



# **Recent Data from Japanese Registry Study in Comparison between Everolimus-eluting Stent and Sirolimus-eluting Stent for the Bifurcation Lesion (J – REVERSE)**

**Yoshinobu Murasato<sup>1</sup>, Yoshihisa Kinoshita<sup>2</sup>, Toshiro Shinke<sup>3</sup>,  
Masahiro Yamawaki<sup>4</sup>, Yoshihiro Takeda<sup>5</sup>, Kenichi Fujii<sup>6</sup>,  
Shin-ichiro Yamada<sup>7</sup>, Yoshihisa Shimada<sup>8</sup>,  
Takehiro Yamashita<sup>9</sup>, Kazuhiko Yumoto<sup>10</sup>, Masaya Arikawa<sup>11</sup>,  
Yoritaka Otsuka<sup>12</sup> and Masaki Tanabe<sup>13</sup>  
On behalf of J-REVERSE investigators**

1. New Yukuhashi Hospital, 2. Toyohashi Heart Center, 3. Kobe University, 4. Saiseikai Yokohama Eastern Hospital, 5. Rinku General Medical Center, 6. Hyogo Medical University, 7. Himeji Cardiovascular Center, 8. Shiroyama Hospital, 9. Hokkaido Ono Hospital, 10. Yokohama Rosai Hospital, 11. Oita Medical Center, 12. Fukuoka Wajiro Hospital, 13. The Second Okamoto Hospital



# Purpose of the study

## Study-1

To compare clinical outcome of provisional stenting between EES and SES deployment under the IVUS guidance.

## Study-2

To investigate whether asymmetrical expansion in the bifurcation lesion leads to more disturbance of neointimalization.

# Endpoints

## Study-1

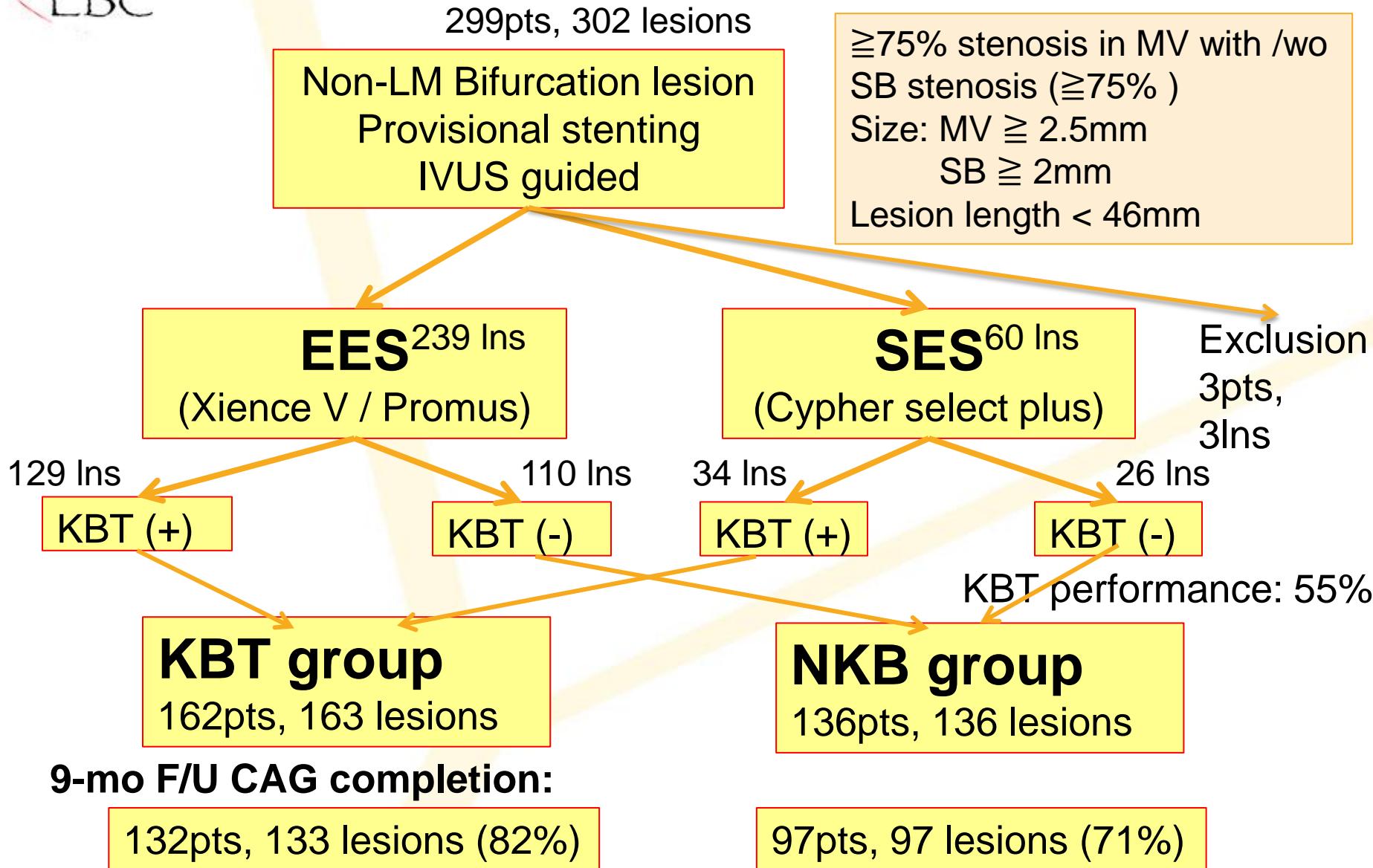
Major adverse cardiac events (MACE) during 9-mo F/U period  
Death, Myocardial infarction, Target lesion revascularization (TLR),  
Target vessel revascularization (TVR), Stent thrombosis

## Study-2

OCT abnormal findings (unevenness of intimal growth, uncovered struts, thrombus attachment)



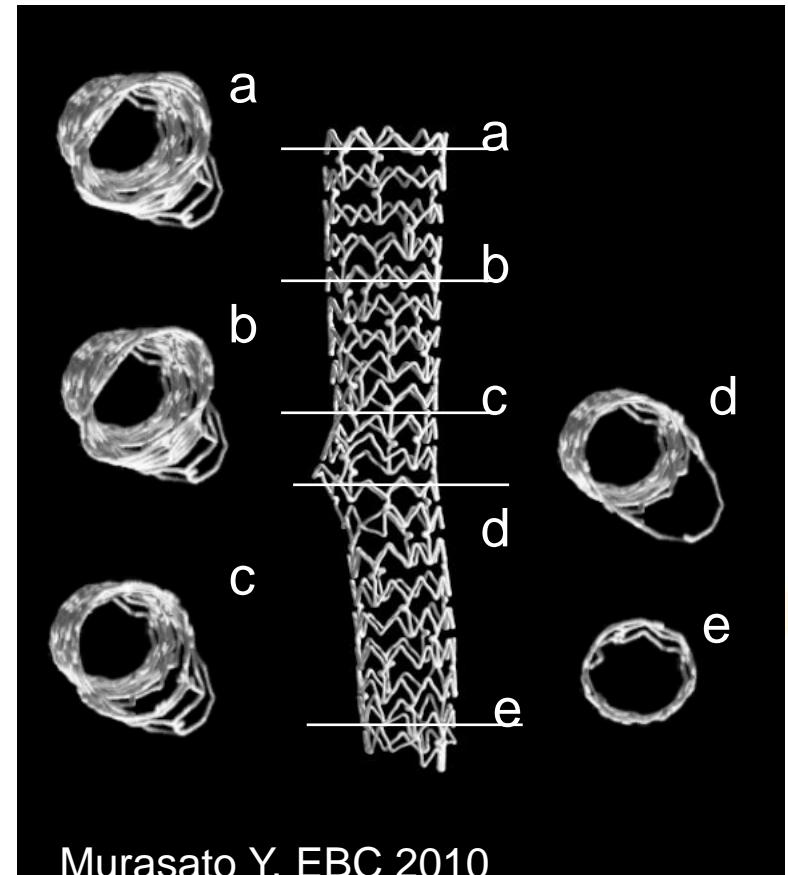
# J-REVERSE: Patient flow





## J-REVERSE Study-2

**KBT vs. non-KBT**



Murasato Y, EBC 2010



# Baseline patient characteristics (1)

	KBT		NKB		p-value
Patient No.	162		136		
Lesion	163		136		
Age (years)	$67.6 \pm 8.5$		$67.6 \pm 10.0$		0.990
Male gender, n (%)	131	80.4%	110	80.9%	1.000
Body mass index (Kg/m <sup>2</sup> )	$23.6 \pm 3.3$		$24.1 \pm 3.1$		0.199
Hypertension, n (%)	120	73.6%	109	80.1%	0.218
Dyslipidemia, n (%)	118	72.4%	100	73.5%	0.178
Statin, n (%)	95	58.3%	82	60.3%	0.813
LDL	$110.1 \pm 31.8$		$108.1 \pm 31.4$		0.589
Diabetes mellitus, n (%)	63	38.7%	69	50.7%	0.047
Insulin, n (%)	5	3.1%	14	10.3%	0.016
HbA1C	$5.9 \pm 0.9$		$6.2 \pm 1.4$		0.017
Current Smoker	48	29.4%	35	25.7%	0.518



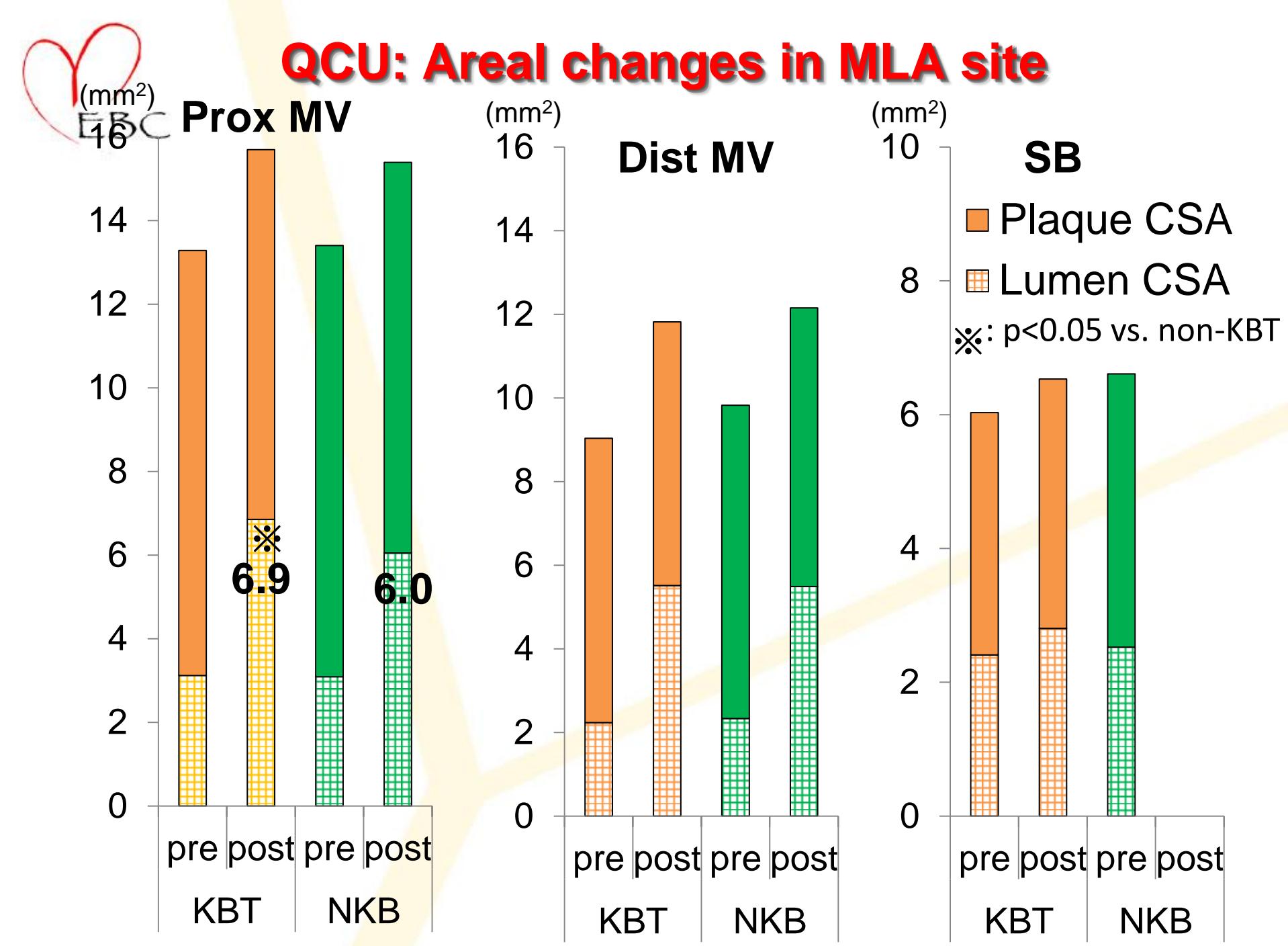
# Baseline lesion characteristics

		KBT		Non-KBT		P-value
Diseased vessel						
	1VD	91	55.8%	72	52.9%	0.642
	2VD	54	33.1%	36	26.5%	0.255
	3VD	18	11.0%	28	20.6%	0.025
Culprit vessel						
	LAD	124	76.1%	90	66.2%	0.071
	LCX	23	14.1%	29	21.3%	0.125
	RCA	16	9.8%	17	12.5%	0.466



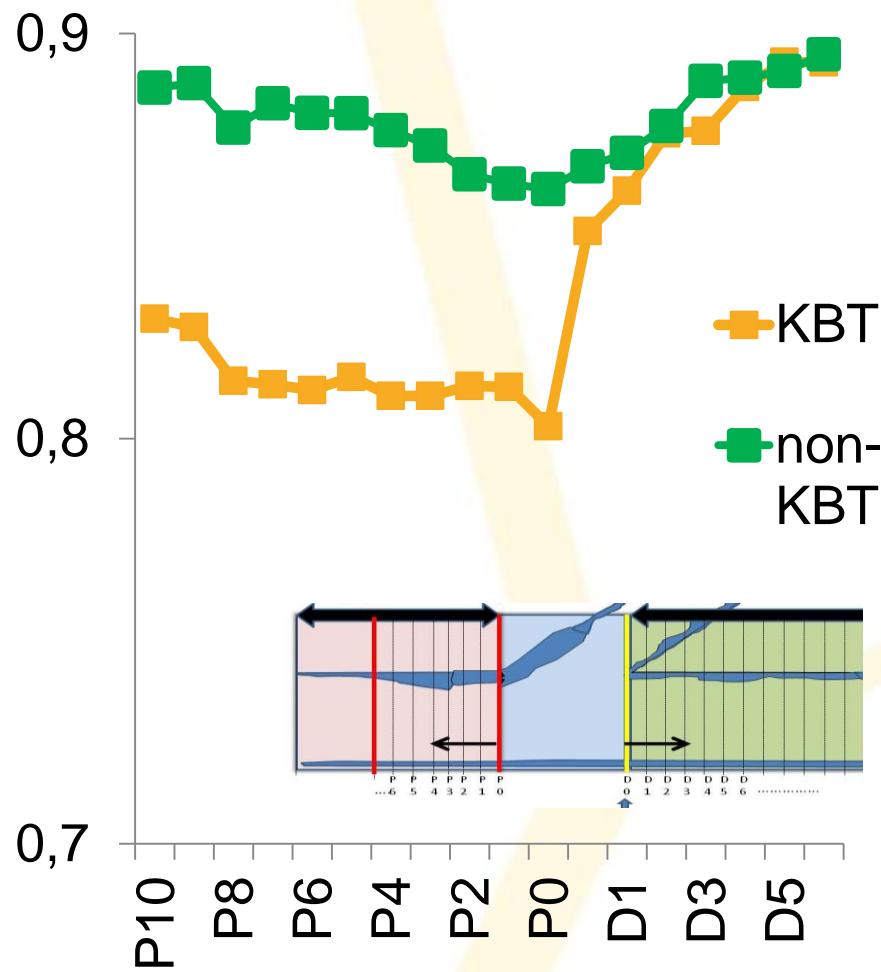
# Procedural characteristics (2)

		KBT	NKB	p-value
MV stent	size	$2.97 \pm 0.34$	$2.95 \pm 0.34$	0.73
	length	$22.2 \pm 5.2$	$21.1 \pm 5.4$	0.06
	pressure	$11.1 \pm 2.8$	$11.4 \pm 3.0$	0.27
Additional MV stent				
	size	$3.07 \pm 0.37$	$2.90 \pm 0.30$	0.07
	length	$18.6 \pm 6.8$	$18.3 \pm 4.9$	0.87
	pressure	$12.2 \pm 2.7$	$11.3 \pm 2.7$	0.20
Predilation balloon				
(MV)	size	$2.64 \pm 0.42$	$2.62 \pm 0.40$	0.68
	length	$14.5 \pm 3.0$	$14.0 \pm 3.3$	0.30
(SB)	size	$2.11 \pm 0.28$	$2.26 \pm 0.45$	0.15
	length	$13.8 \pm 2.0$	$14.0 \pm 3.2$	0.69



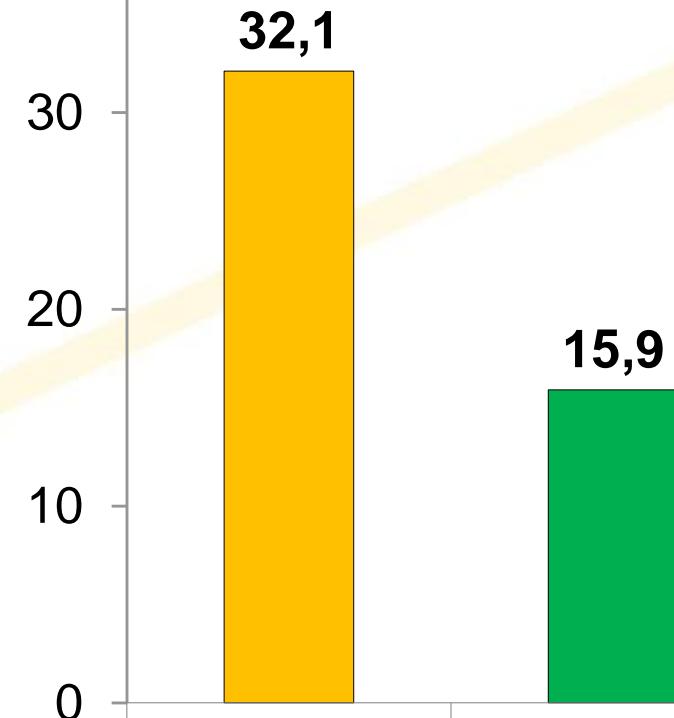
# QCU: Asymmetric expansion induced by KBT

## Stent Eccentric Index



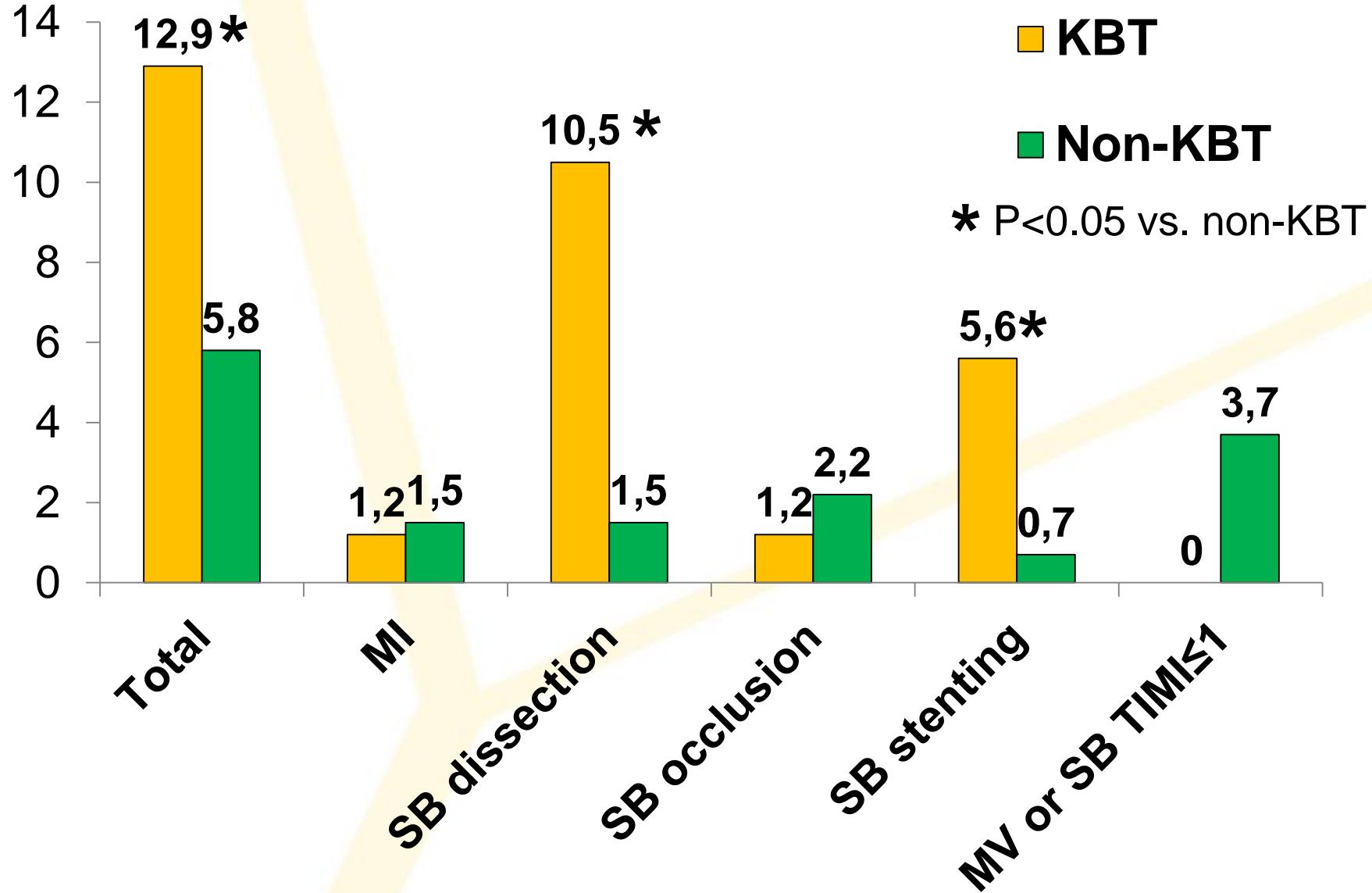
% Lumen volume gain:  
(%) prox MV vs. dist MV

**P<0.001**



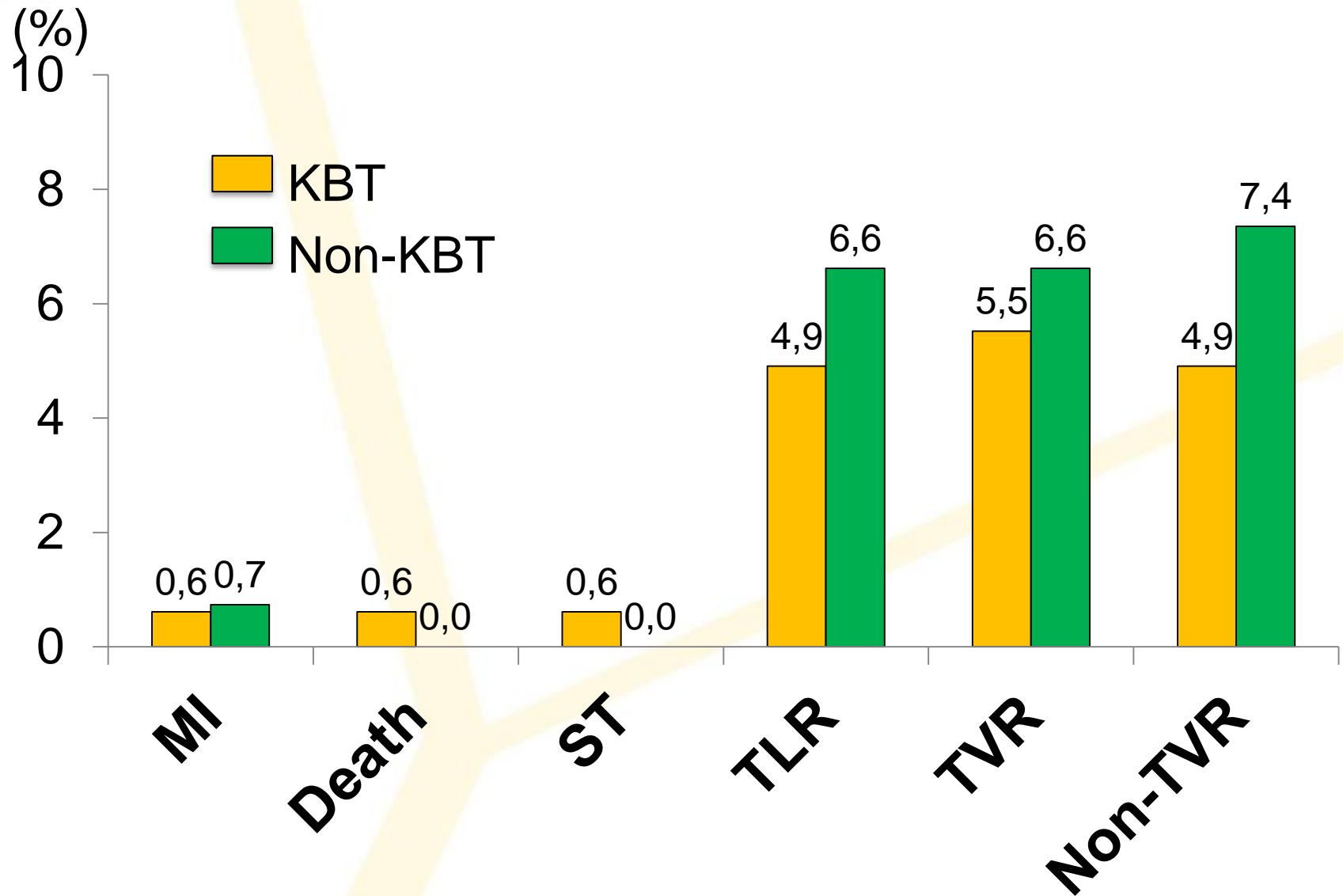


# Procedure related complications





# Major Adverse Cardiac Events (MACE) at 9Mo



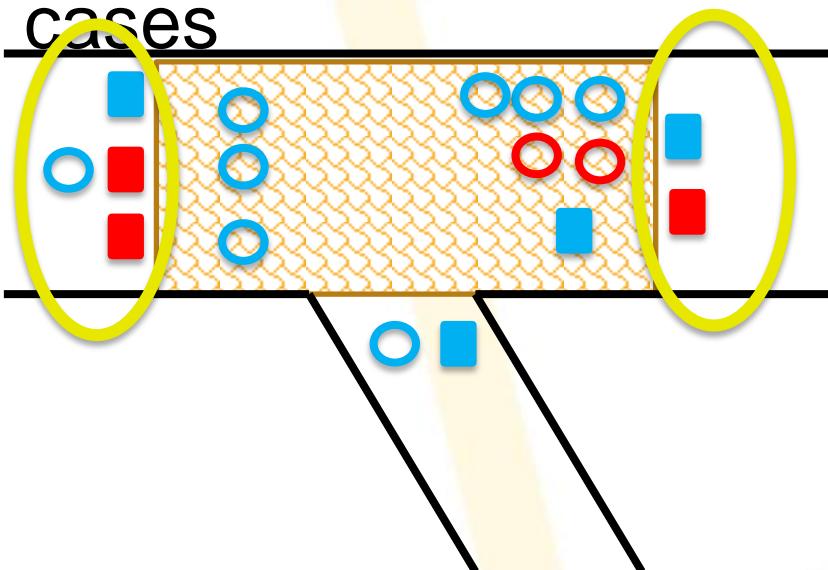


# MACE: TLR

## Location of TLR

MV 15 cases, SB 2

cases



- EES NGBT
- SES NGBT
- EES KBT
- SES KBT

## MV edge restenosis

KBT 5/6

NKB 1/9 ( $P < 0.05$ )

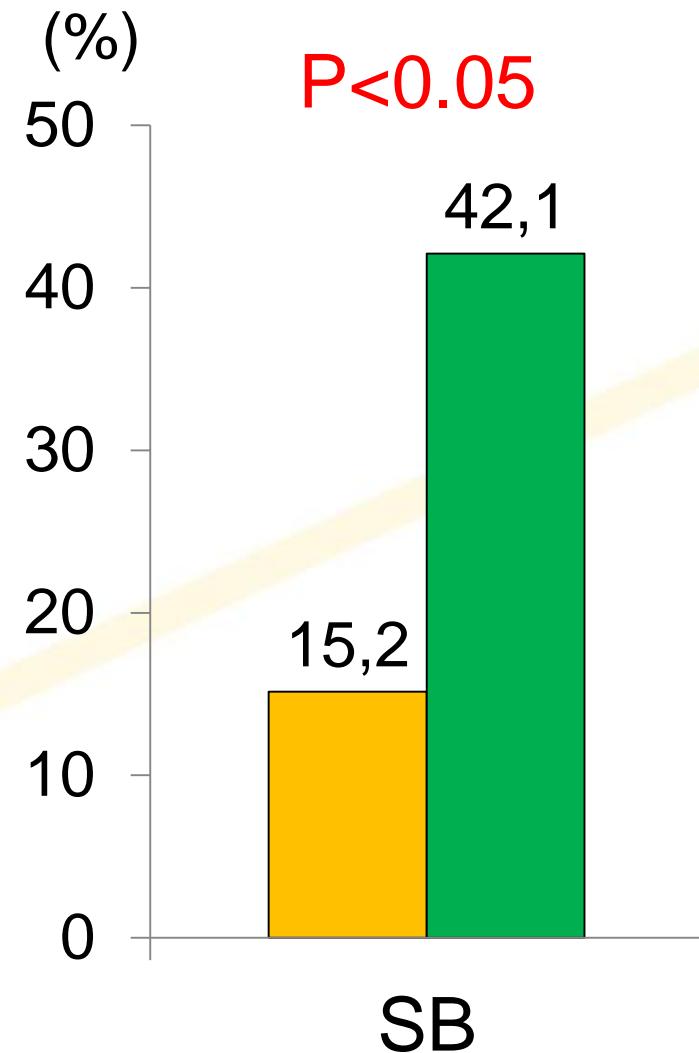
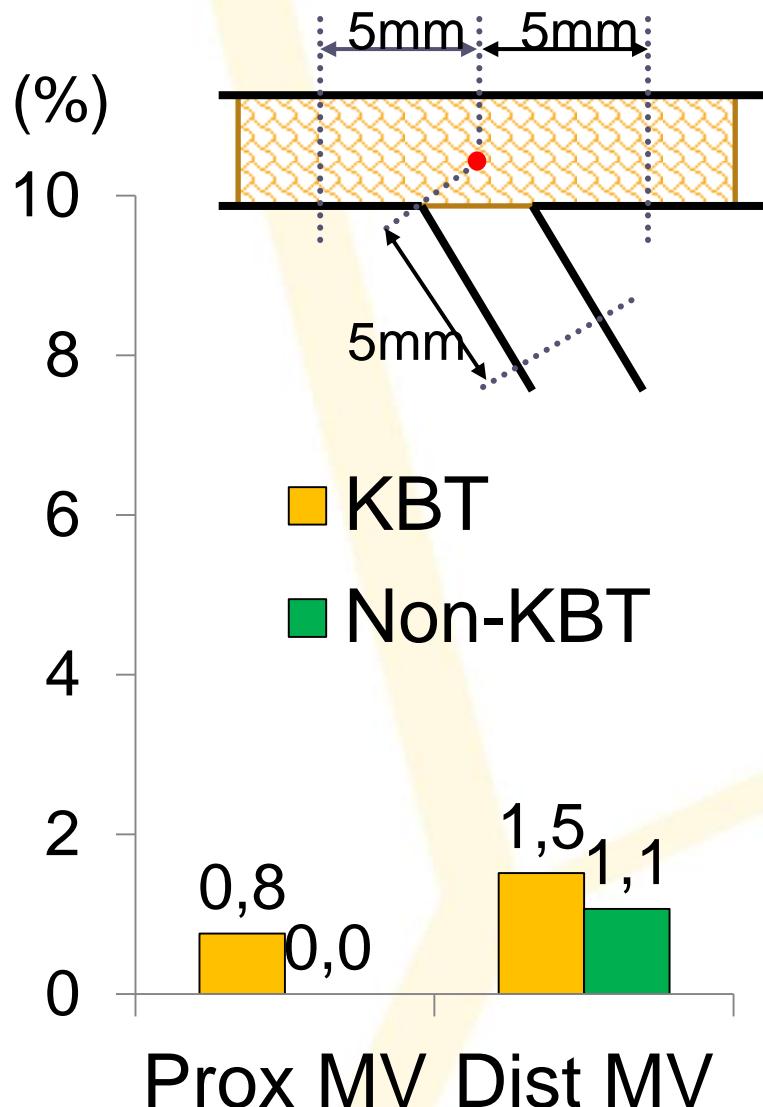
## Type of restenosis

Focal	15 cases
Diffuse	2 cases

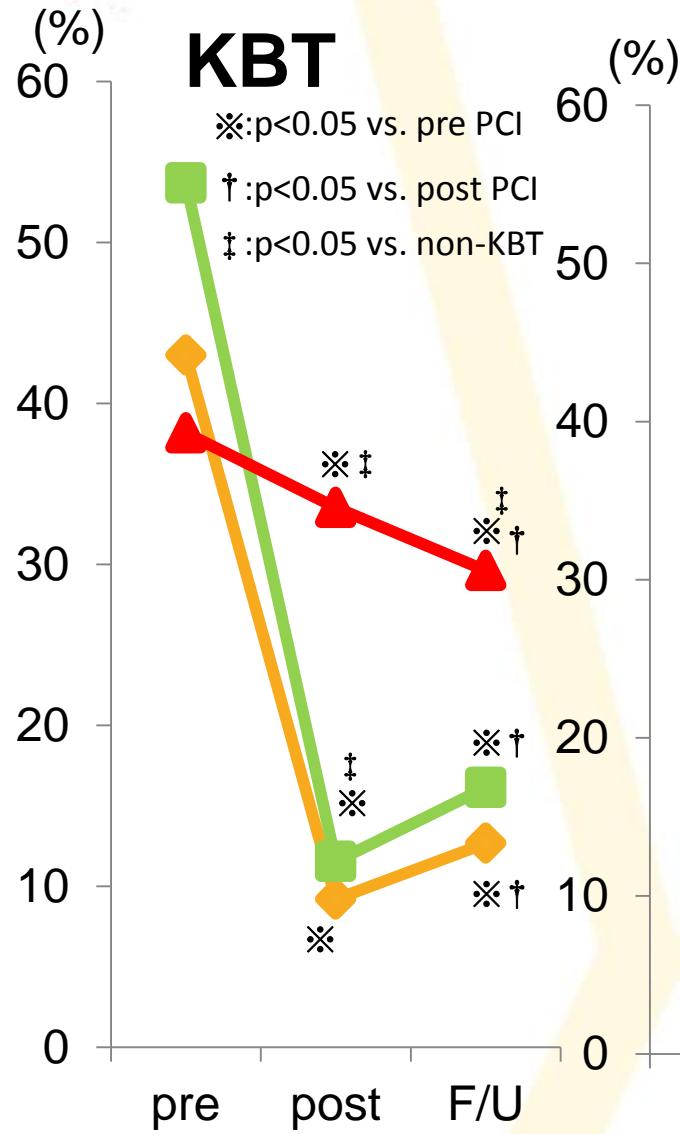
## Treatment

DES	10 cases
POBA	7 cases

## QCA: Binary restenosis in bifurcation area

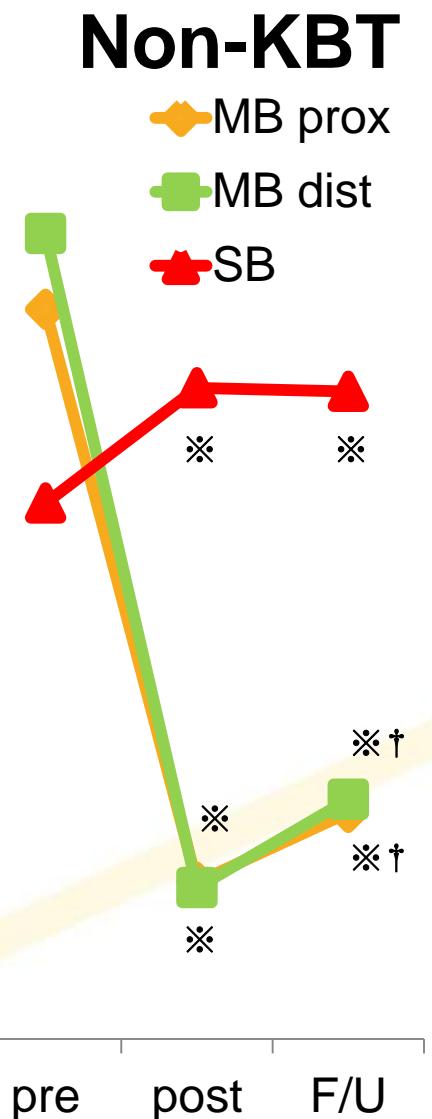


# % Diameter stenosis

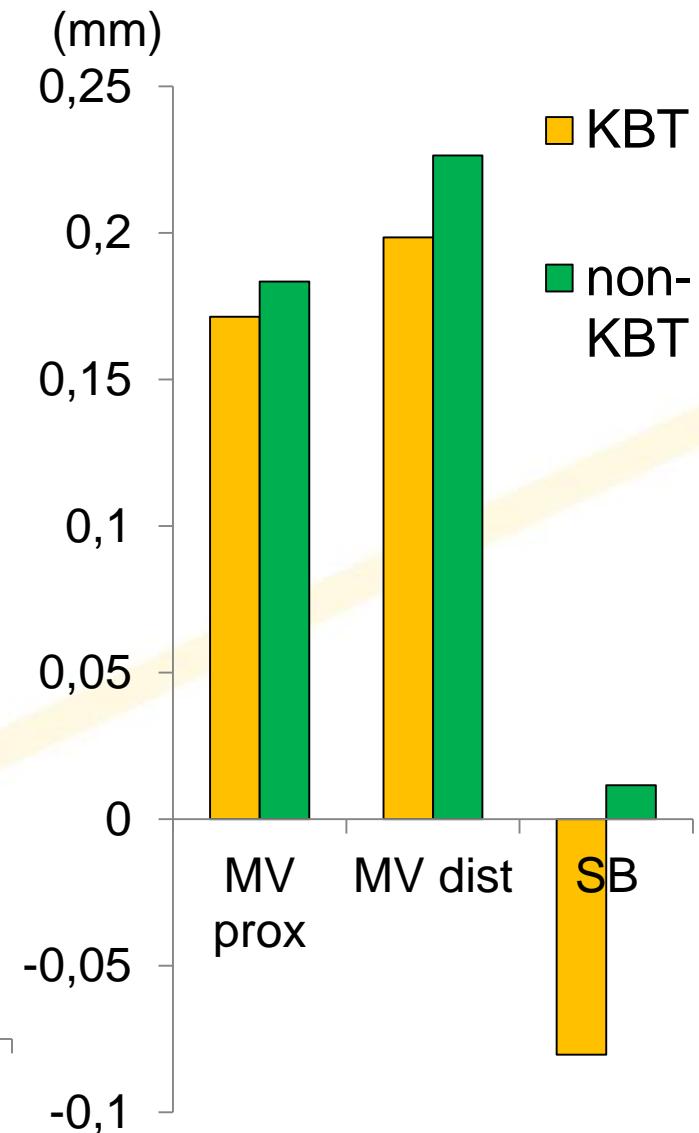


# Non-KBT

MB prox (orange)  
 MB dist (green)  
 SB (red)



# Late loss



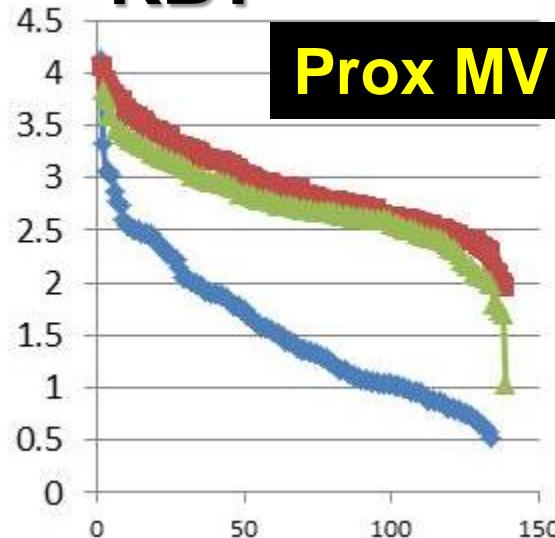


# QCA: Minimum lumen diameter

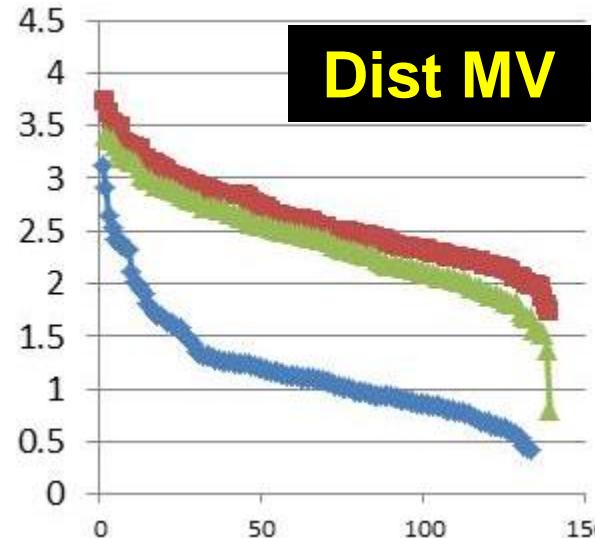
## Cumulative distribution curve

KBT

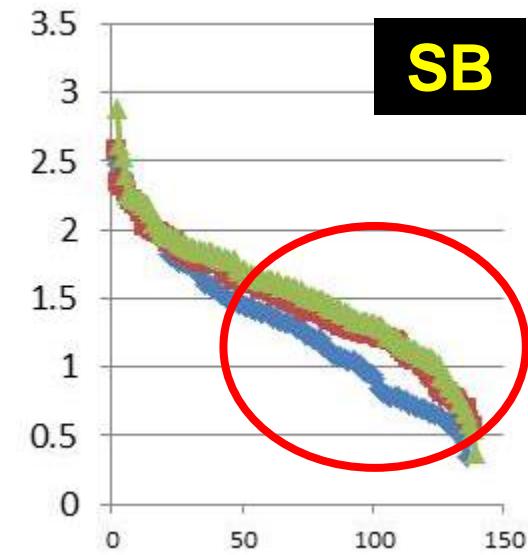
Prox MV



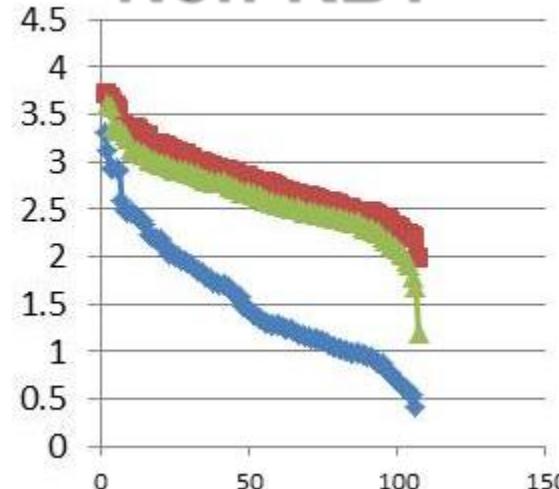
Dist MV



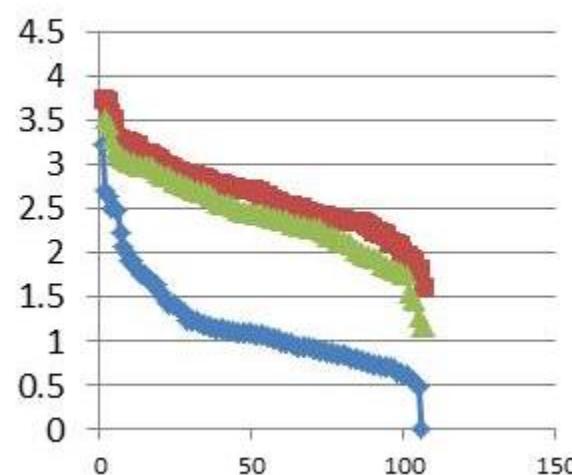
SB



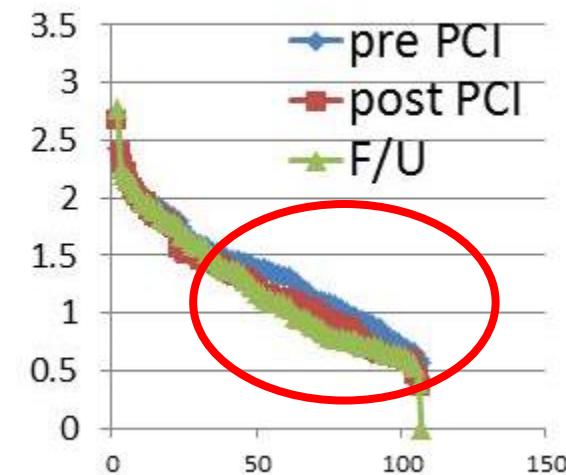
Non-KBT



(mm)

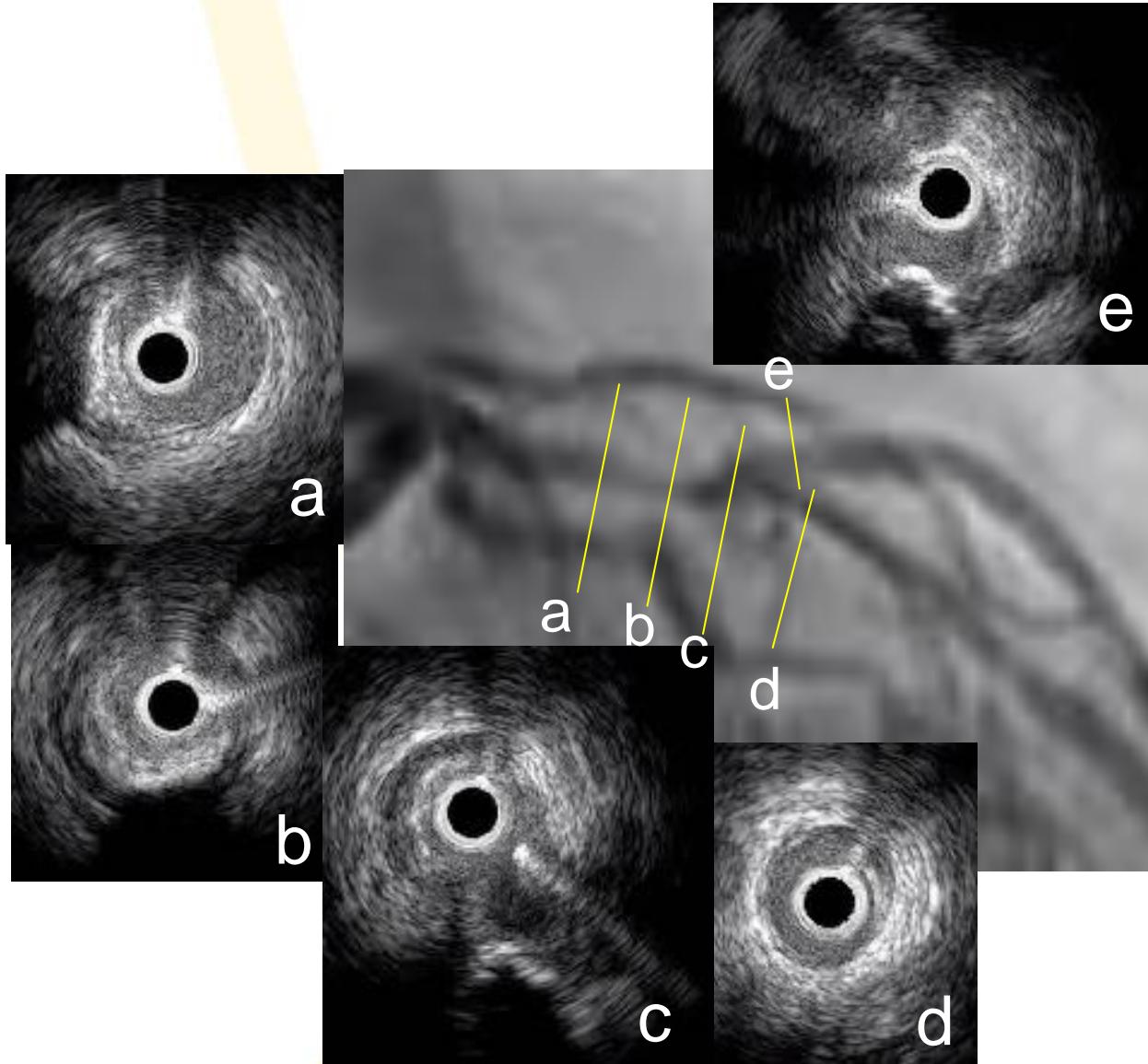


(mm)



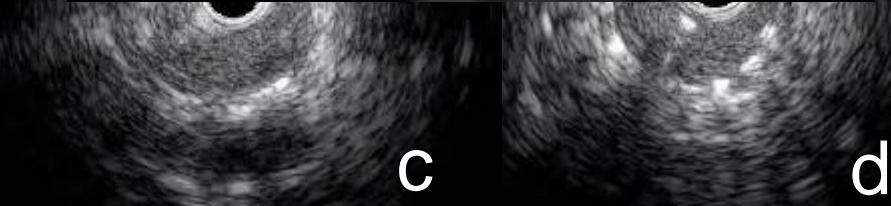
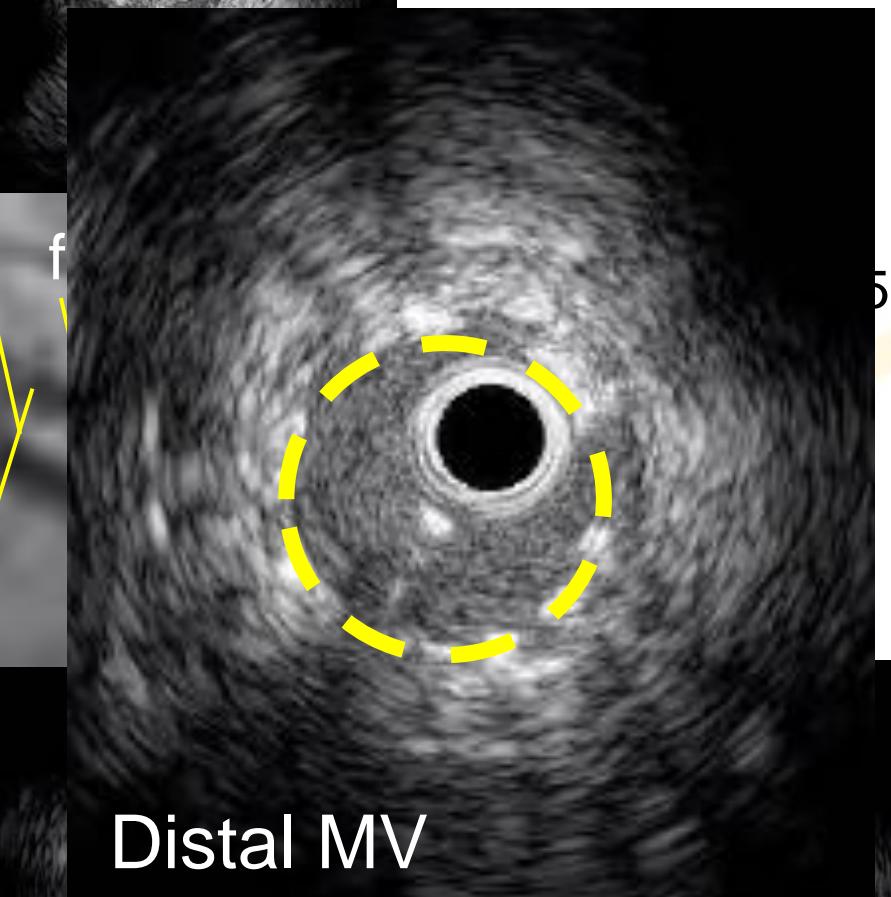
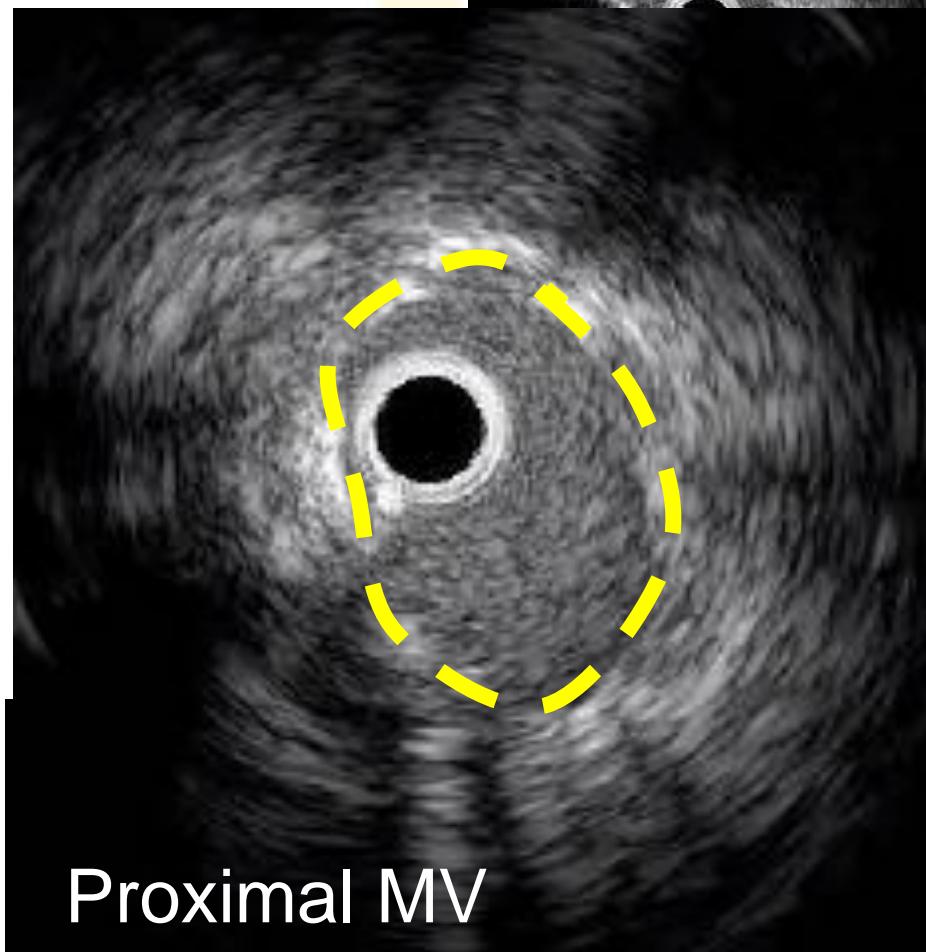
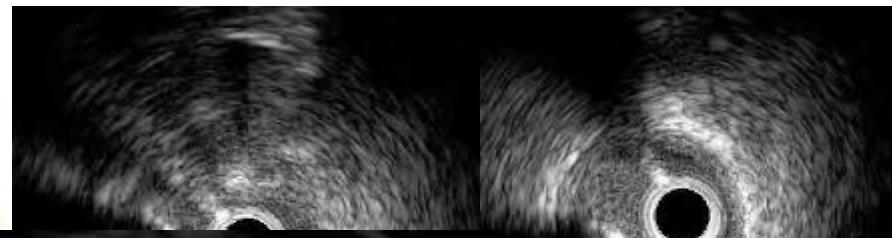


# SES + KBT



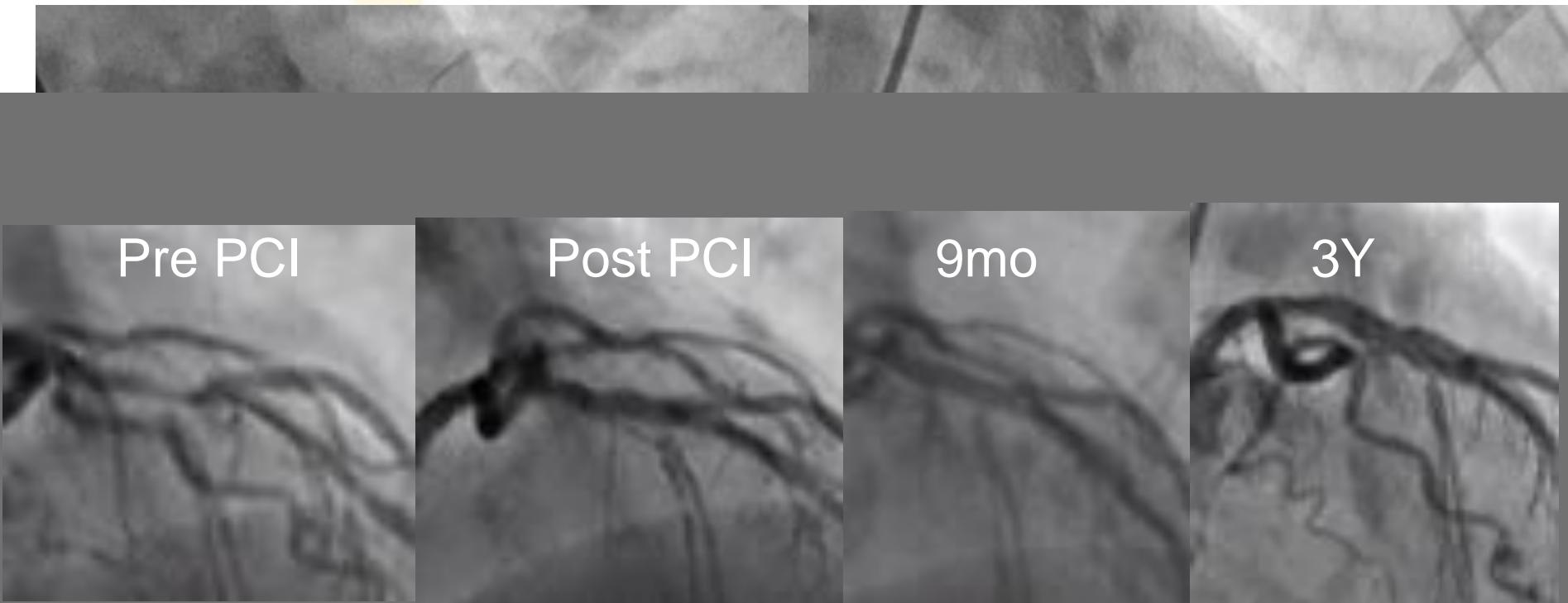
IVUS: Viewlt

126832 HO



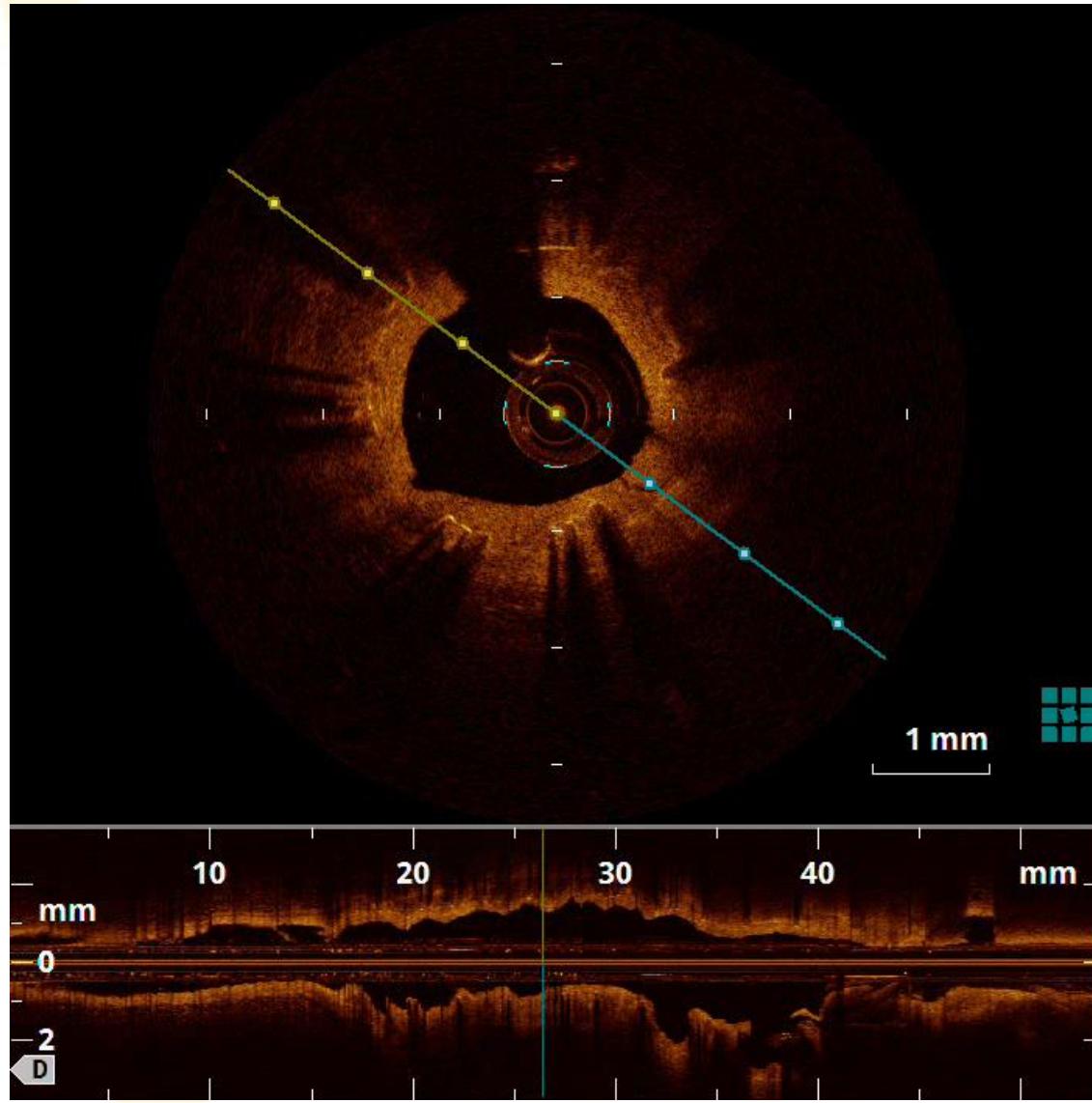


**3Y F/U CAG**

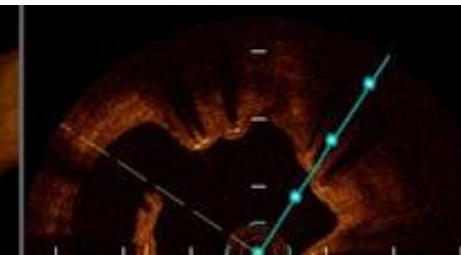




# OCT @ 3-year F/U



# Late malapposition was observed only in the overdilated proximal MV.



Overexpansion by KBT



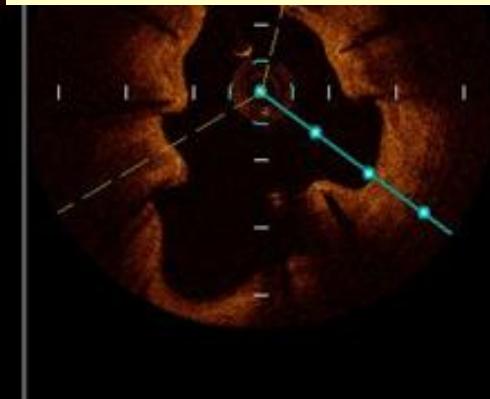
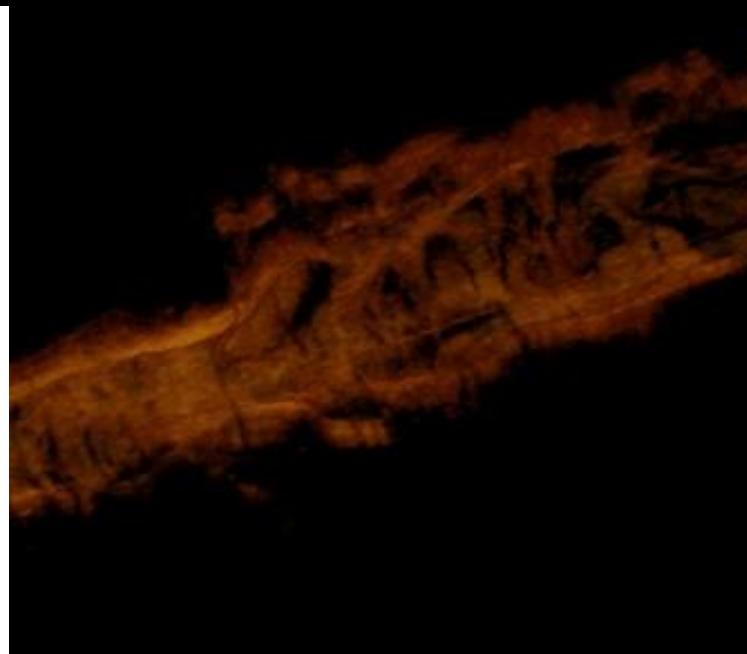
Destruction or degradation of  
internal elastic lamina



Persistent inflammation

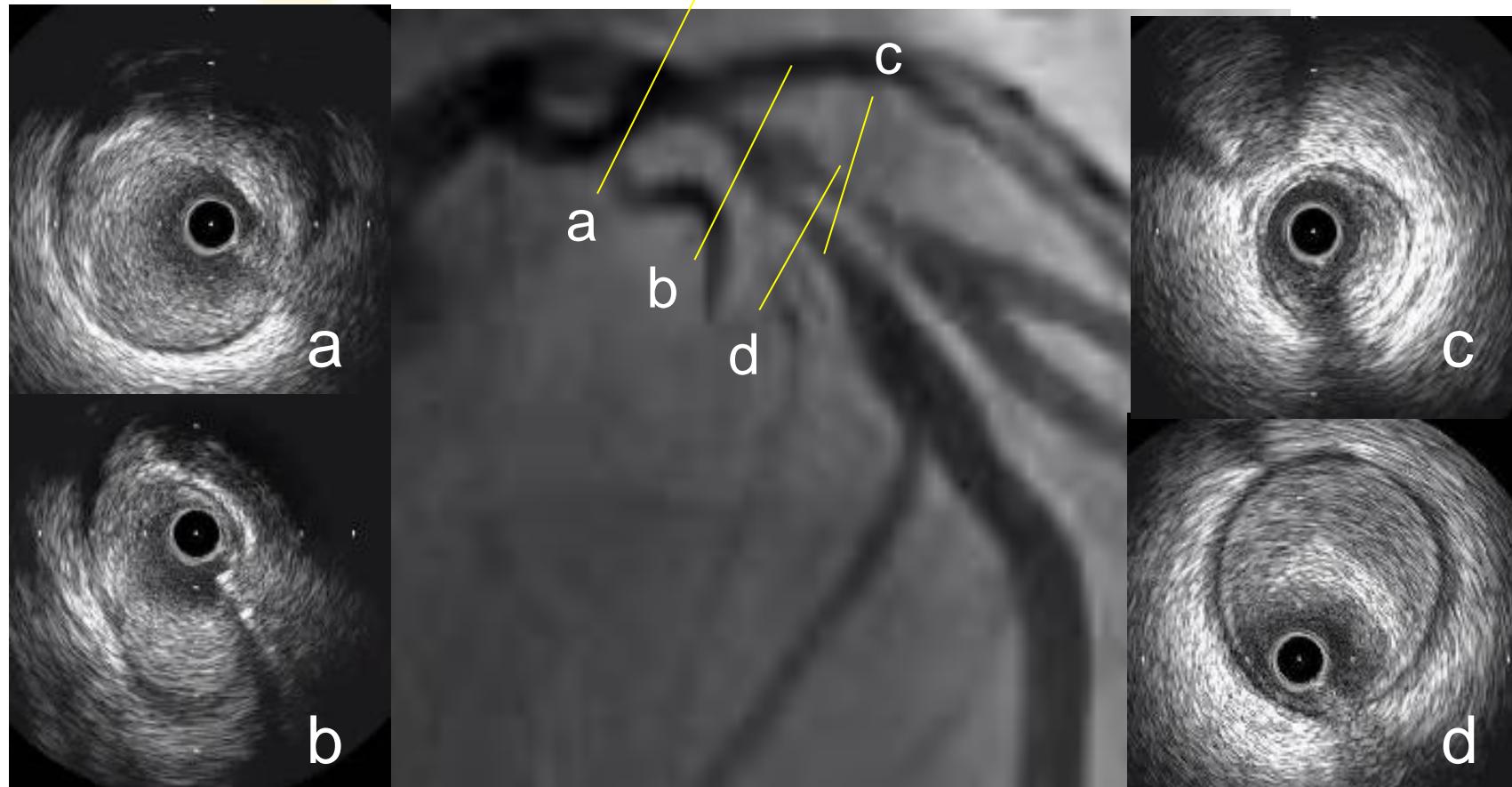


Ectasic degeneration





# EES + KBT

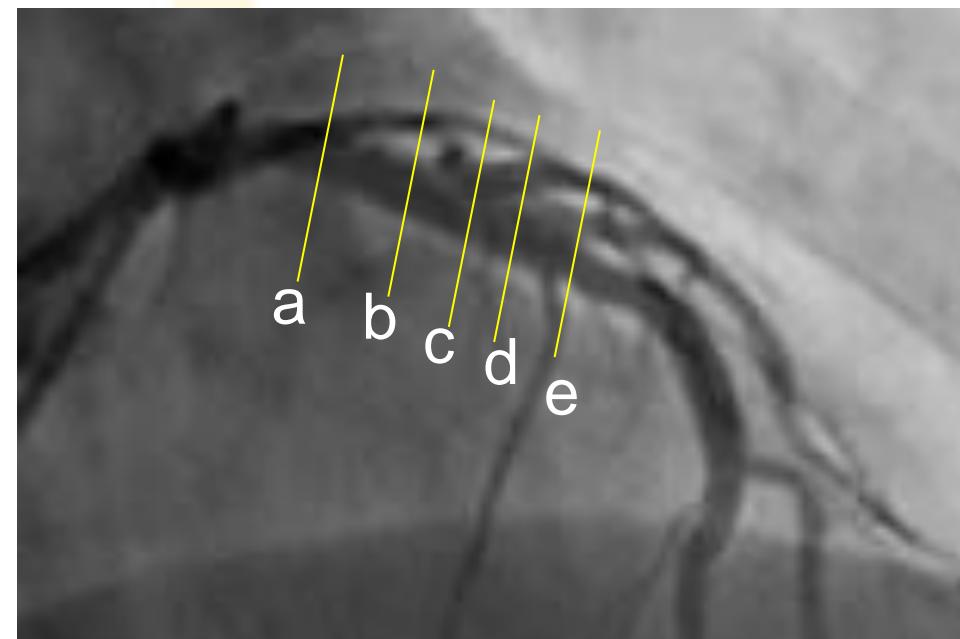
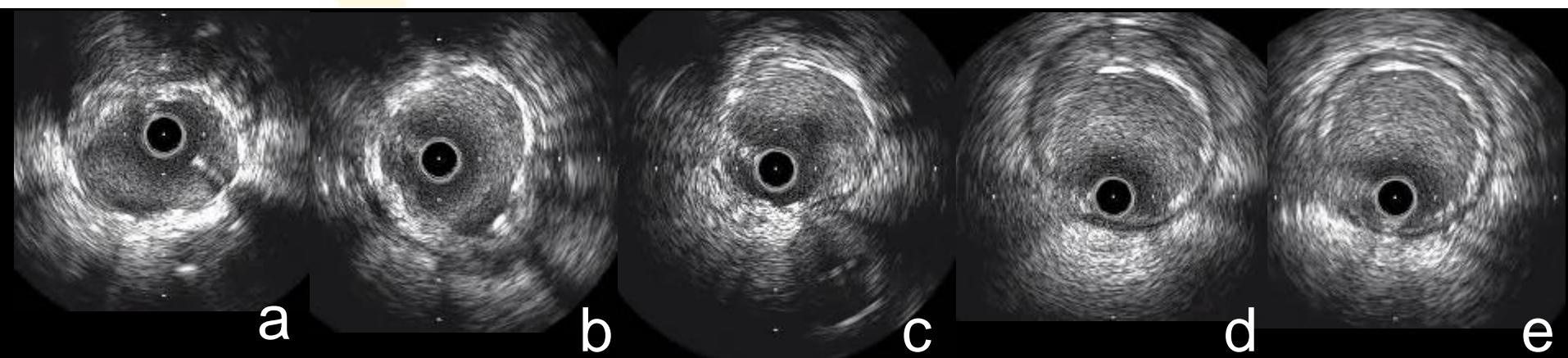


IVUS: Viewlt

127858 TY



# EES + KBT



Xience V 3.5/23  
KBT: Hiryu 3.5/15  
i-BP22 2.75/15

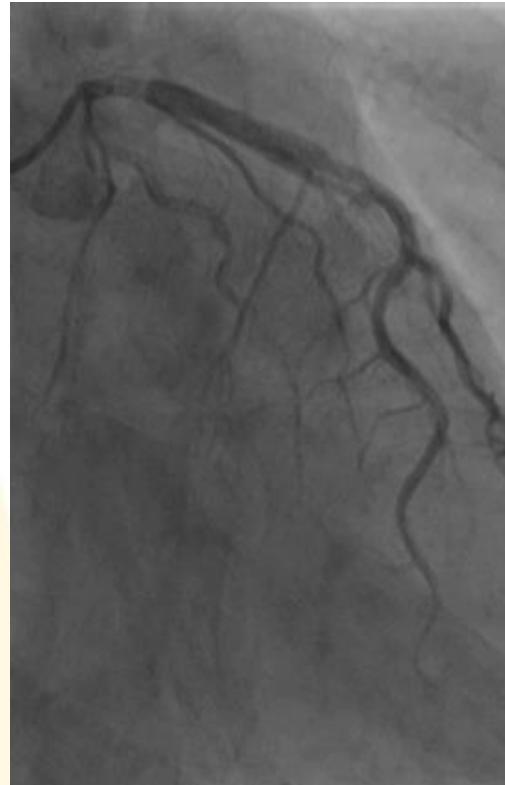
127858 TY

# Time course of resolution of vasospasm around the stent

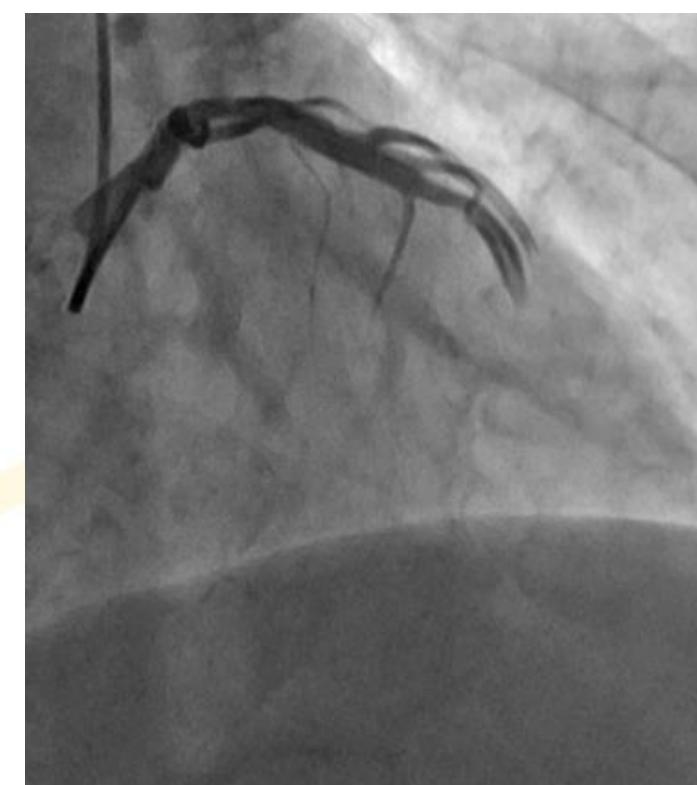
9mo



15mo



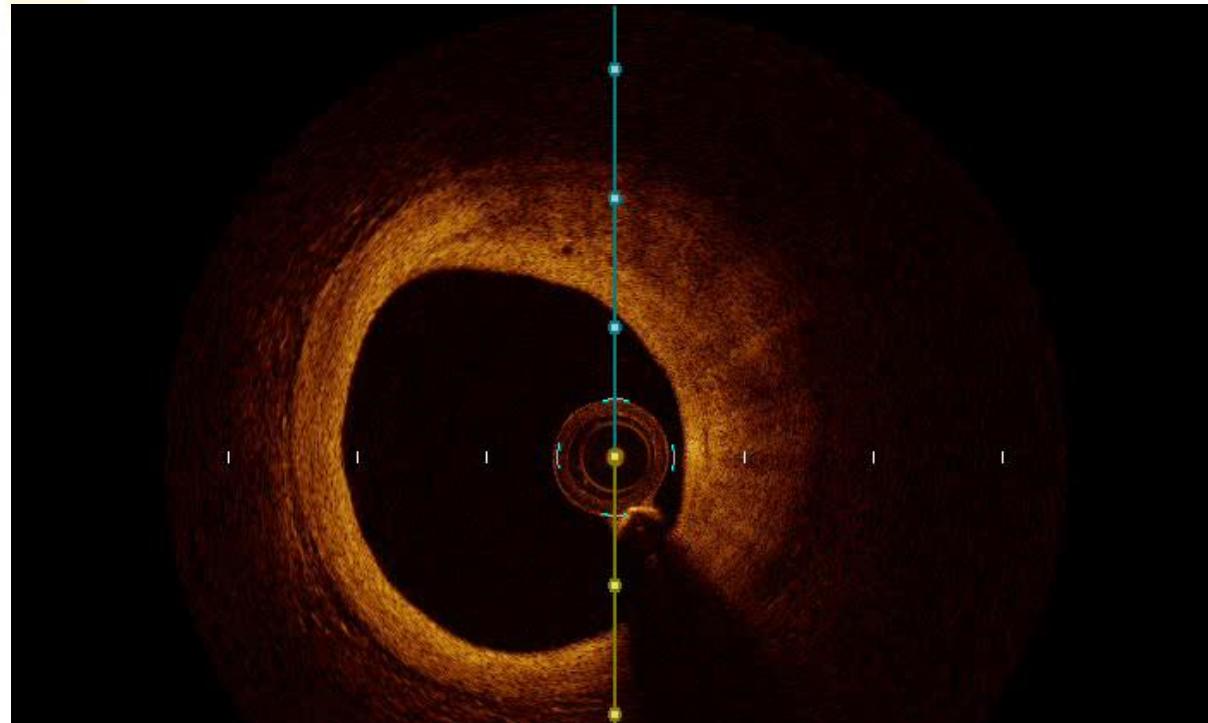
3Y



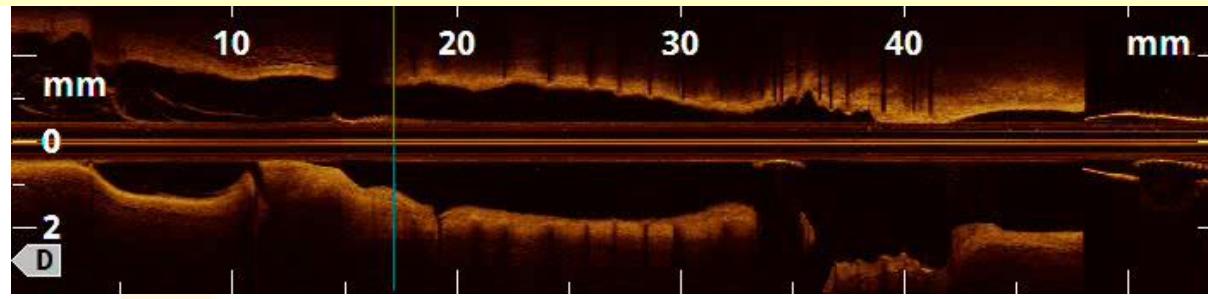
Overexpansion might be related to vasospasm induced by persistent inflammation.



## F/U OCT @ 3Y



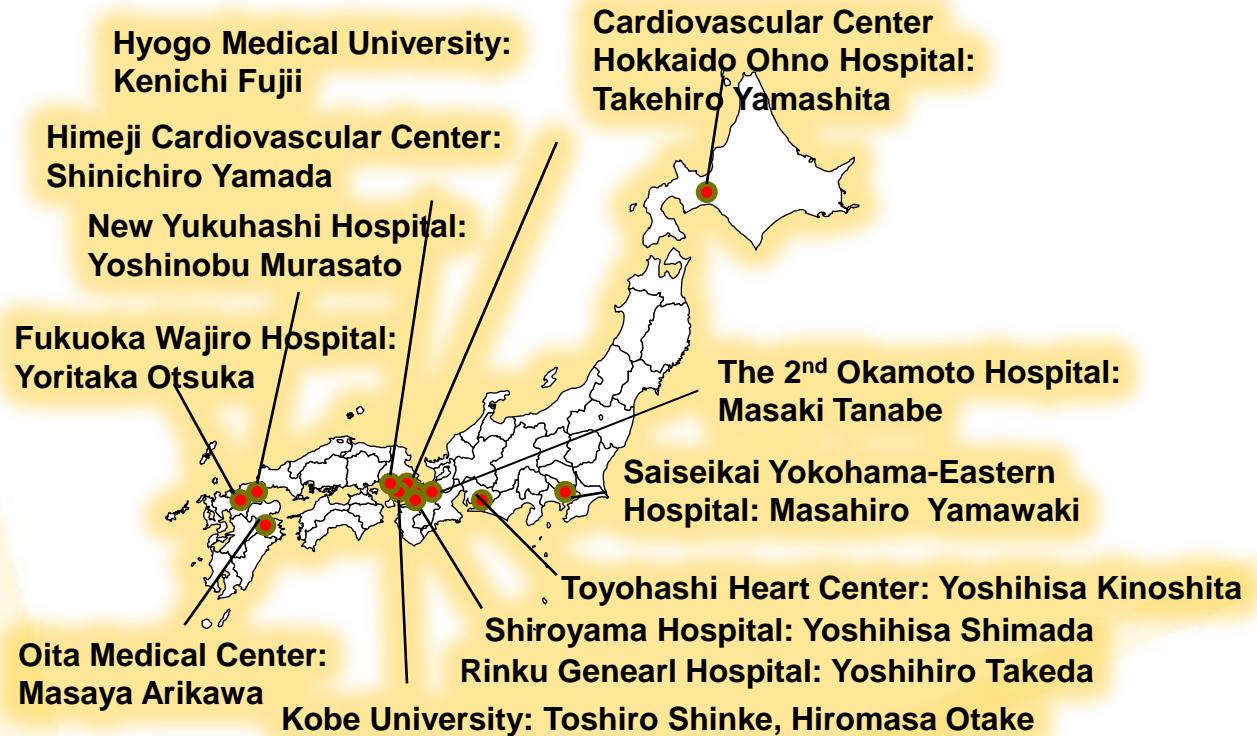
The EES has a potential to sedate inflammation even in the overdilated area.





# Conclusion

- The KBT induced more SB dissection required stenting and asymmetrical stent expansion in the proximal MV, however, it led to maintaining lower SB stenosis and larger proximal MV lumen during the 9-month F/U period without any increase in MACE.
- Asymmetric or overexpansion induced by KBT has a potential to generate more intimal disturbance in the long-term F/U period.

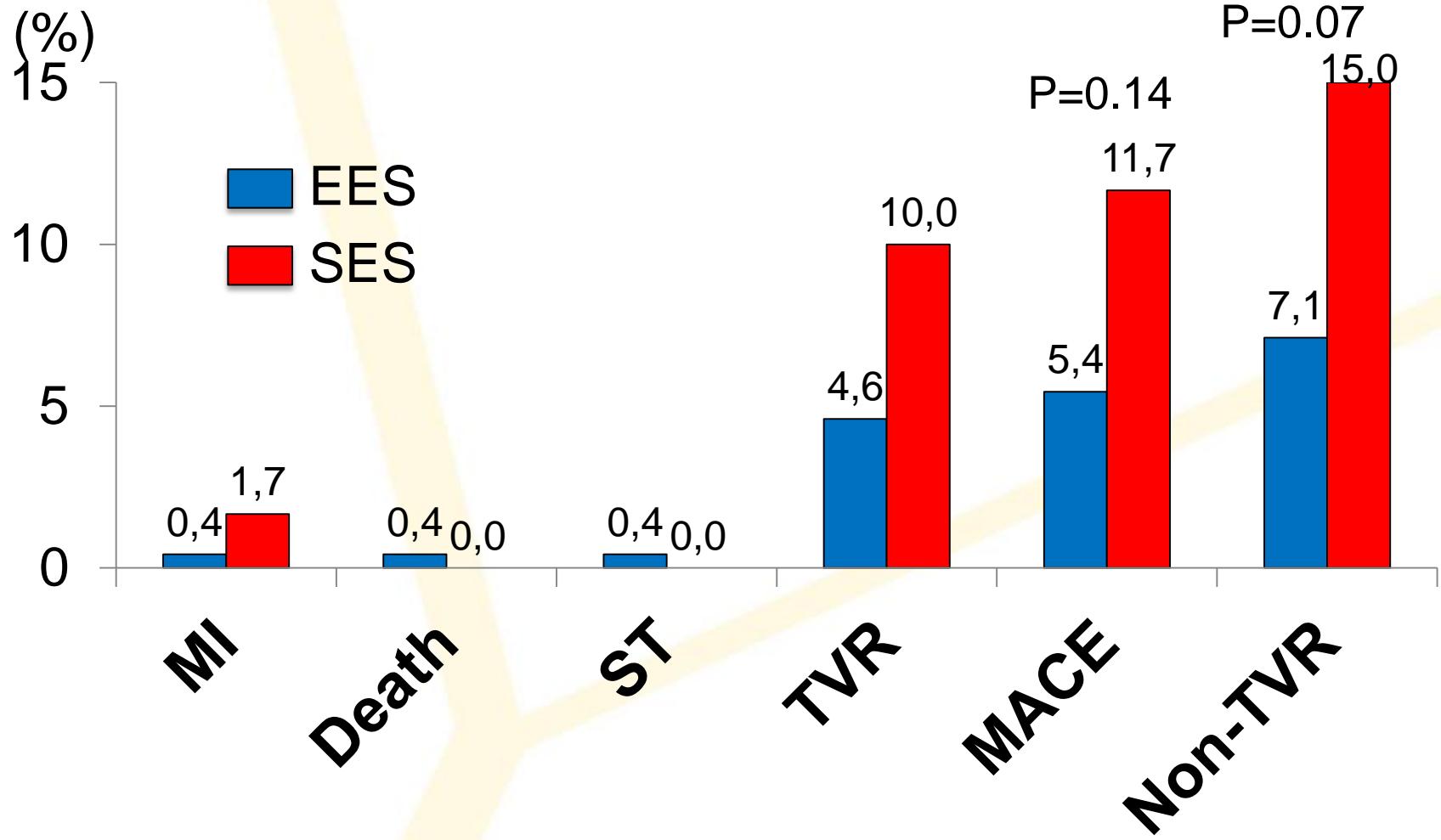


# J-REVERSE Study-1

## EES vs. SES



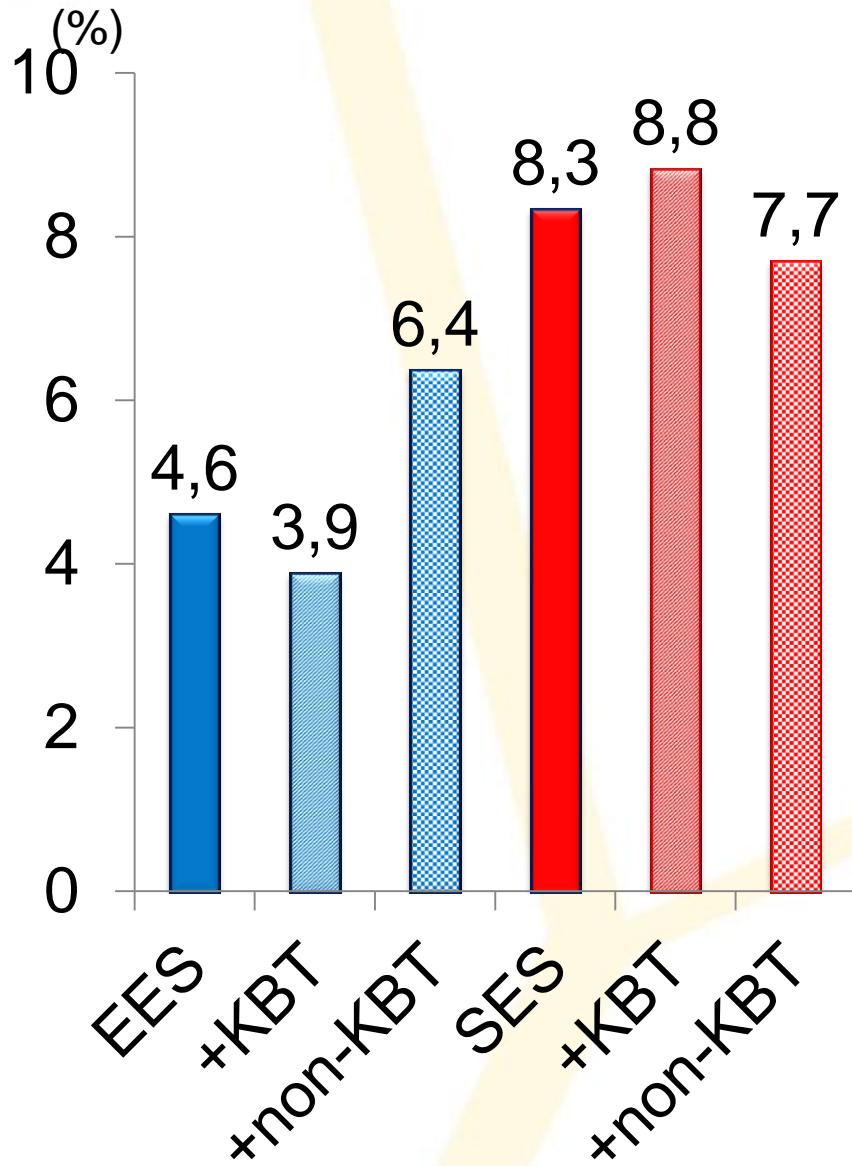
## MACE @ 9Mo



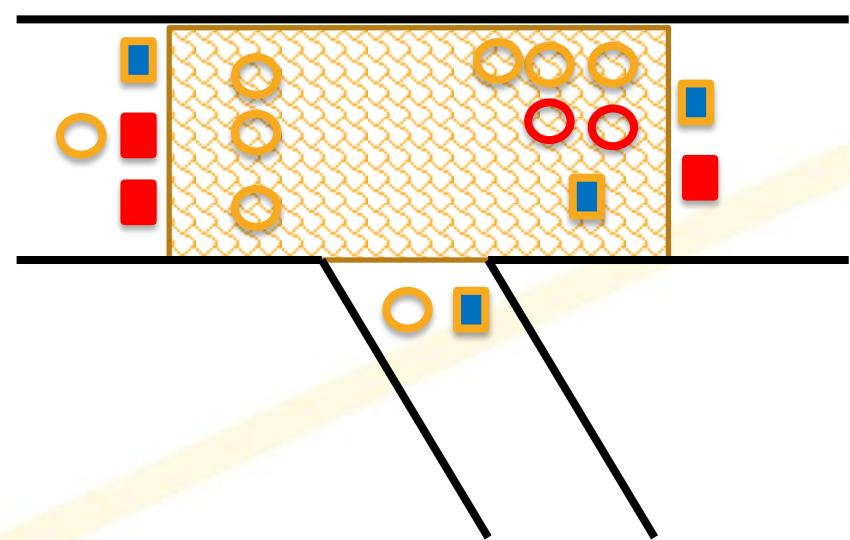
MACE: Composite endpoint of MI, death, ST, and TVR



# MACE: TLR



MV 15 cases, SB 2 cases



○ EES NKBT    □ EES KBT  
○ SES NKBT    ■ SES KBT

## QCA: Binary restenosis in bifurcation area

