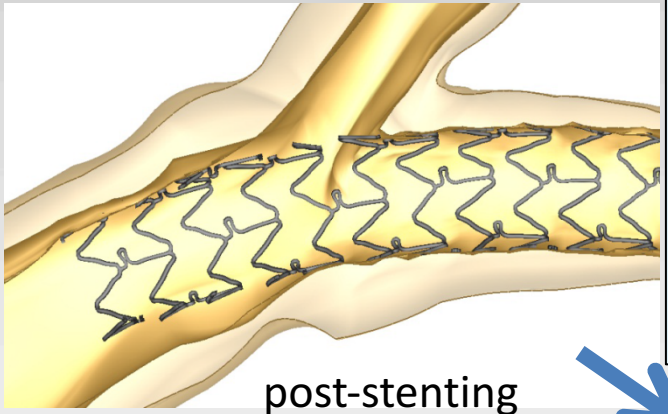
Background

- Several bench tests have revealed that the proximal optimization technique (POT) leads to beneficial effect on coronary bifurcation stenting in terms of less stent deformation and improvement of malapposition.
  - *Murasato Y.et al. EuroInterv 2014, 10:934-41*
  - *Foin N. et al. JACC Interv 2012, 5:47-56*
  - *Finet G. et al. JACC Interv 2015, 8:1308-17*
- However, the efficacy of POT in actual clinical setting has not yet been clarified.

Proximal Optimization Technique (POT)



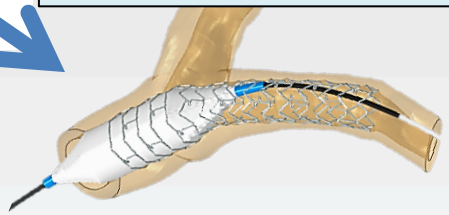
post-stenting

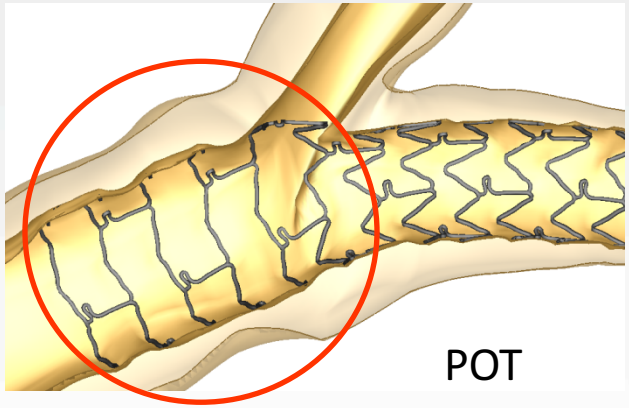
Merit

- Large expansion of the jailed strut
- Easy access through the SB
- Optimal GW position at the distal strut

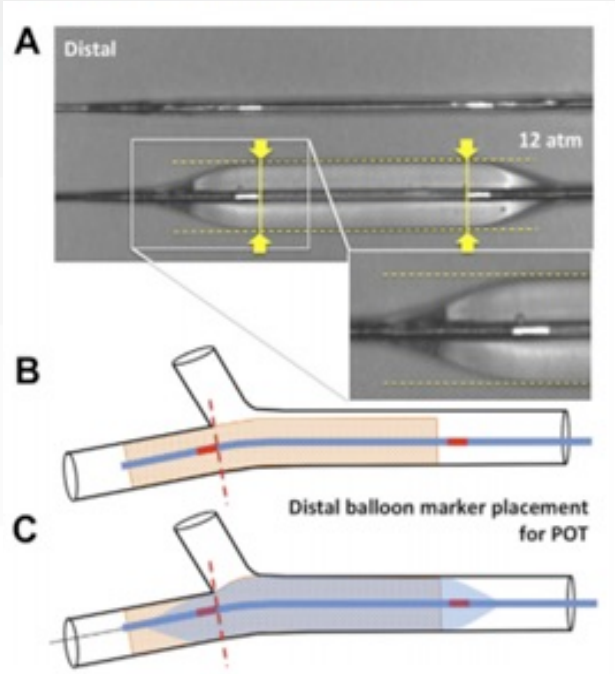
Demerit

- Risk of worsening the carina shift





POT



Distal marker of the POT balloon should be located at the carina.

Finet G, et al. JACC Interv. 2015; 8,1308

Aim

To investigate the efficacy of the POT in crossover stenting followed by SB dilation in the 3D-OCT Bifurcation Registry study.

3D-OCT Bifurcation Registry

Design Multicenter prospective non-randomized observational study from 10 Japanese Centers

Objective 168 bifurcation lesions in 167patients who underwent bifurcation stenting under the guidance of OCT

Period 2014/06/01～2015/12/31

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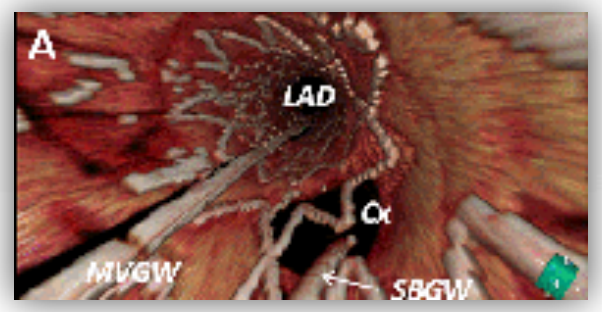
Stent enhanced 3D OCT



Okamura et.al EuroIntervention 2014

Endpoints

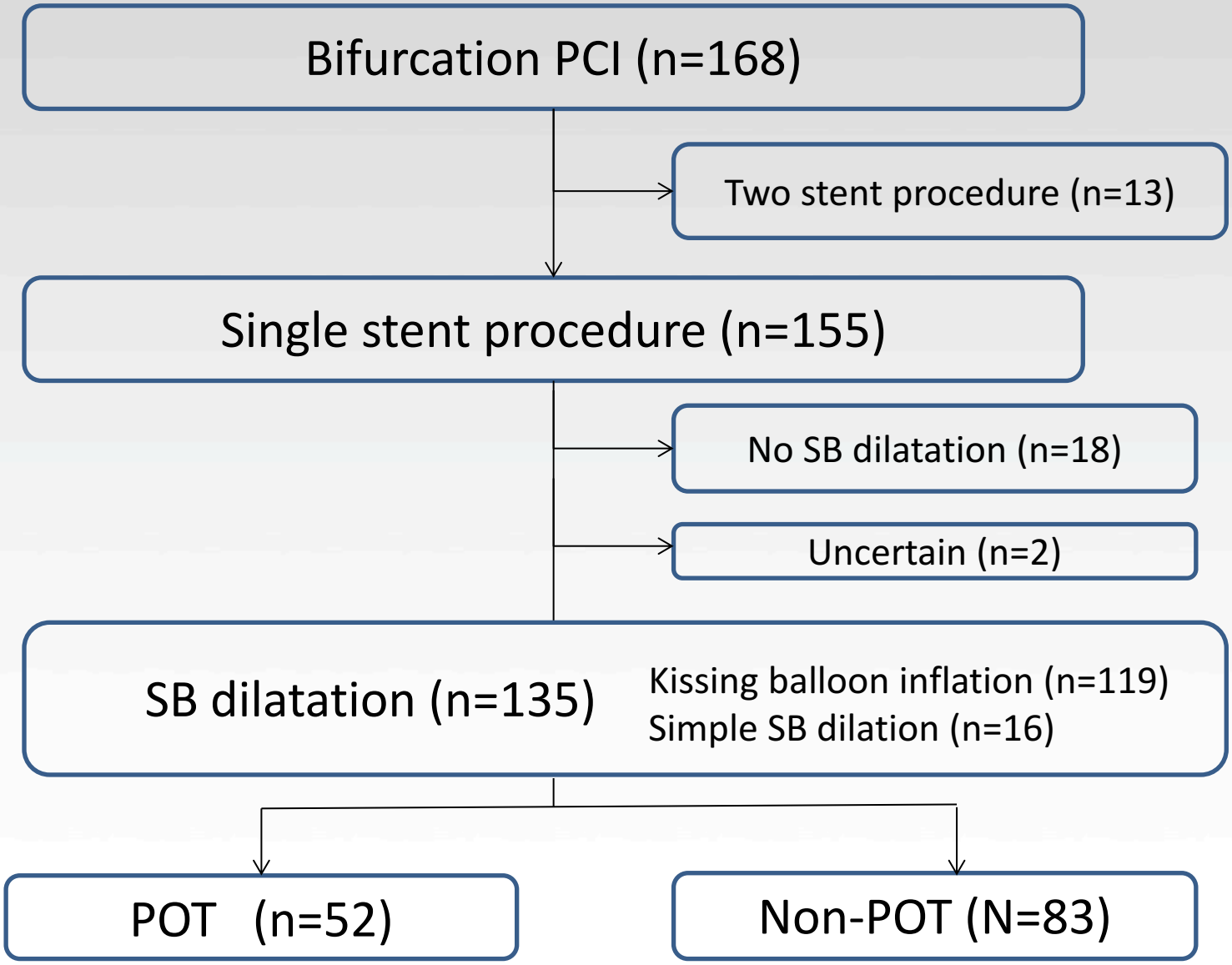
Primary

- Frequency of distal cell crossing and free-carina type
- Stent eccentricity index
- Stent expansion ratio
- Incomplete strut apposition (ISA)

Secondary

- Procedure-related factors
  - ✓ Operation time
  - ✓ Radiation time
  - ✓ Amount of contrast medium
- Timing of POT
  - ✓ Pre-POT: POT before SB dilation
  - ✓ Final POT: POT after SB dilation
  - ✓ Re-POT: twice POTs before and after SB dilation

Study flow


Bifurcation PCI (n=168)
Two stent procedure (n=13)
Single stent procedure (n=155)
No SB dilatation (n=18)
Uncertain (n=2)
SB dilatation (n=135)
Kissing balloon inflation (n=119)
Simple SB dilation (n=16)
POT (n=52)
Non-POT (N=83)

Patient background

＊P<0.05 vs. Non-POT

	POT	Non-POT
Age (years old)	70.5±9.5	70.7±9.9
Male, n (%)	36 (67.9)	62 (75.6)
Primary Disease		
Stable angina, n (%)	32 (61.5)	53 (63.9)
Unstable angina, n (%)	3 (5.8)	4 (4.8)
OMI, n (%)	6 (11.5)	9 (10.8)
SMI, n (%)	11 (21.2)	16 (19.3)
Risk Factor		
Hypertension, n (%)	47 (88.7)	71 (86.6)
Dyslipidemia, n (%)	35 (66.0)	60 (73.2)
Diabetes mellitus, n (%)	14 (26.4) ＊	40 (48.8)
Smoking, n (%)	25 (47.2)	42 (51.2)
Creatinine	0.86±0.41	0.90±0.48
LVEF (%)	60.0±9.6	61.1±12.3

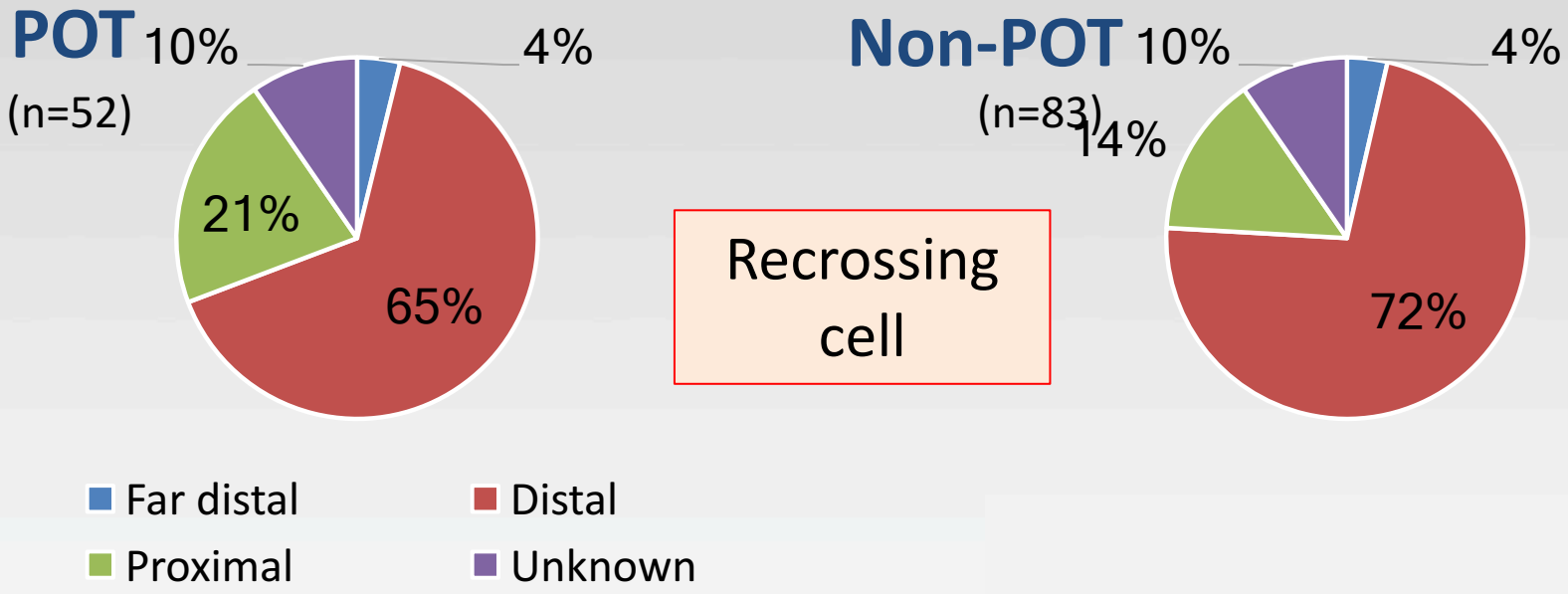
Lesion characteristics

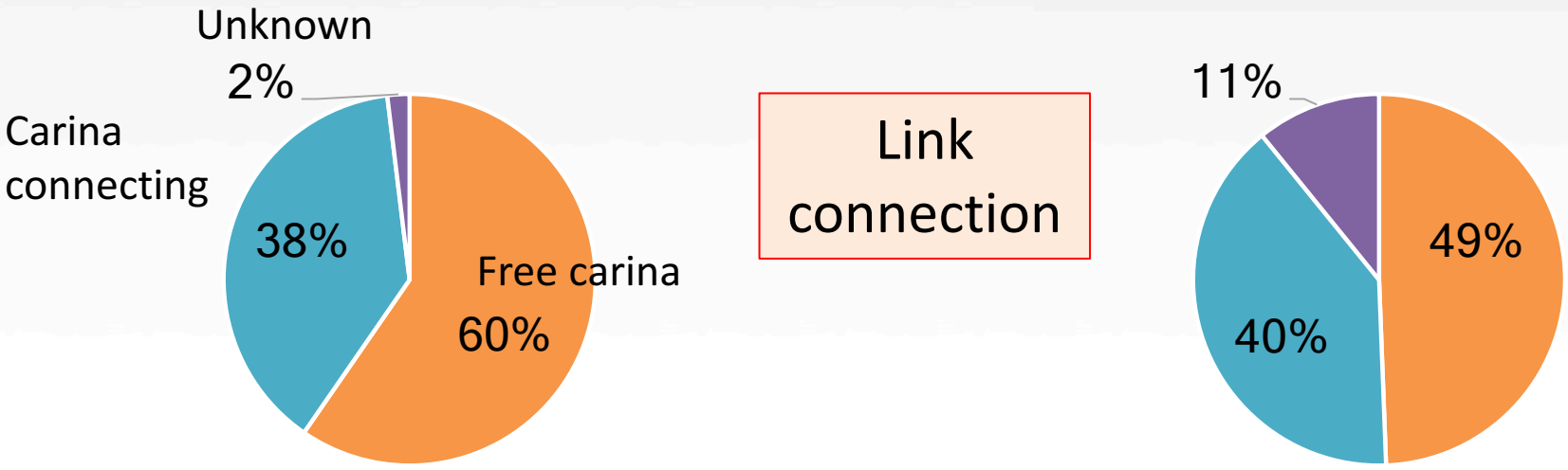
	POT	Non-POT
Location		
LMCA, n (%)	22 (42.3)	22 (26.5)
LAD, n (%)	20 (38.5)	42 (50.6)
LCX, n (%)	5 (19.2)	13 (15.7)
RCA, n (%)	5 (19.2)	6 (7.2)
True bifurcation lesion, n (%)	14 (26.9)	34 (41.0)
QCA		
Proximal MV reference (mm)	3.3± 0.6	3.0± 0.7
% DS (%)	27.7± 24.3	29.7± 25.1
Distal MV reference (mm)	2.6± 0.5	2.4± 0.6
% DS (%)	48.0± 20.5	43.6± 21.8
SB reference (mm)	2.3± 0.6	2.2± 0.7
% DS (%)	23.6± 17.5	27.9± 20.0

Procedural characteristics

	POT	Non-POT
Stent size, (mm)	2.98 ± 0.44	3.04 ± 0.47
length, (mm)	22.6 ± 7.0	23.1 ± 7.3
Xience, n (%)	7 (13.5)	28 (33.7)
Resolute, n (%)	18 (34.6)	22 (26.5)
Nobori, n (%)	16 (30.8)	17 (20.5)
Promus, n (%)	7 (13.5)	12 (14.5)
Ultimaster, n (%)	4 (7.7)	4 (4.8)
MV balloon size, (mm)	3.10 ± 0.46	3.07 ± 0.49
SB balloon size, (mm)	2.51 ± 0.47	2.40 ± 0.41
POT balloon size, (mm)	3.54 ± 0.65	-
Pre-POT, n (%)	26 (50.0)	-
Final POT, n (%)	12 (23.1)	-
Re-POT, n (%)	13 (25.0)	-

GW recrossing

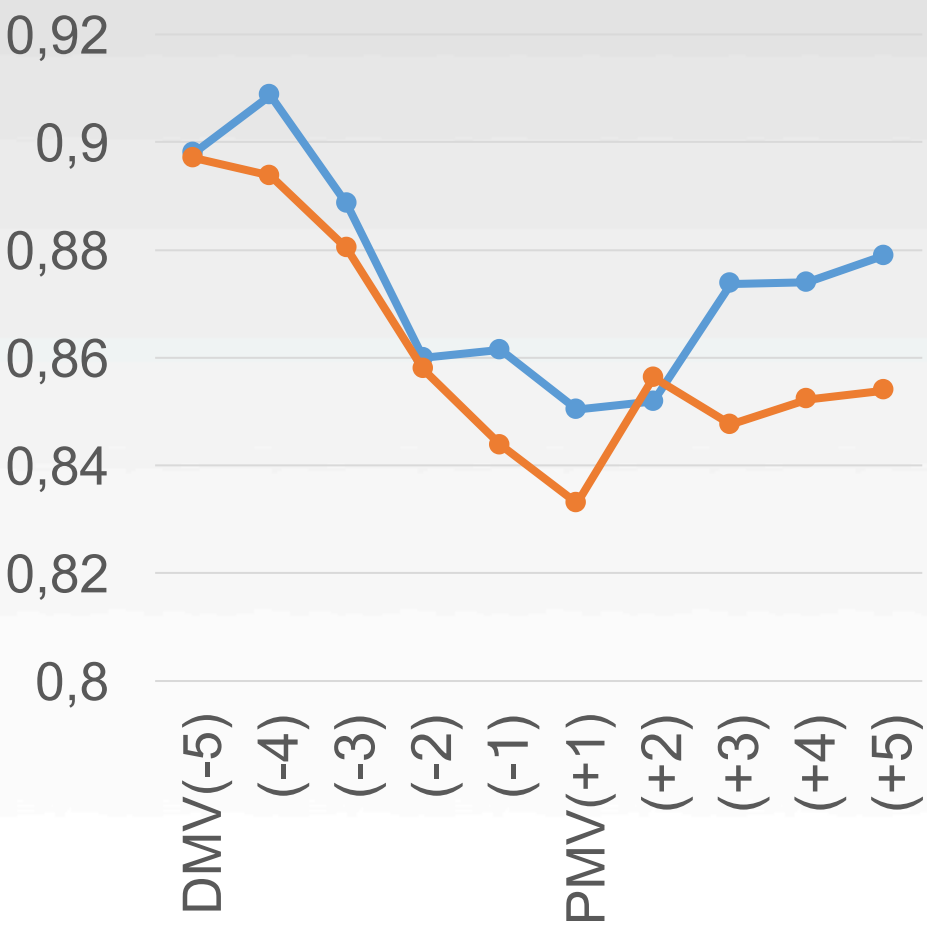




Stent expansion

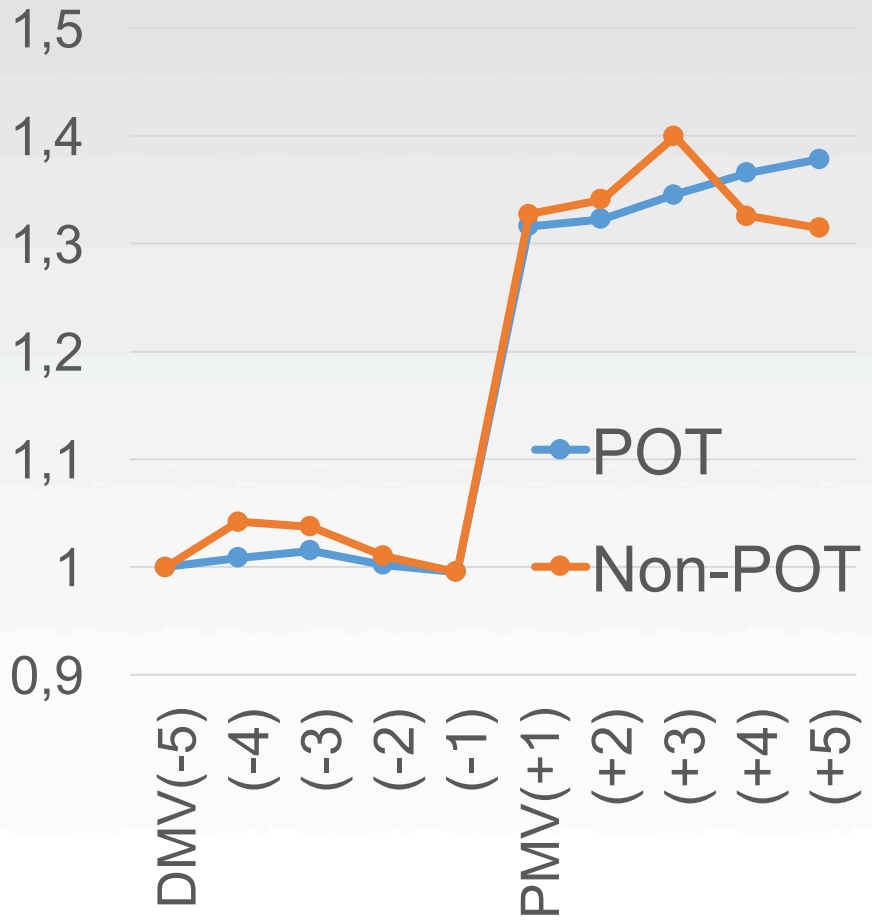
Eccentricity Index

max diameter / min diameter



Expansion Ratio

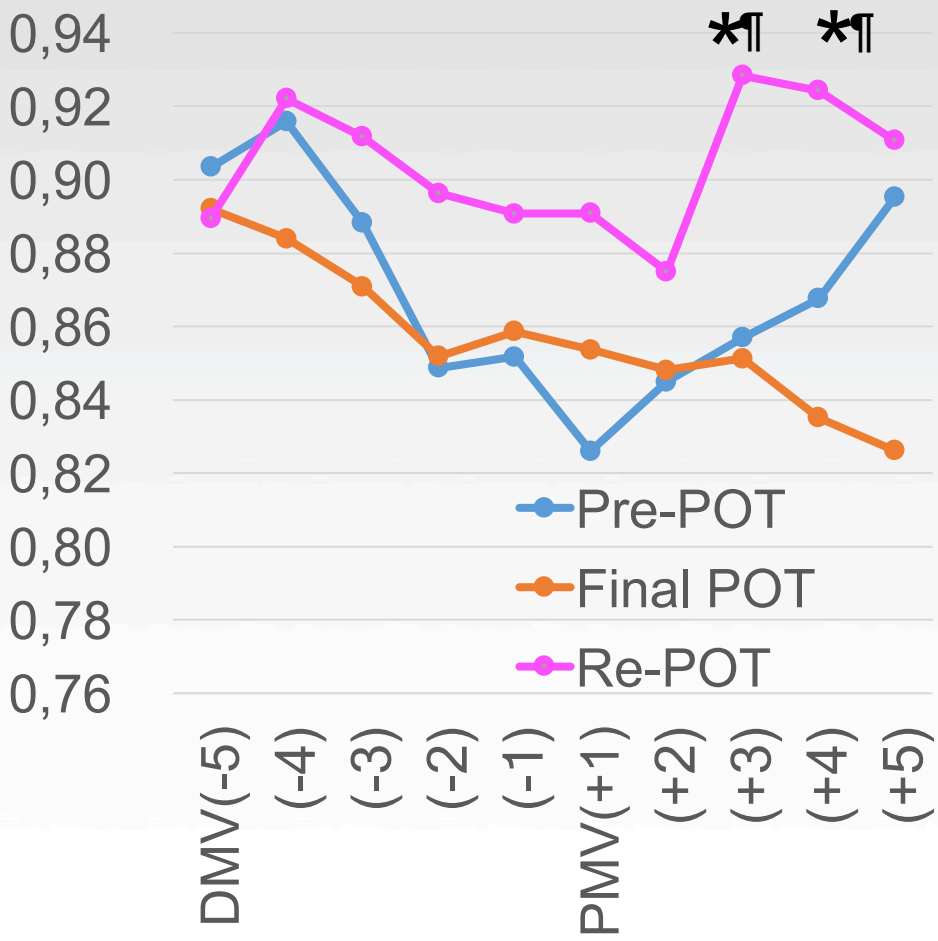
stent area / stent area @ DMV(-5mm)



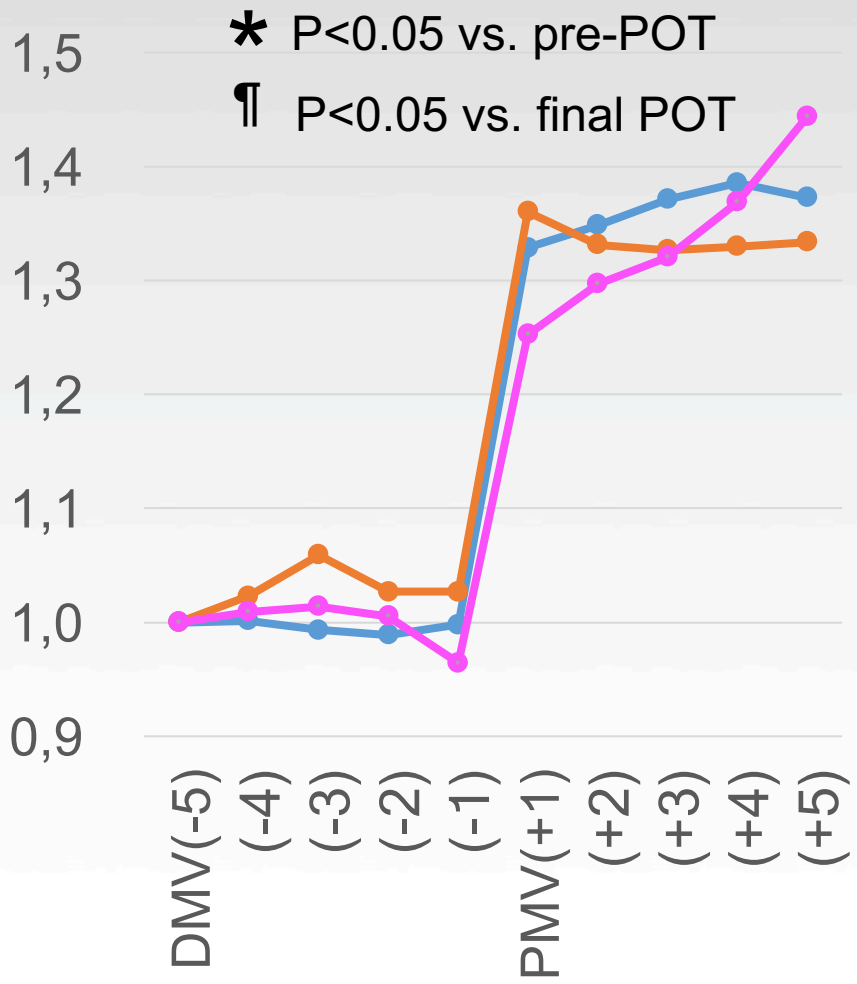
Pre-POT vs. Final POT vs. Re-POT

(n=26) (n=12) (n=13)

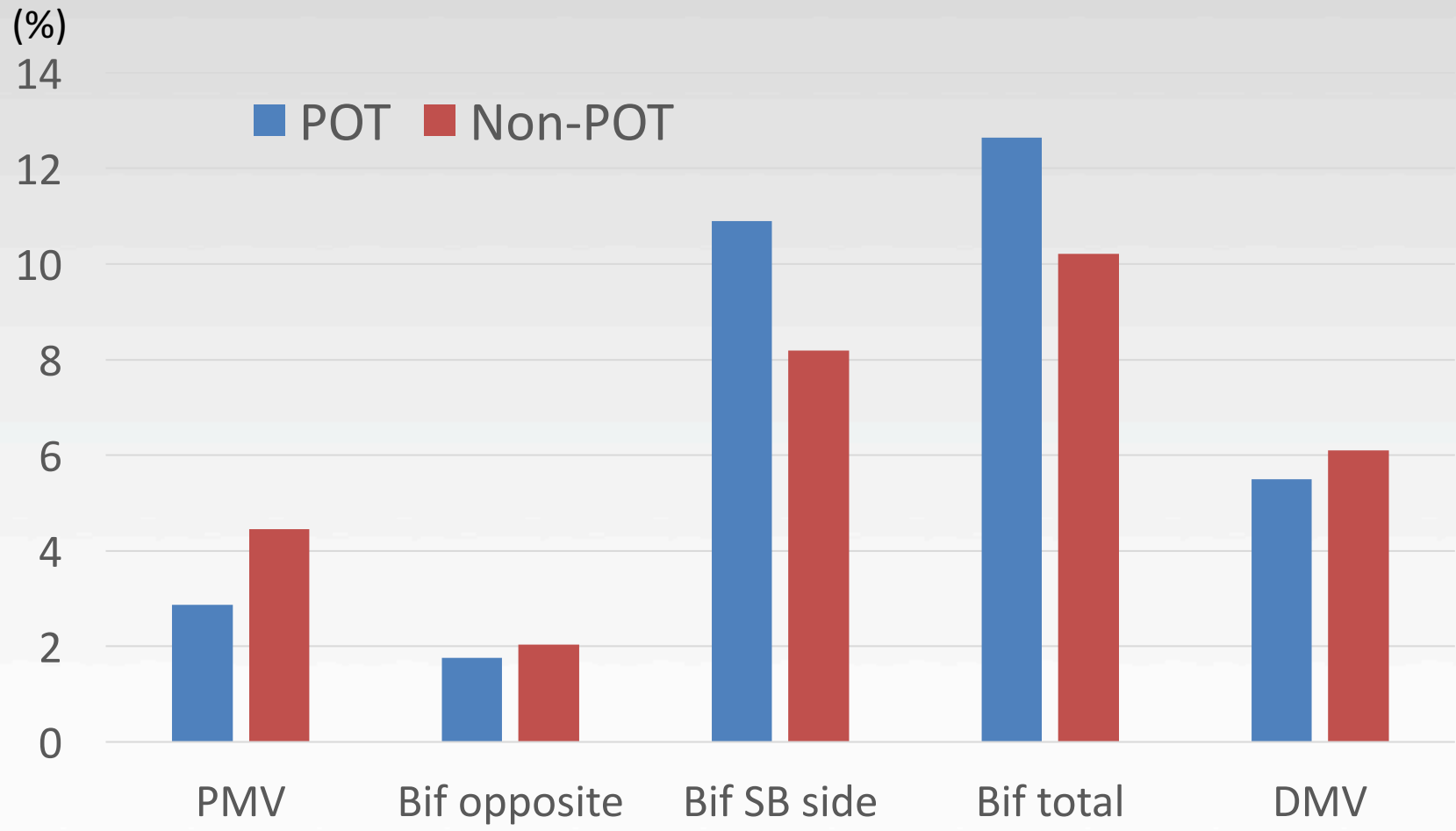
Eccentricity Index



Expansion Ratio

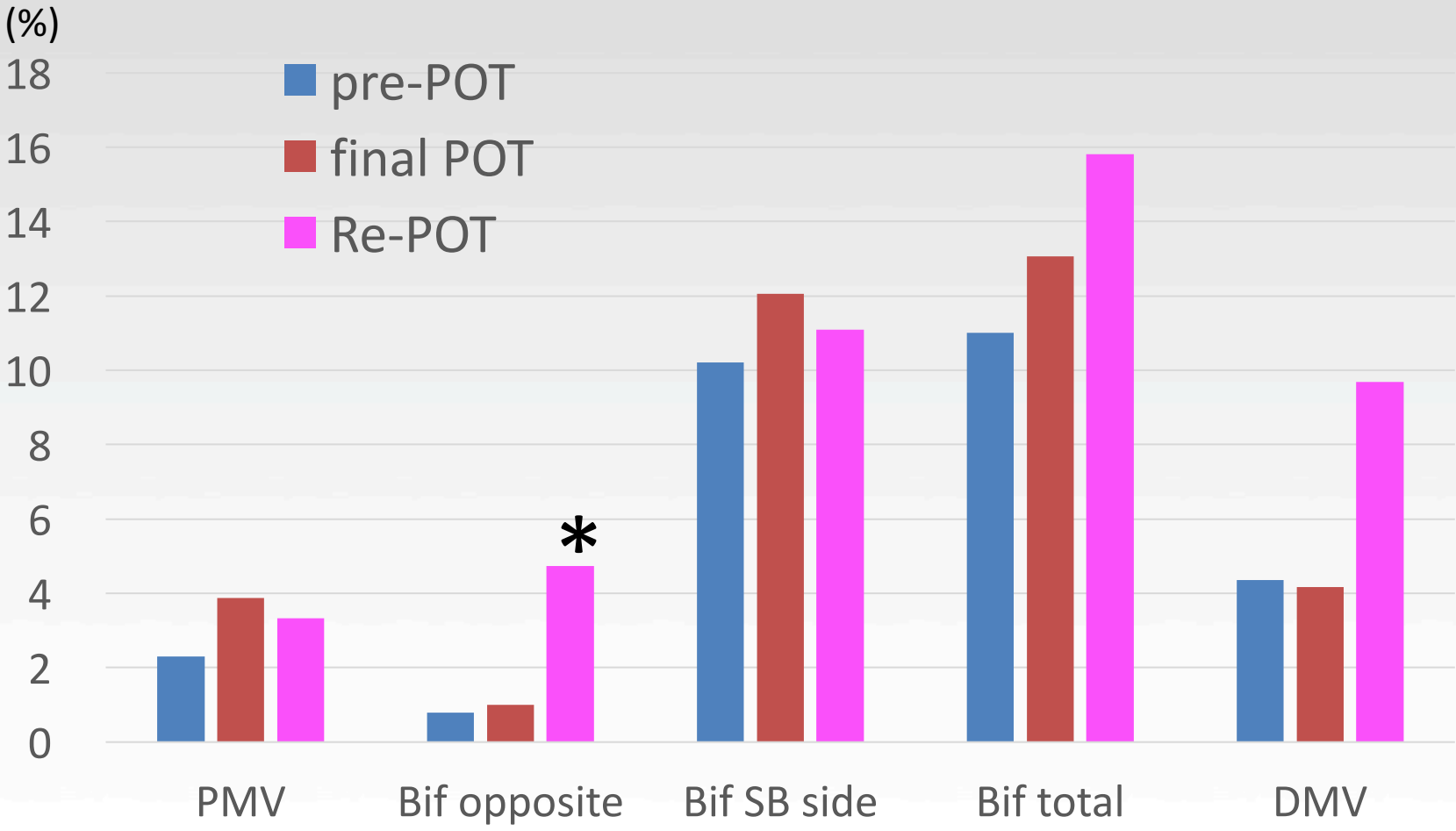


Incomplete strut apposition



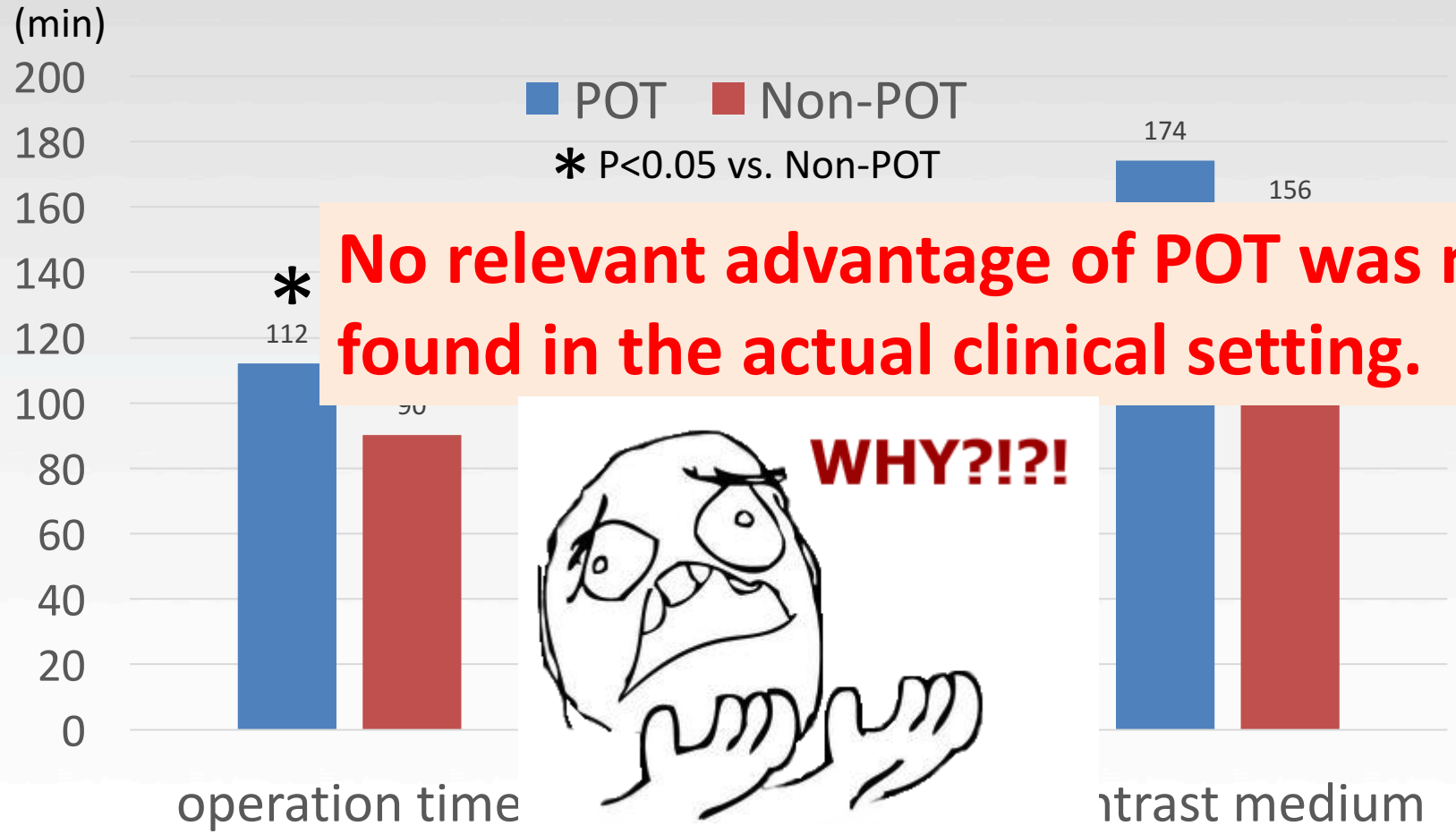
Incomplete stent apposition

Only pre-POT vs. Only final POT vs. Re-POT



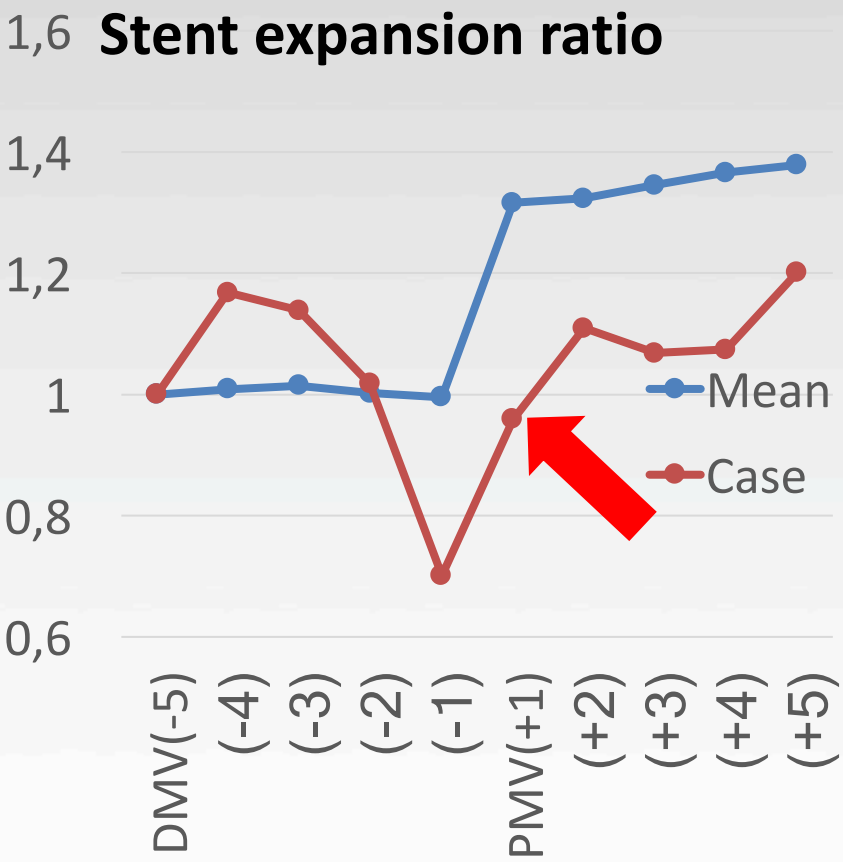
* P<0.05 vs. pre-POT

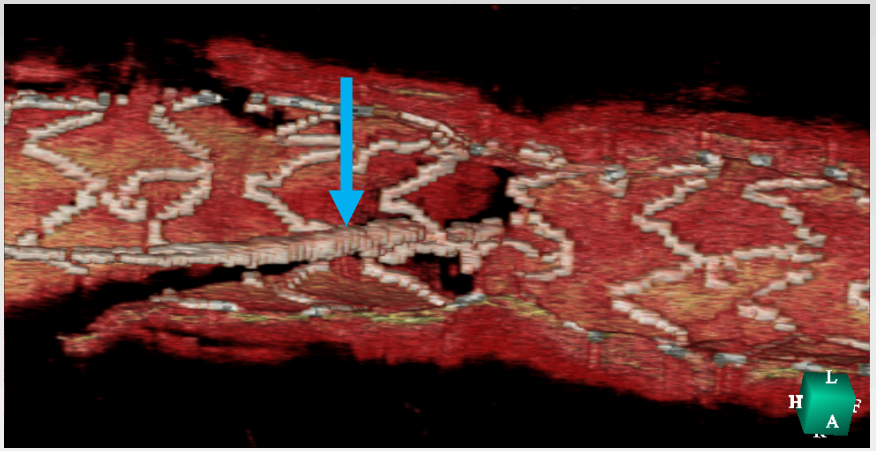
Procedure-related factors

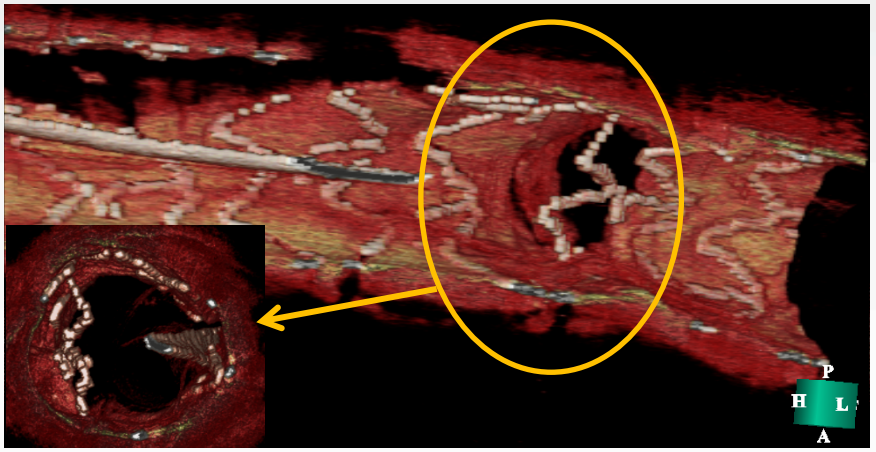


No relevant advantage of POT was not found in the actual clinical setting.

POT: Ineffective case



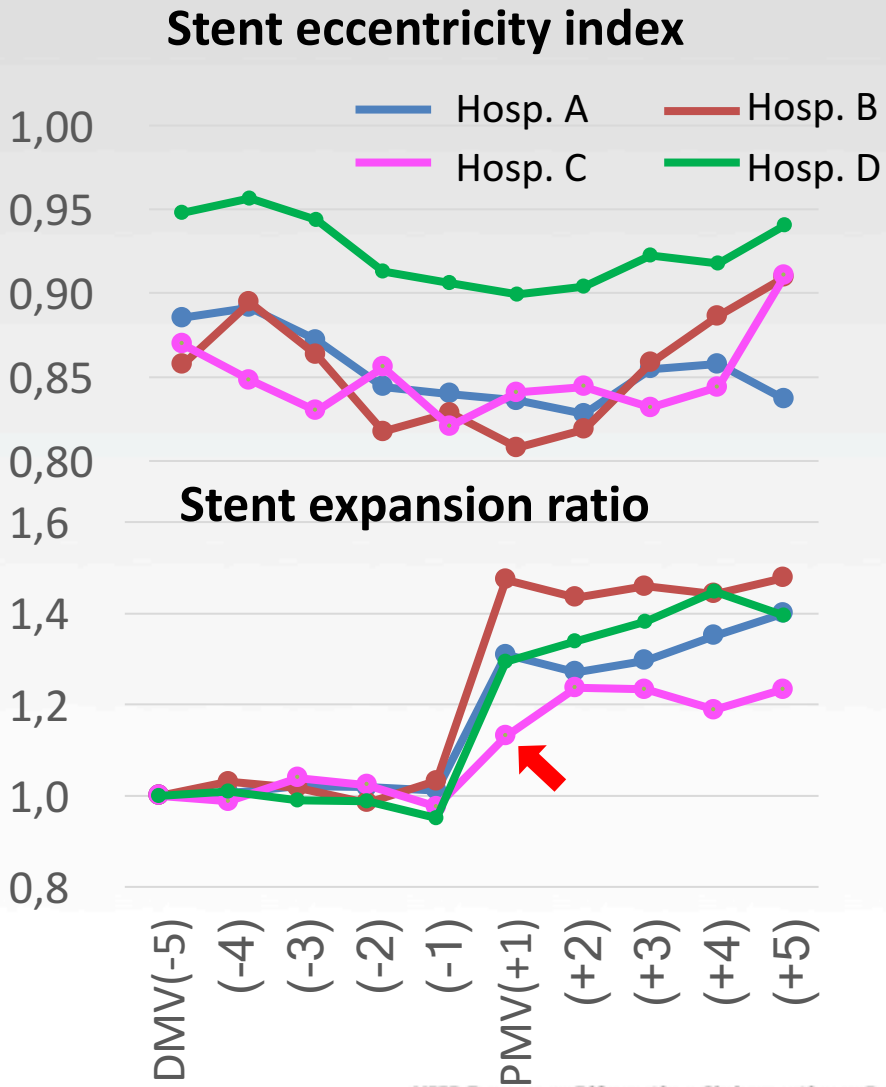


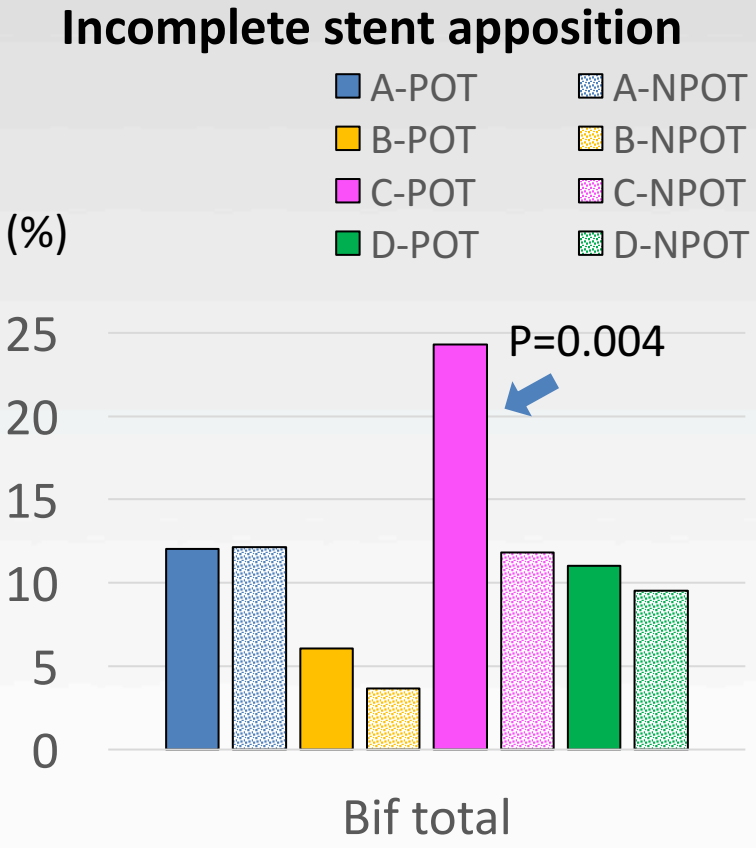


Insufficient expansion in the carinal site (red arrow) did not allow GW recrossing to the distal cell (blue arrow), which led to large ISA in the SB ostium (yellow circle).

Lack of consensus in the POT

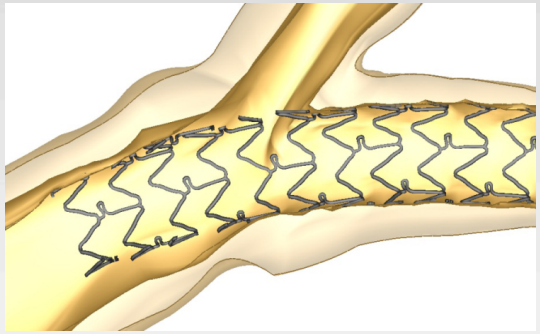
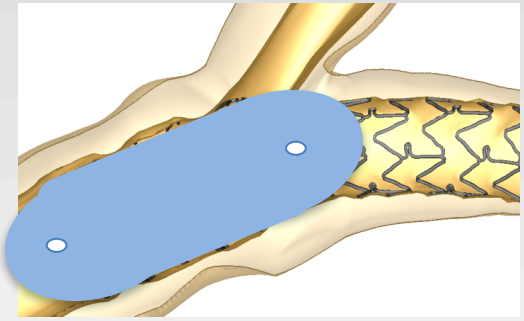
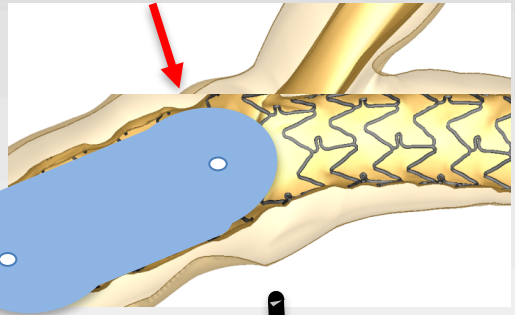
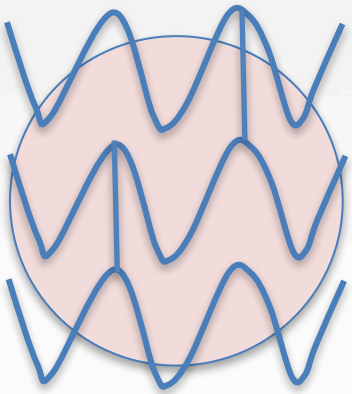
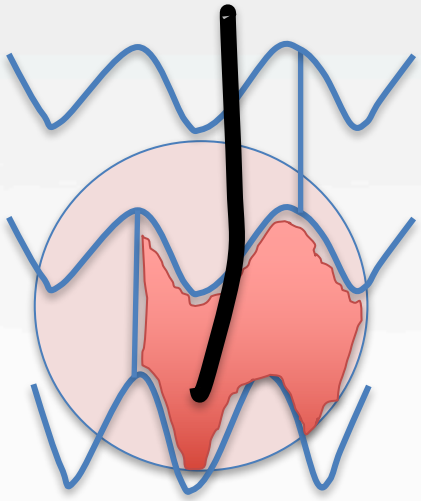
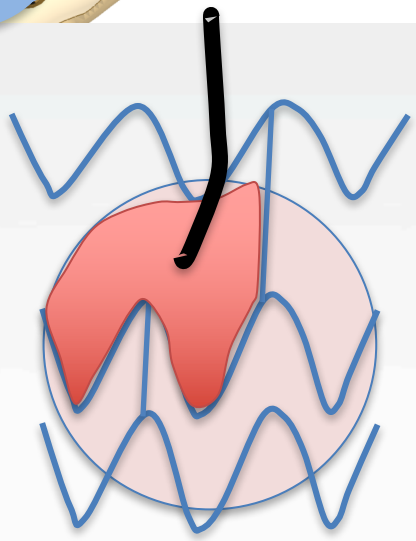
Comparison among 4 hospitals where ≥20 cases were enrolled in the registry





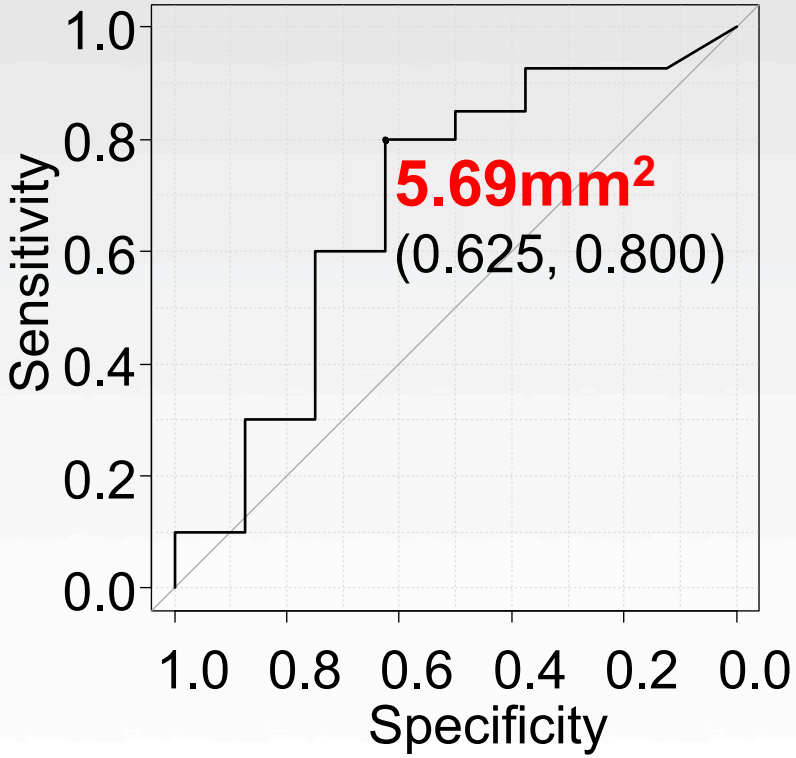
Insufficient expansion in the carinal site (red arrow) led to large ISA (blue arrow) in Hospital C.

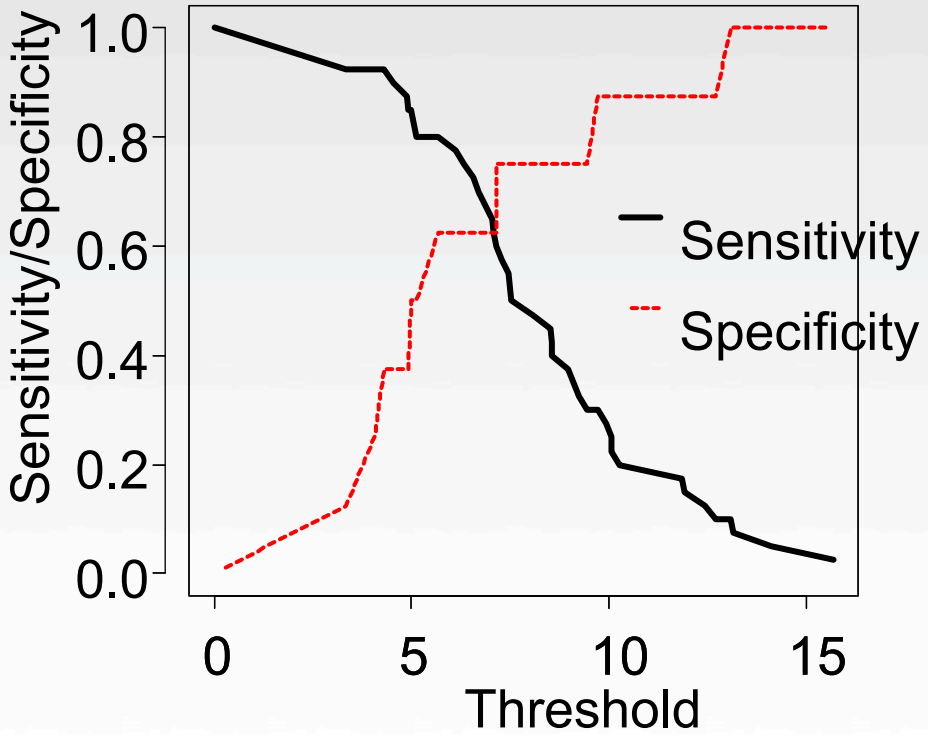
POT: optimal vs. suboptimal

Before POT	Optimal POT	Suboptimal POT
		
		
	Optimal distal GWR ↑ Malapposition ↓	Proximal GWR ↑ Malapposition ↑

Predictive value of Stent area @ PMV+1mm for Distal GWR

POT group





AUC 0.683, 95%CI 0.447 - 0.919

Multivariate analysis
Independent contributor on distal GWR

POT group

	Odds ratio	95%CI	p-value
Bifurcation angle (PMV-SB)	0.91	0.839-0.996	0.04
Stent area at PMV+1mm	1.91	0.972-3.750	0.06

Non-POT group

No significant contributor

Conclusion

- Sufficient stent expansion in the carinal site induced by the POT led to successful distal GWR, and cut-off value was 5.7mm^2. Its insufficient stent expansion resulted in more incomplete stent apposition.
- Re-POT improved symmetricity in the PMV.
- However, the POT did not bring any significant effect on distal cell recrossing or frequency of free carina type despite of increasing operation time in this registry.
- The consensus of optimal POT among the participating institutes is required for obtaining better clinical outcome in the bifurcation study.

Thank you for your attention!