

# - PCI for LMT lesion -

- From MITO to Beyond -

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# MITO registry

- From 2002 to 2019 -

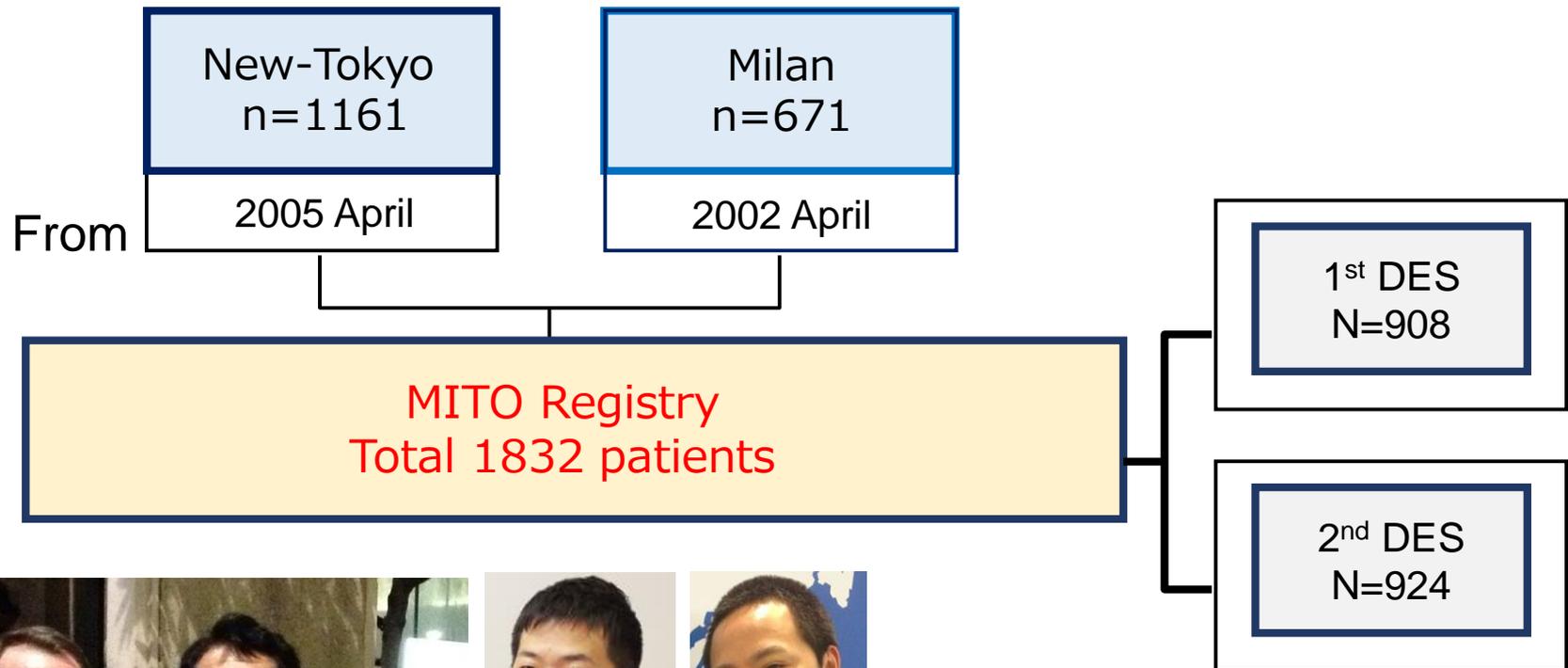
**Already : 25 papers**



- To foresee the meaning, truth -

# The Milan and New-Tokyo (MITO) Registry

Between April 2002 and Jun 2019



# 1. Fate of LCx

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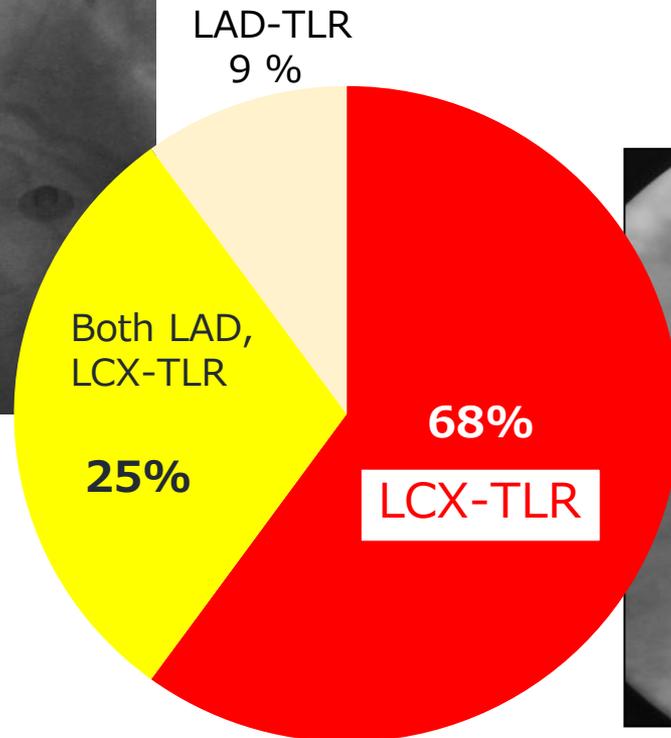
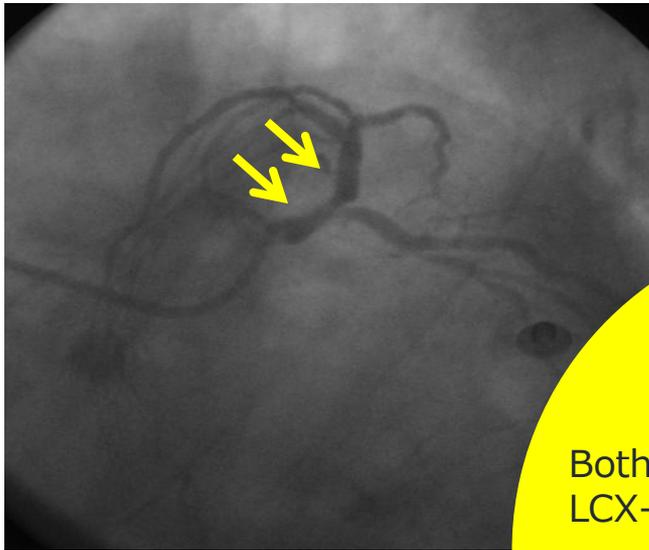


LMT PCI is always suffered from higher restenosis rate in LCX.  
However, the incidence really impact on the patient's prognosis ??

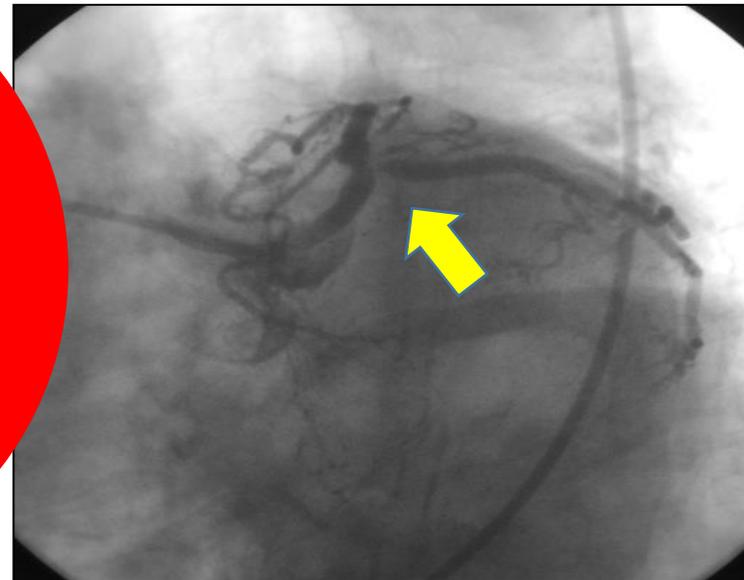
# The impact of Main Branch Restenosis on Long Term Mortality Following Drug-eluting Stent Implantation in Patients with De Novo Unprotected Distal Left Main Bifurcation Coronary Lesions: The Milan and New-Tokyo (MITO) Registry

K.Takagi, S.Nakamura A.Colombo et.al Catheter Cardiovasc Interv. 2013

## Distal LAD-ISR

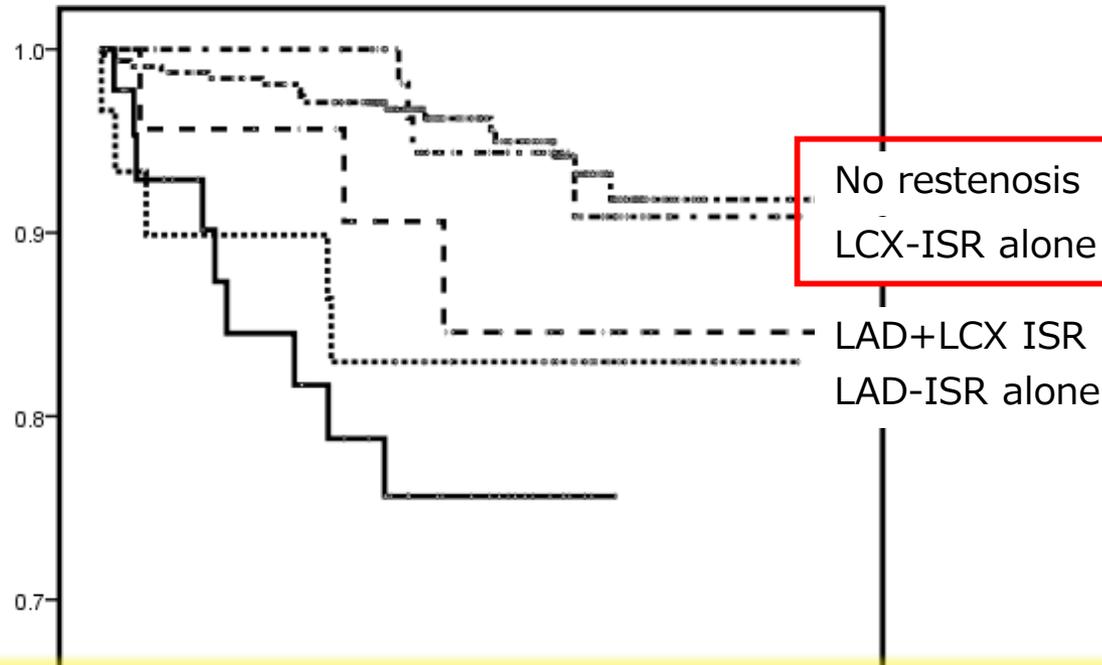


## LCx ostial ISR alone



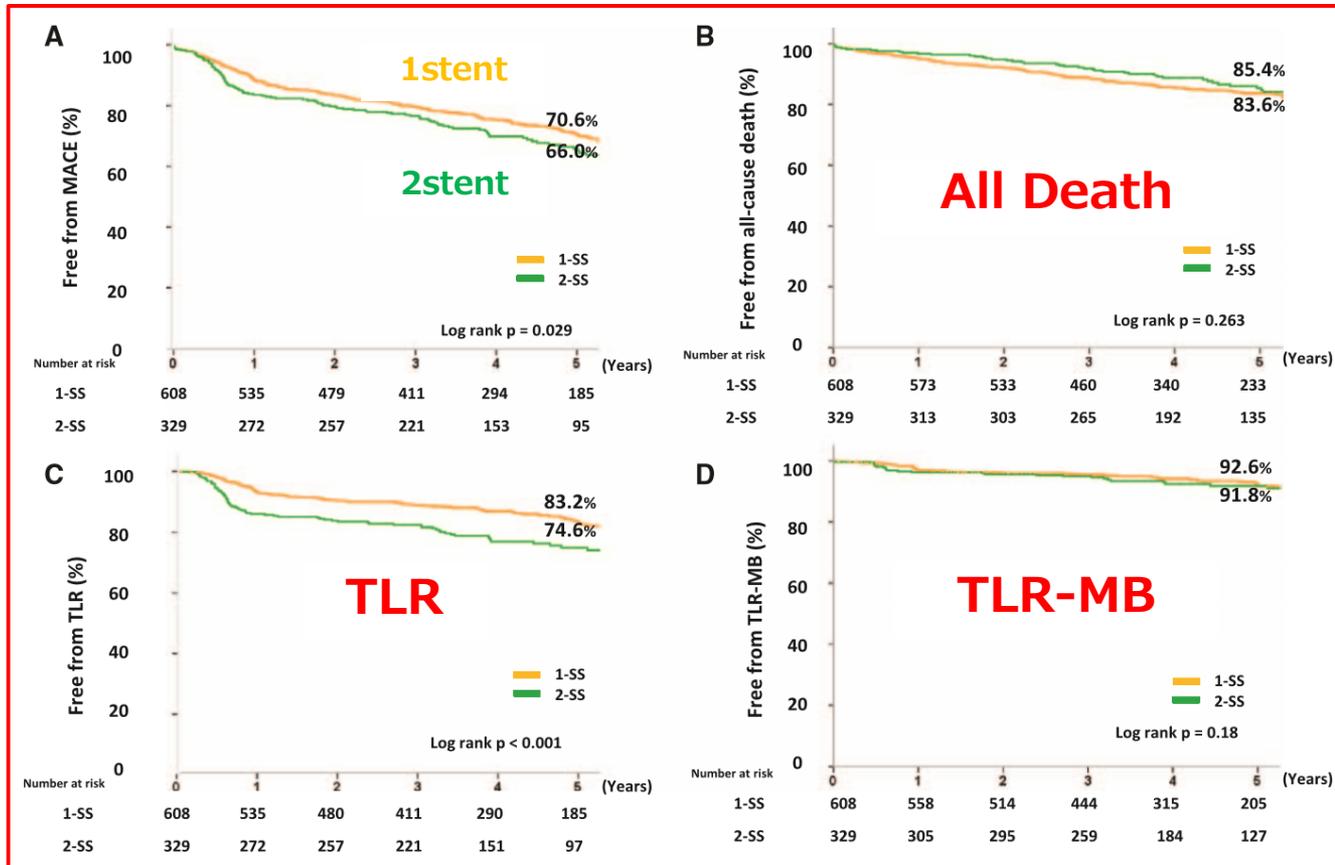
# ① LCX reoste. is not directly link to fatal prognosis ??

n=753



Among restenosis after LMT PCI, restenosis at LCX ostium is not directly link to fatal prognosis in most of the cases. Therefore our focus should be shifted to restenosis at LM toward LAD, which strongly affect on patients' fatal prognosis.

## ② Same Trend in 2<sup>nd</sup> generation DES era



The 2-SS might have been caused by the high development of LCX reoste. However overall this had little impact on long-term mortality.

# Comparison Between 1- and 2-Stent Strategies in Unprotected Distal Left Main Disease The Milan and New-Tokyo Registry

Circ Cardiovasc Interv. 2016 by K.Takagi, S.Nakamura A.Colombo et.al

**Table 3. Clinical Outcome According to Stent Strategy in Unprotected Distal Left Main Patients**

Event at Follow-Up	<b>1-stent</b> (n=608)	<b>2-stent</b> (n=329)	HR, 95% CI; P Value	Adjusted HR, 95% CI; P Value
MACE	180 (29.6)	126 (38.3)	1.29, 1.03–1.62; 0.03	1.19, 0.92–1.54; 0.20
All-cause death	101 (16.6)	48 (14.6)	0.82, 0.58–1.16; 0.26	0.88, 0.60–1.29; 0.53
Cardiac death	52 (8.6)	18 (5.5)	0.60, 0.35–1.02; 0.06	0.52, 0.29–0.92; 0.03
TLR	96 (15.8)	92 (28.0)	1.91, 1.43–2.54; <0.001	1.59, 1.15–2.20; 0.005
TLR-MB	44 (7.2)	37 (11.2)	1.35, 0.84–2.10; 0.18	1.05, 0.64–1.72; 0.86
TLR-SB	63 (10.4)	76 (23.1)	2.38, 1.71–3.33; <0.001	1.94, 1.33–2.82; 0.001
MI	21 (3.5)	9 (2.8)	0.73, 0.33–1.59; 0.42	0.53, 0.23–1.24; 0.14
Definite/probable ST	11 (1.8)	6 (1.8)	0.99, 0.37–2.69; 0.99	0.86, 0.29–2.62; 0.80

CI indicates confidential interval; HR, hazard ratio; MACE, major adverse cardiovascular events; MB, main branch; MI, myocardial infarction; SB, side branch; ST, stent thrombosis; and TLR, target lesion revascularization.

### ③ Favorable outcomes in 1-stent strategy

The worse outcome in 2-stent strategy might have been caused by the high development of SB restenosis mostly of the ostium of the LCx even in the era of 2<sup>nd</sup> generation DES. However overall this had little impact on long-term mortality.

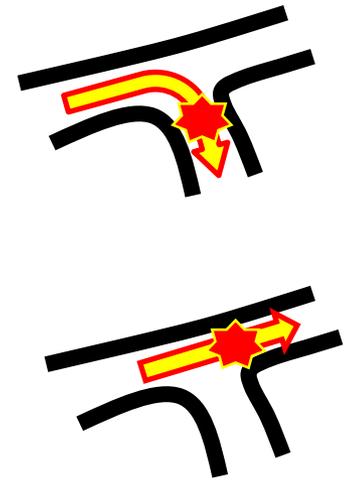
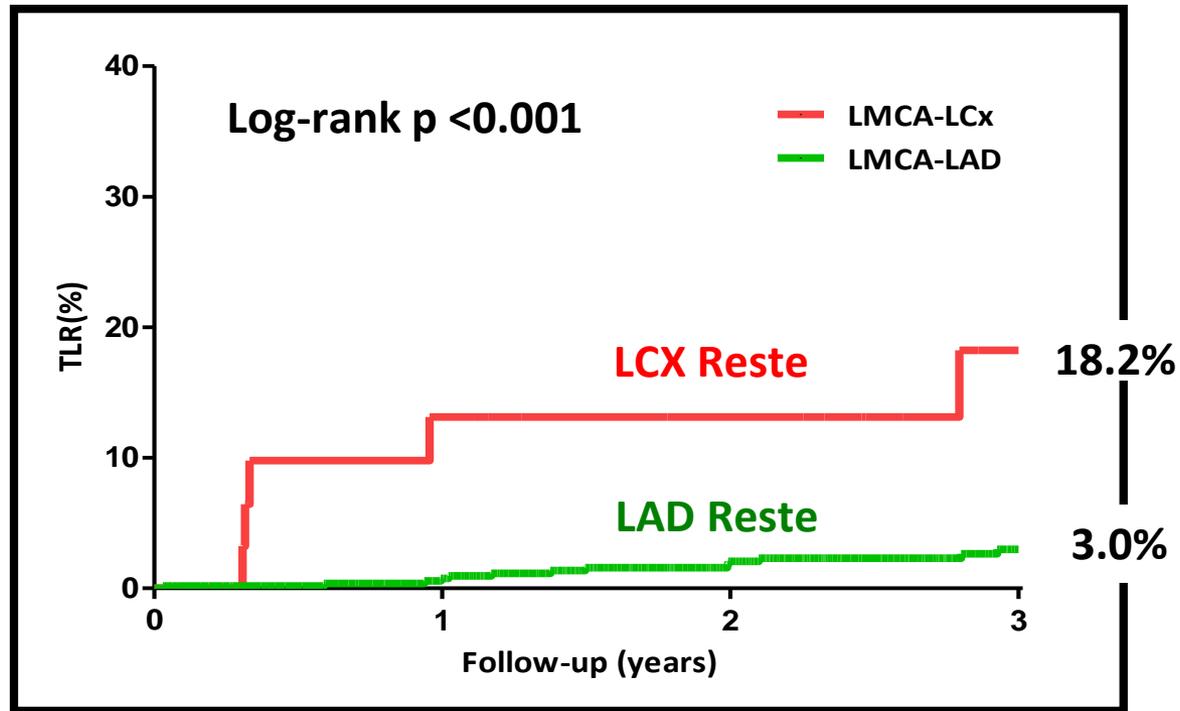


**Kensuke Takagi M.D. FACC**

Catheter Cardiovasc Interv. 2013 Sep 2

Circ Cardiovasc Interv. 2016

## ④ LCX independently shows high restenosis

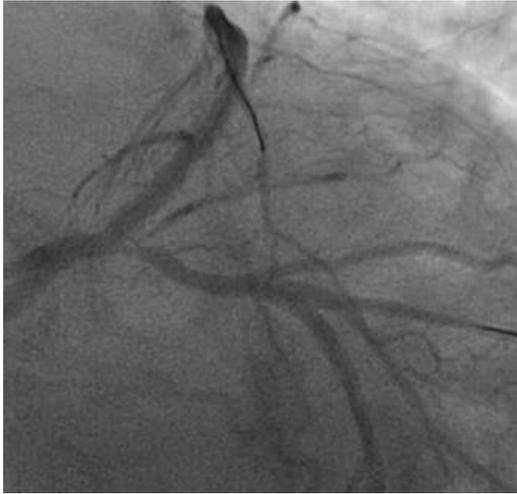


LCX ostium itself independently shows high restenosis rate  
in patients with LMT PCI.

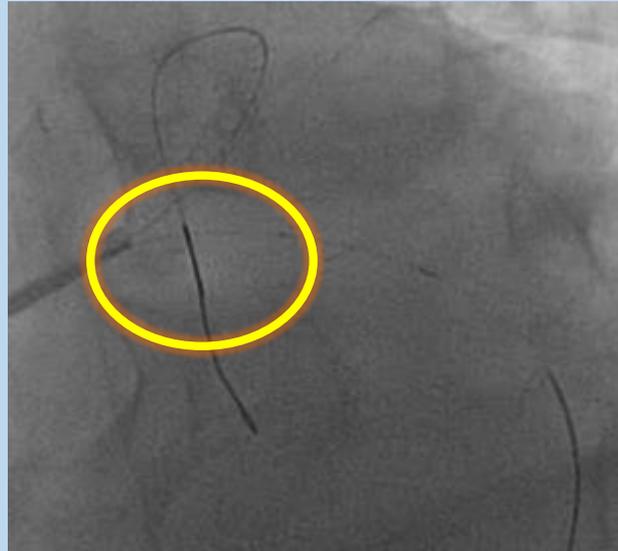
# ⑤ Implant. BVS at Prox. LCX may be problematic

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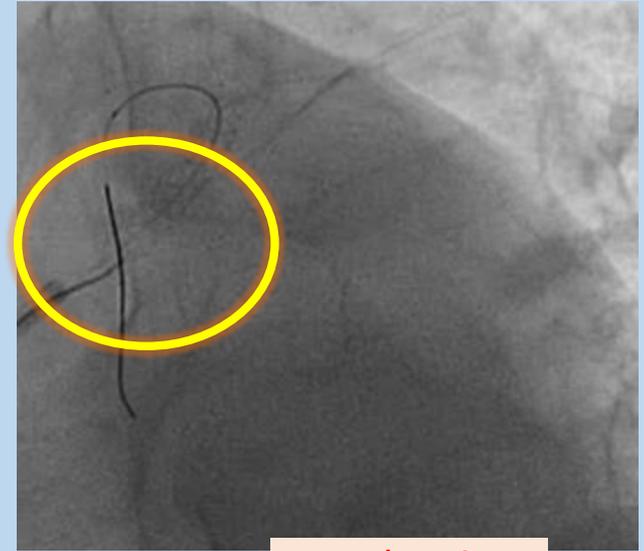
Pre



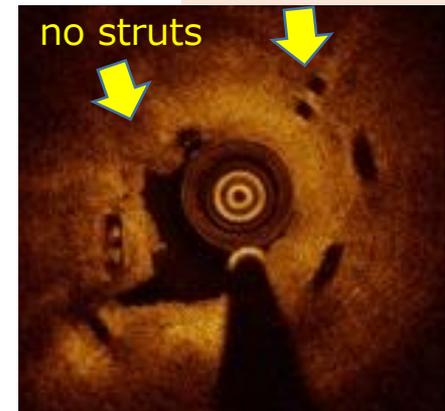
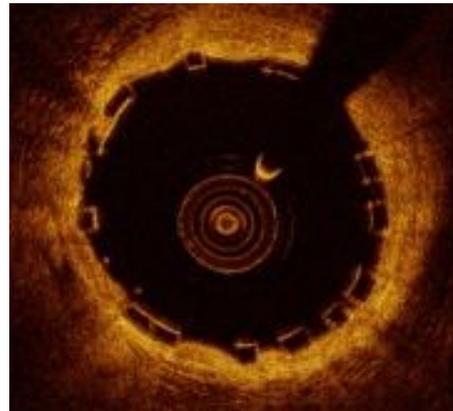
Just After PCI



6 Month



overlapping





**Do not chase to much !!**  
**"LCX" is a**  
**different animal**

This is very unique part of coronary artery !!!

So called, **HINGE POINT...**

**But point is "moving and Twitching"**

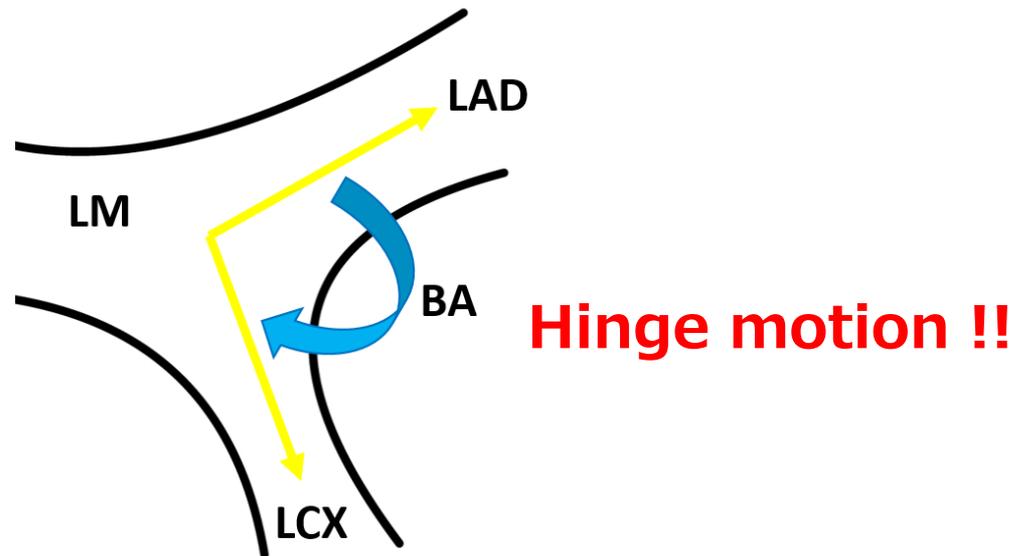
And not so much important as compared with LAD and RCA  
for keeping Ejection fraction of the patient's HEART.

.... LCX is not directly relevant to the patient prognosis

## ⑥ Higher restenosis rate in LCX

is associated with the hinge motion

$$\text{BA change} = (\text{End-diastolic BA}) - (\text{End-systolic BA})$$



**Median** of BA change = **7.2**

BA change below the median  $\Rightarrow$  Small BA change group

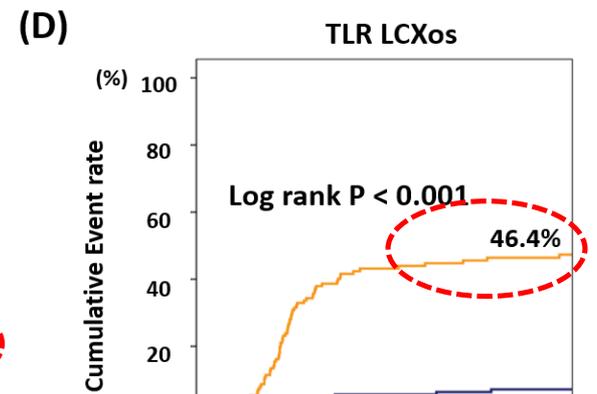
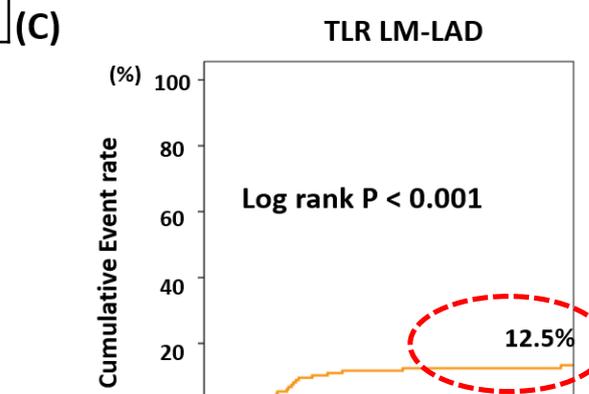
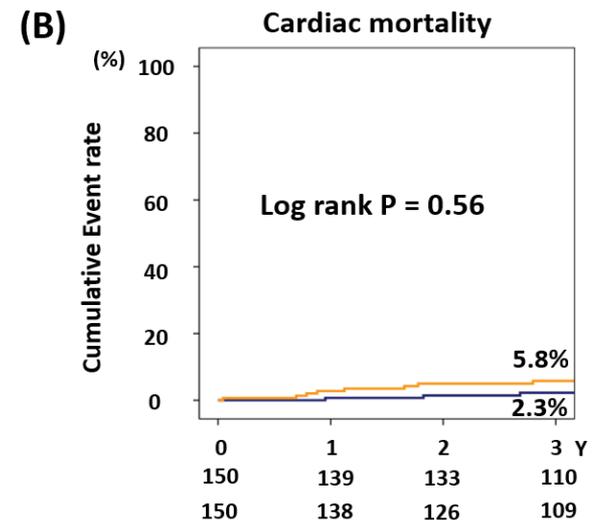
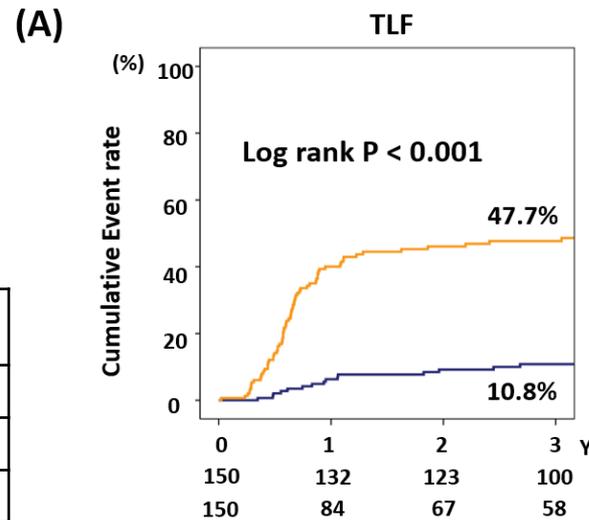
BA change above the median  $\Rightarrow$  Large BA change group

## ⑥ Higher restenosis rate in LCX

is associated with the hinge motion



	Small BA (n=150)	Large BA (n=150)	P value
2 <sup>nd</sup> DES	96 (64.0)	86 (57.3)	0.29
Mini crush	82 (54.7)	87 (58.0)	0.64
Culotte	35 (23.3)	27 (18.0)	0.32
TAP	33 (22.0)	36 (24.0)	0.78



**Large hinge motion is associated with LCX os restenosis**

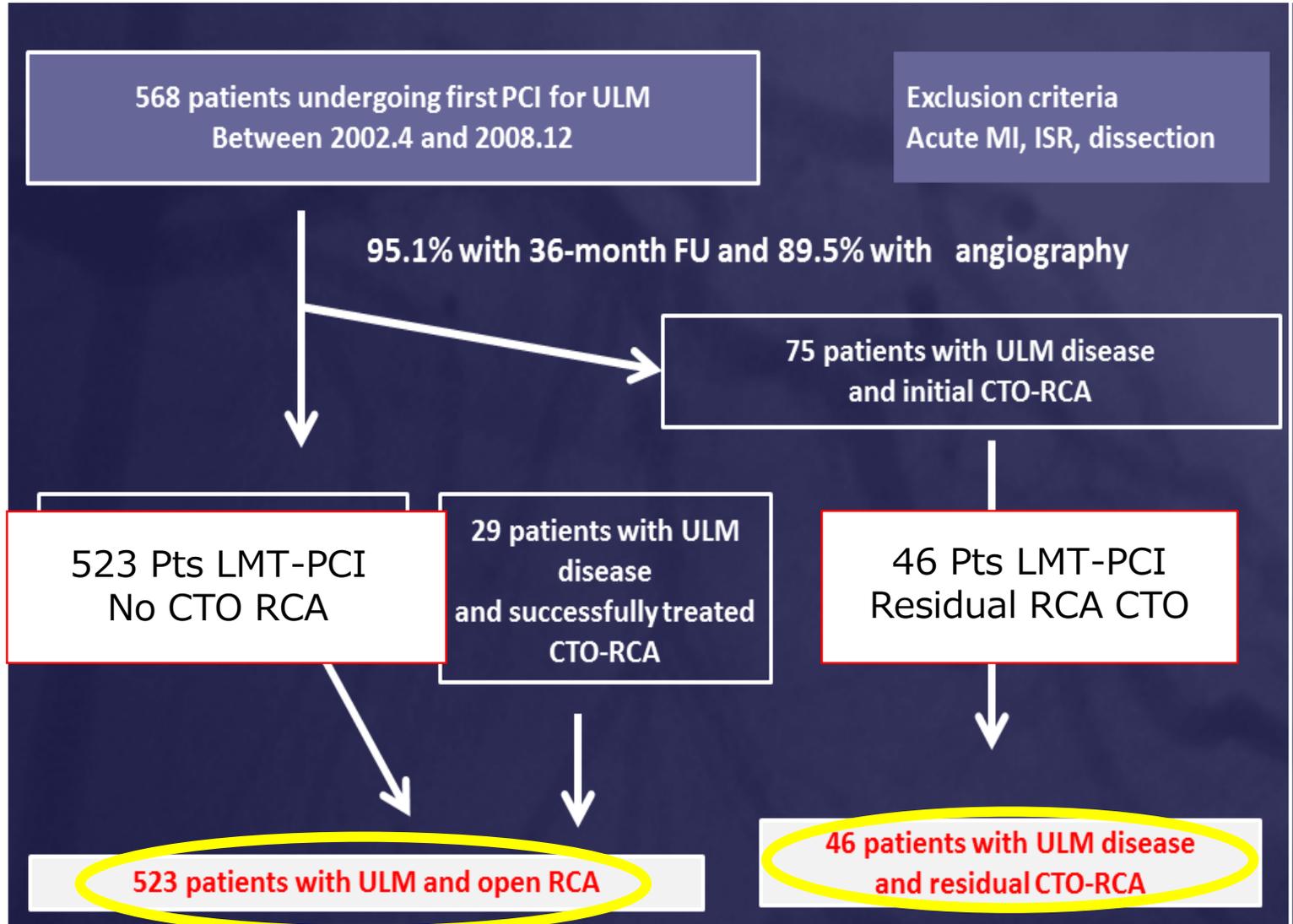


- 
1. LAD is important in terms of Patient's prognosis.
  2. LCX is not directly link to fatal prognosis in most of the cases
  3. What about RCA ??

Let's think in case of LMT PCI with RCA CTO ??

Impact of residual chronic total occlusion of right coronary artery on the long-term outcome in patients treated for unprotected left main disease: the Milan and New-Tokyo (MITO) registry.

Circ Cardiovasc Interv. 2013 April;6(2);154-60 by K.Takagi, S.Nakamura A.Colombo et.al



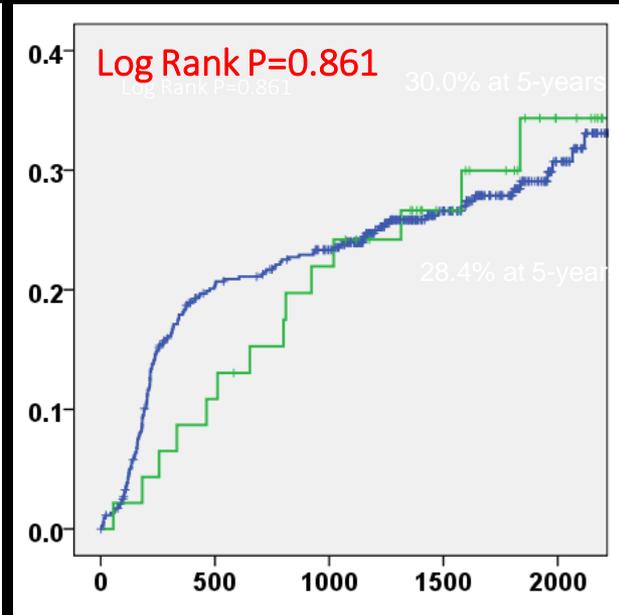
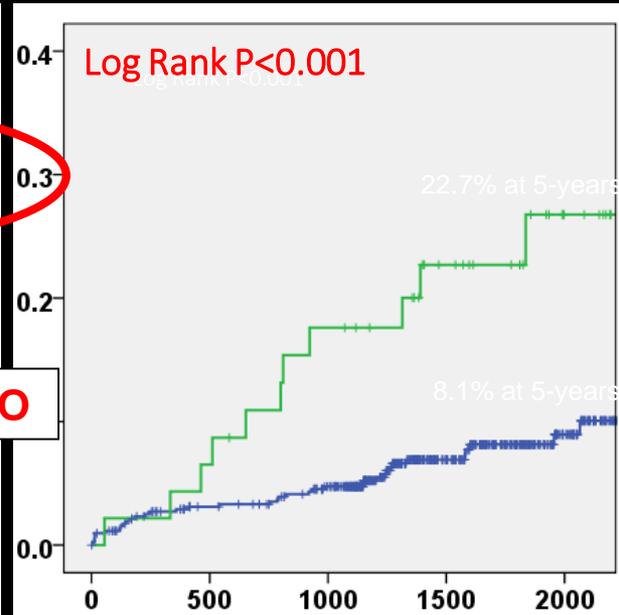
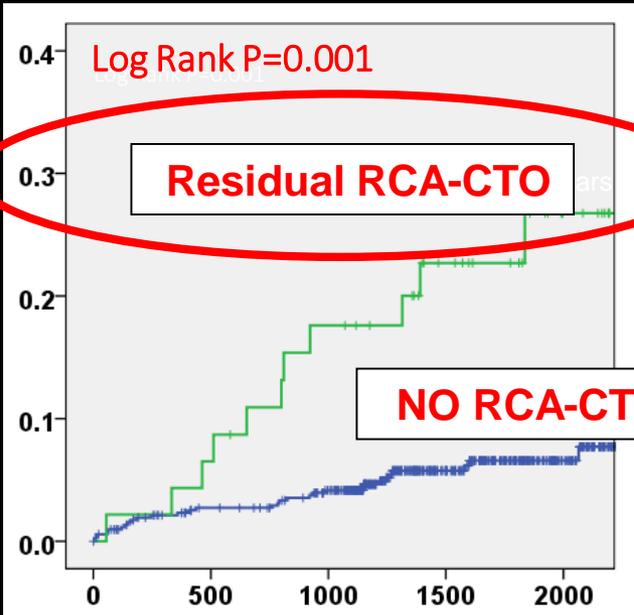
# Cumulative event rate at 5 years follow-up

- No RCA CTO and RCA CTO -

(A) Cardiac-death

(B) Cardiac-death + MI

(C) MACE



No at Risk	1-year	3-years	5-years
(1)	494	440	162
(2)	44	36	21

No at Risk	1-year	3-years	5-years
(1)	491	437	160
(2)	44	36	21

No at Risk	1-year	3-years	5-years
(1)	414	349	128
(2)	42	33	18

- (1) ULM without residual CTO-RCA (ULM with no CTO-RCA + ULM with treated CTO-RCA ) n=522
- (2) ULM with residual CTO-RCA n=46

## ⑦ RCA : also important for Pt's LIFE

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In LMT-PCI,

Cardiac-death occurred more frequently in patients with residual CTO-RCA, while a few cardiac death occurred in patients without residual CTO-RCA. These findings may suggest that recanalization of CTO-RCA may impact on the Long-term cardiac mortality in patients with LMT-PCI.

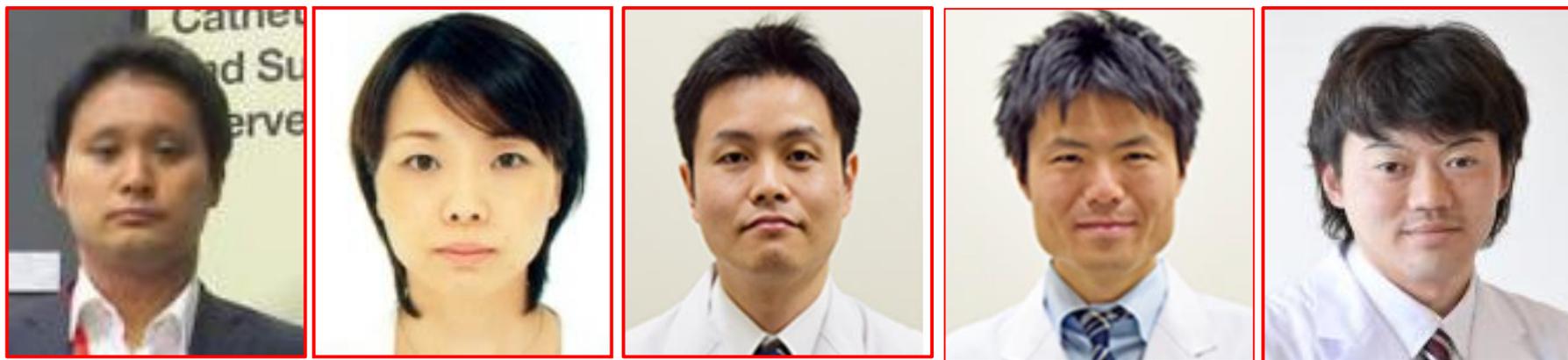


**Kensuke Takagi M.D. FACC**

Circ Cardiovasc Interv. 2013

# What is going on after LMT stenting??

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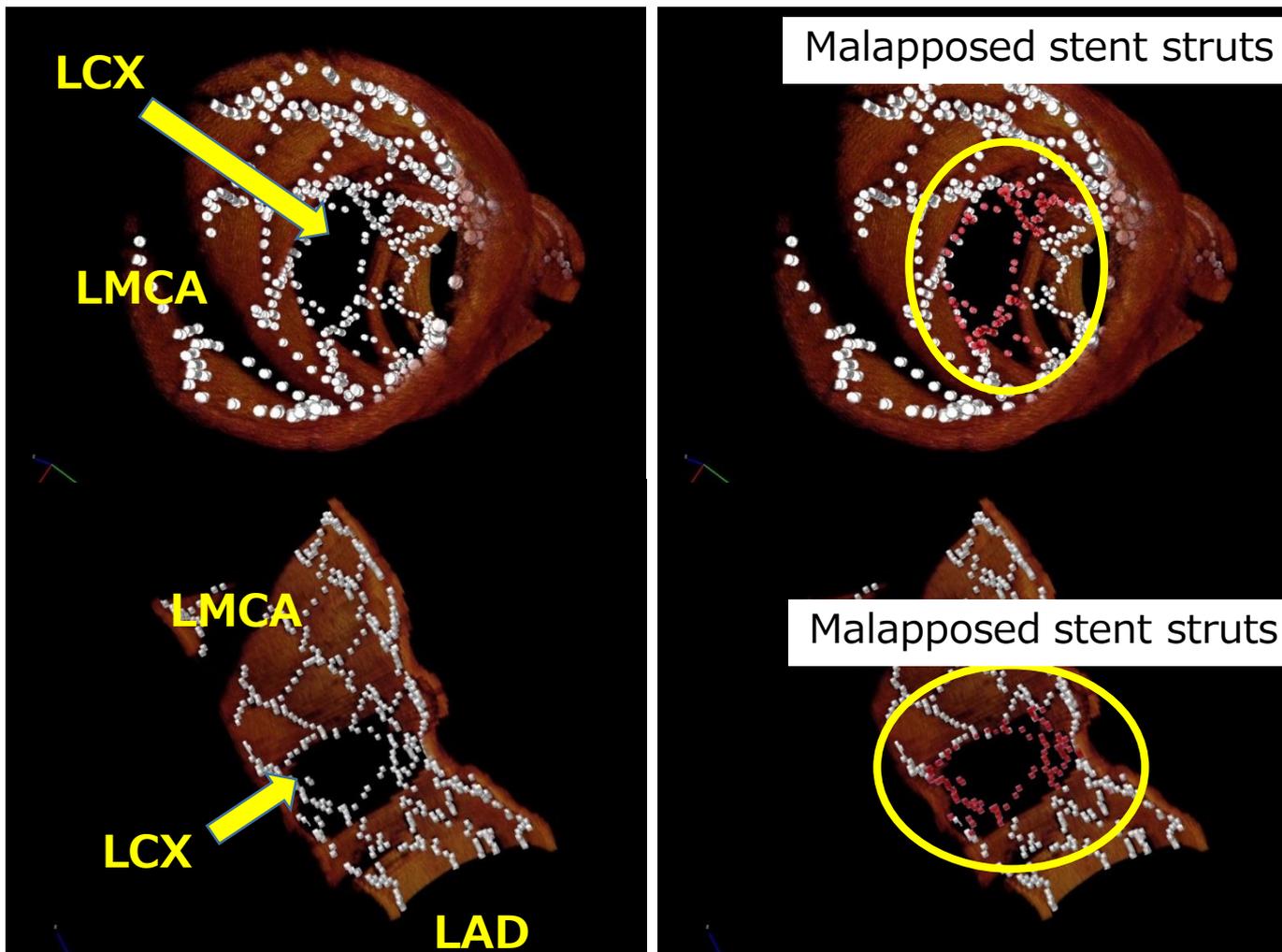
- New Tokyo Imaging Team -

The ultimate treatment is to know the cause,  
to eradicate the cause. Even a clinician,  
we need a research mind to investigate "cause" .

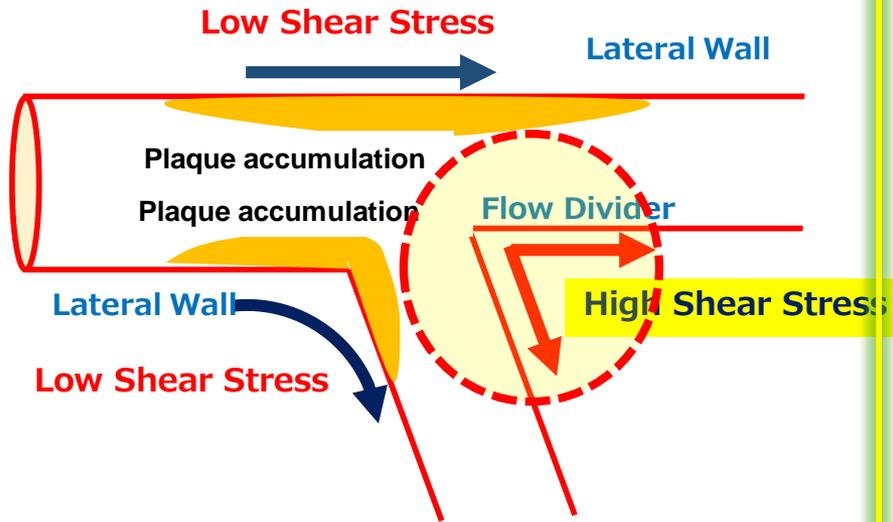
## ⑧ End-thelialization ; Initiation of the restenosis !!



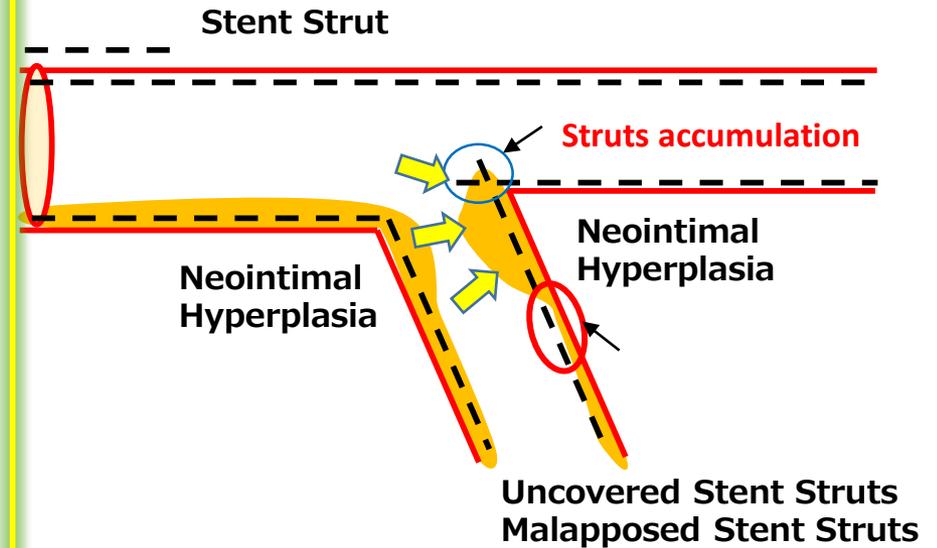
3D OCT after SES Implant. with inappropriate KBT



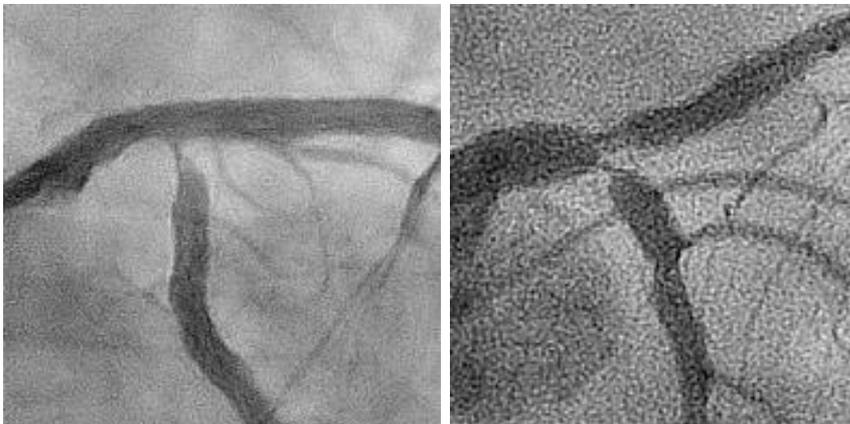




Physiological Condition  
(No stent)



Non-physiological Condition  
(After stent implantation)



Why ??

Restenosis occur frequently in LCx.

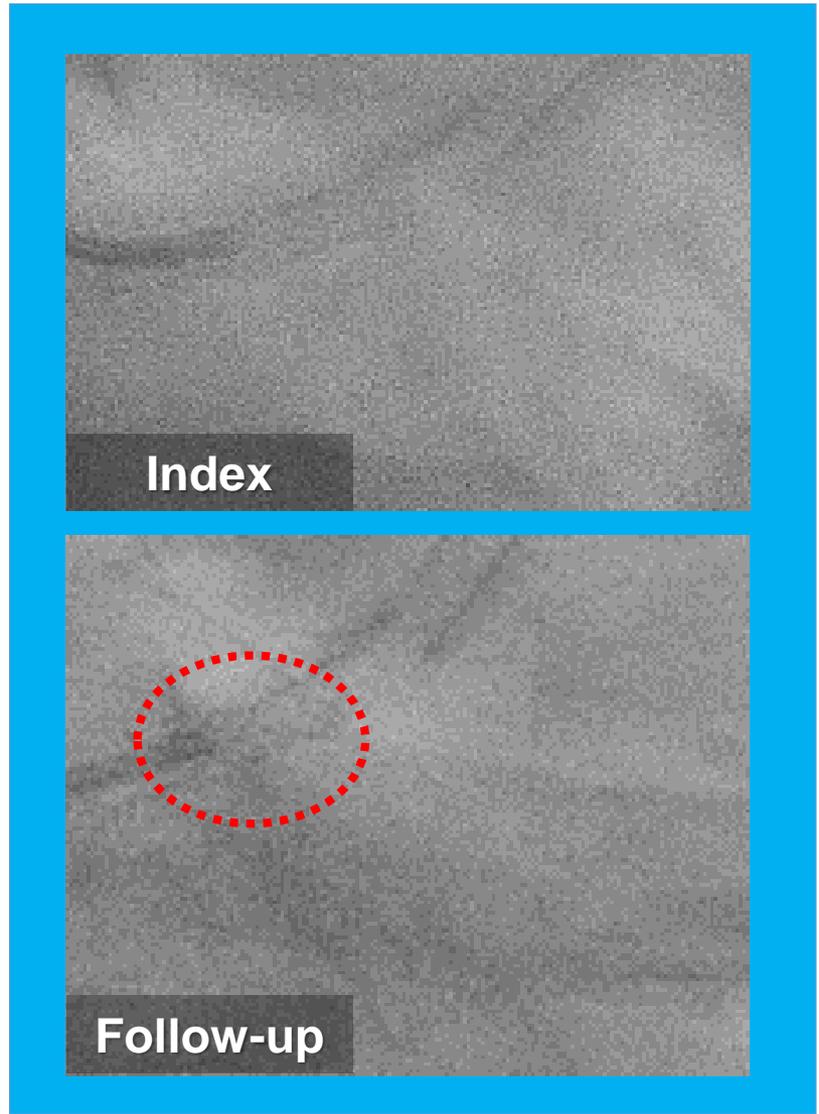
In LMT PCI.... If you use contrast....

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**A**



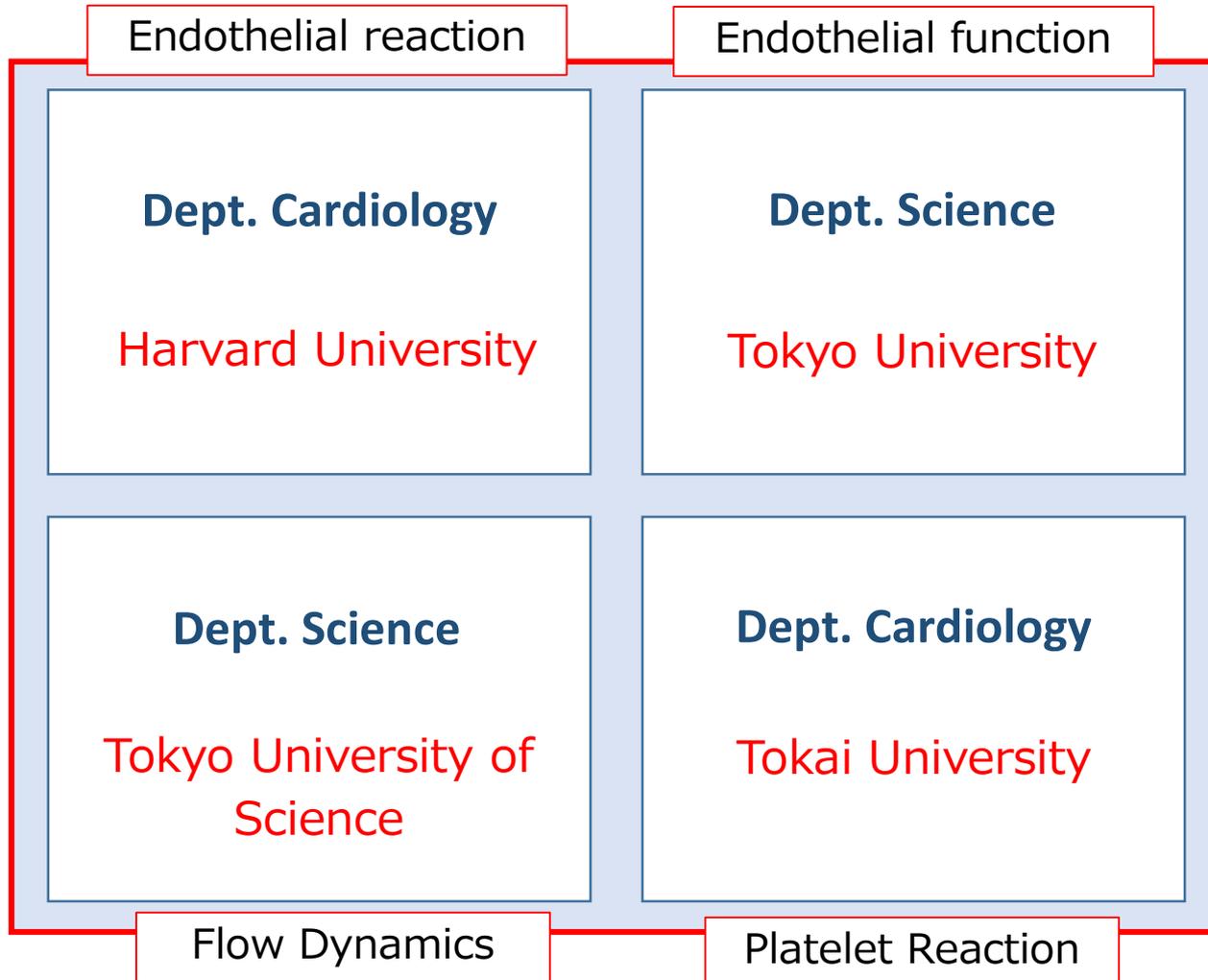
**B**





# We are collaborating...

(New Tokyo Research Program)





# We are collaborating...

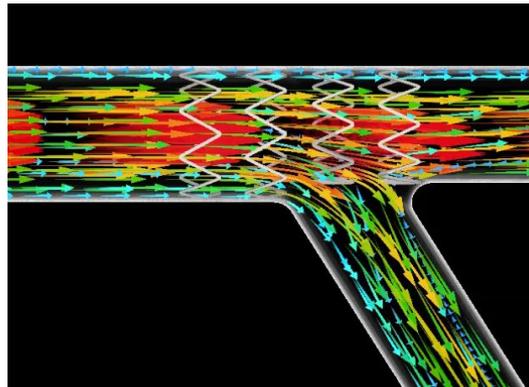
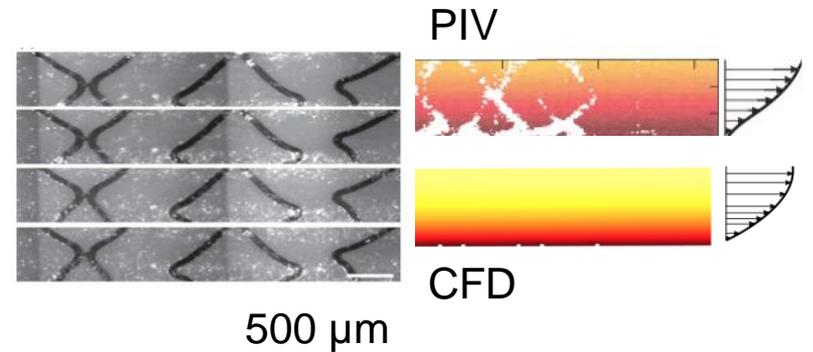
(New Tokyo Research Program)

Endothelial reaction

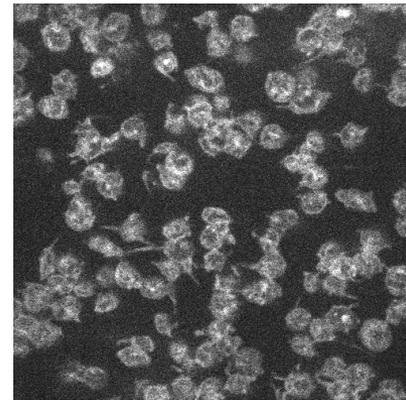


Prof. Ik-Kyung (IK) Jang

Endothelial function



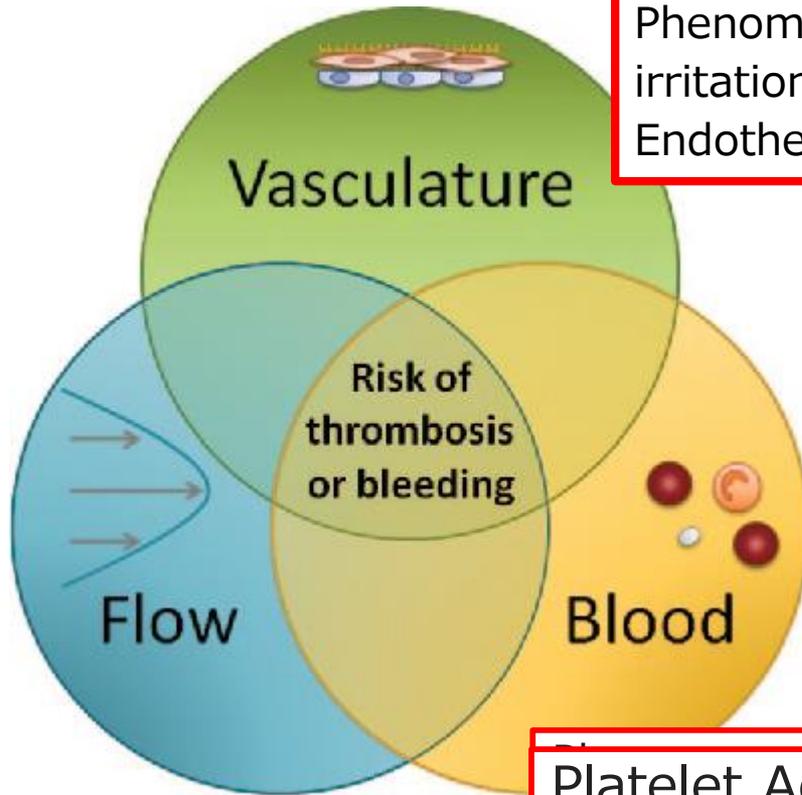
Flow Dynamics



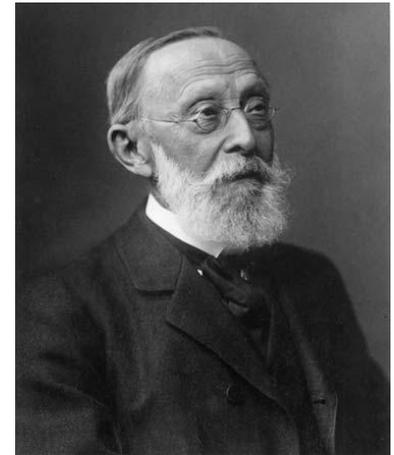
Prof. Gotoh

Platelet Reaction

# Virchow's triad



Phenomena associated with irritation of the vessel and its vicinity  
Endothelial injury or vessel wall injury



Rudolf Ludwig  
Virchow  
1821-1902

Platelet Action !!!

Phenomena of interrupted blood-flow

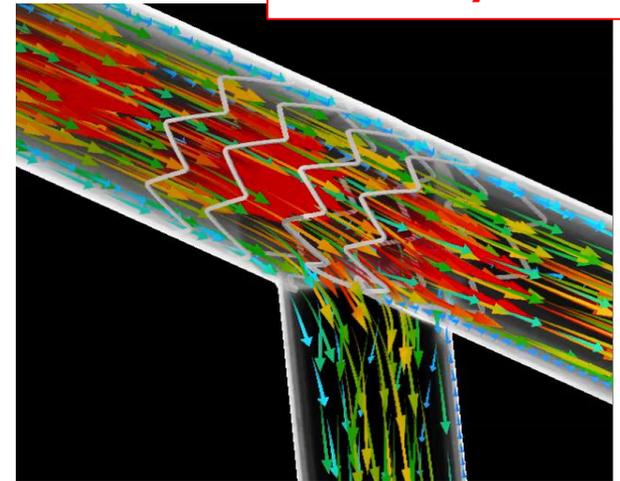
# Problem of PCI can not be solved by PCI !!

- Collaboration study with Tokyo University of Science =

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**Flow Dynamics**



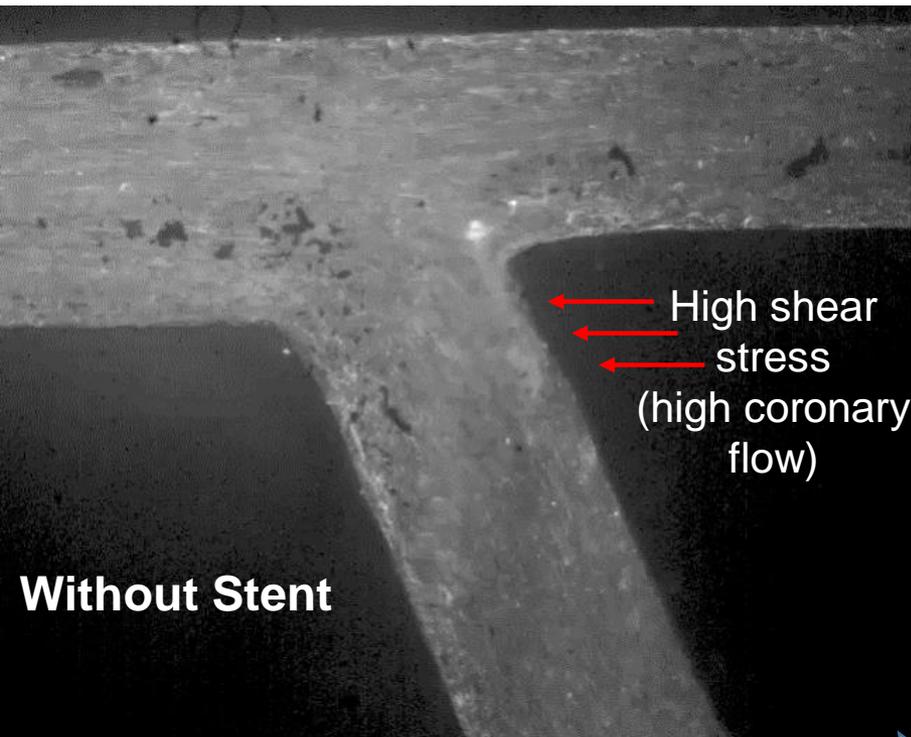
- Research for biomechanics team -

To understand what happen after PCI in the area of LMT bifurcated lesion, we started to research not on clinical but also Flow dynamics , platelet reaction and endothelial function.

## ⑩ Big Change of Shear Stress around Mal.apo. Area

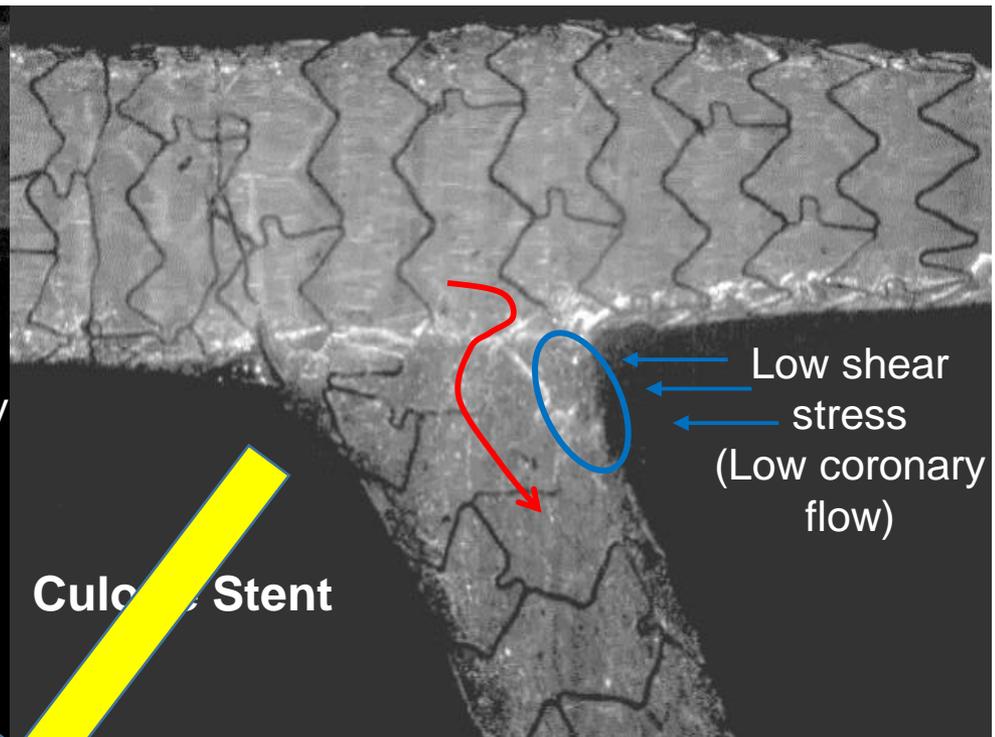
### Without stent placement

Blood flow at carina is quite fast.



### After stent implantation

Flow is delayed, causing turbulence.

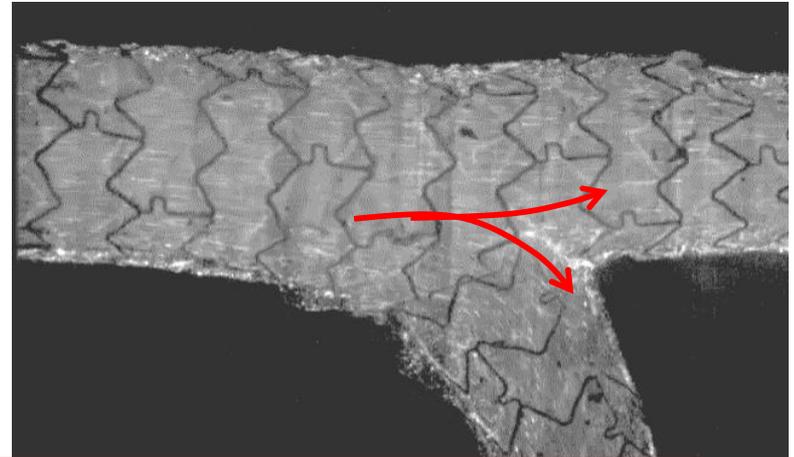


Insensible in the past, but now I sense

**Without stent**

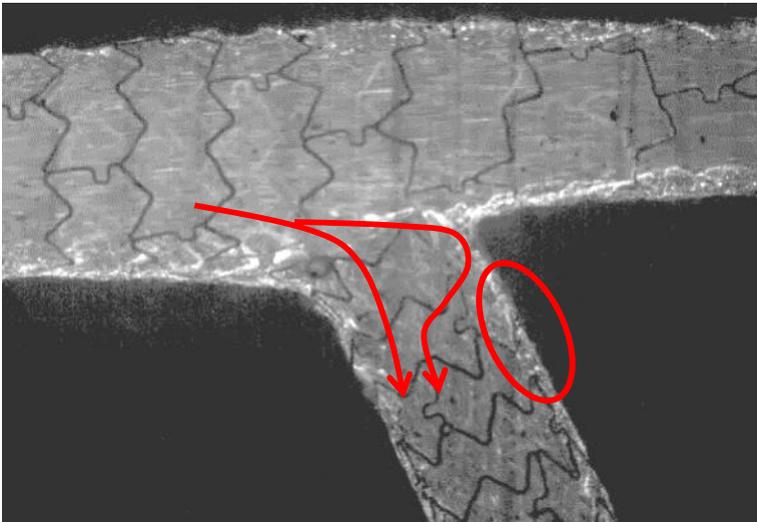


**T- stent**

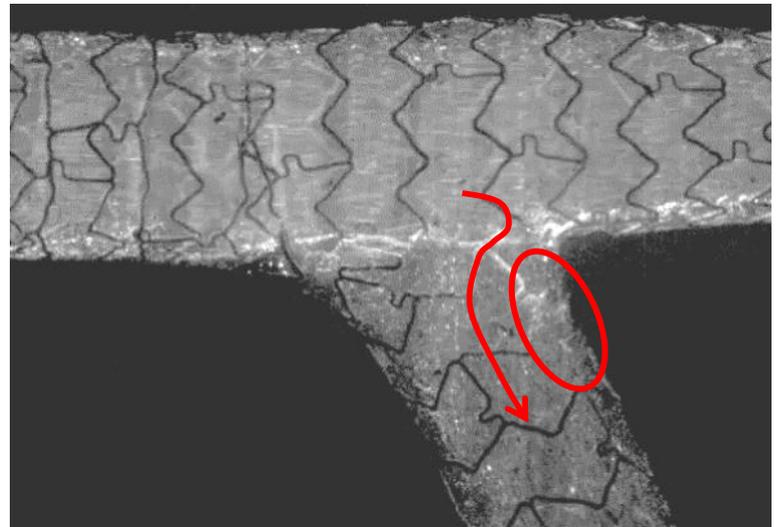


Accumulated stent struts might impact the flow pattern then progress the NIH in 2-stent PCI cases

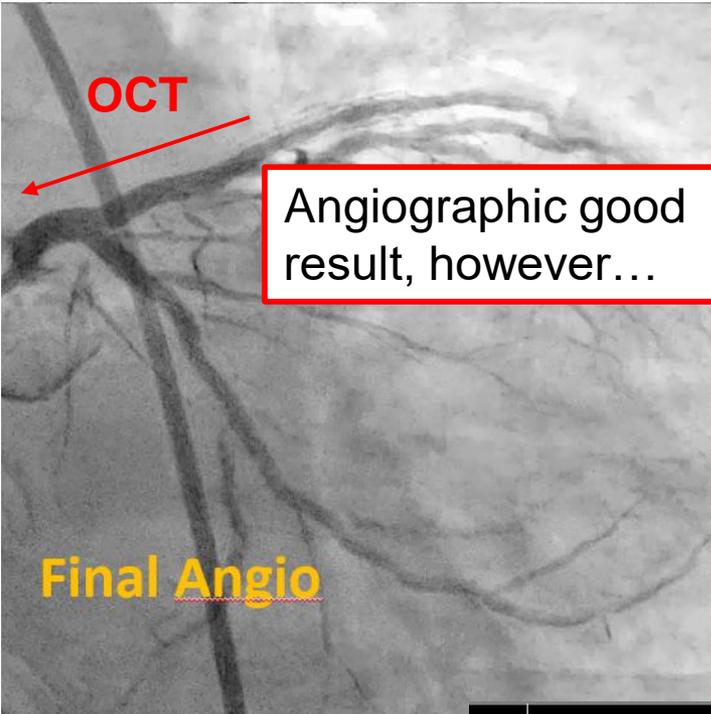
**Crush stent**



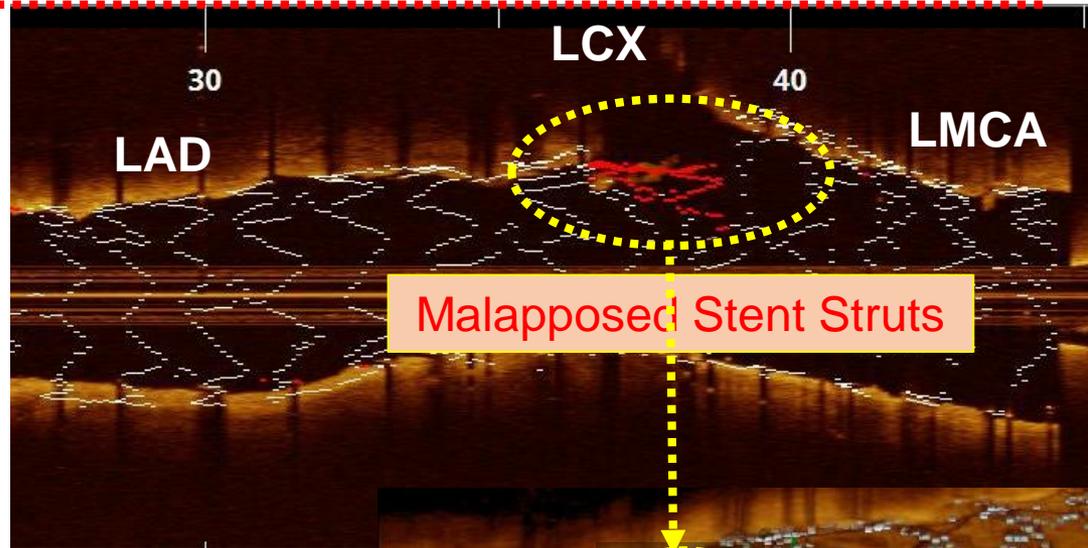
**Culottes stent**



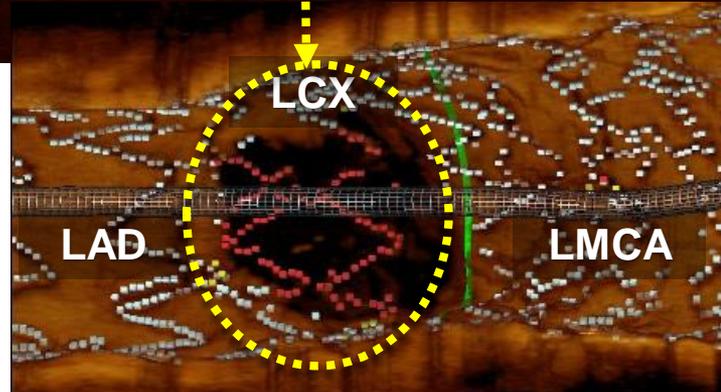
# Favorable or Unfavorable Culotte in LM



Angiographic good result, however...



Unfavorable Culotte



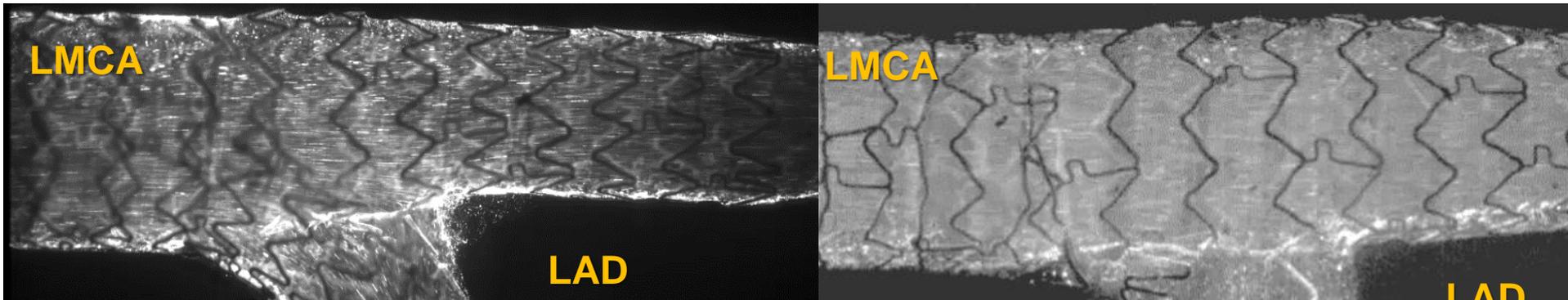
Favorable Culotte



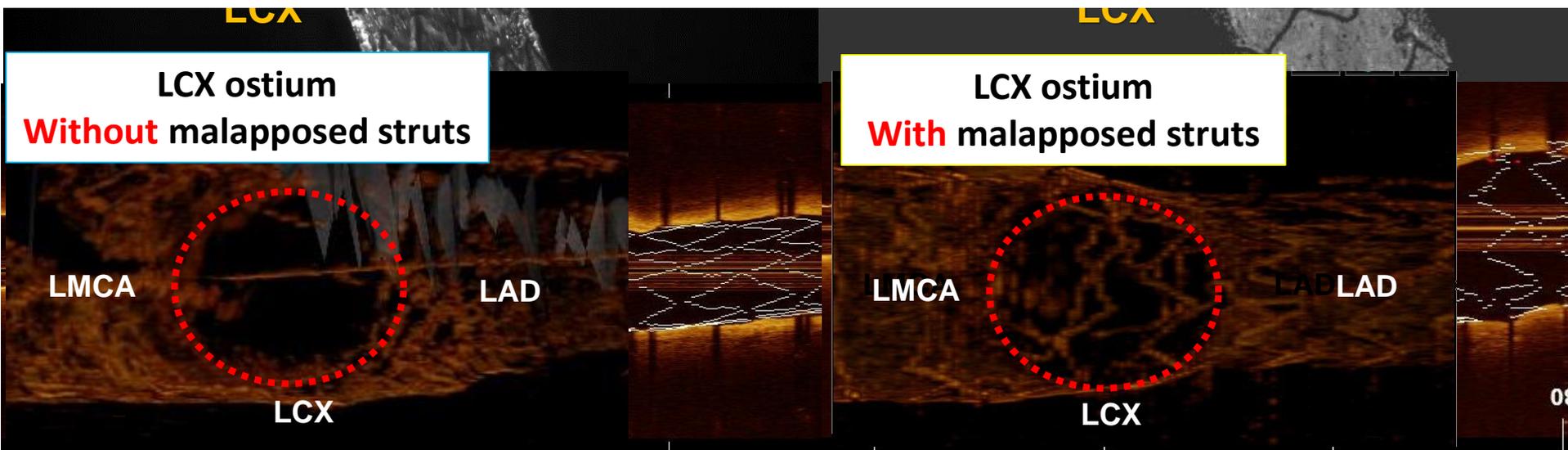
# Flow dynamics after Culotte Stent

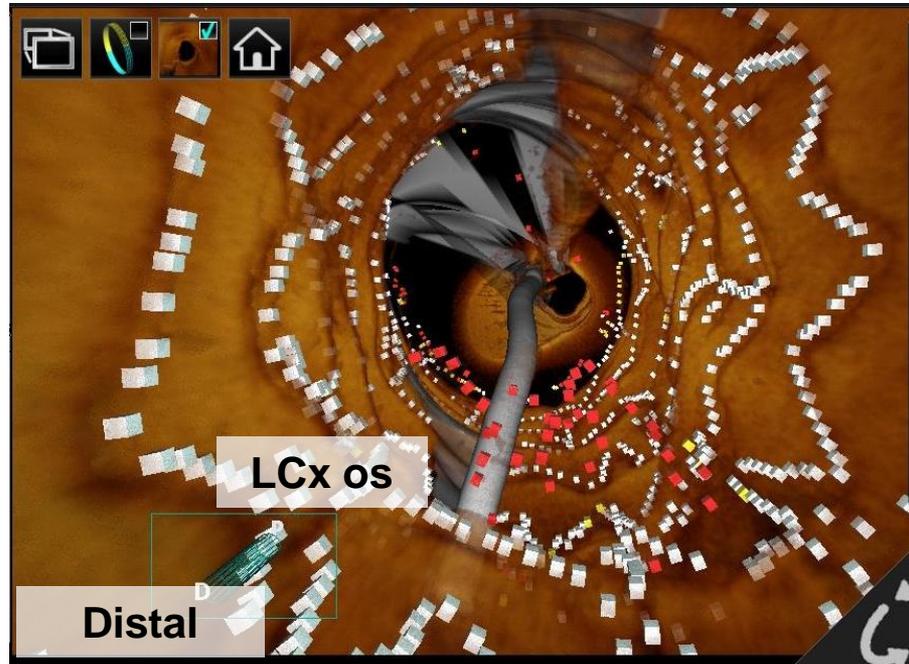
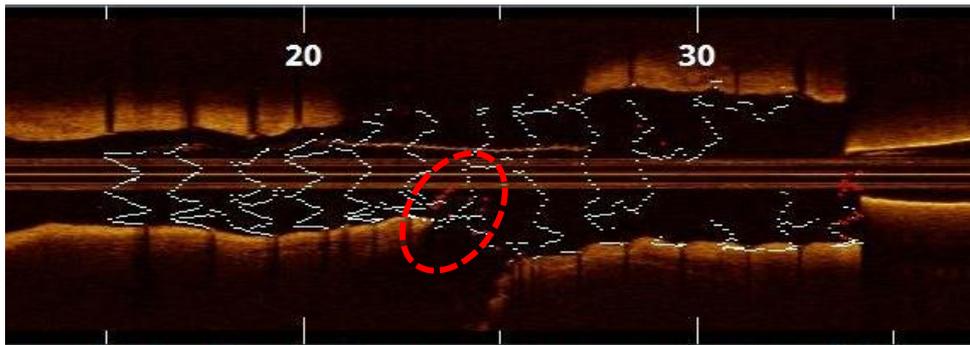
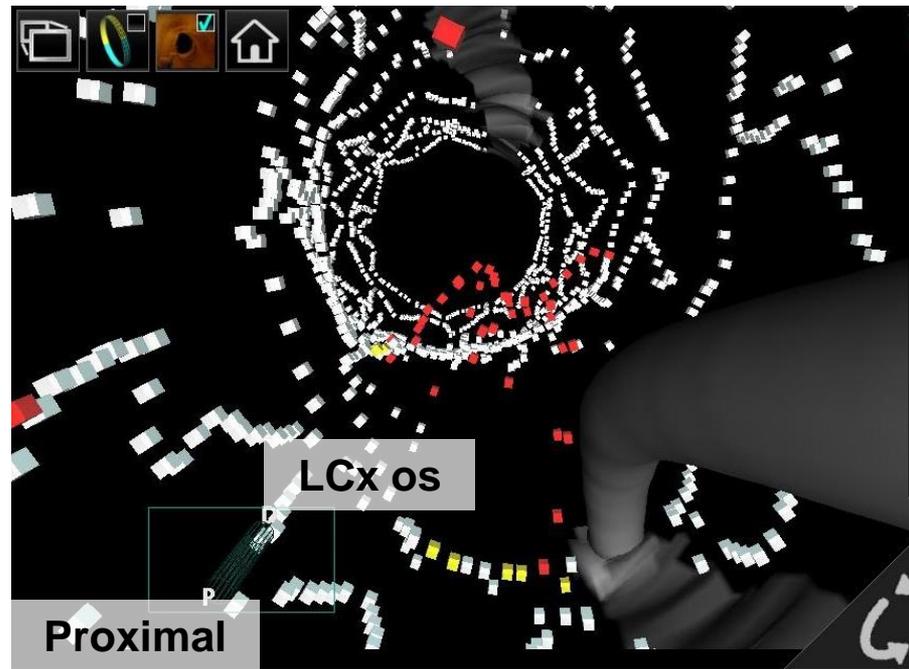
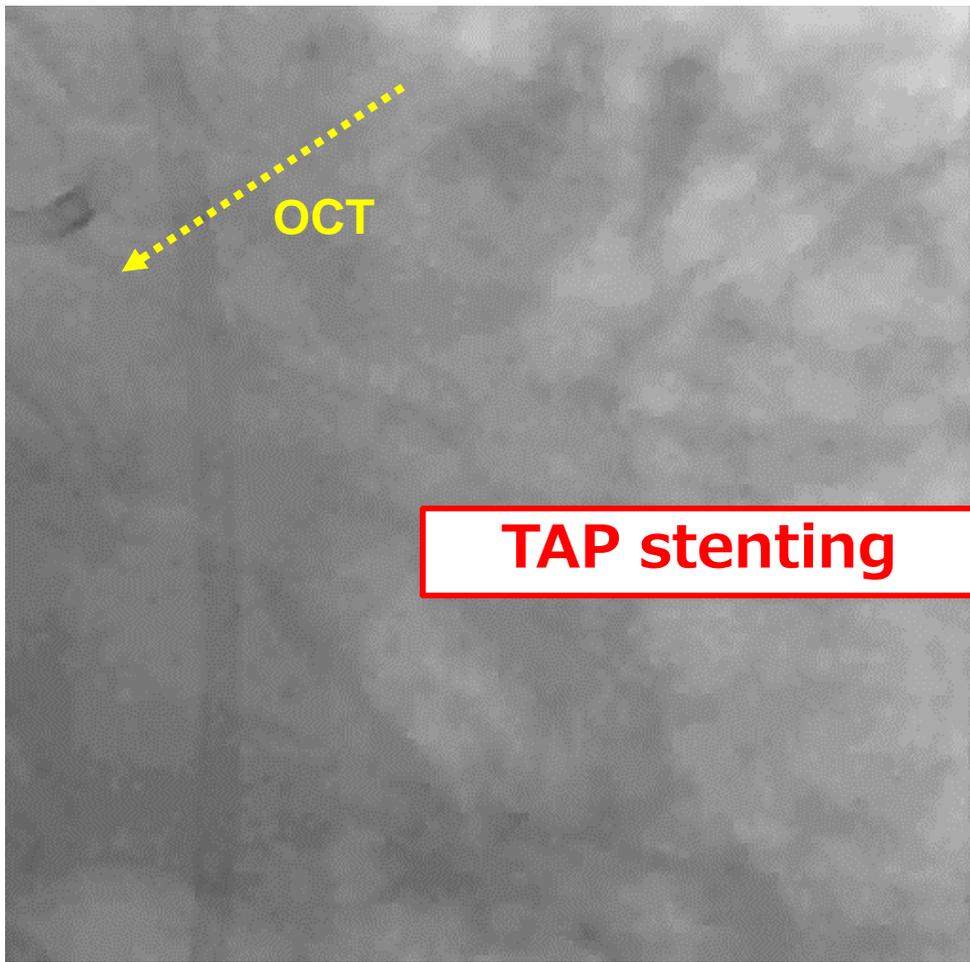
Favorable Culotte

Unfavorable Culotte



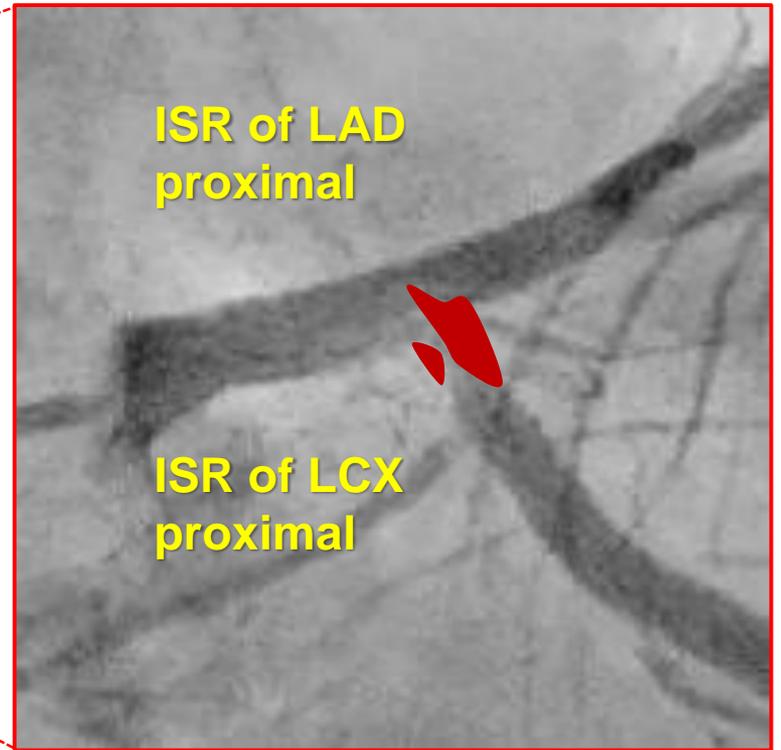
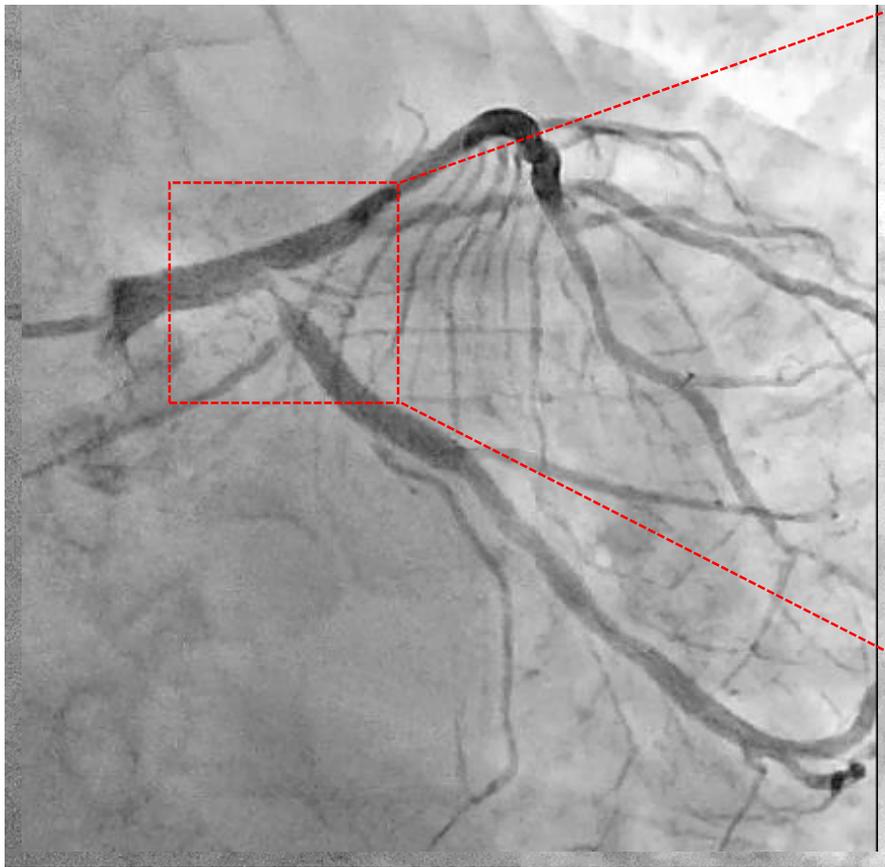
Even in the same Culotte stenting,  
there are significant different OCT findings and coronary flow





# Follow-up CAG after PCI

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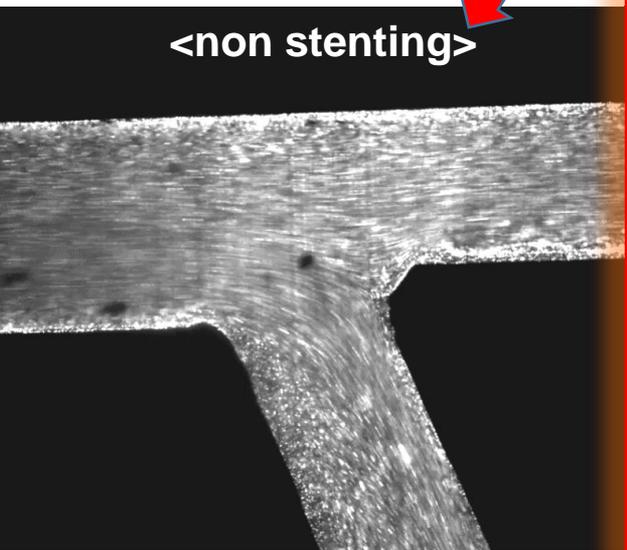
## Without stent placement

Blood flow at carina is quite fast.

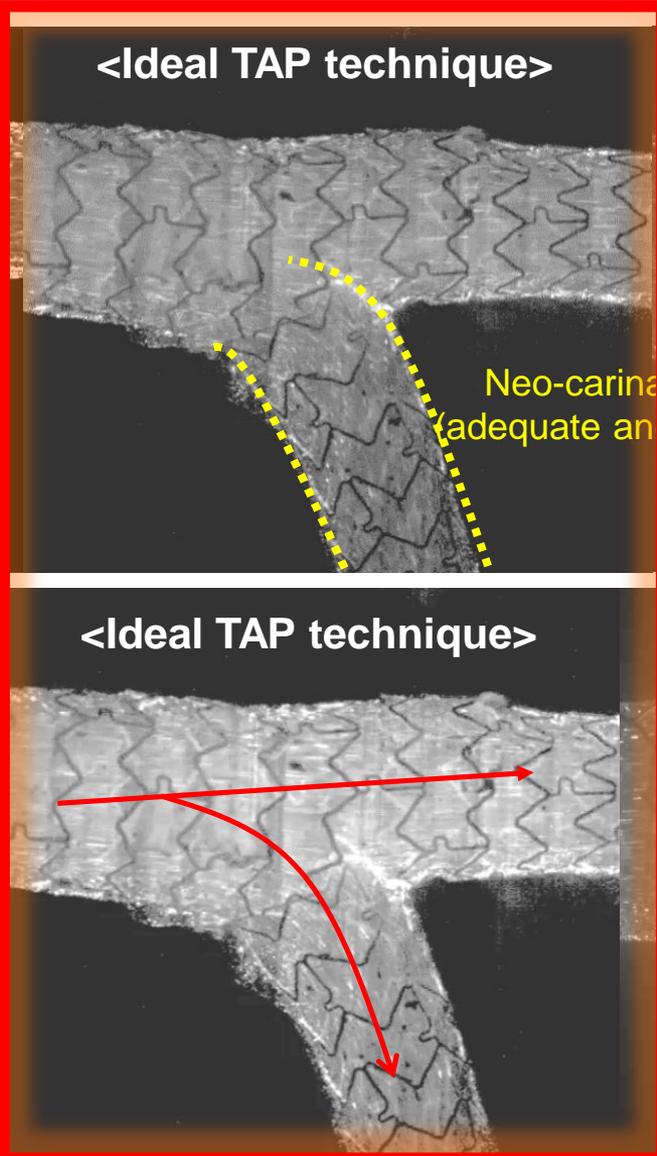
## Unfavorable TAP stent

Flow is roiling, causing turbulence.

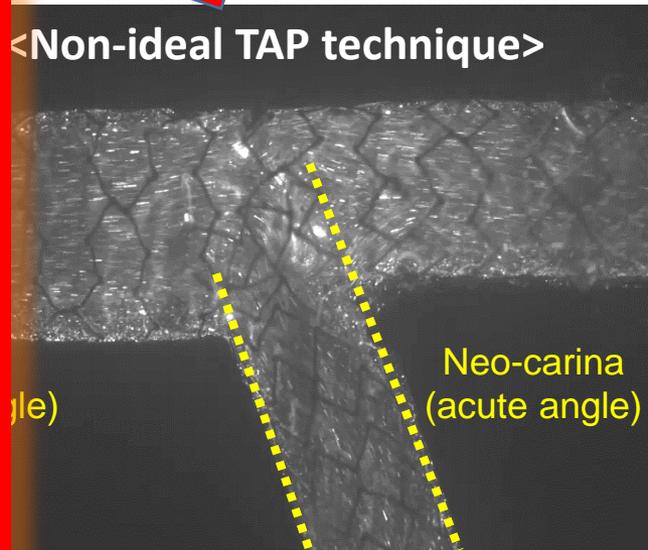
<non stenting>



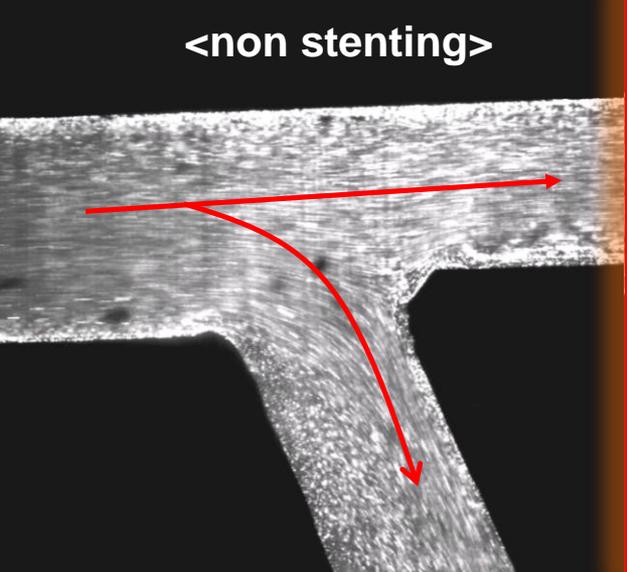
<Ideal TAP technique>



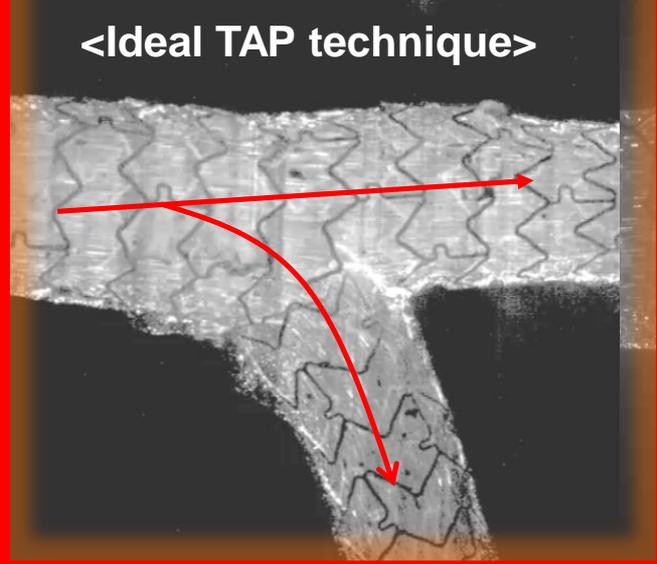
<Non-ideal TAP technique>



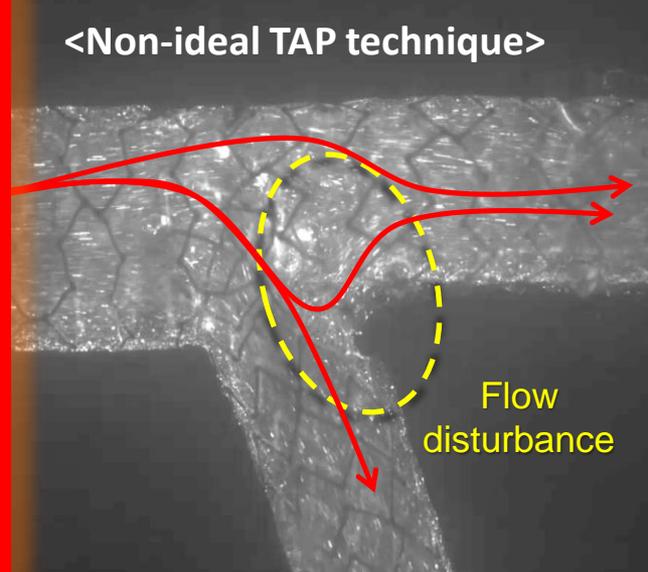
<non stenting>



<Ideal TAP technique>



<Non-ideal TAP technique>



Flow disturbance

**⑪ Malapposed struts make coronary flow different even in the same stent strategy.**

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Depending on which 2-stent technique is used, coronary flow toward LCX would be different, and... even whether favorable stenting is achieved or not makes the flow pattern different significantly.

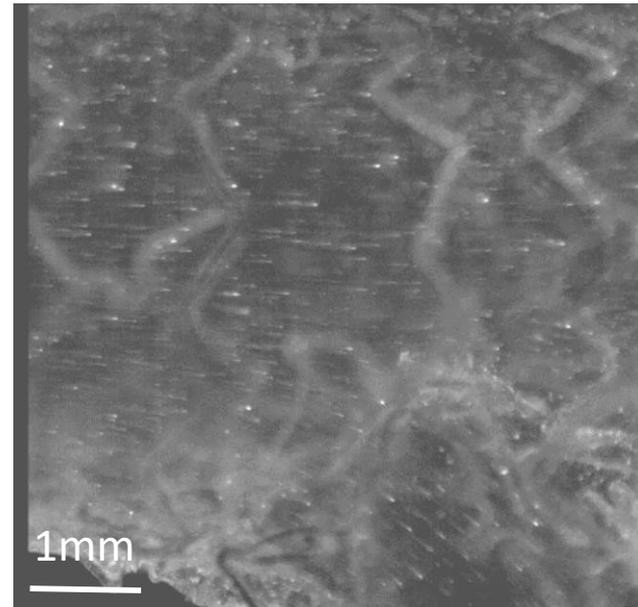
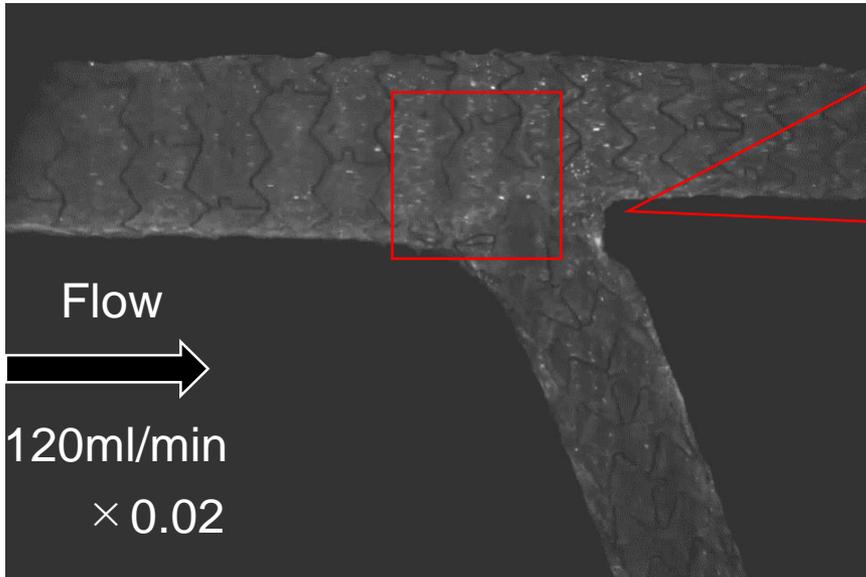


**Yusuke Fujino M.D. FACC**

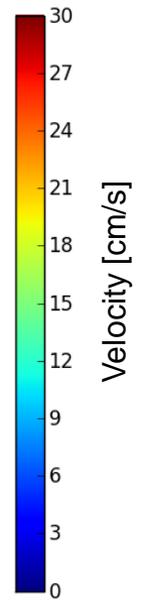
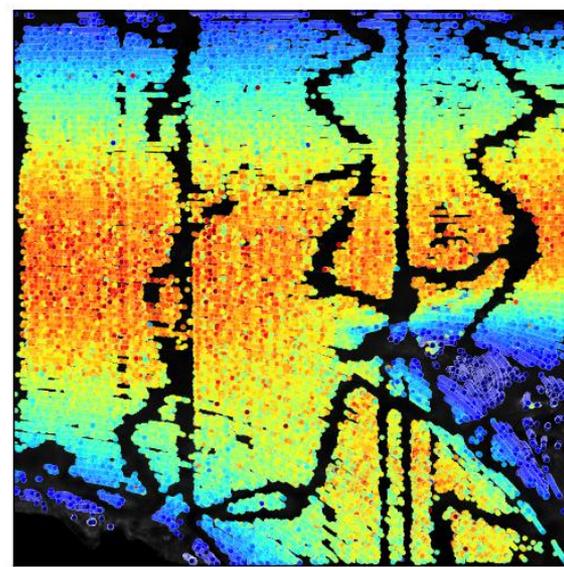
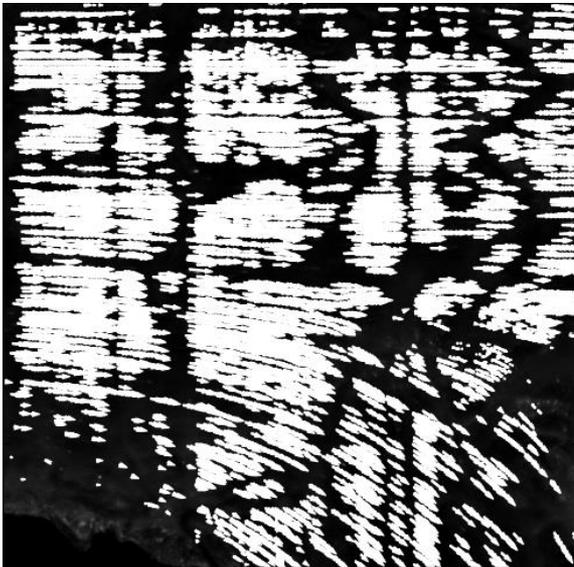
JACC Imaging Vol 7 No.8 2014

# Quantification of flow dynamics

## ➤ Model (Mini crash)

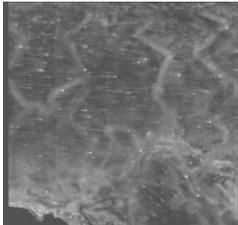


## ➤ Result

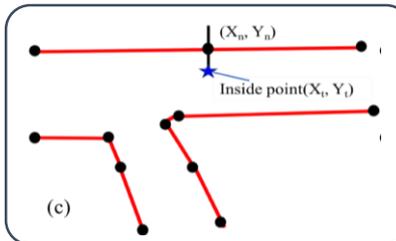
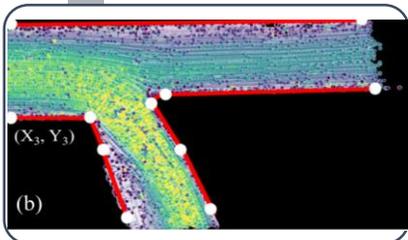


# Work flow of quantification of WSS

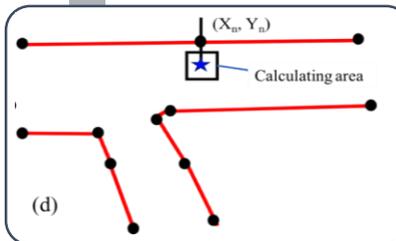
Calculating the velocity field from movie



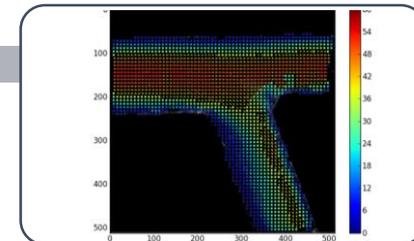
Detecting the wall position from movie



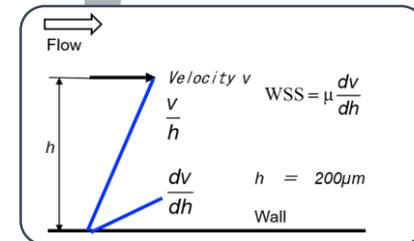
Calculating the velocity detecting the point inside the wall position on the normal vector



Detecting the normal vector from Wall position



Calculating the WSS from calculated velocity



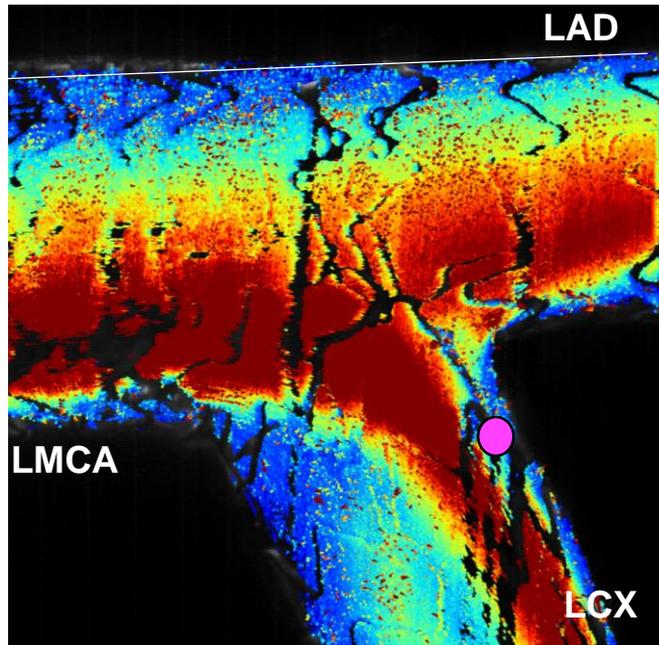
**Quantification of WSS**

# Flow dynamics after Culotte Stent

- Comparative study with Fovorable or Unfavorable Cullote ?? -

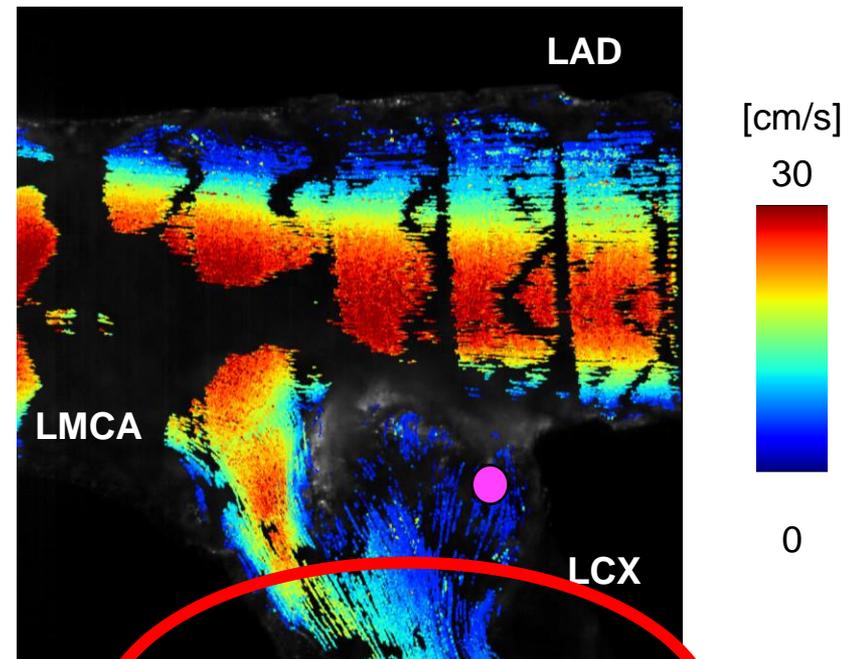
---

Favorable Cullotte

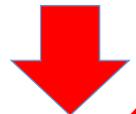


WSS 0.32 [Pa]

Unfavorable Cullotte



WSS 0.02 [Pa]



**Clinical Relevance ??**

# ⑫ Impact of malapposed stent struts on LCX TLR

-2-stent technique (N=50)-

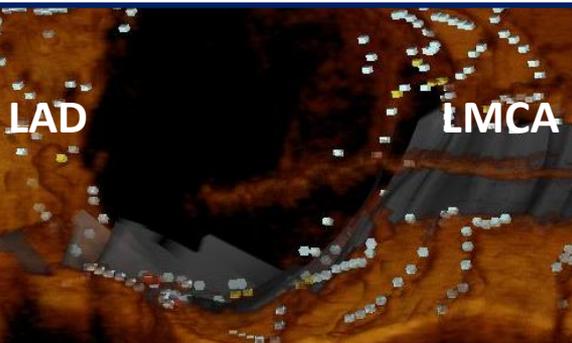
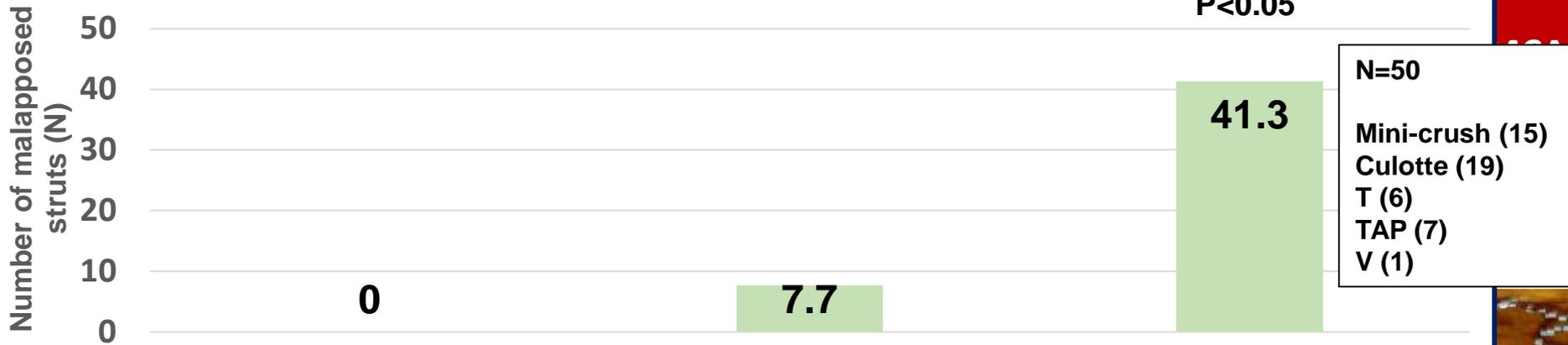
No malapposed stent struts (N=25)

Slightly malapposed stent struts exits at  (N=11)

Significantly malapposed stent struts at   (N=14)

Number of malapposed struts at LCX ostium

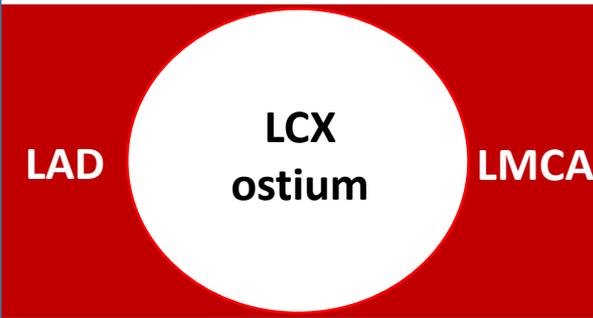
P<0.05



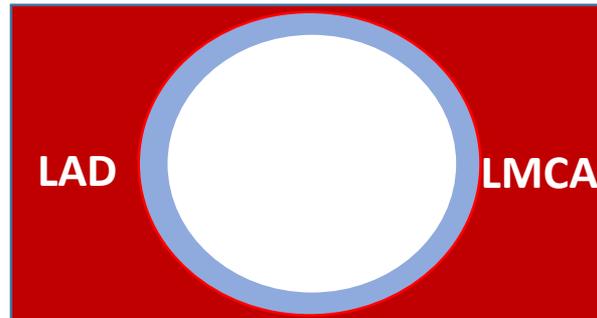
# ⑫ Impact of malapposed stent struts on LCX TLR

-2-stent technique (N=50)-

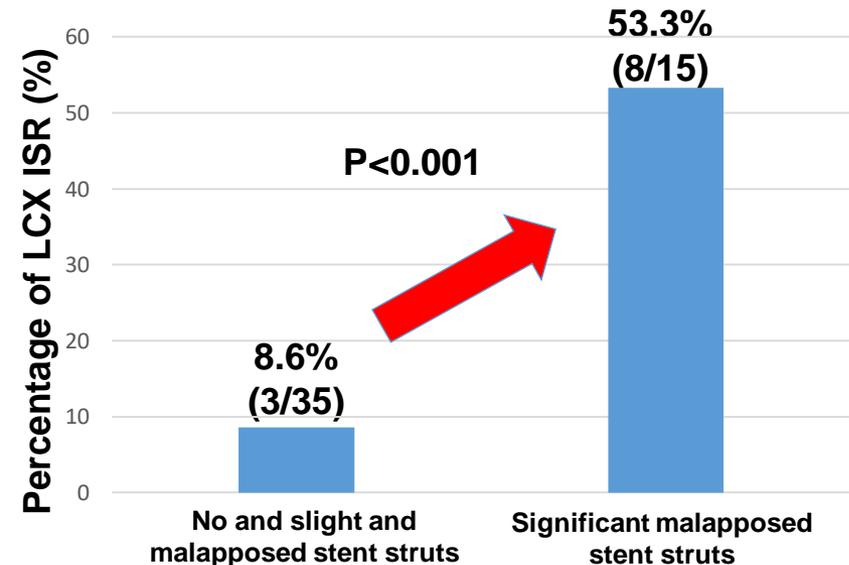
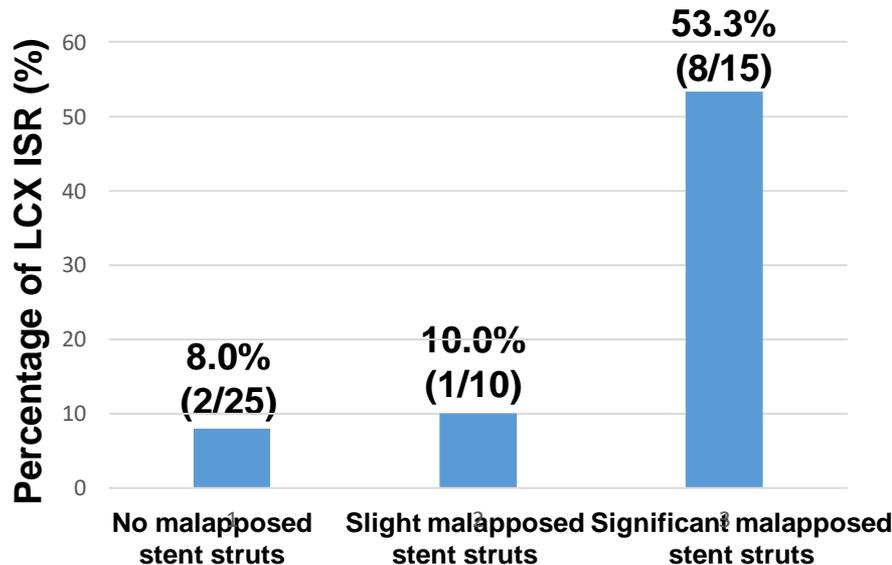
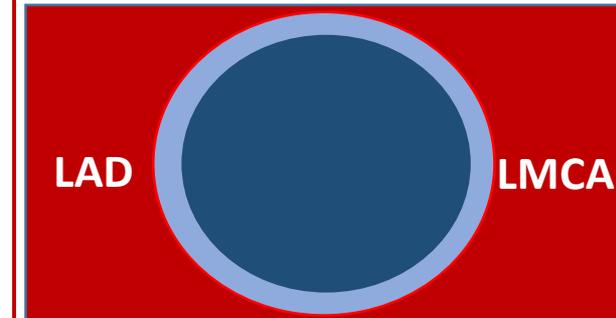
No malapposed stent struts  
(N=25)



Slightly malapposed stent struts  
exits at  (N=11)



Significantly malapposed stent  
struts at   (N=14)





## Now we recognize ...

Presence of mal-apposed strut may lead excessive end-thelialization around the area of these, resulting in clinical restenosis.

From the current our clinical data clearly shows the similar trend (so called clinical relevance) group having a lot of mal-apposed stent strut in the ostium of LCX have a big tendency of restenosis.

Finally, in our data suggest that current Study about bifurcation stenting which compare single vs double stenting or X stenting vs Y stenting way is scientifically UNFAIR ?

# What our data tell are...

---

1. Focus on LAD stenting !!,  
Do not chase too much LCX!!
2. Imaging Device is necessary !!
3. If you can finish One stent ,  
You have a big advantage in terms of restenosis.
4. If you can not avoid 2-stent strategy,  
You need to optimize the apposition of stent strut.

## Tips and Tricks in LMT PCI

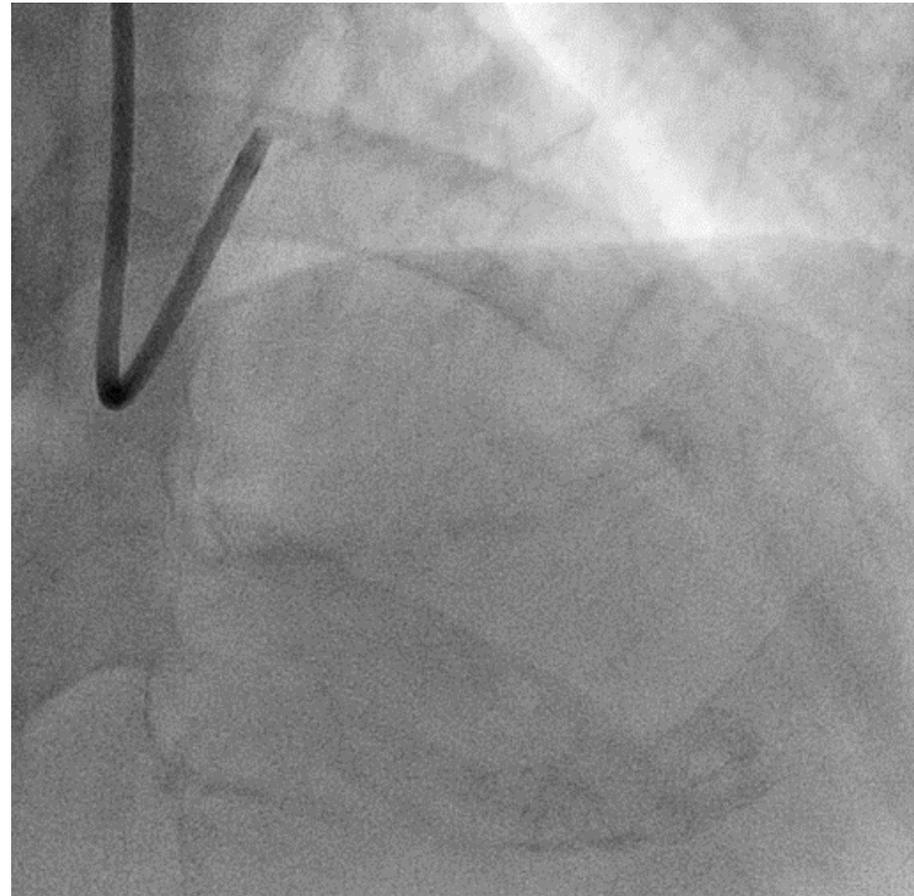
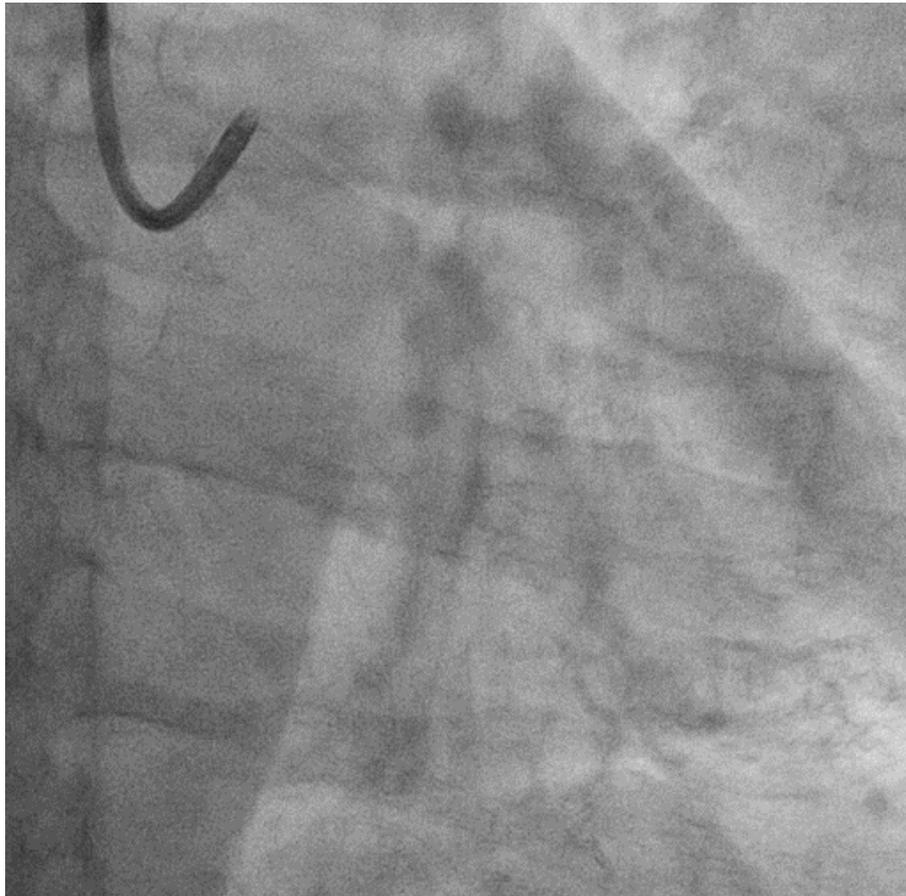
# **1; Calcification !!**

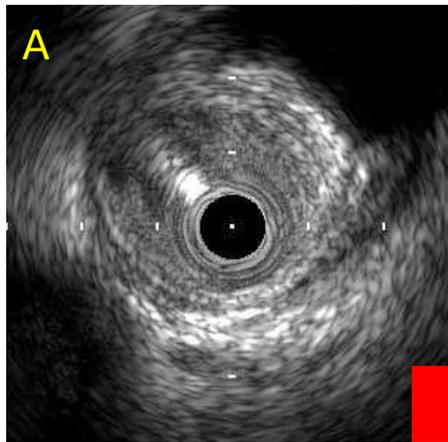
- Last, Big Issue -

# Case : LMT body stenosis including....??

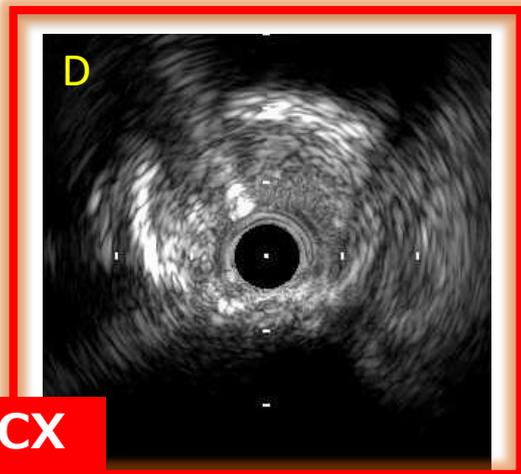
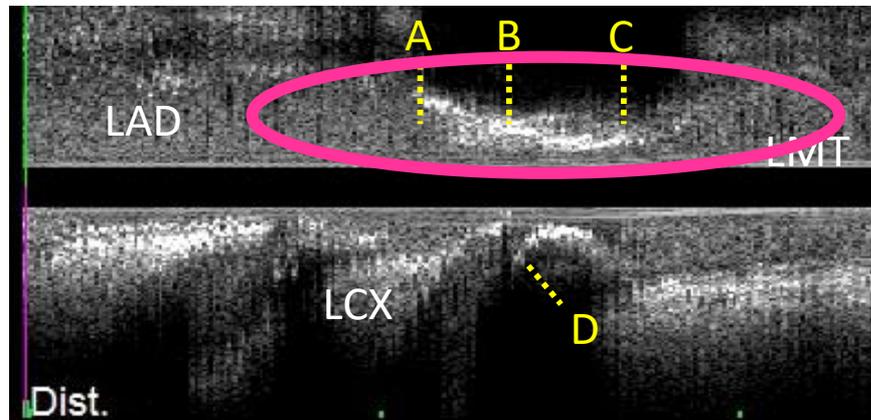
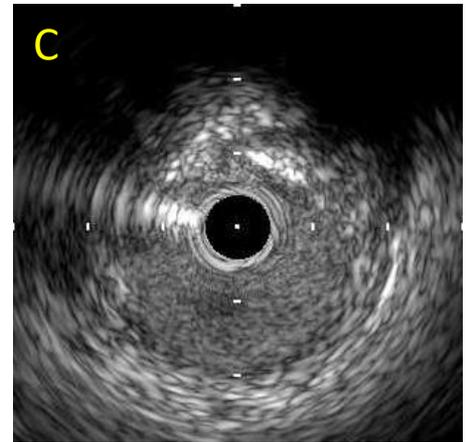
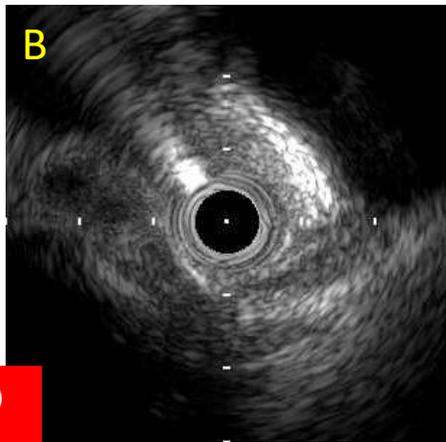
---

Looks like a very simple LMT body stenosis with some lesion of LCX ostium.





LAD



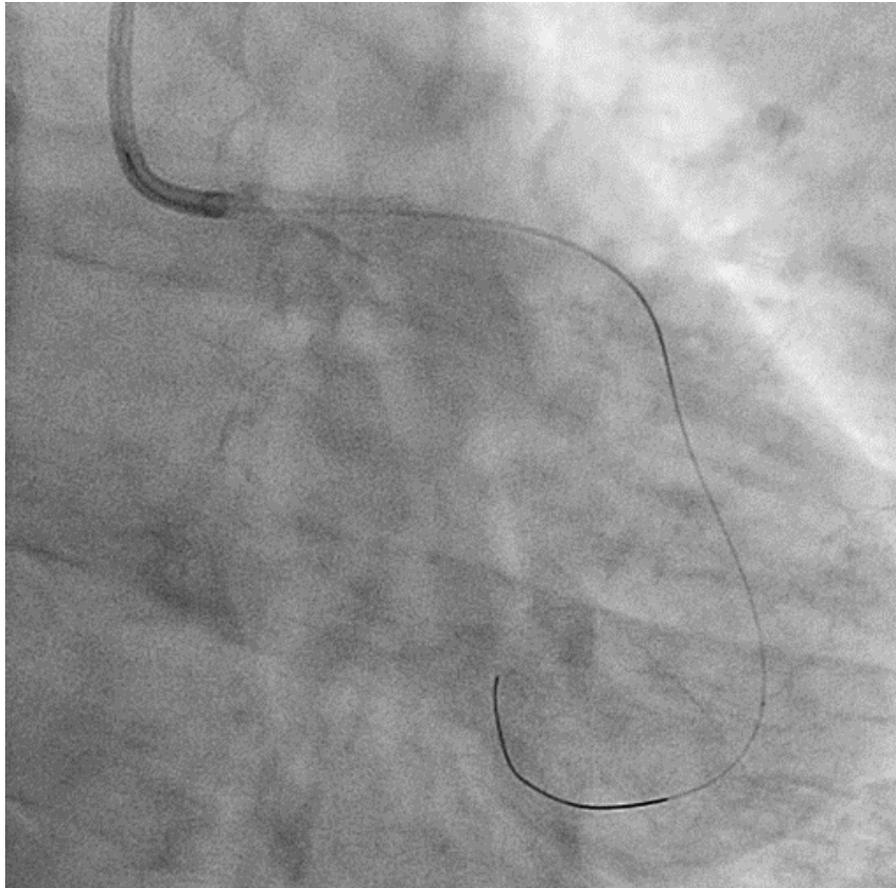
LCX

# It never rains but it pours

- Troubles never come singly -

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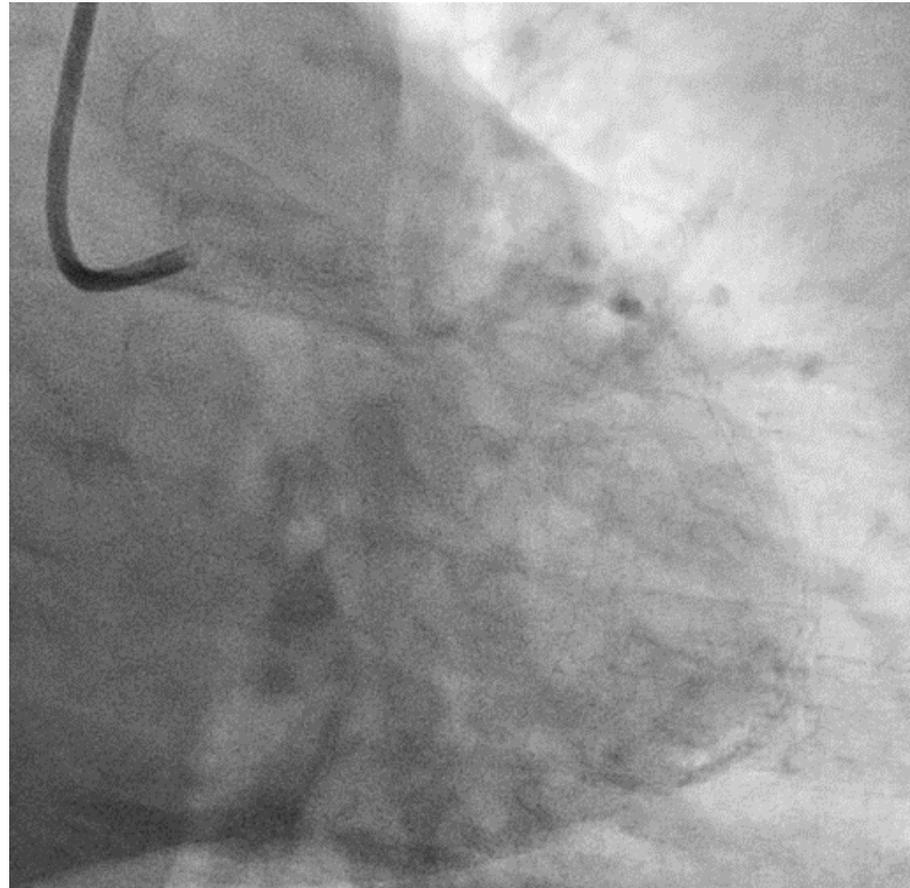
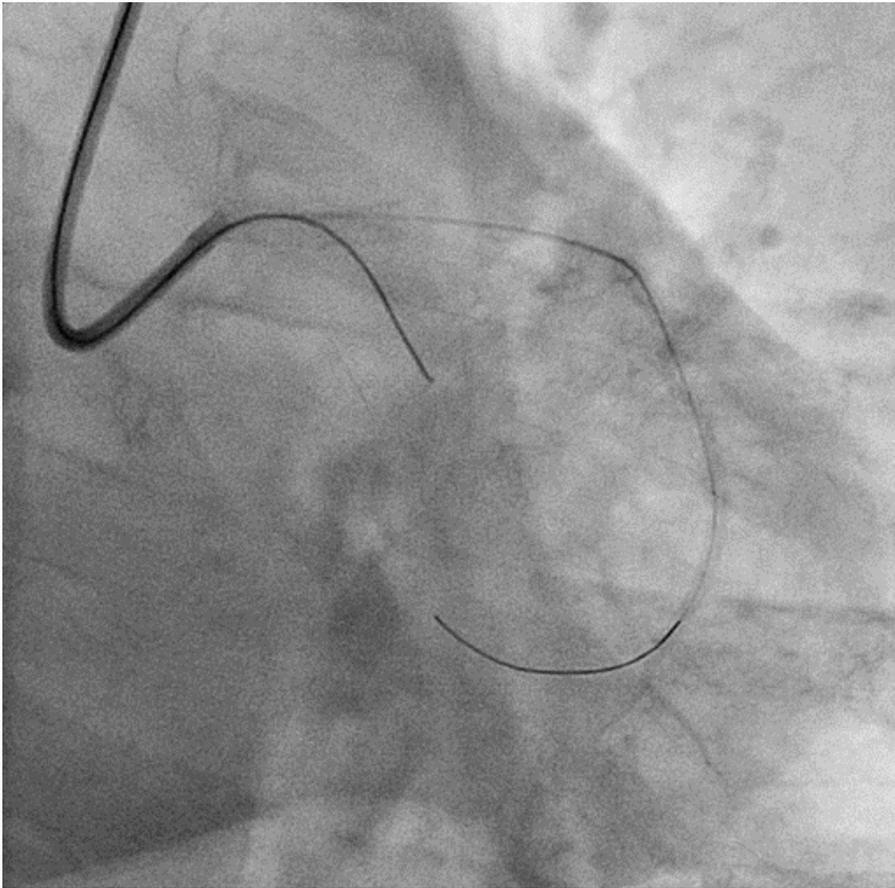
Protection GW in LCX accidentally come out , but continued LMT stenting. Then...



# Case : LMT body stenosis including....??

---

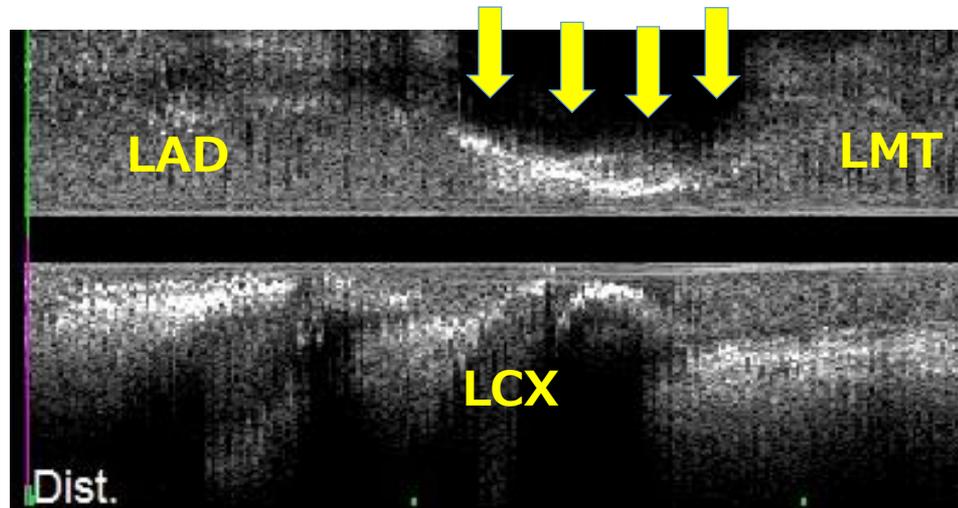
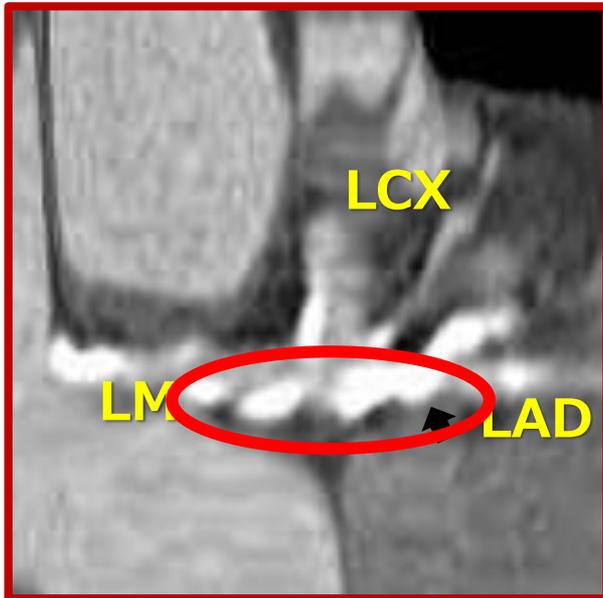
Thanks to the technique of CTO PCI, successfully recanalized with CTO GW



# Interference Factor: Calcification

- Calcification opposing to a side branch -

---



# Impact of main-branch calcified plaque on side-branch stenosis in bifurcation stenting: an optical coherence tomography study.

Y. Fujino, S. Nakamura et al. Int J Cardiol. 2014 Oct

## Calcium Plaque opposite of carina

### Predictive Risk Factor of Side Branch Occlusion

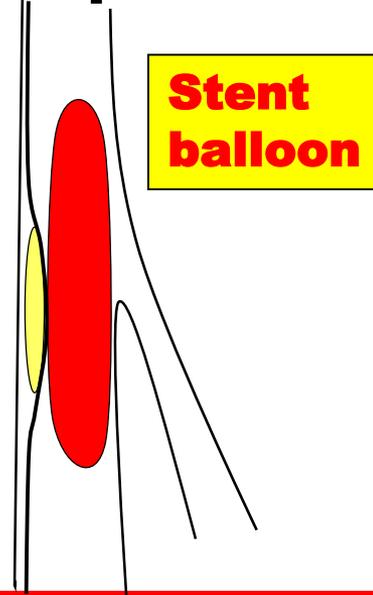
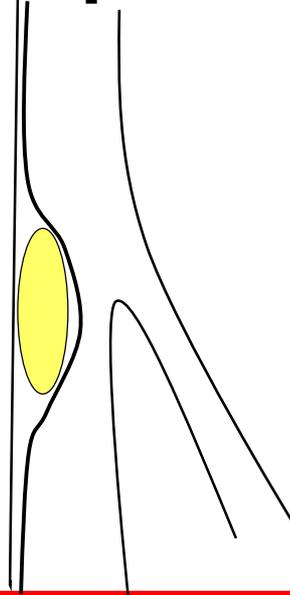
	Univariate Logistic Regression			Multivariate Logistic Regression		
	OR	95% CI	p-value	OR	95% CI	p-value
Age	0.99	0.94-1.04	0.632			
Gender#	1.47	0.55-3.95	0.449			
Hypertention	0.94	0.36-2.47	0.901			
Diabetes Mellitus	0.72	0.29-1.82	0.491			
Dyslipidemia	0.46	0.18-1.18	0.106			
Smoking	1.09	0.39-3.03	0.867			
EF (%)	0.97	0.91-1.03	0.294			
Angle (angiographic) <70	9.13	1.93-43.28	0.005	<b>11.83</b>	<b>2.00-70.02</b>	<b>0.007</b>
Angle QCA	0.98	0.96-1.00	0.021			
Calium detected by Angiogram	2.2	0.68-7.16	0.189			
True bifurcation	2.17	0.81-5.82	0.125			
Pre dilatation	1.2	0.47-3.07	0.699			
Pre-stent implantation Main branch, %DS	0.99	0.93-1.05	0.777			
Pre-stent implantation Side branch, %DS	1.05	1.01-1.10	0.018	<b>1.07</b>	<b>1.02-1.13</b>	<b>0.012</b>
Average stent diameter	1.92	0.51-7.21	0.335			
Average stent length	0.99	0.93-1.06	0.776			
Max inflation pressure	1.01	0.89-1.14	0.863			
Calcium Plaque Evaluated by OCT	11.25	2.86-44.25	<0.001	<b>12.32</b>	<b>2.58-58.83</b>	<b>0.002</b>

**A Pre Stent Implantation**

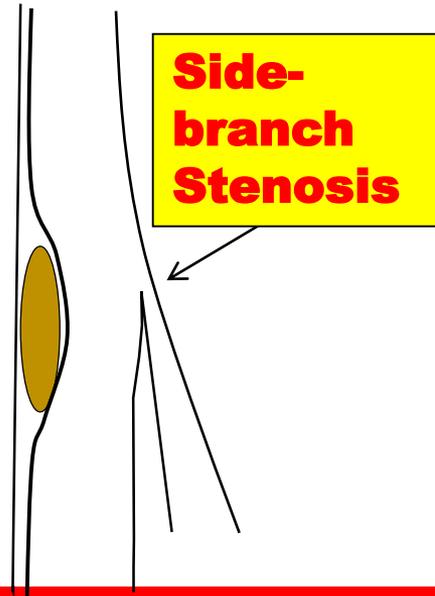
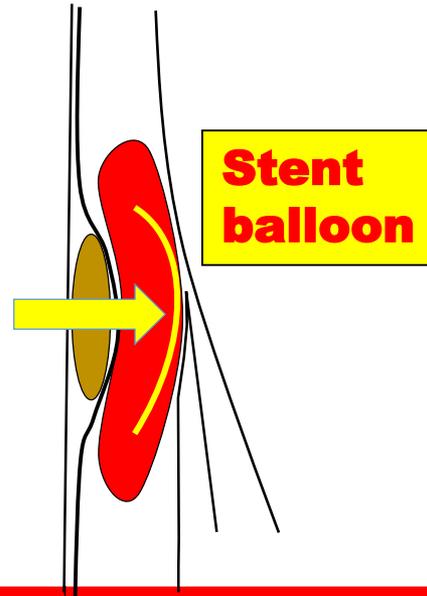
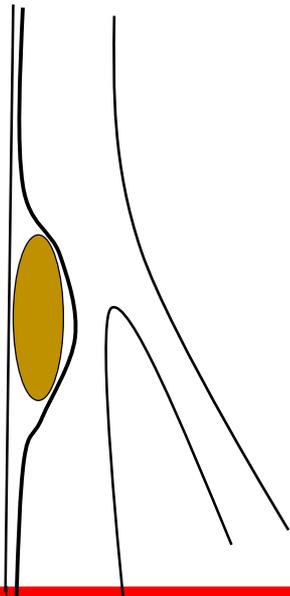
**B Stent Implantation**

**C Post Stent Implantation**

**Non-  
Calcified  
plaque  
(lipid or  
fibrous)**



**Calcified  
plaque**



## ⑬ CAL in LMT : should be very careful !!



Calcification opposing to a side branch is a predictive risk factor of occlusion of the side branch in the case of LMT bifurcation PCI.



Kensuke Takagi  
M.D. FACC

Coronary Artery Disease 2015



Yusuke Fujino  
M.D. FACC

Int J Cardiol 2014

JACC Cardiovasc Interv 2014

## Tips and Tricks in LMT PCI

### **2; HD patients !!**

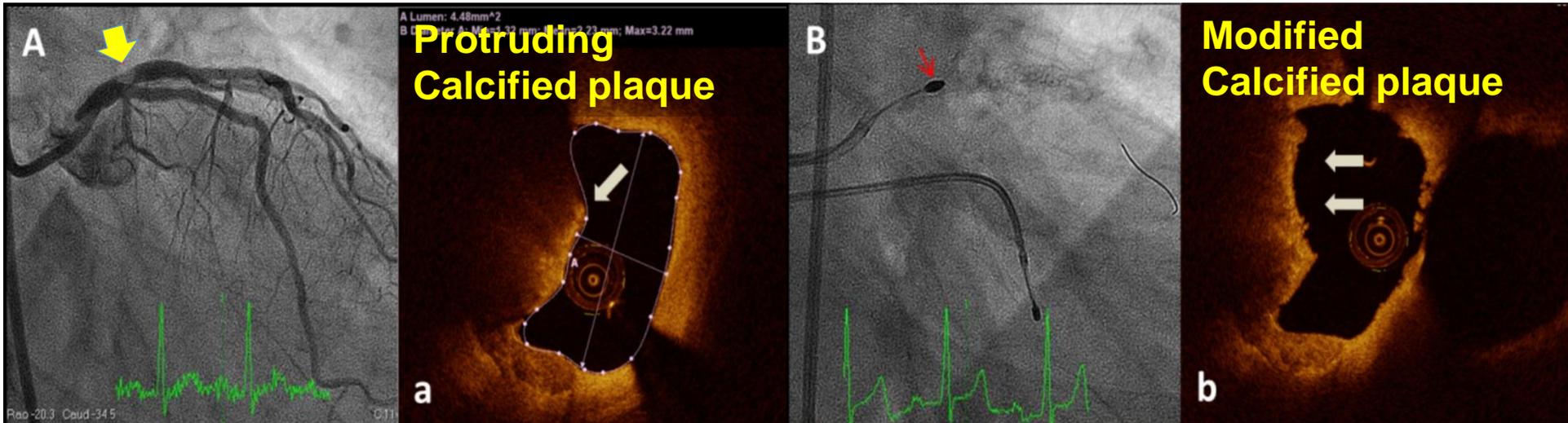
- Big Issue -

# FD-OCT Assessment of Stent Constriction 9-M after SES Implantation in Patient With Hemodialysis

Y. Fujino, S. Nakamura, M Costa, et al. JACC Intervention. 2013

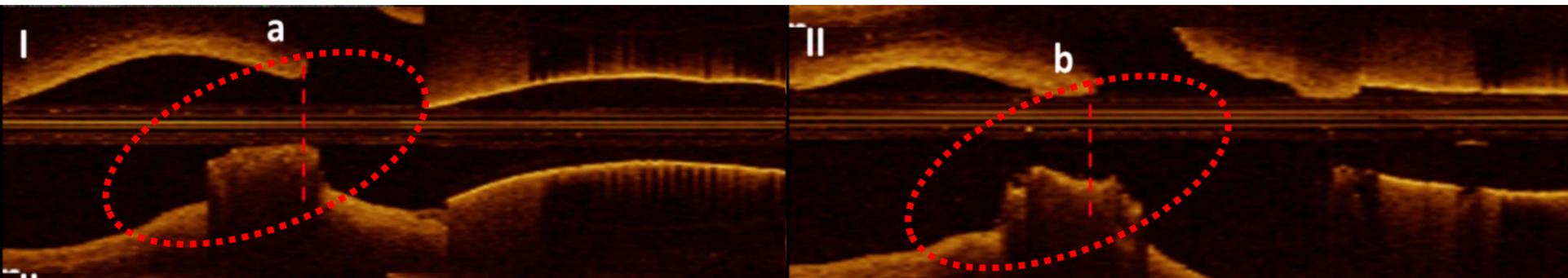
Pre Rota

Post Rota



Protruding Calcified plaque

Modified Calcified plaque

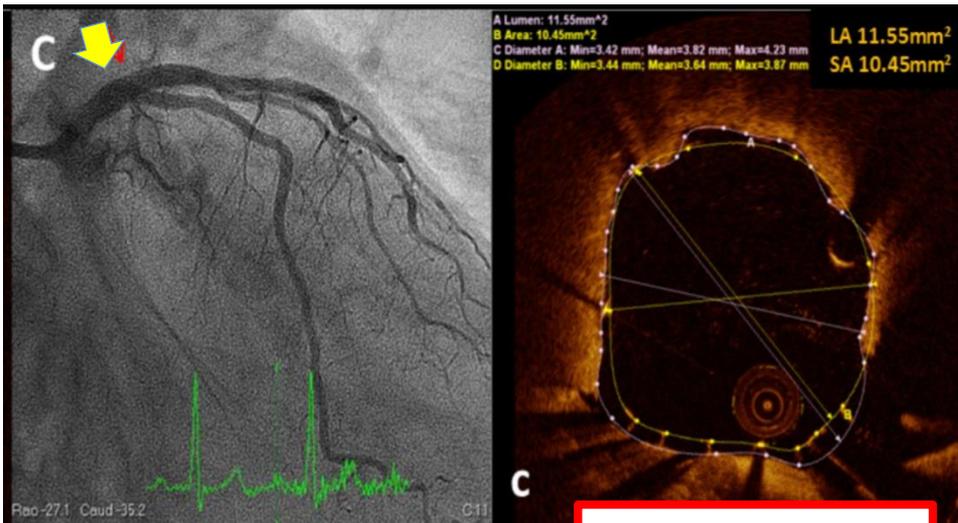


# FD-OCT Assessment of Stent Constriction 9-M after SES Implantation in Patient With Hemodialysis

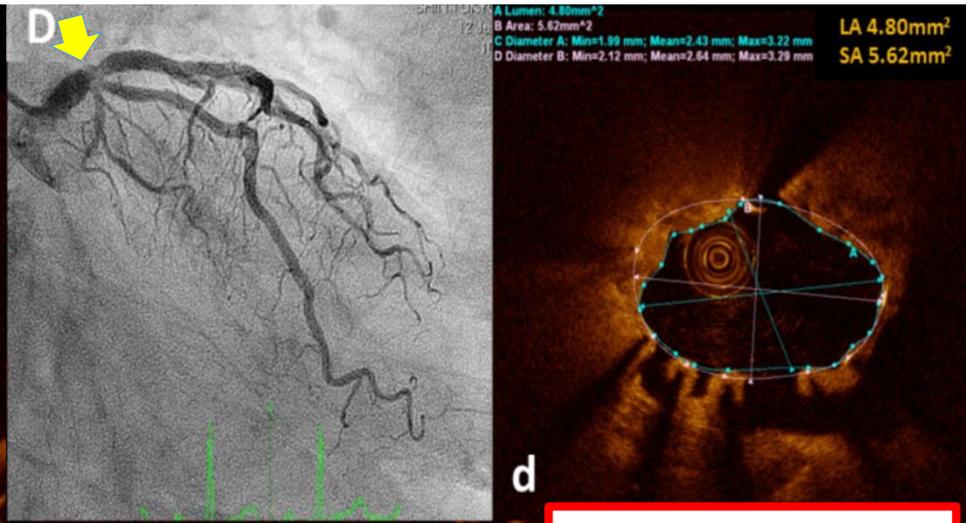
Y. Fujino, S. Nakamura, M Costa, et al. JACC Intervention. 2013

Post SES

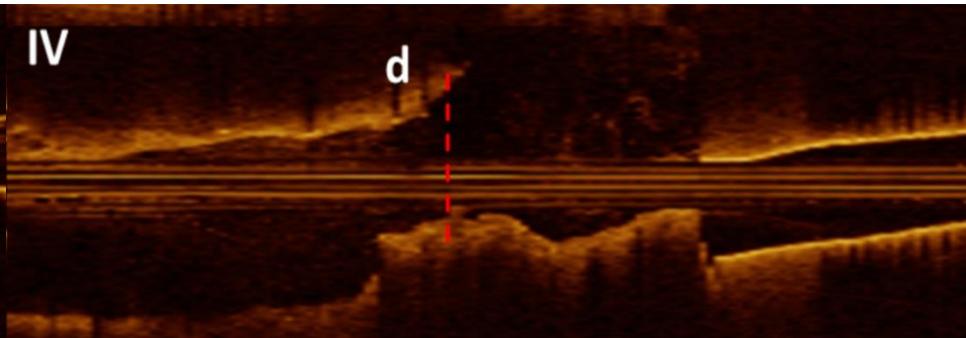
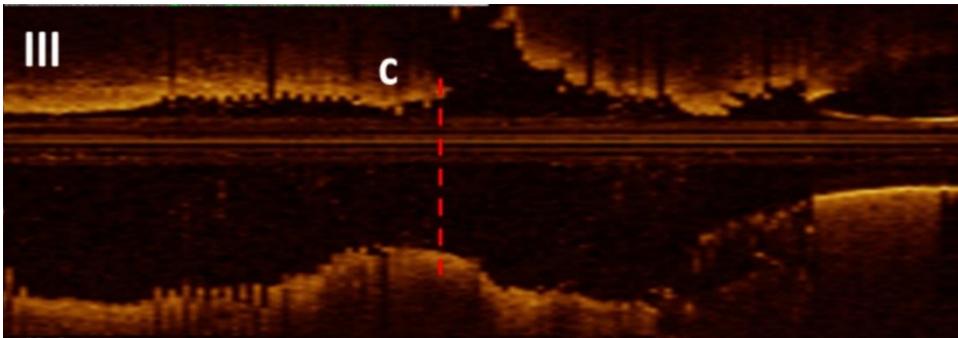
F/U 9mo.



Symmetrically expanded stent



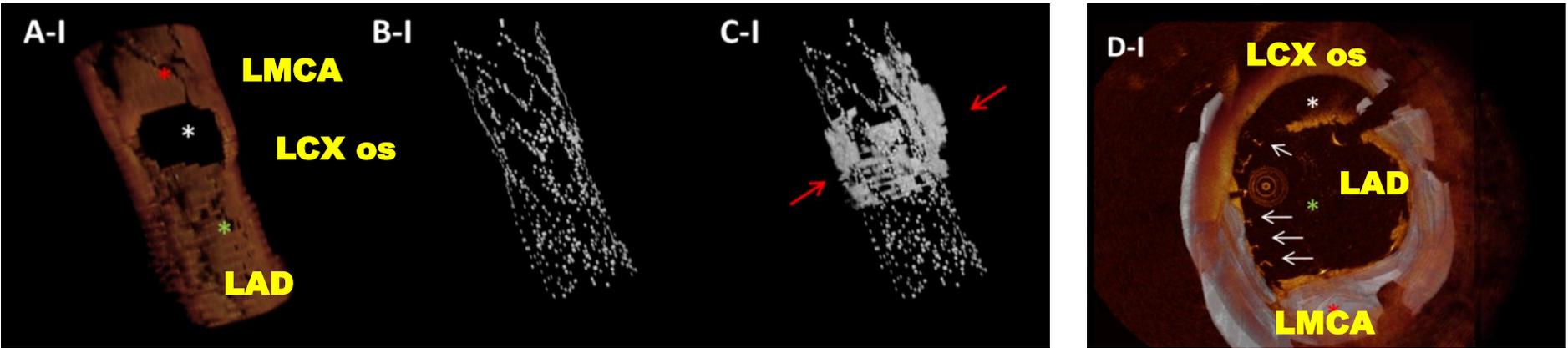
Stent constriction  
minimal neointima



# FD-OCT Assessment of Stent Constriction 9-M after SES Implantation in Patient With Hemodialysis

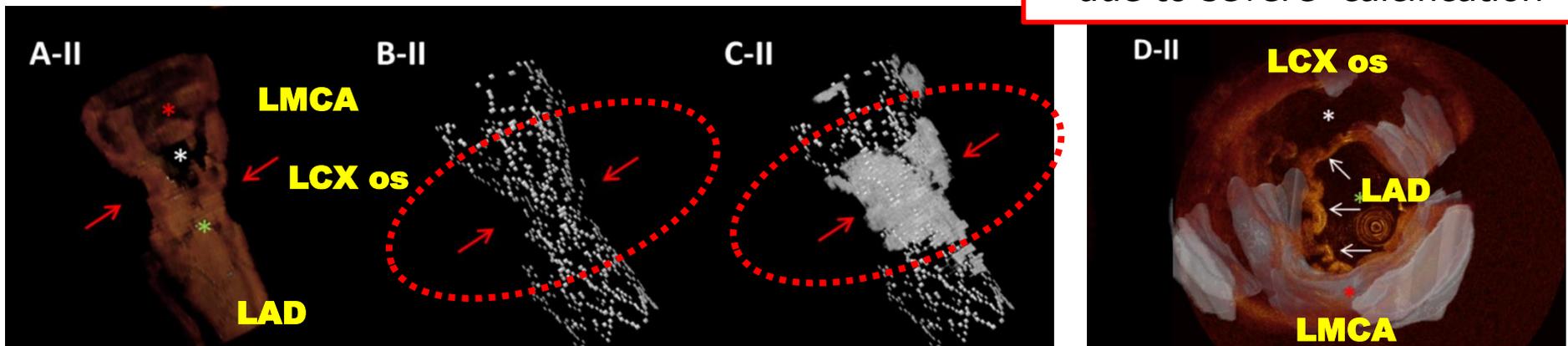
Y. Fujino, S. Nakamura, M Costa, et al. JACC Intervention. 2013

Post SES



F/U 9mo.

Significant stent recoil due to severe calcification



# Impact of Rotational Atherectomy for Heavily Calcificated Unprotected Left Main Disease: The New Tokyo Registry.

H.Yabushita, S.Nakamura et.al Cicalation Jounal 2013

**TLR-MB 7 (10.9)**

**TLR-MB in non-HD (n=51) 1 (2.1)**

**TLR-MB in HD (n=13) 6 (46.2)**

TLR 12 (18.8)

TLR-MB 7 (10.9)

TLR-MB in non-HD patients (n=51) 1 (2.1)

TLR-MB in HD patients (n=13) 6 (46.2)

MI 3 (4.7)

Definite/Probable ST 2 (6.1)

# ⑭ In case of HD : Need to be highly attention !!



## Calcification in HD patients

In hemodialysis patients, Highly probable to cause stent recoil at chronic phase despite of ablation of calcified lesion using ROTA. Therefore they are prone to restenosis.



Yusuke Fujino  
M.D. FACC

JACC Intervention. 2013



Hiroto Yabushita  
M.D.

Circulation Journal 2013

## Tips and Tricks in LMT PCI

### **3; About POT**

- Important procedure -

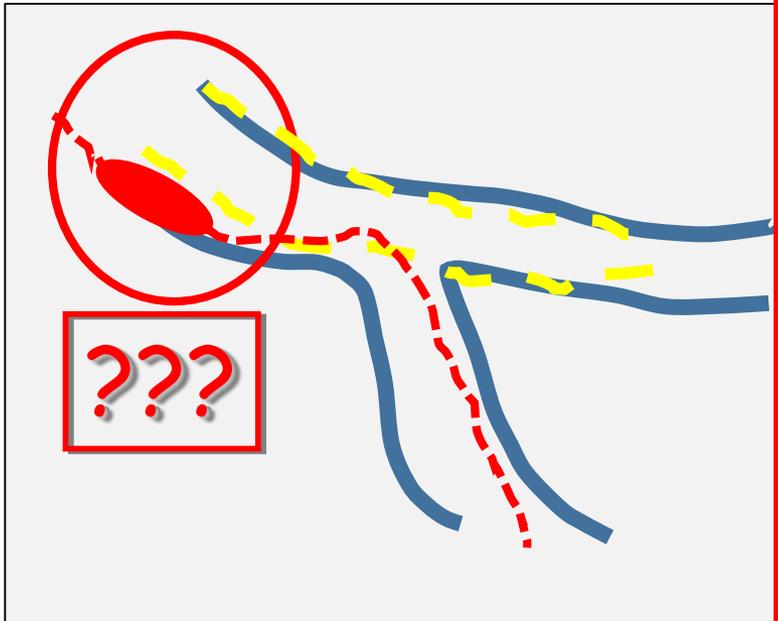
The impact of Main Branch Restenosis on Long Term Mortality Following Drug-eluting Stent Implantation in Patients with De Novo Unprotected Distal Left Main Bifurcation Coronary Lesions: The Milan and New-TOKyo (MITO) Registry

Catheter Cardiovasc Interv. 2013 K.Takagi, S.Nakamura A.Colombo et.al

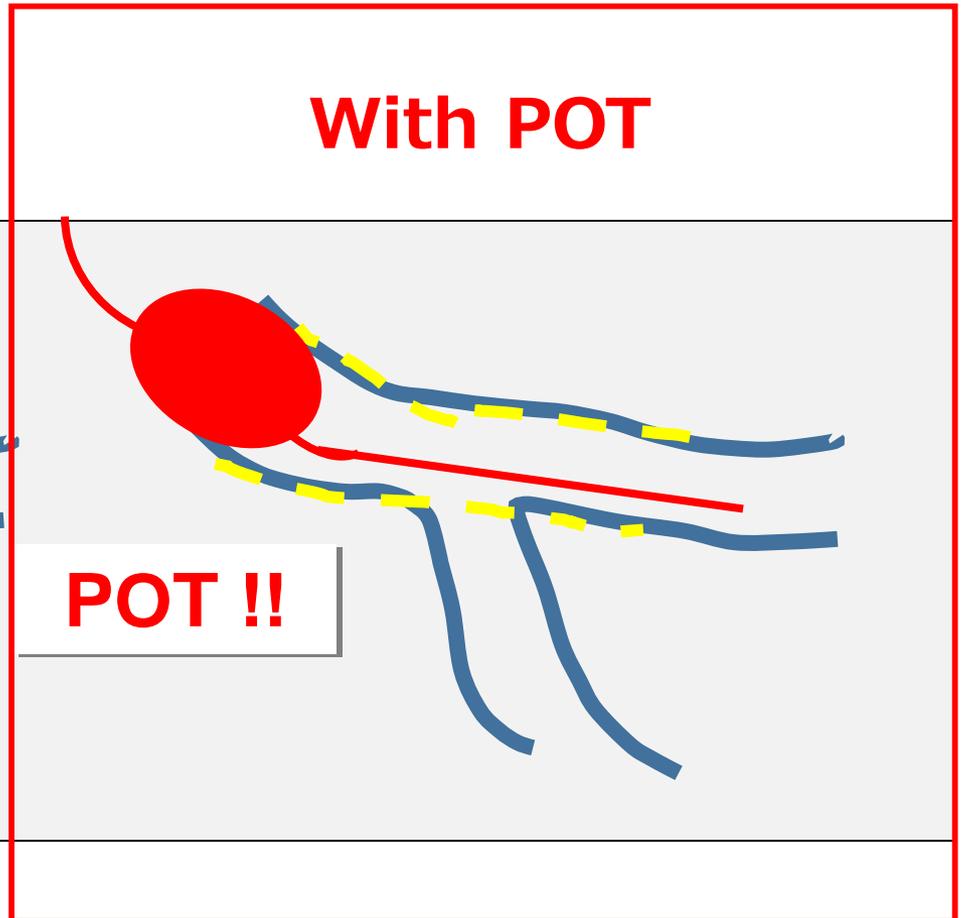
<b>n=753</b>	<i>Univariable HR (CI)</i>	<i>P Value</i>	<i>Coxadjusted HR (CI)</i>	<i>P Value</i>
<b>Calcification</b>	2.114 (1.085-4.121)	0.028	<u>2.284</u> (1.165-4.475)	0.016
<b>True-bifurcation</b>	2.764 (1.344-5.668)	0.006	<u>2.331</u> (1.117-4.862)	0.024
<b>Insulin DM</b>	2.742 (1.234-6.092)	0.013	<u>2.259</u> (1.007-5.068)	0.048
<b>Post MLD</b>	0.568 (0.346-0.932)	0.025	<u>0.611</u> (0.364-1.026)	0.062
<b>POT</b>	0.428 (0.228-0.805)	0.008	<u>0.548</u> (0.281-1.067)	0.077
<b>Full cover approach</b>	0.409 (0.235-0.709)	0.001	<u>0.605</u> (0.336-1.088)	0.093
<b>IABP</b>	2.115 (1.126-3.971)	0.020		
<b>3 VD</b>	1.750 (1.015-3.016)	0.044		
<b>Dialysis</b>	2.760 (0.993-7.670)	0.052		
<b>2-stent strategy</b>	1.651 (0.957-2.848)	0.071		

# If you do not POT Before KBT....

**W/O POT**



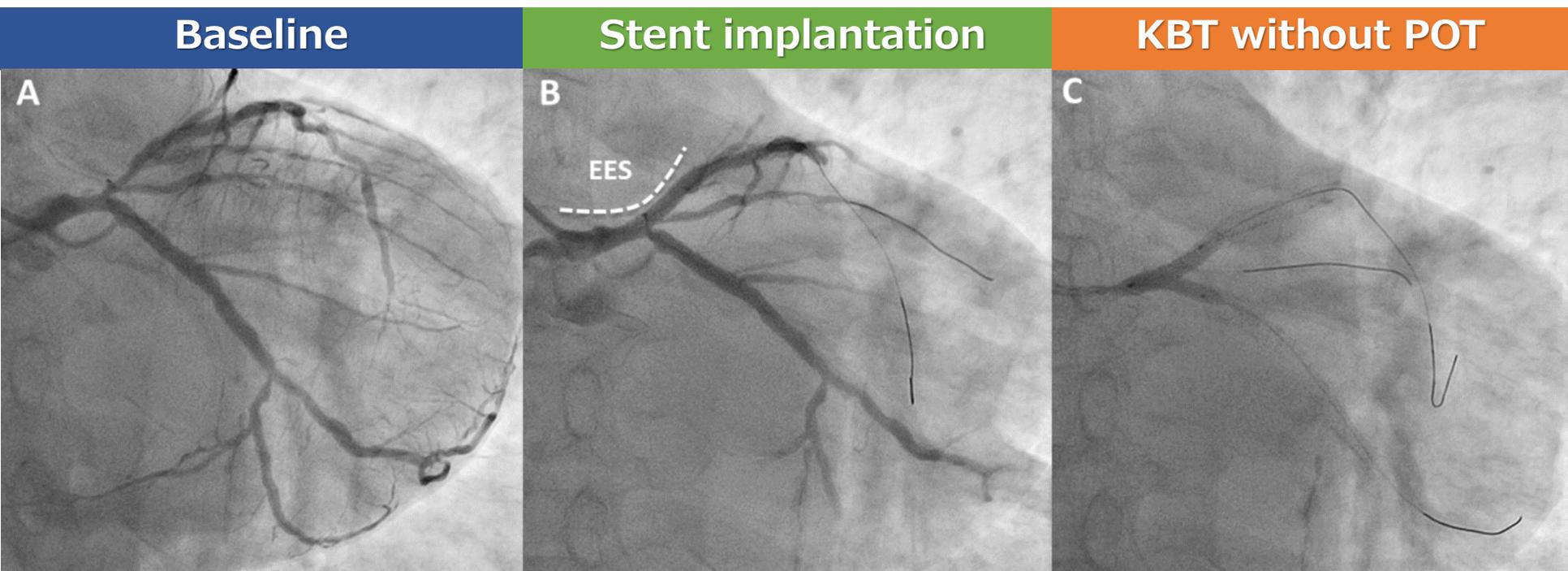
**With POT**



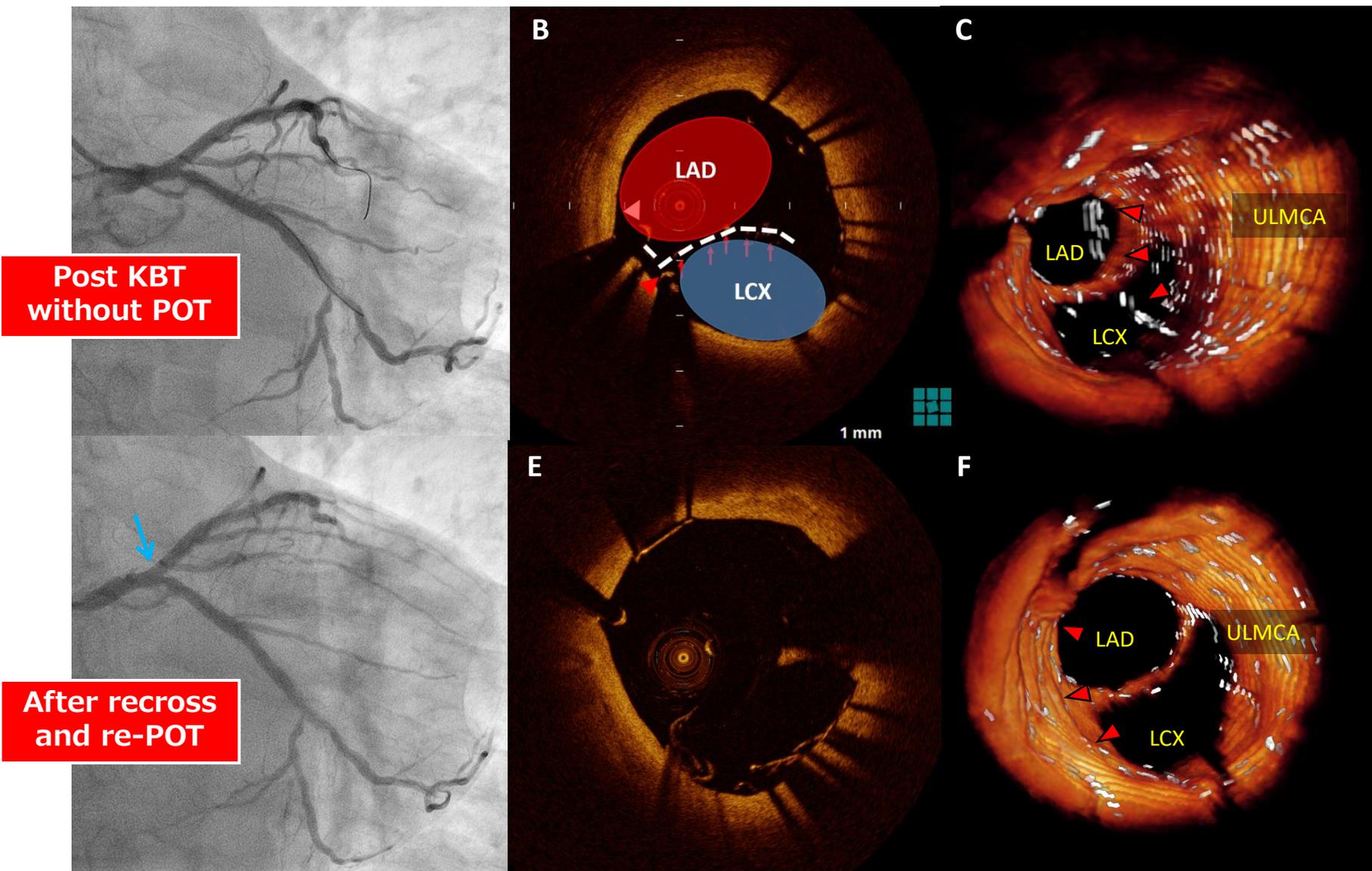
Meaning of POT: Avoiding unfavorable KBI

## FD-OCT assessment of Unfavorable KBT Result in ULMCA

---



# OCT Assessment of Unfavorable KBT



## ⑮ POT is quite important !!

---

POT after LMT stenting is very mandatory to avoid unfavorable KBT and achieve better stent apposition.

K.Takagi et al Catheter Cardiovasc Interv. 2013

K.Takagi et al Catheter Cardiovasc Interv. 2013

Y Fujino et al JACC Cardiovasc Interv 2012



**Kensuke Takagi**  
M.D. FACC



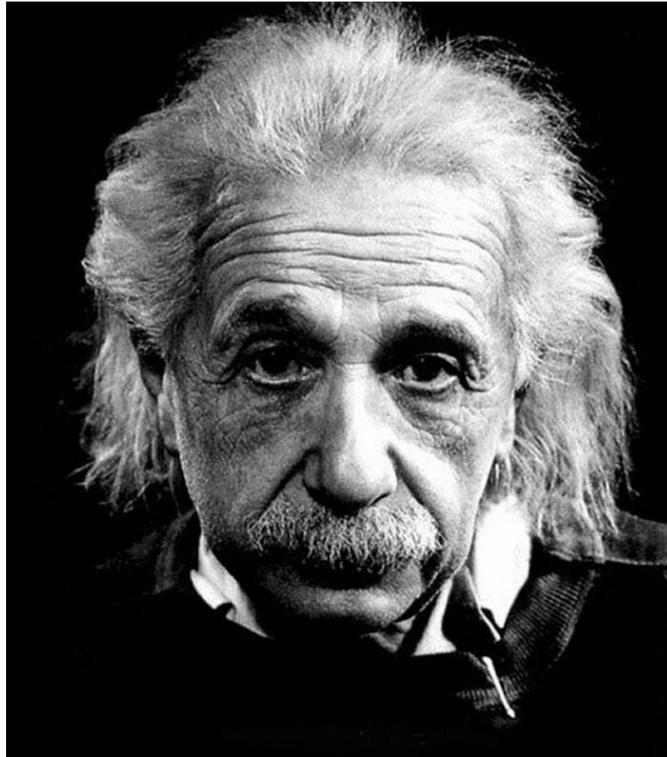
**Yusuke Fujino**  
M.D. FACC

## Tips and Tricks in LMT PCI

### **4; KBT ?? and POT**

- Important procedure -

# Why ?? KBT or not KBT



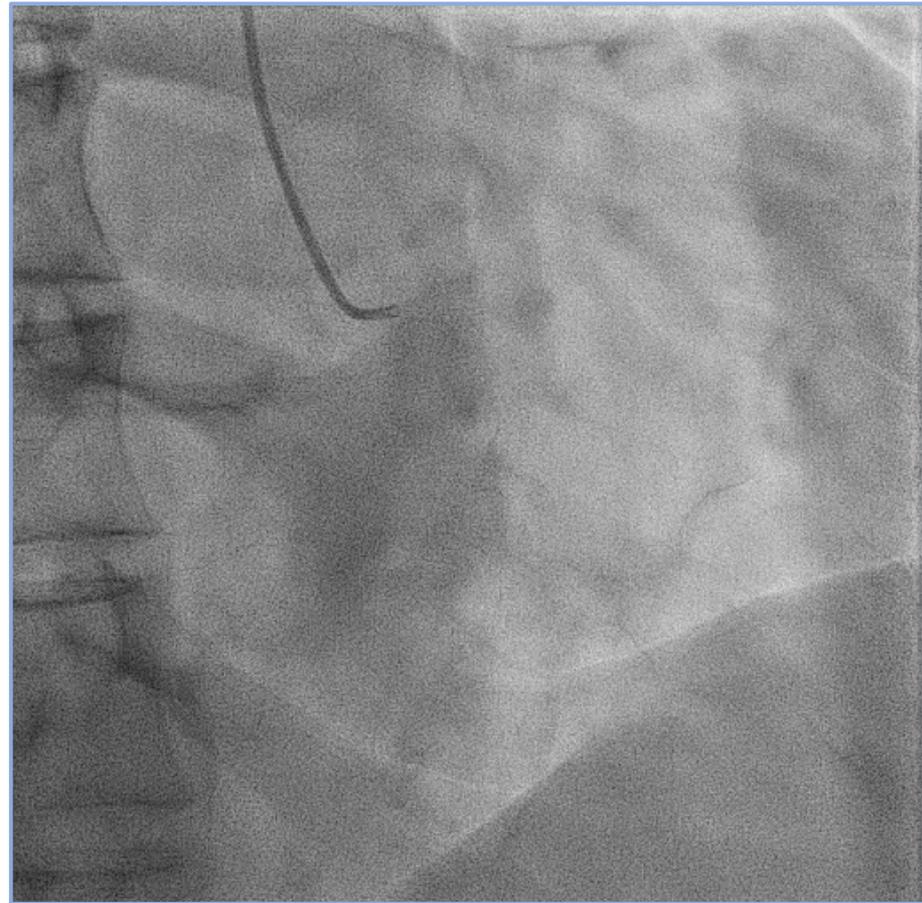
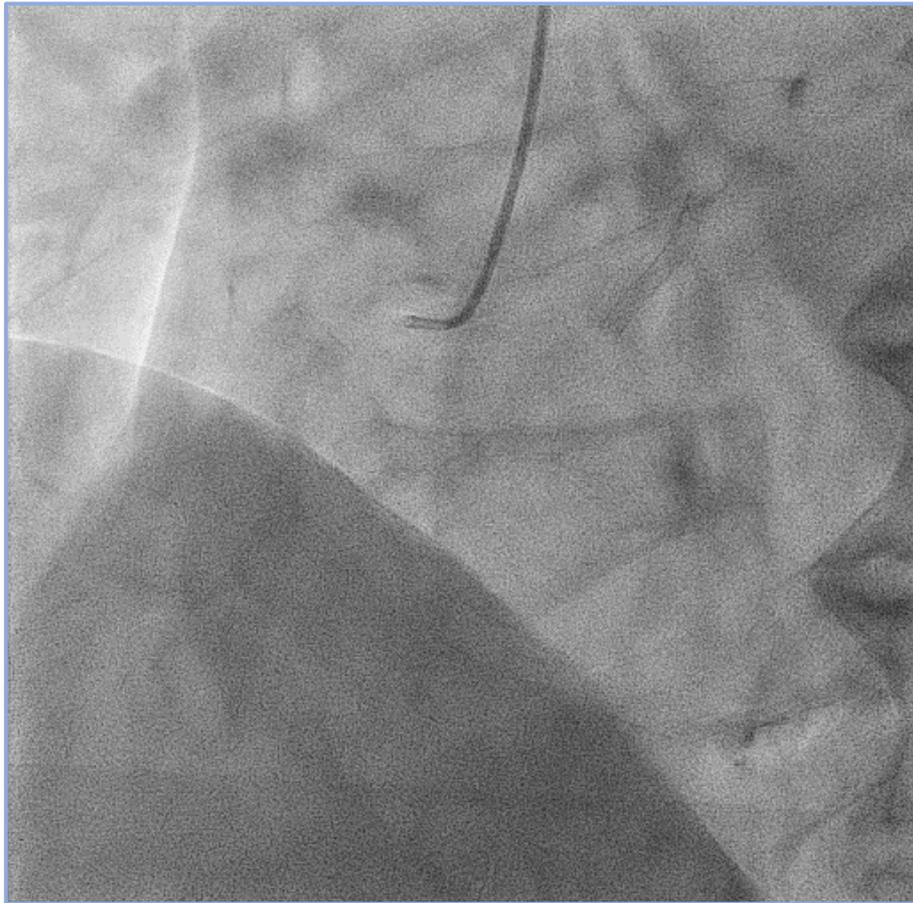
Albert Einstein  
(1879 - 1955) Physicist

Common sense is the collection of prejudices  
acquired by age eighteen.

# Case : 83yo: M **LMT** true bifurcated Disease

---

RCA: no significant stenosis

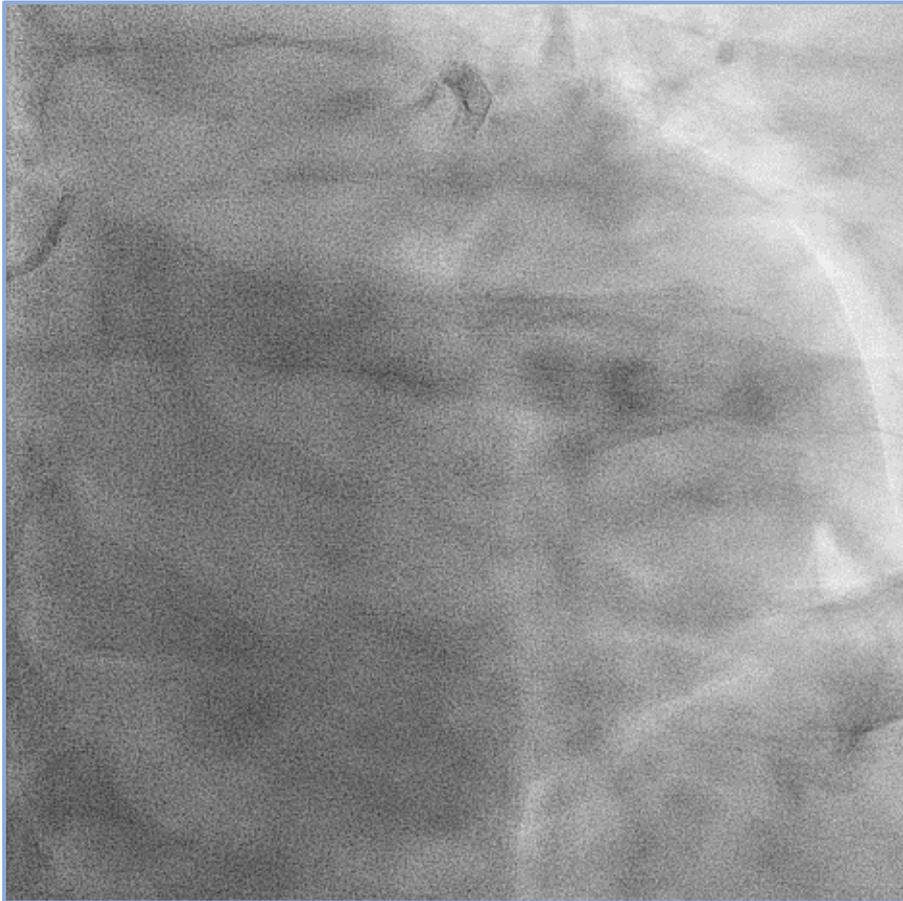


# Case : 83yo: M **LMT** true bifurcated Disease

---

LMT distal true bifurcated Lesion (1.1.1.)

Prox. LCx 90%, Prox.LAD diffuse 80% with Cal.

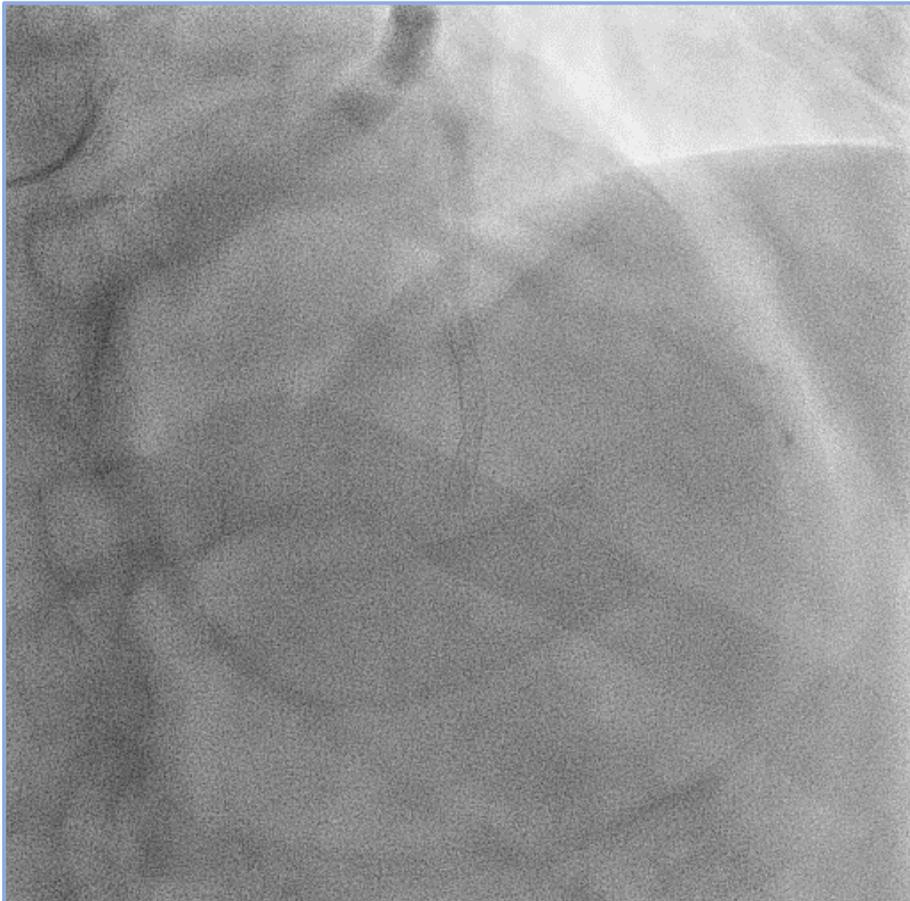


# Case : 83yo: M **LMT** true bifurcated Disease

---

LMT distal true bifurcated Lesion (1.1.1.)

Prox. LCx 90%, Prox.LAD diffuse 80% with Cal.

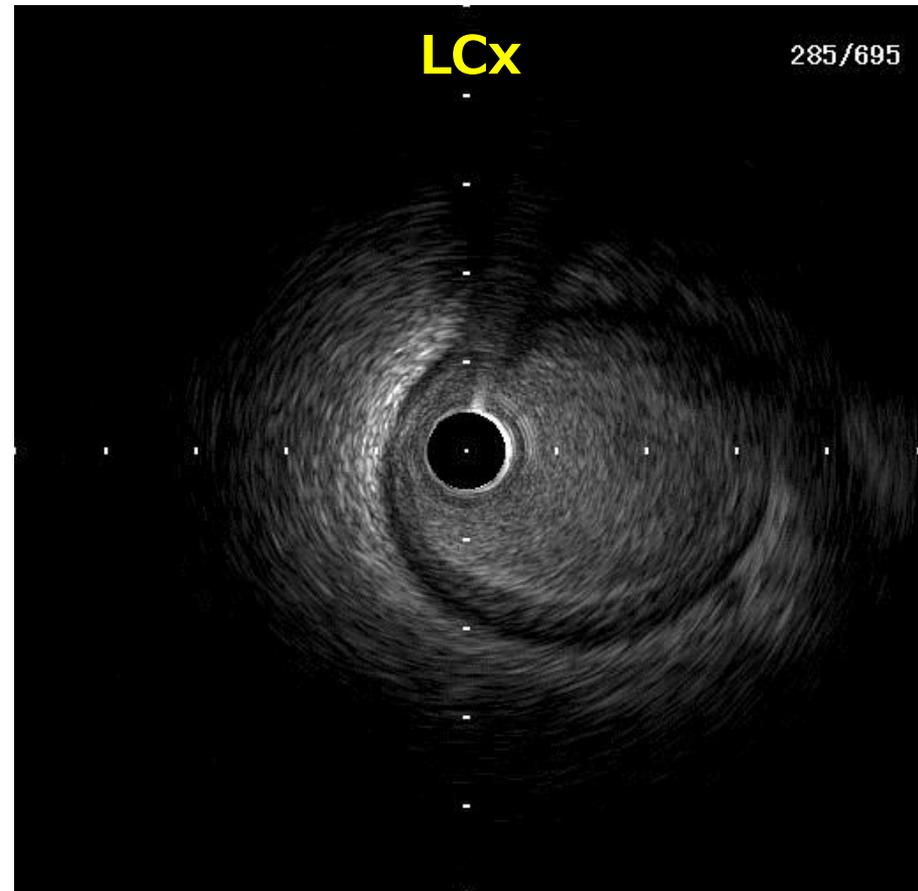
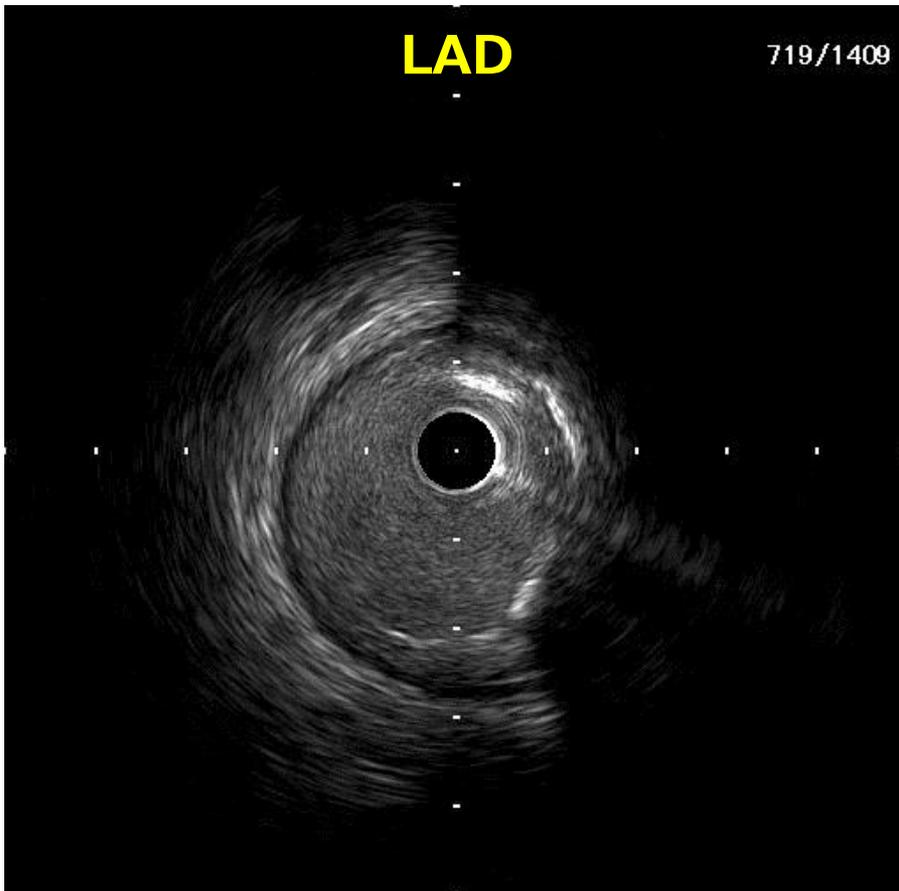


# Case : 83yo: M **LMT** true bifurcated Disease

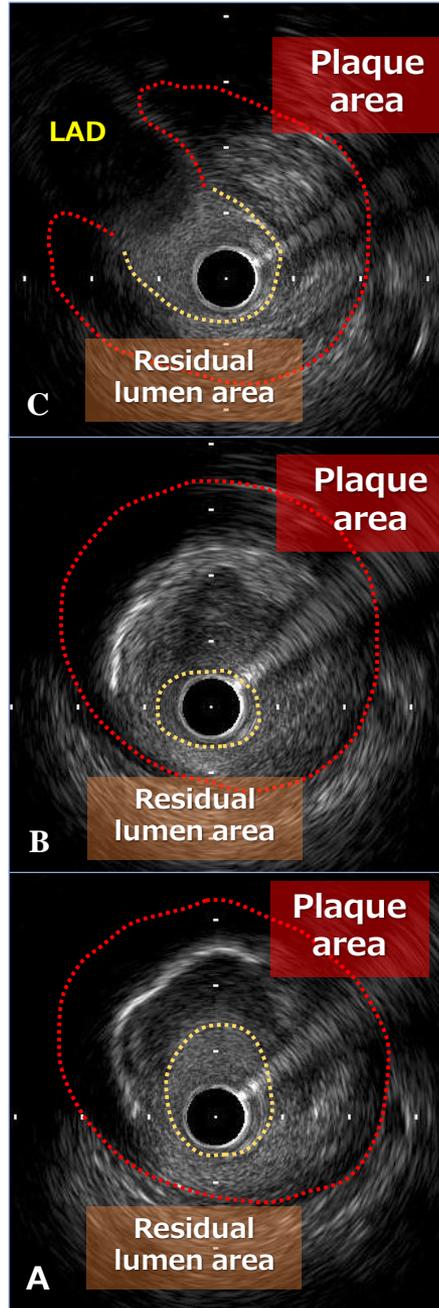
---

LMT distal true bifurcated Lesion (1.1.1.)

Prox. LCx 90%, Prox.LAD diffuse 80% with Cal.



Preprocedural IVUS evaluation:  
proximal LCx



Ostial LCx

Large plaque burden

Proximal LCx

# How would you treat this lesion?

---

1. Provisional Stenting

Highly probable TAP ???



2. DK Crush



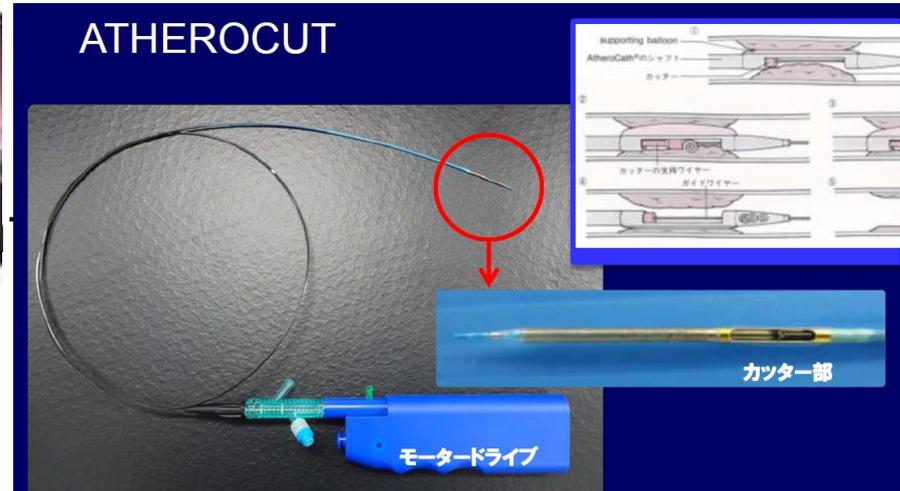
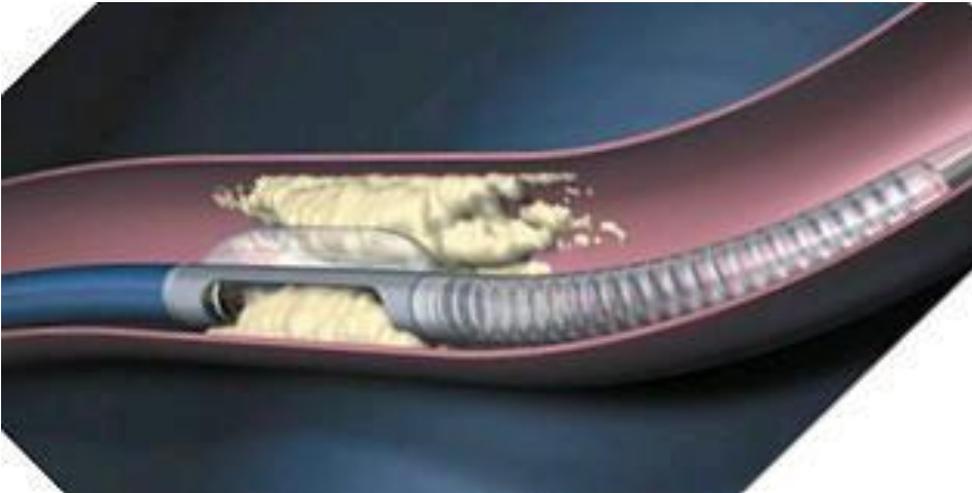
3. Culotte stenting

4. Others..

# Our Choice is No.4

## 1. Provisional Stenting (DCA (Atherocut))

Highly probable TAP ???

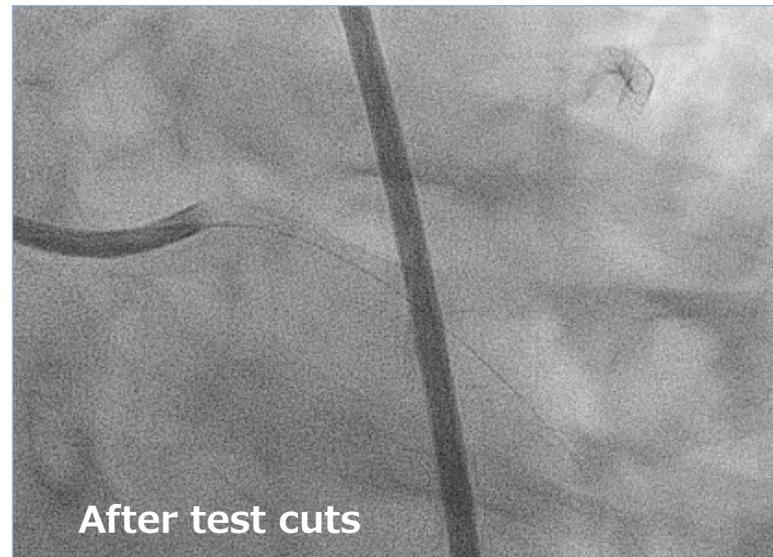
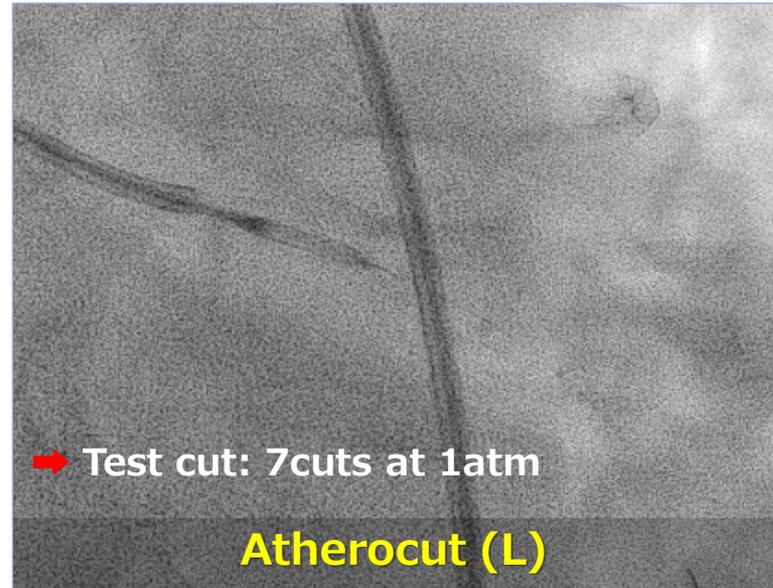


# DCA for the proximal LCx

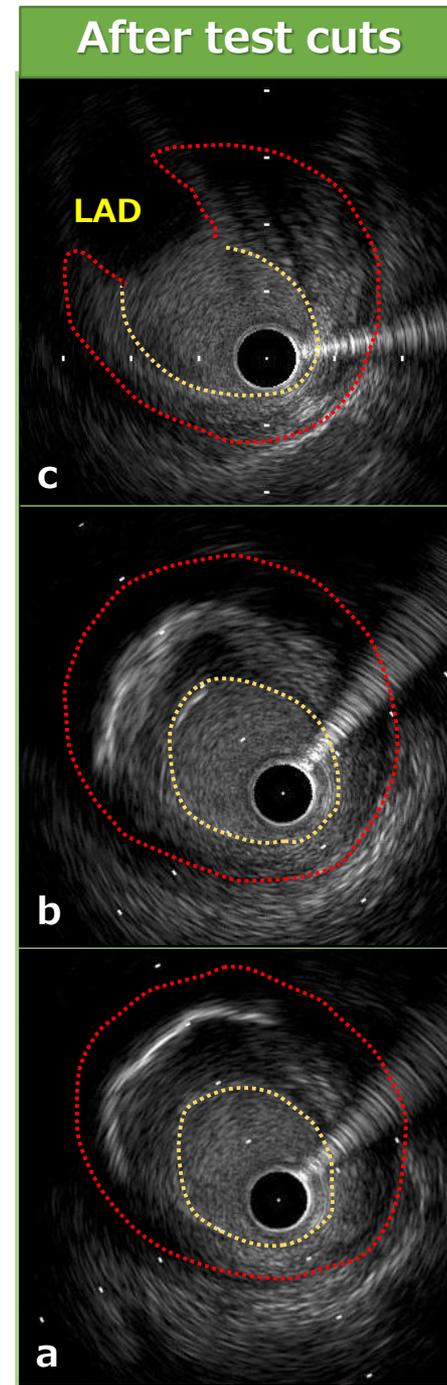
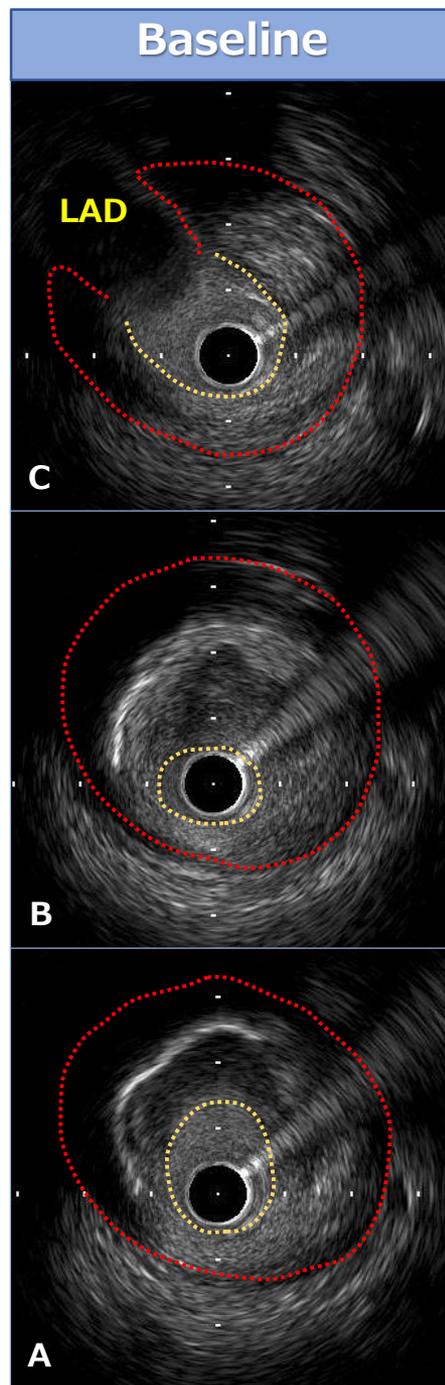
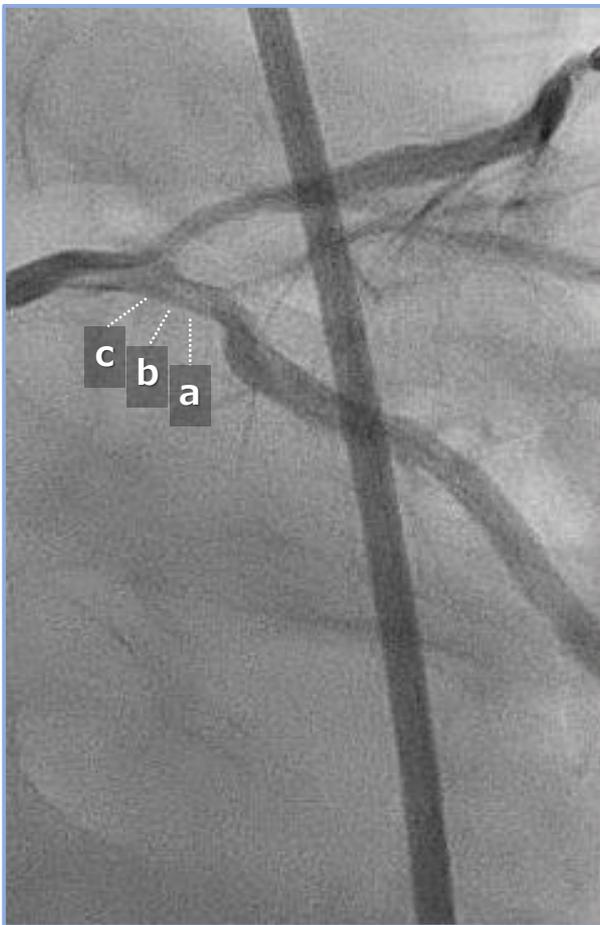
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**Test Cut  
for the proximal LCx**



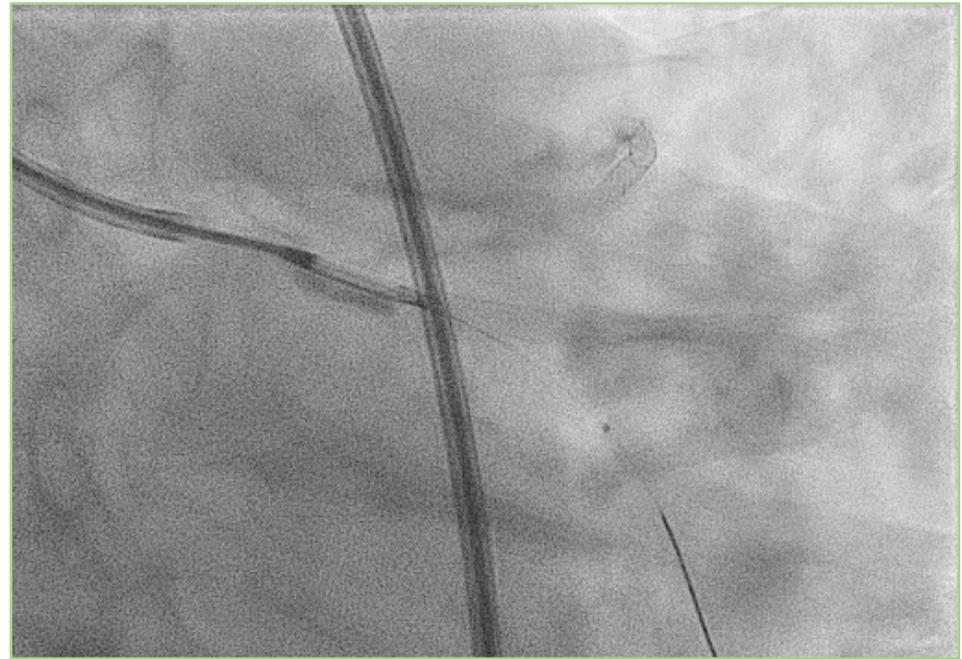
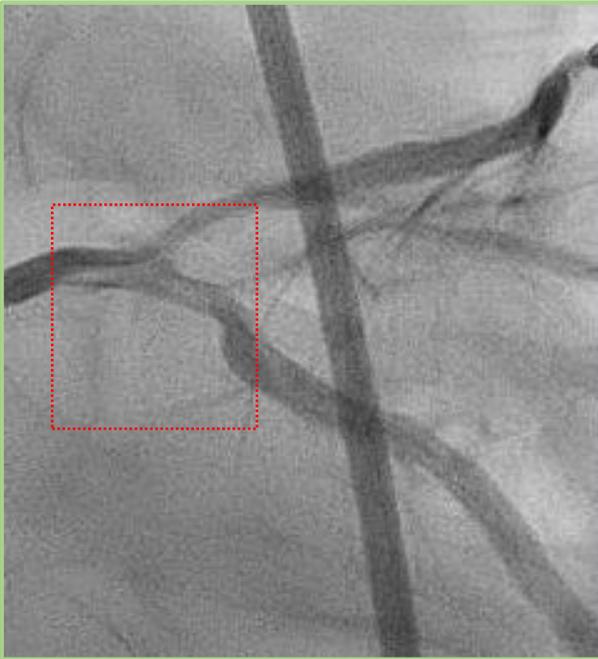
IVUS evaluation after  
test cut for the proximal LCx



# DCA for the proximal LCx

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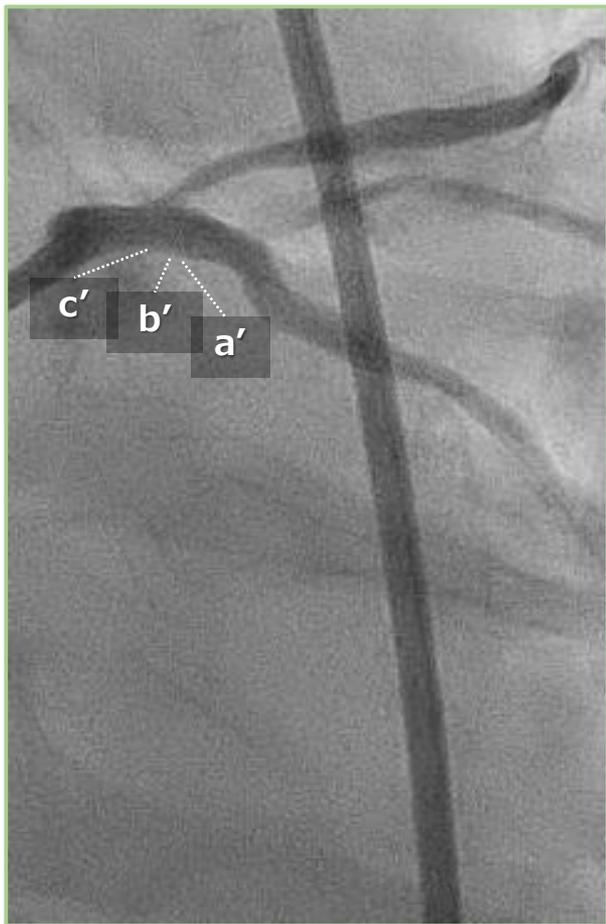
DCA is cut out for Japanese ???



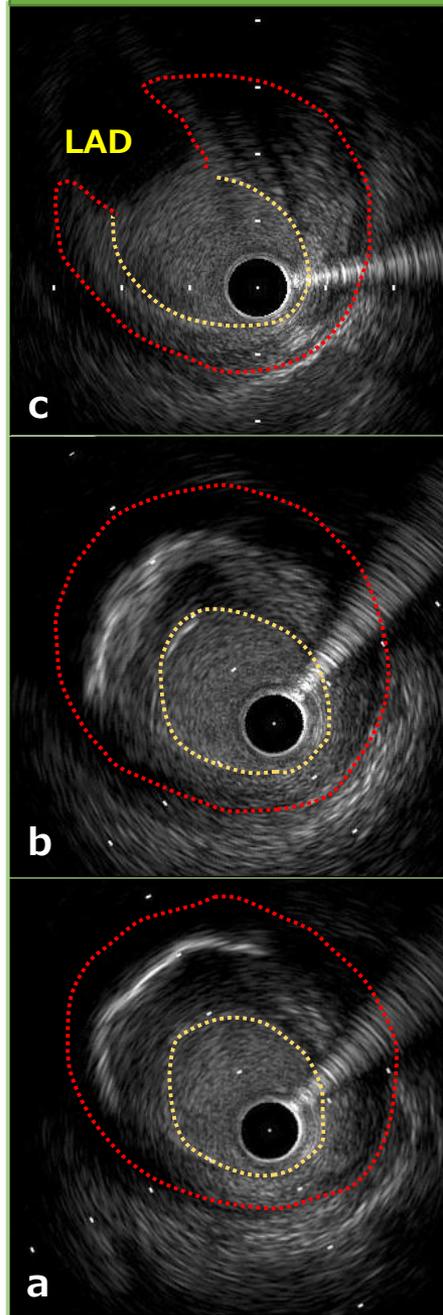
**Multiple cuts for  
the proximal LCx**

- 2atm×5cuts → IVUS evaluation
- 3atm×3cuts → IVUS evaluation
- 2-3atm×6cuts → IVUS evaluation
- 2-3atm×8cuts → IVUS evaluation

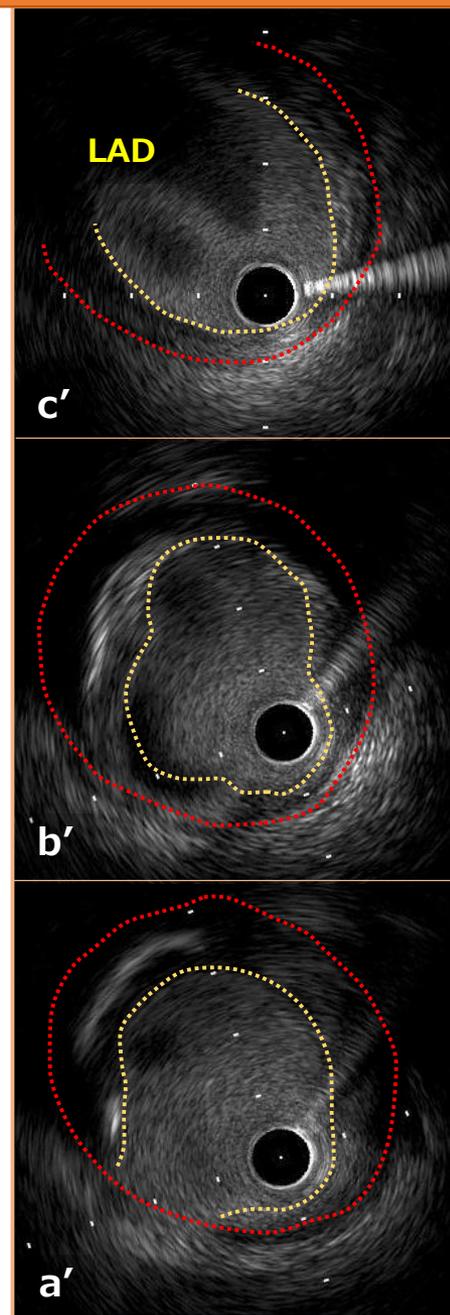
IVUS evaluation after multiple DCA for the proximal LCx



After test cuts

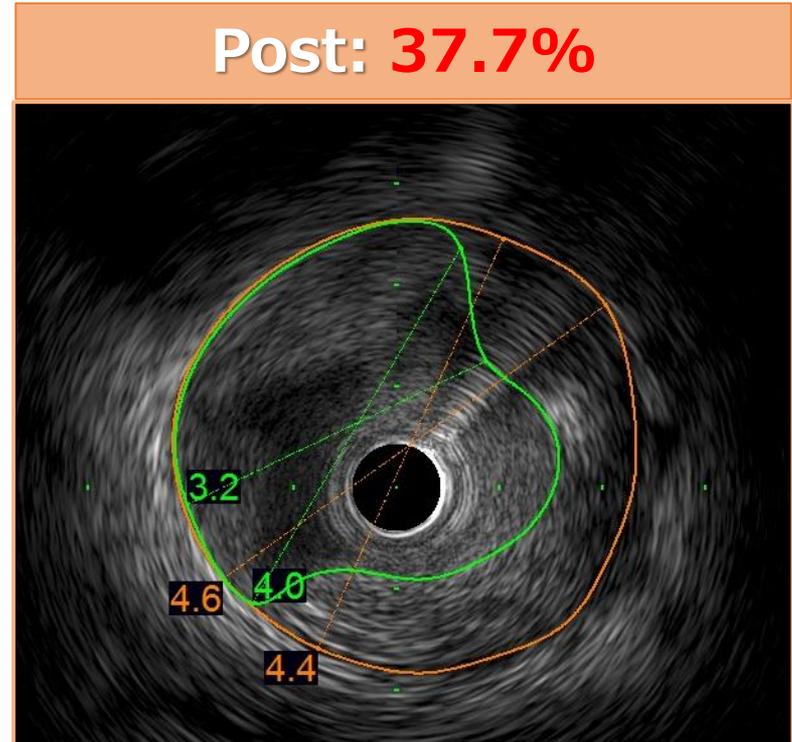
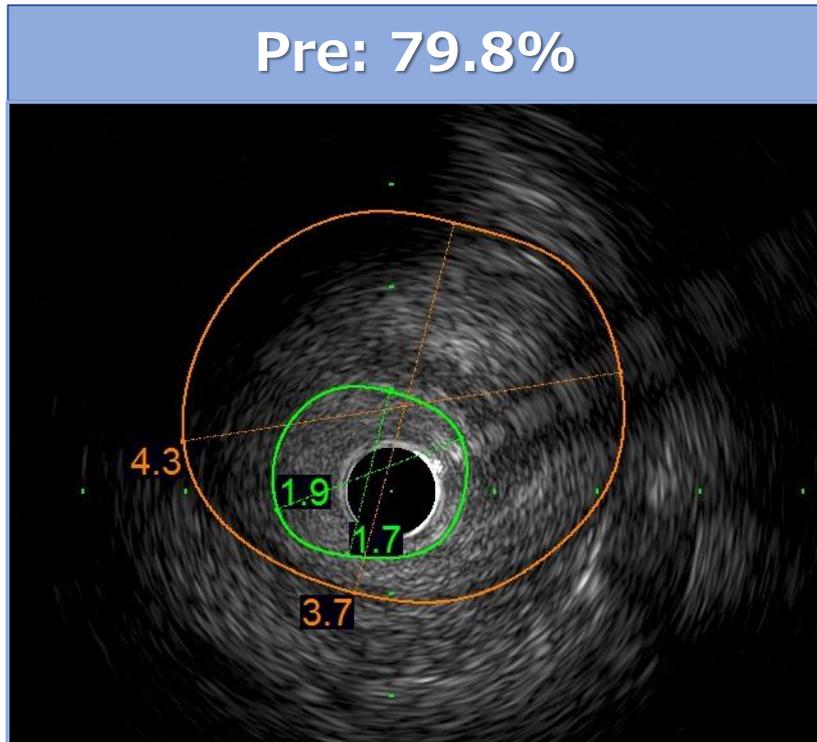


After multiple cuts



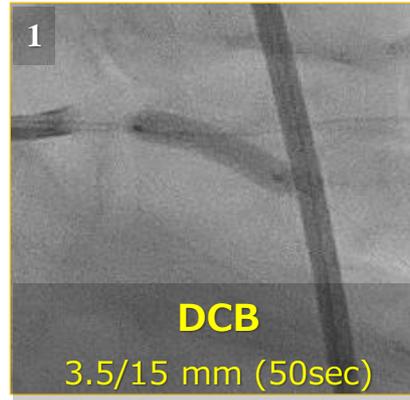
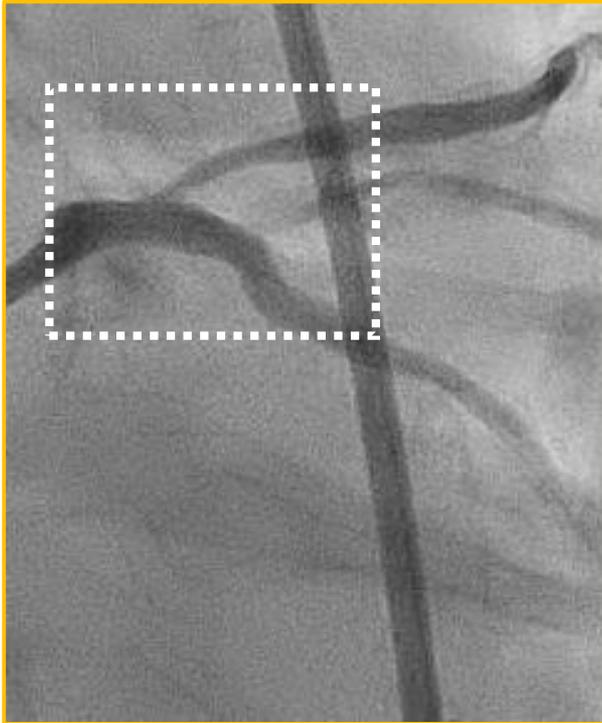
# See !! Big Plaque Reduction !! By DCA

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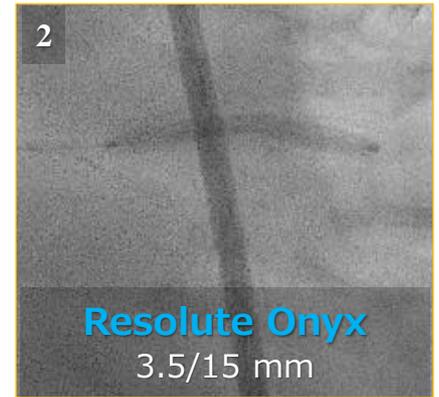


# See !! Stenting in LAD and just DCB in LCx

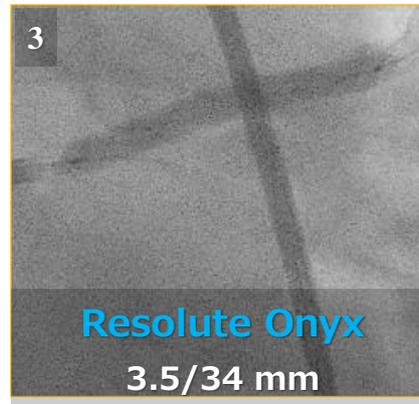
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**Ostial LCx**

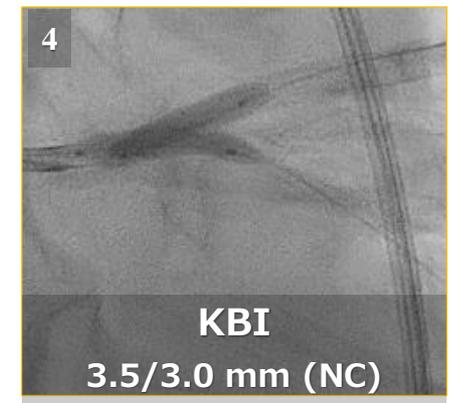


**OM branch**



**LMT-LAD**

➔ POT: 4.5/8 mm

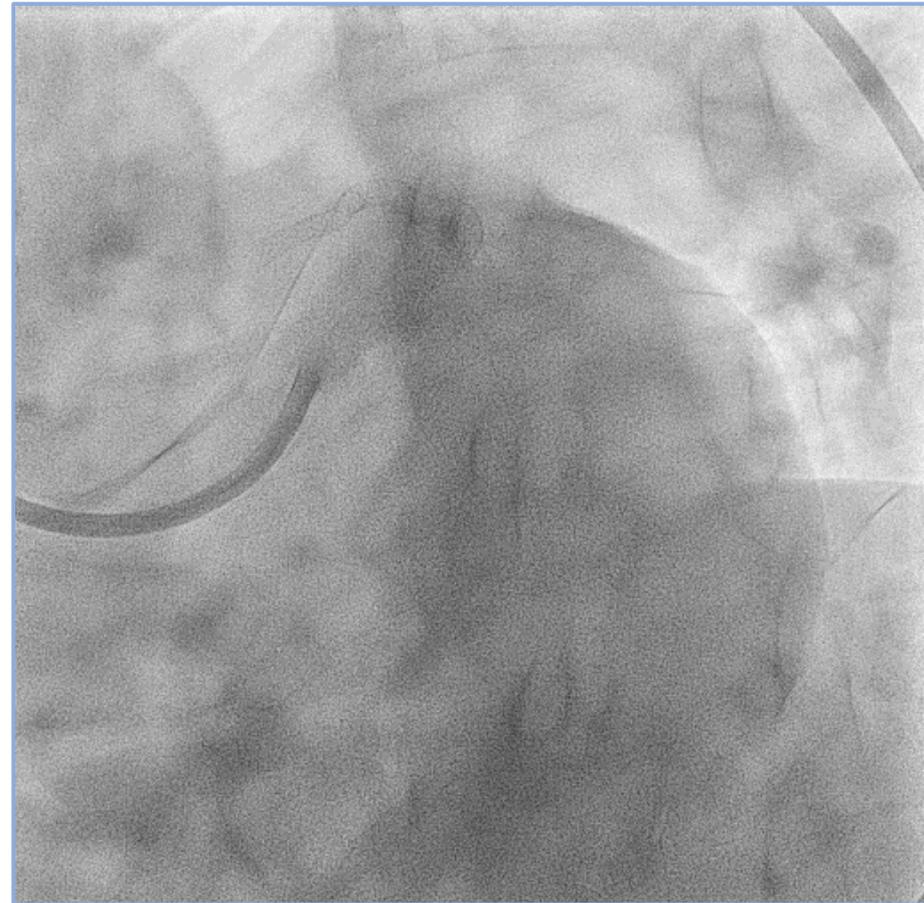
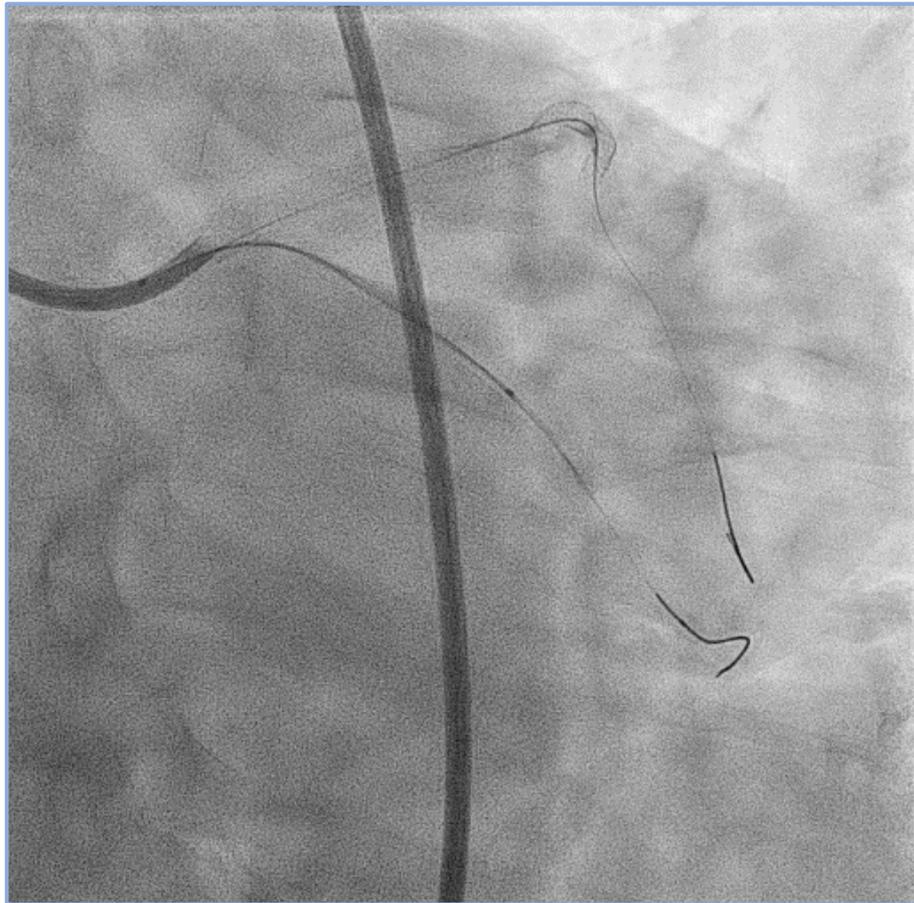


➔ Final POT: 4.5/8 mm

# So Called... Hybrid Strategy with DCAB and DES

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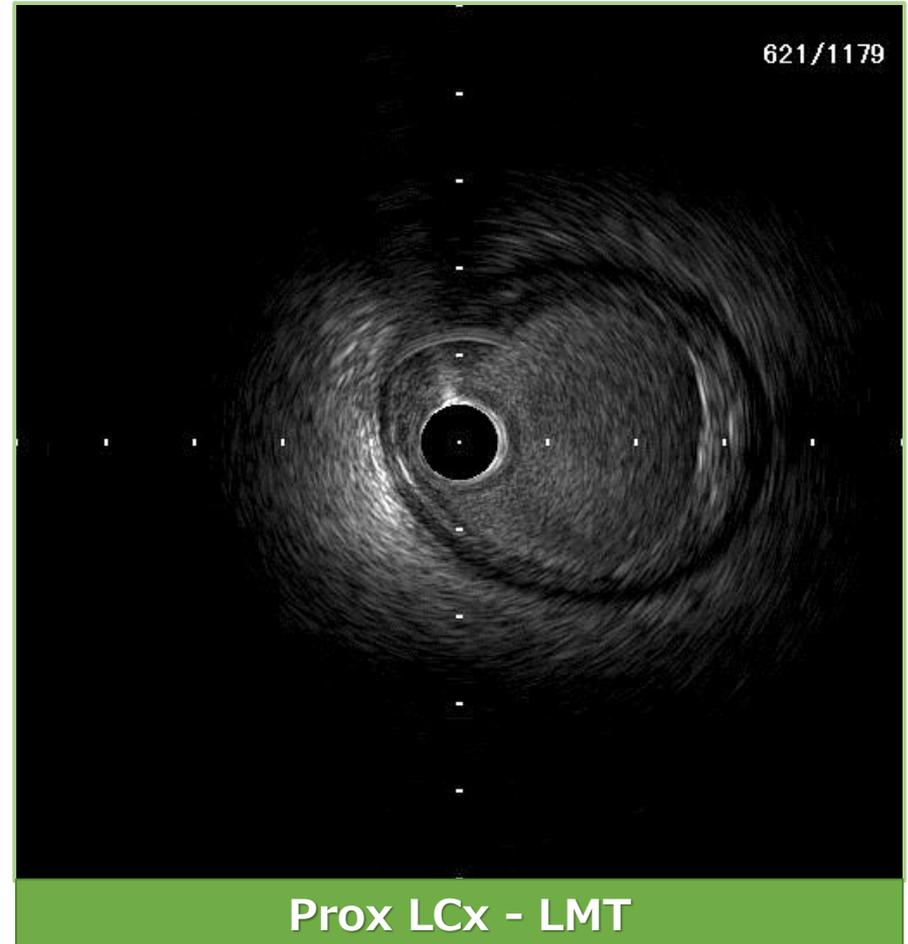
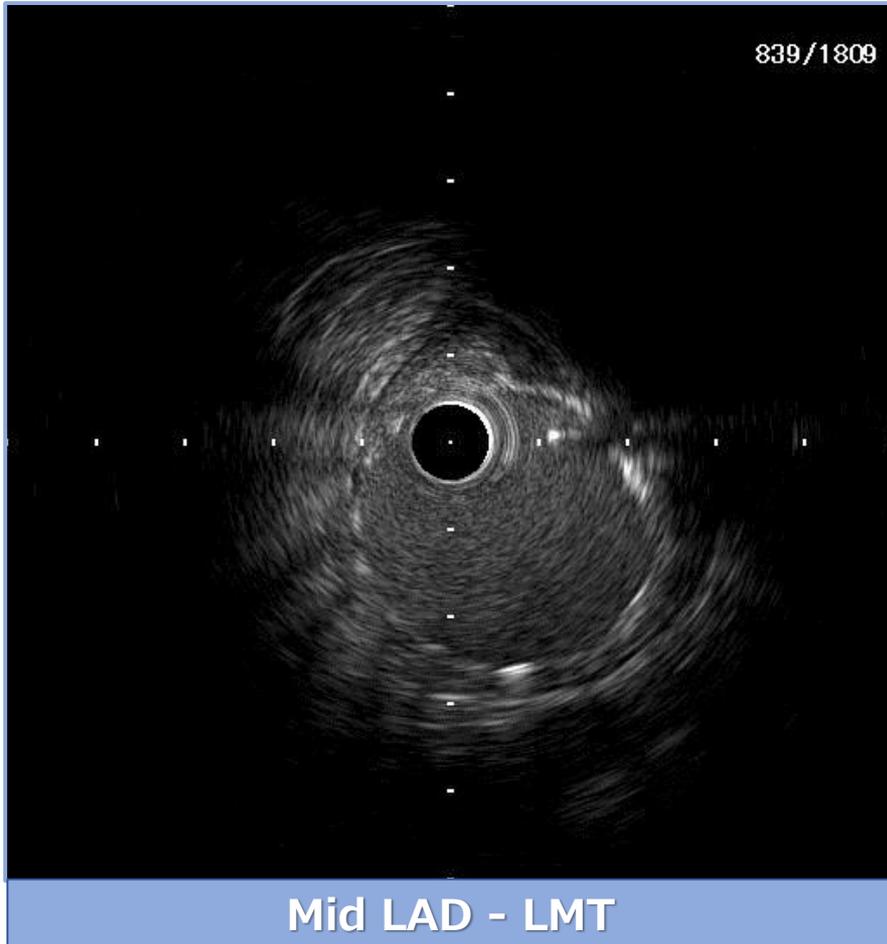
## Final angiography



# So Called... Hybrid Strategy with DCAB and DES

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- Final IVUS evaluation -



# 2 DOGMAS

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**Team PS**



**Team DK**



**Technique is important !!**