Beauty of 4Ps 2017

- 2 case of PCI for LAD CTO with LMT disease -

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Introduction

If... We faced the really difficult situation
of treatment of CAD: PCI...
Personally, I think , better to think “4 Ps”

1st P : Power of image

2nd P : Plan your strategy

3rd P : Product knowledge

4th P : Professionalism/ Perseverance

1st P : Power of image

For maximizing their advantages, we have to know what can be done and what cannot be done for each device and acquire the skill of interpretation of images that are obtained from these modalities.

2nd P : Plan your strategy

Based on the information that you get, plan your PCI strategy. Think scenarios as many as possible and scrutinize them based on lesion information and target of that particular patient.

3rd P : Product knowledge

4th P : Professionalism/ Perseverance

Finally, your professionalism as an interventional cardiologist is crucial for the success of the procedure.

Sense of mission as a cardiologist will drive you to seek for further improvement of your skill constantly.

Perseverance is the indispensable quality that you have to demonstrate as professional cardiologist.

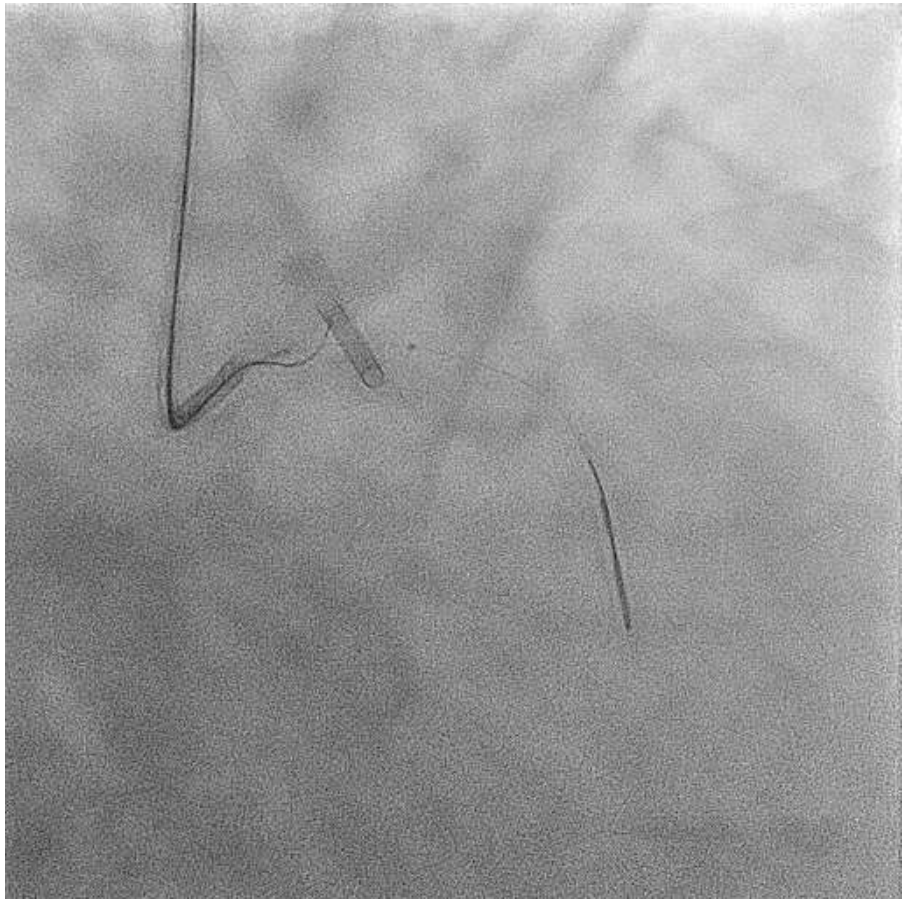
Case 1 ; CT image guide approach

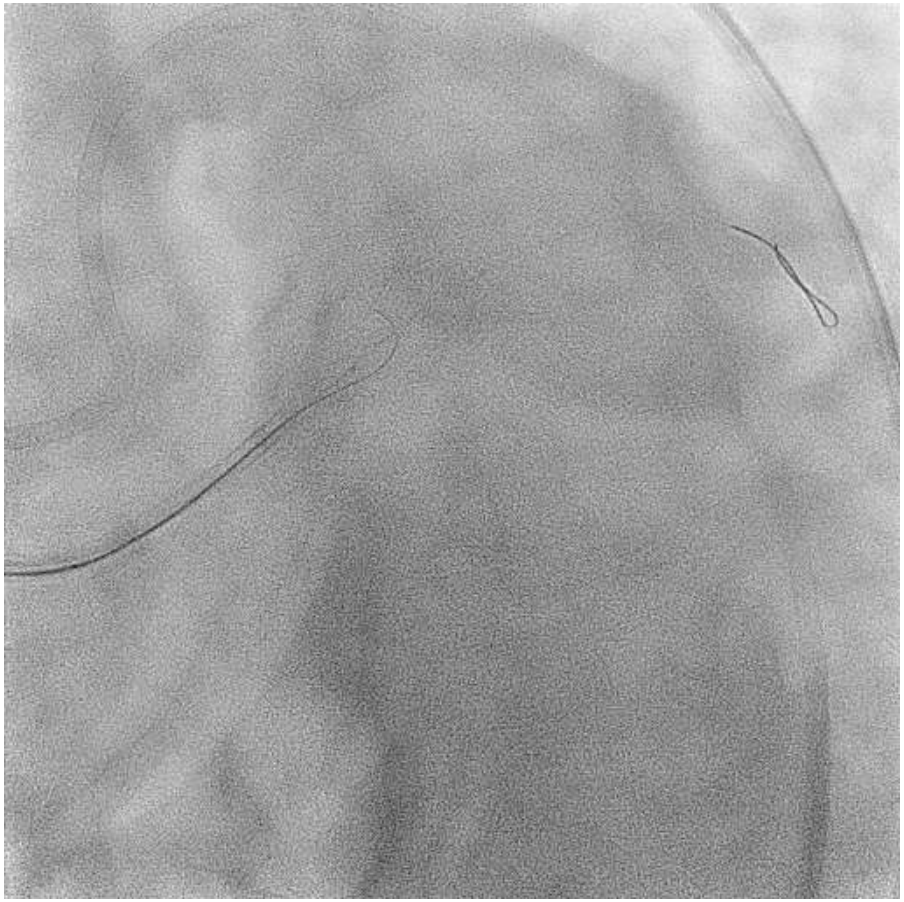
LAD ostium No Stump CTO without
any fine route of retrograde approach,
we need another guide for climbing route.

In case, Angio-coronary CT co-registration System guide GW-ing is useful.

Case 1 : 70yo, M,

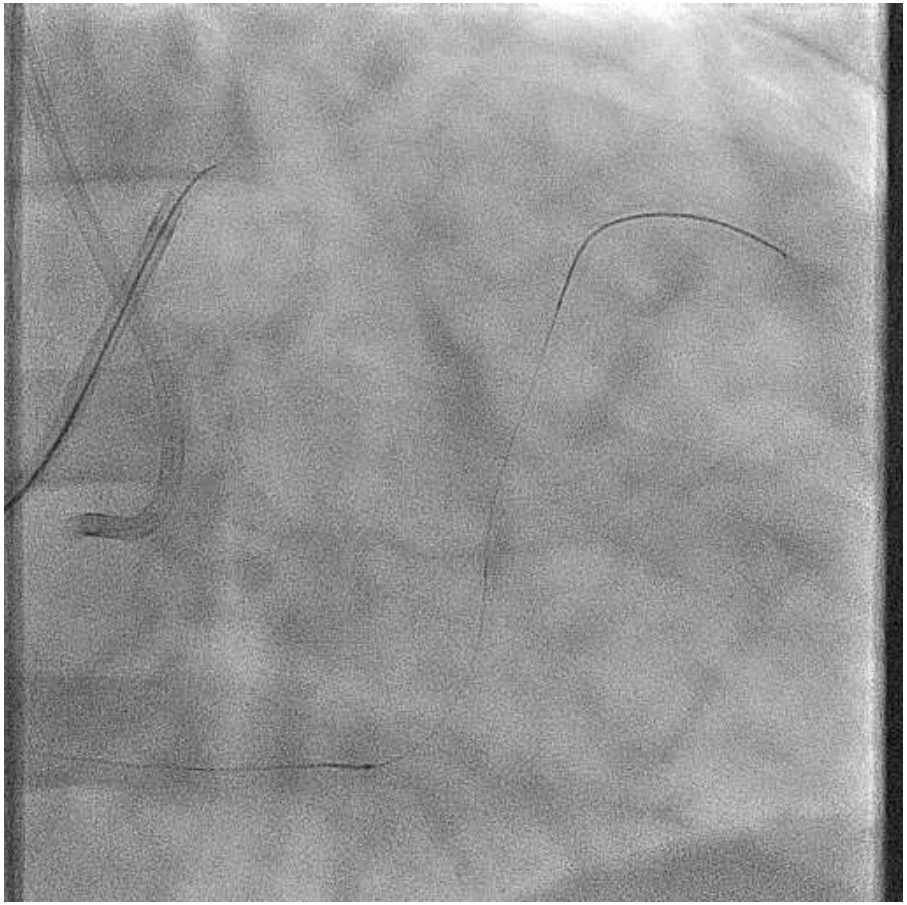
7 years history of Angina, moderate coronary risk factor (HT, Dyslipidemia , No CKD)…. A very small ECG change, UCG: EF was 52 %,
moderate decreased anterior wall motion. Big ischemic aria by scintigraphy.

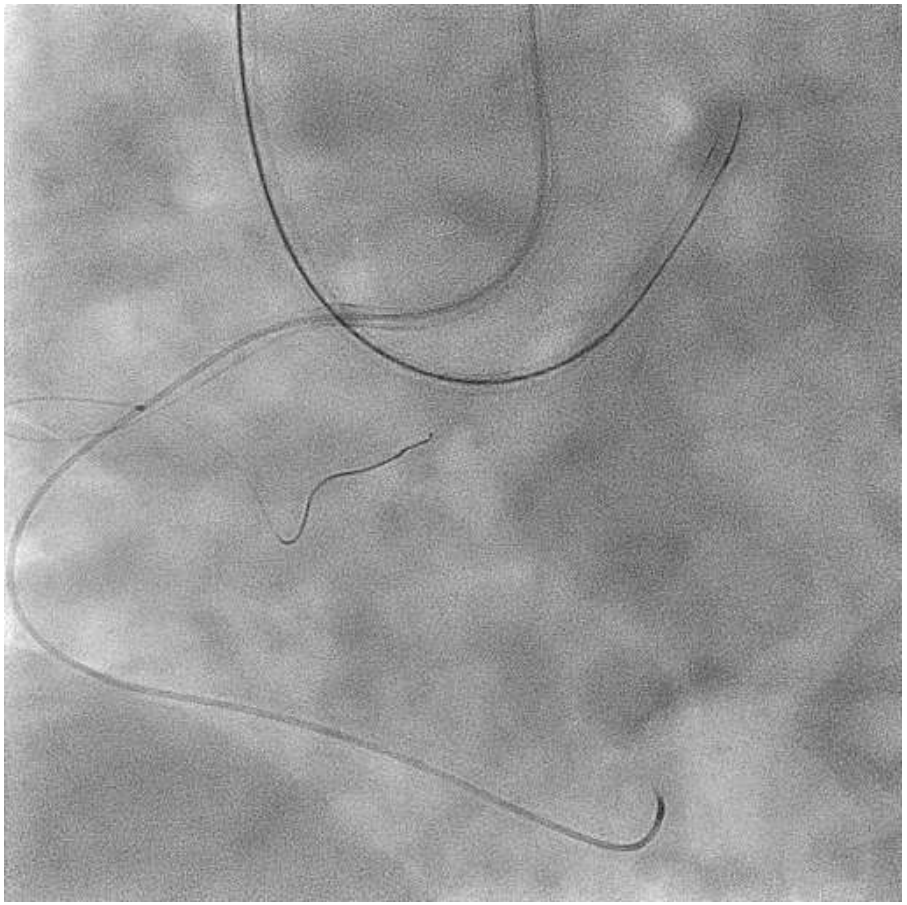




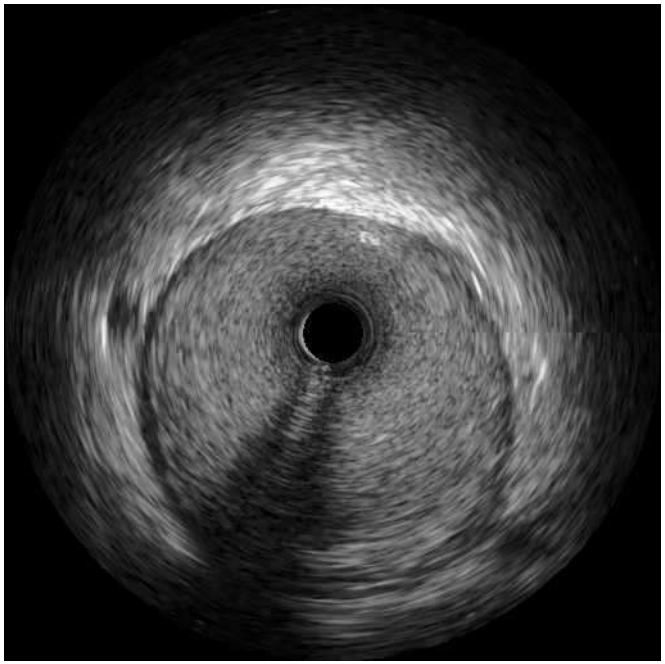
No Stamp LAD CTO

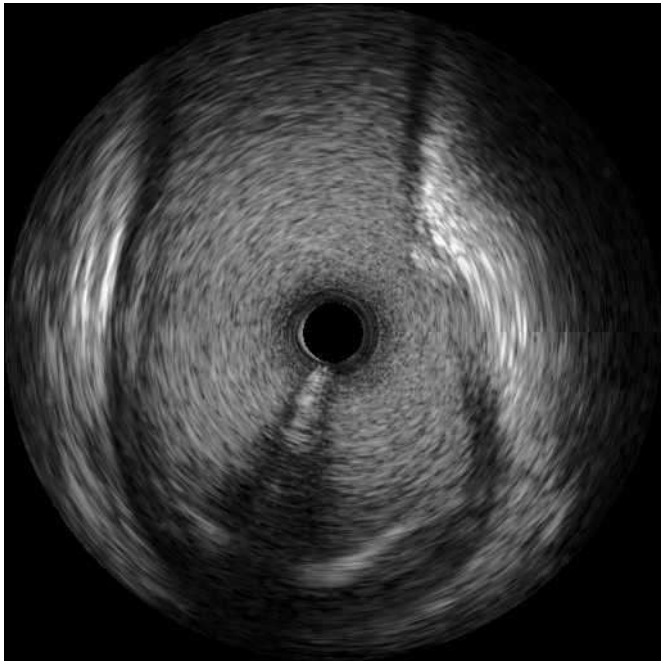
Case 1 : No Stump LAD CTO



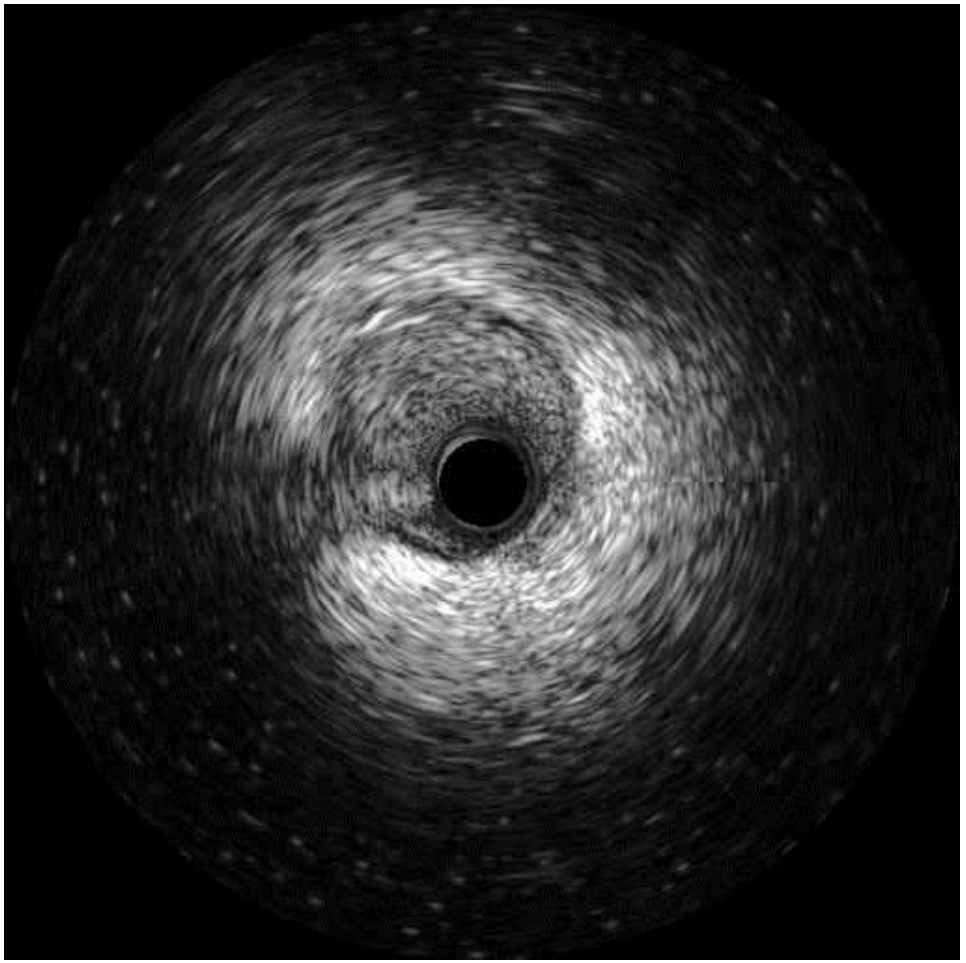


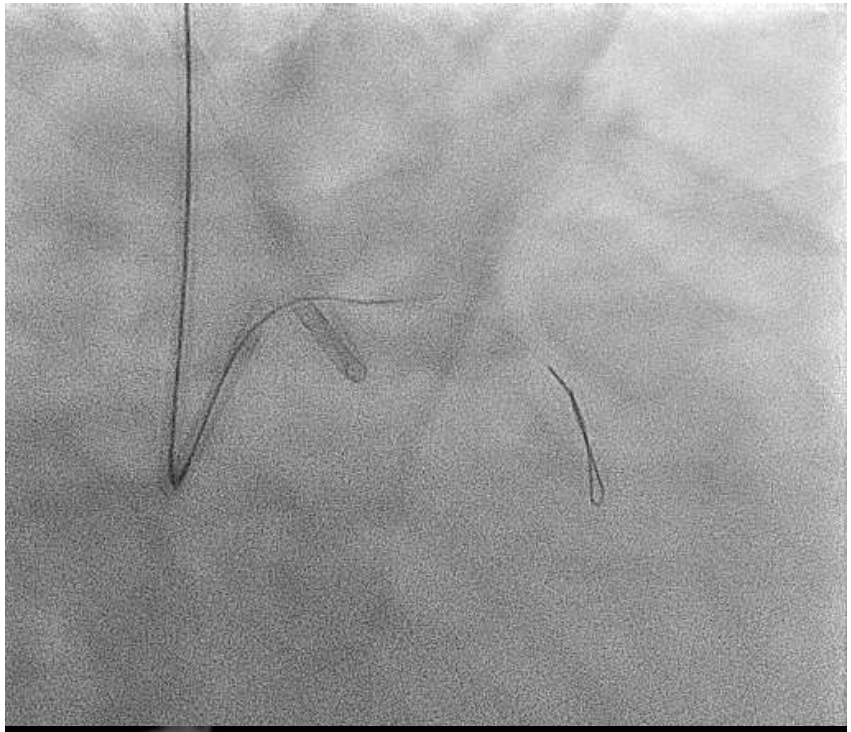
No appropriate retrograde channel for retrograde approach

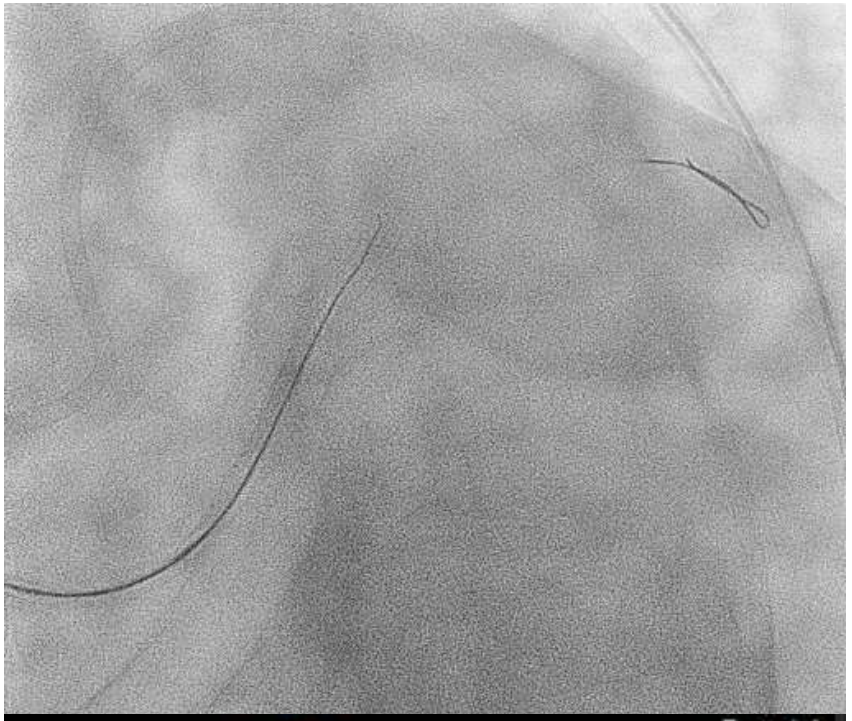


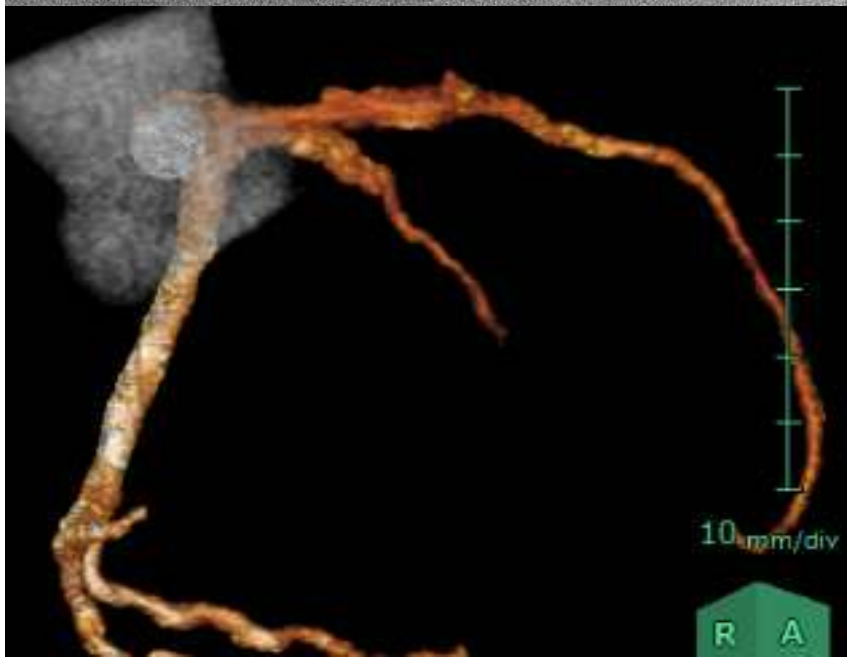


If we checked IVUS from OM to LMT,
We can not find entry of LAD CTO,
But if we review CT finding...





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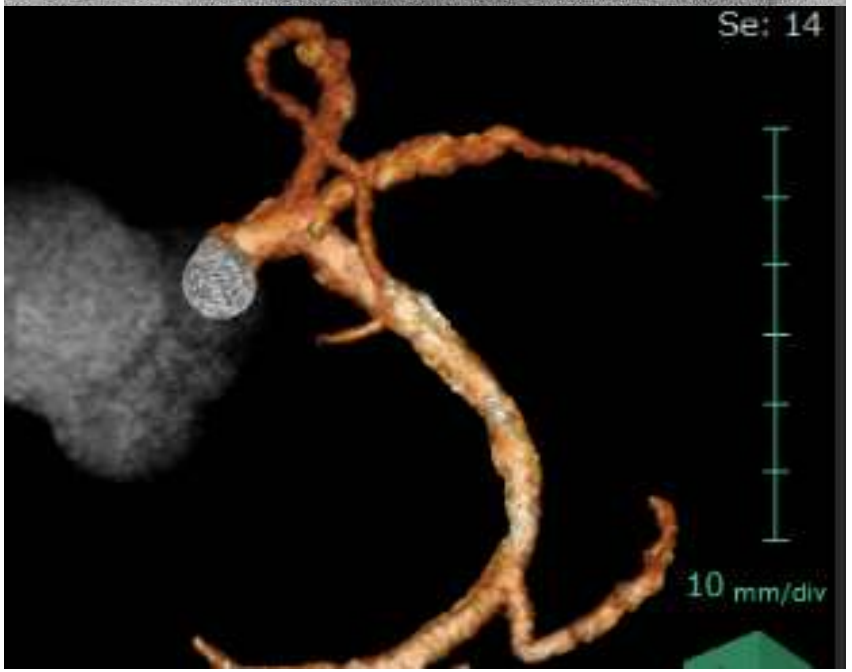
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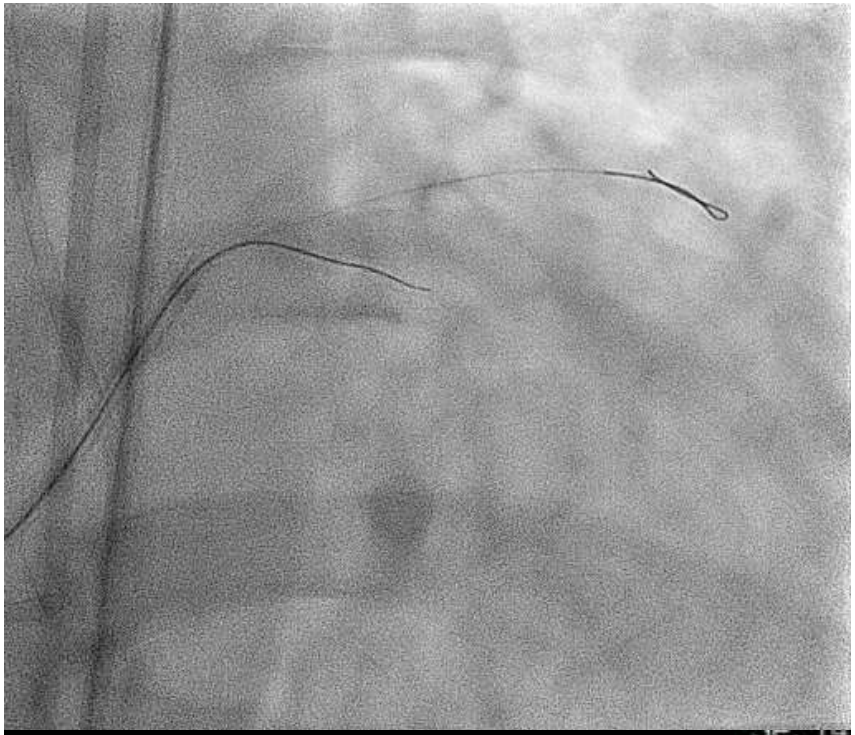

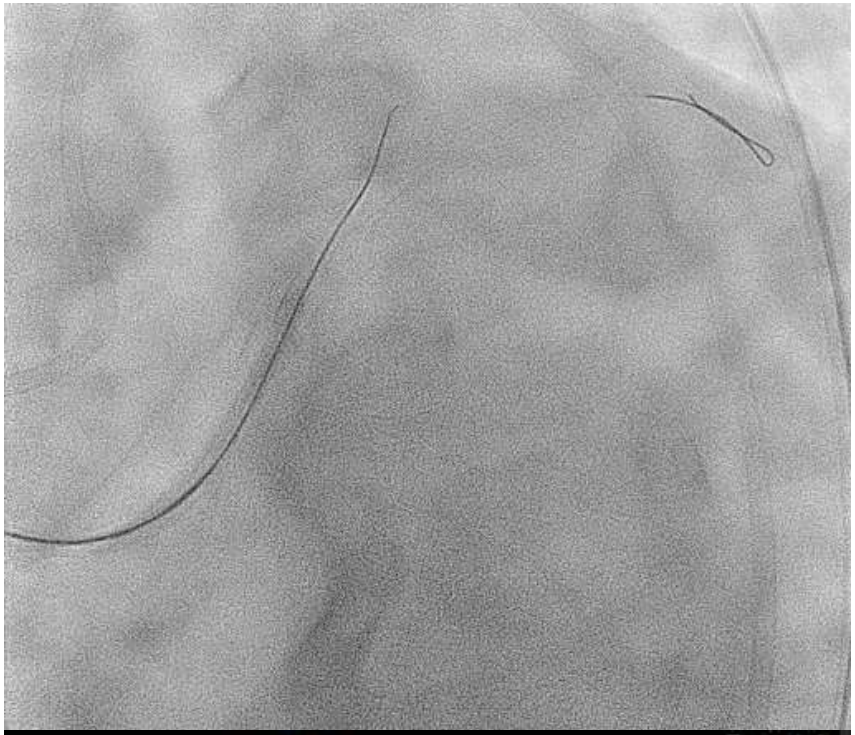

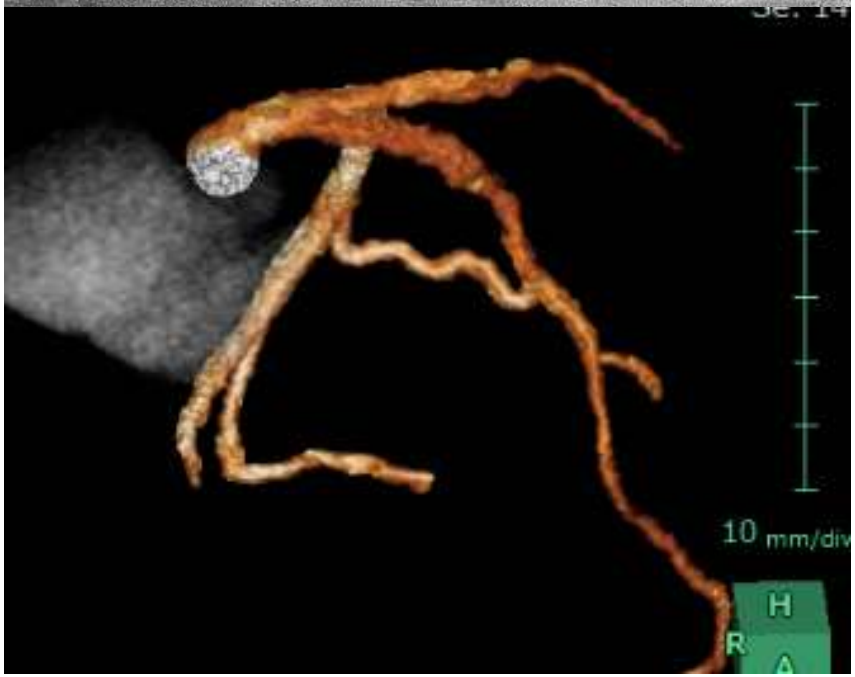
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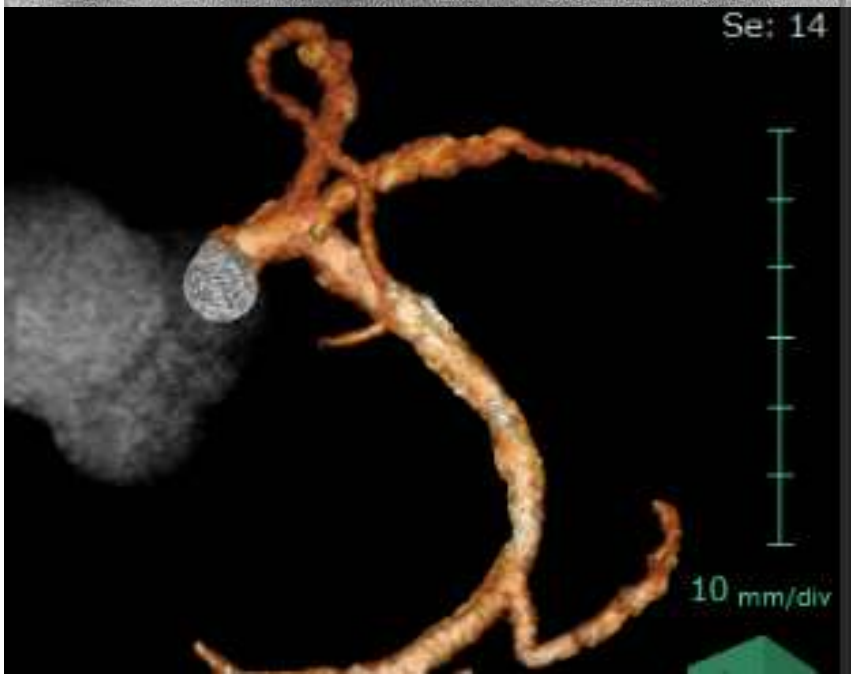
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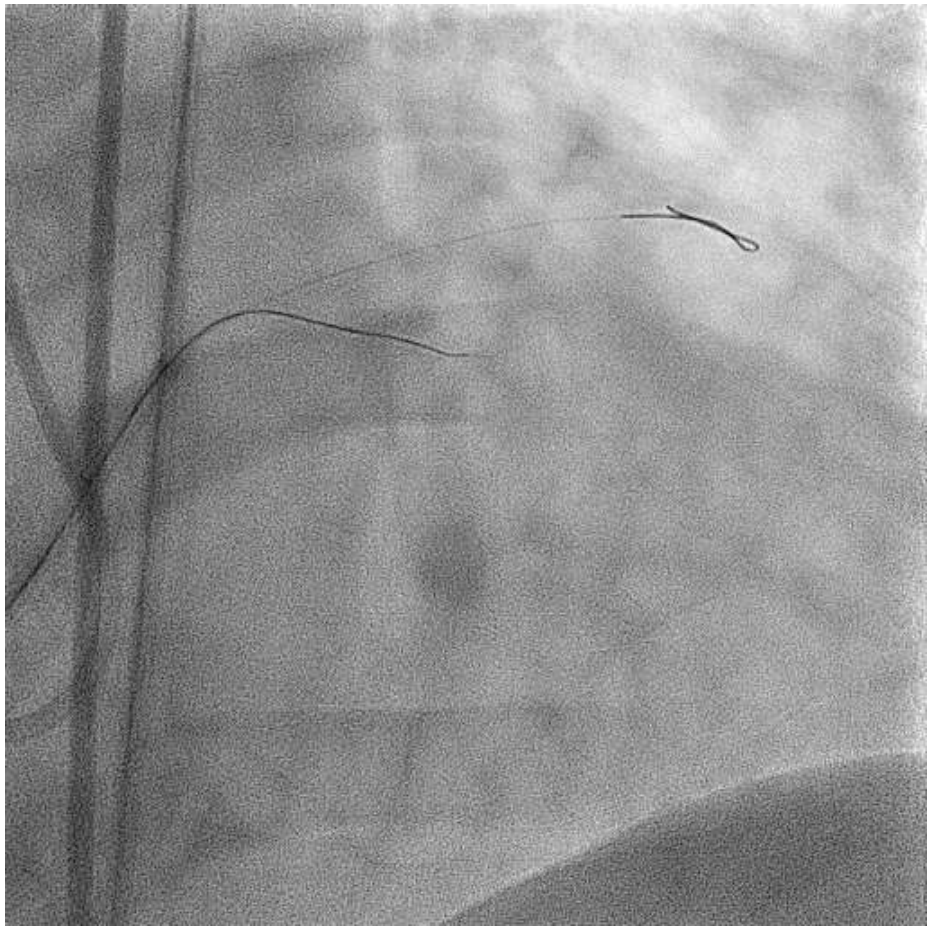
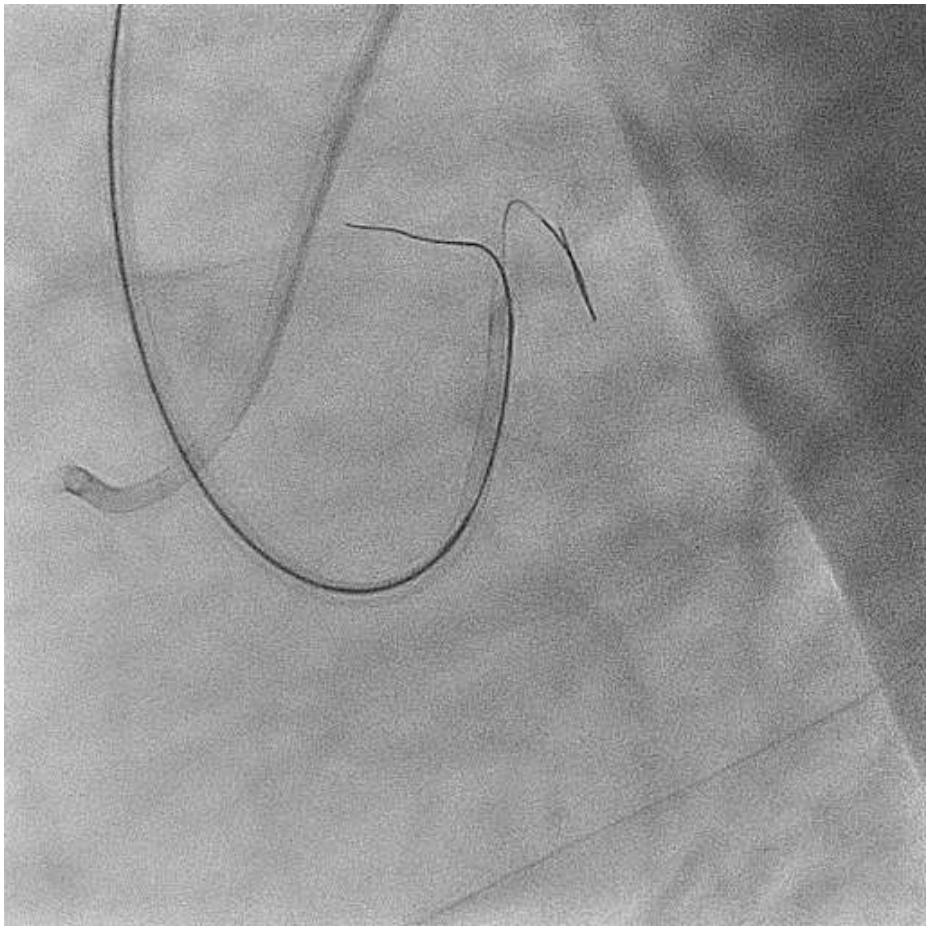
Need Technique

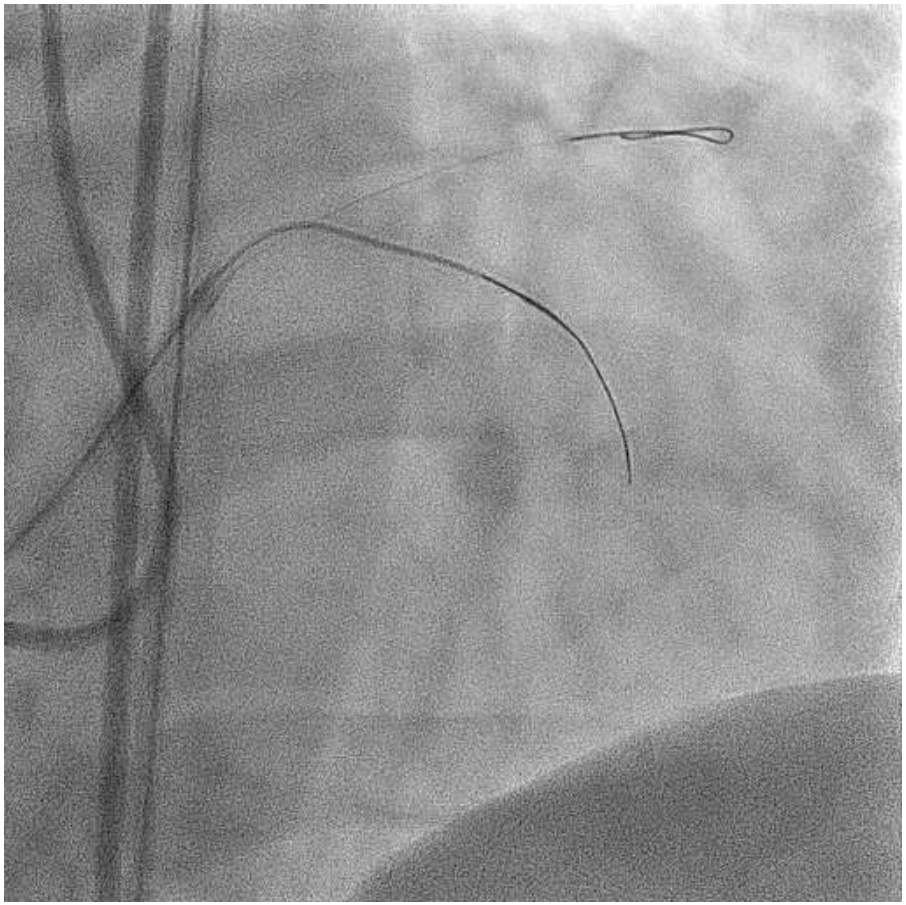
Case 1 : No Stump LAD CTO

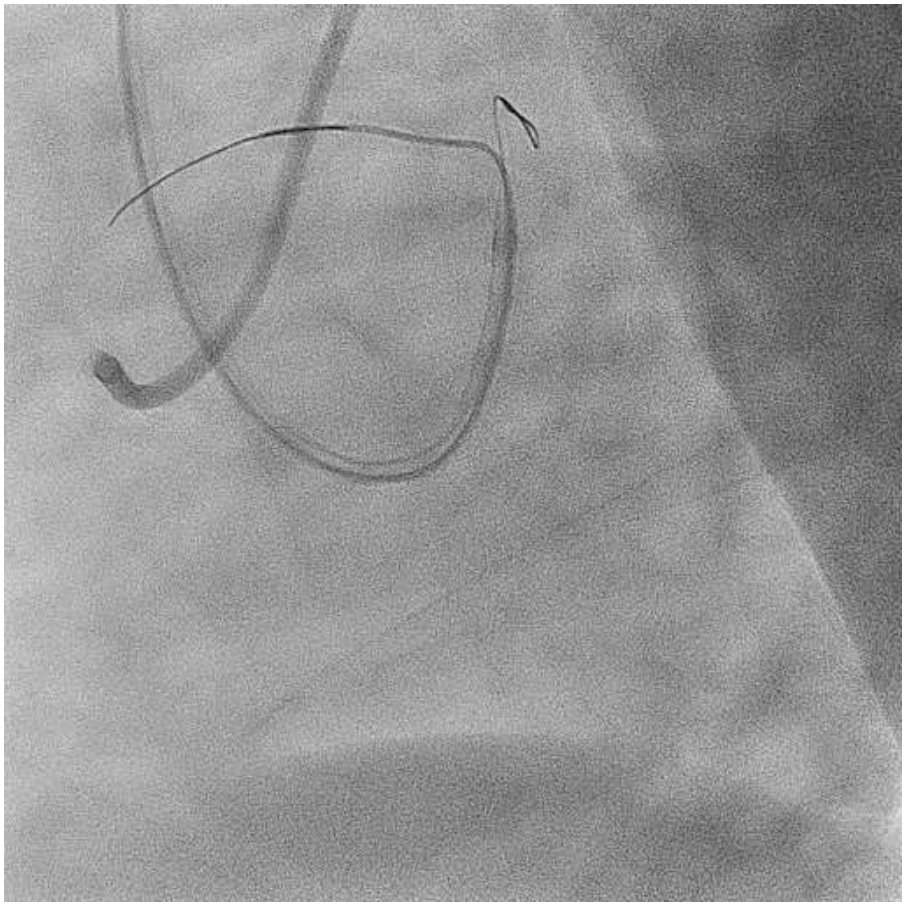




We successfully could enter GW in the lumen of LAD CTO.

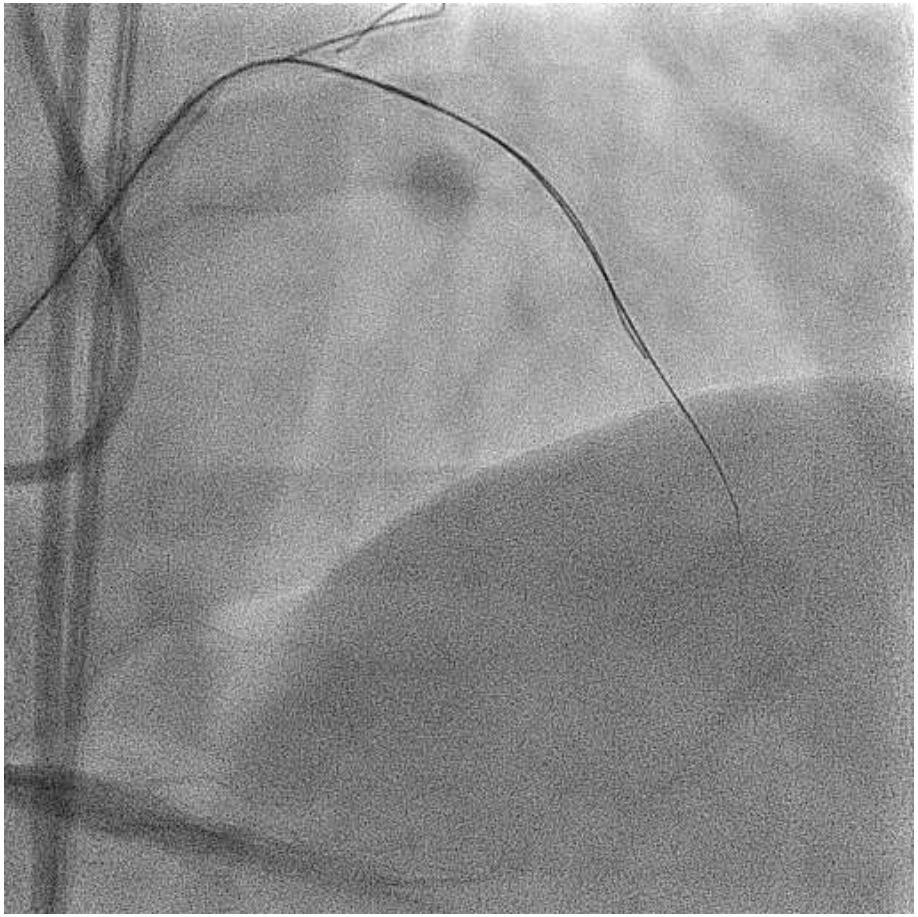
Case 1 : No Stump LAD CTO

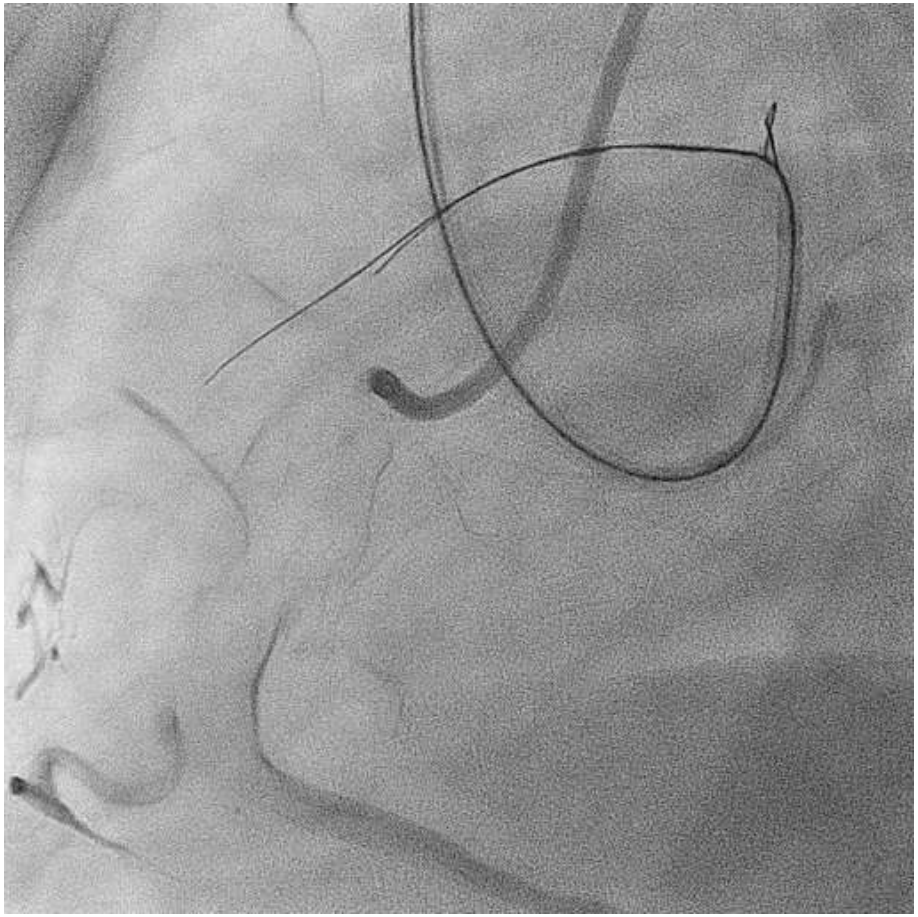




Checked GW position with several view to confirm the GW postion.

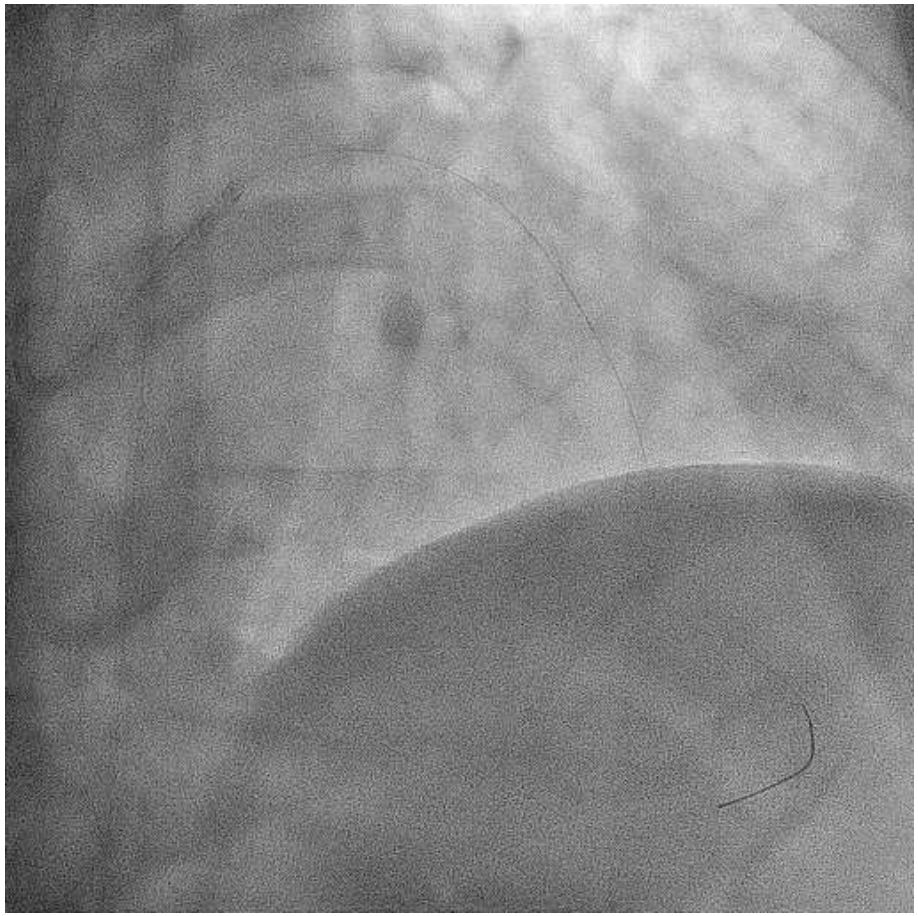
Case 1 : No Stump LAD CTO

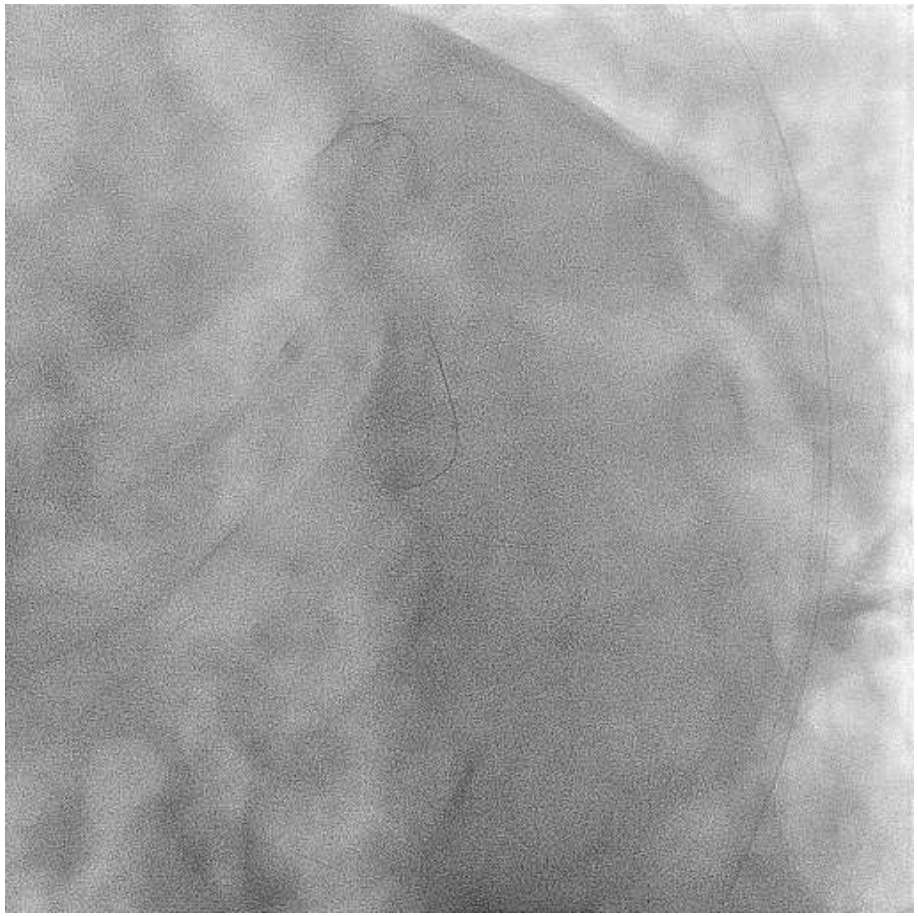




Now, our GW was already inside of true lumen, then ballooning and stenting

Case 1 : No Stump LAD CTO





Final Result

Key Messages 1

In case of LAD no stamp CTO, usually,
we can not see the entry point by IVUS,
because of the big space of LMT.

However, careful observation of CT image of coronary artery is more important than anything else to conjecture of coronary artery route.

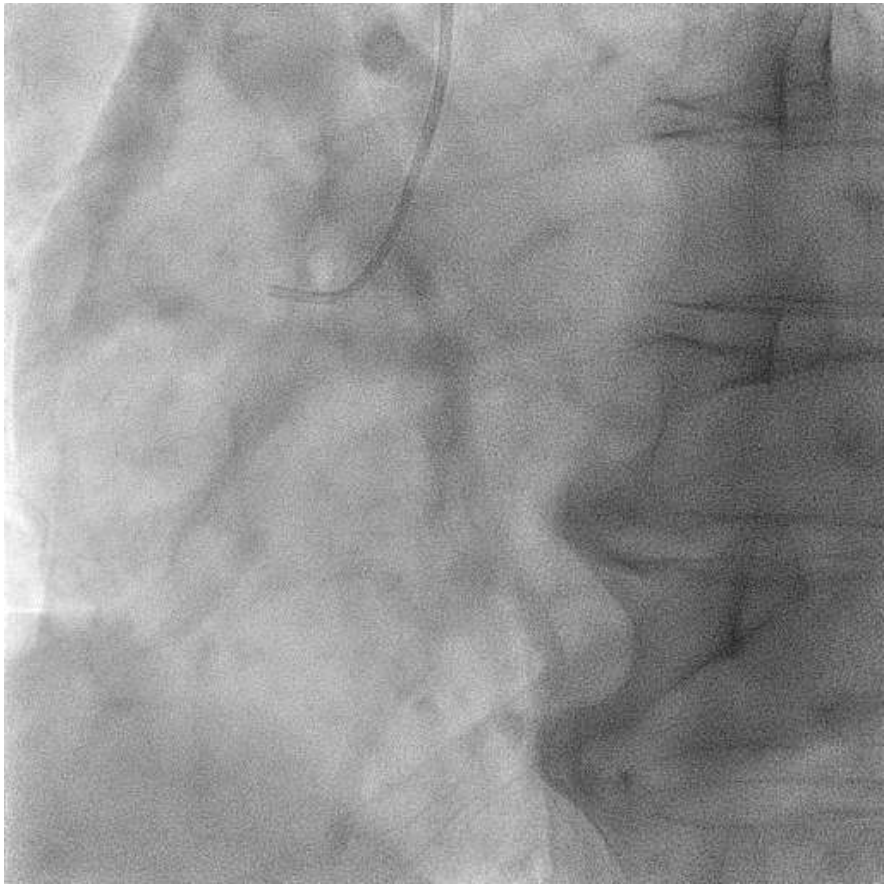
Case 2 ; IVUS guide approach

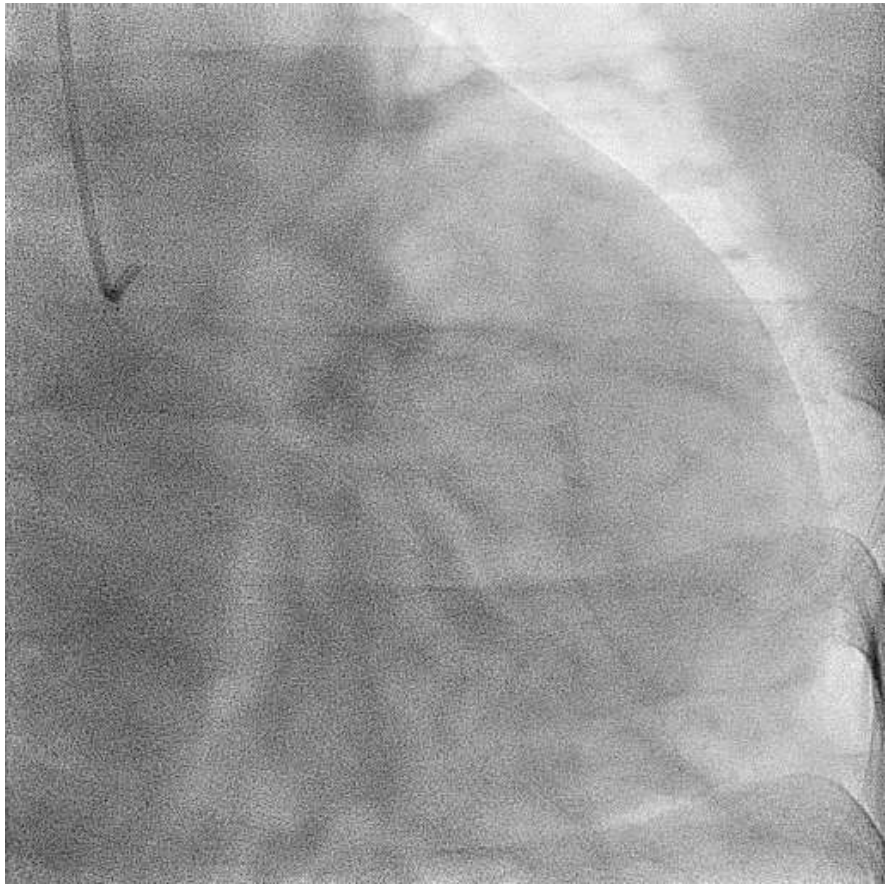
LAD ostium No Stump CTO with LMT stenosis without any fine route of retrograde approach, we need guide for climbing route.

In case, IVUS guide approach to find out entry point is very useful.

Case 2 : 68yo, F,

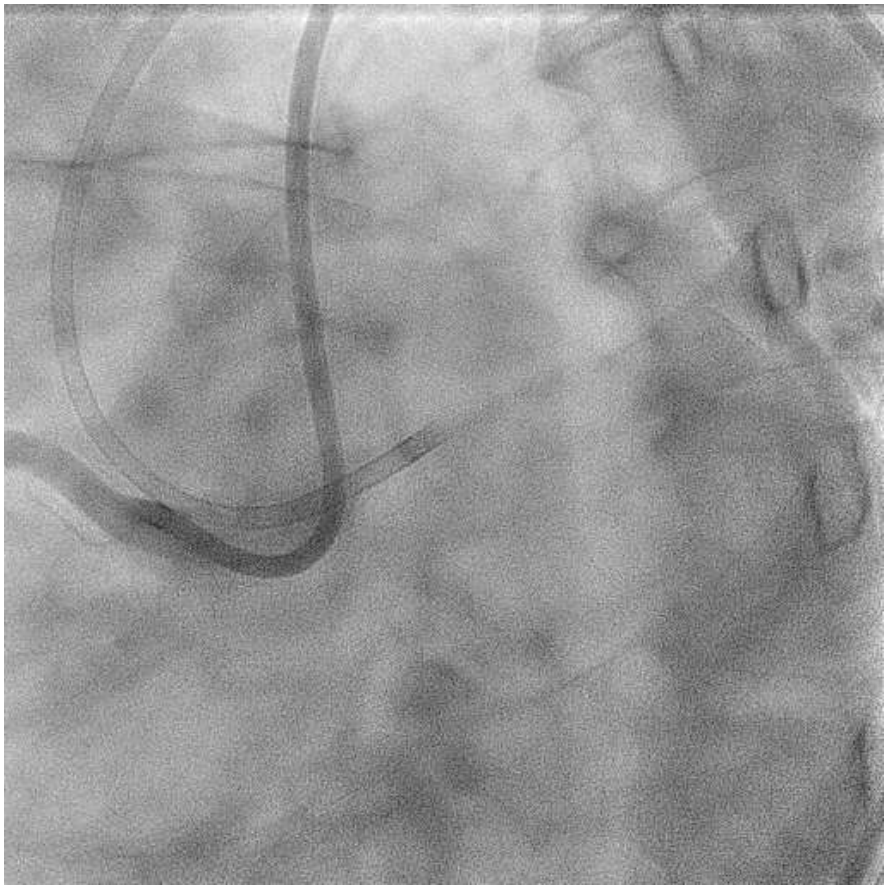
4 years history of Angina, several coronary risk factor (DM, HT, Dyslipidemia , No CKD)…. Broad ST depression in chest lead ;ECG change, UCG: EF was 42 %, moderately decreased anterior wall motion. Big ischemic aria by scintigraphy.

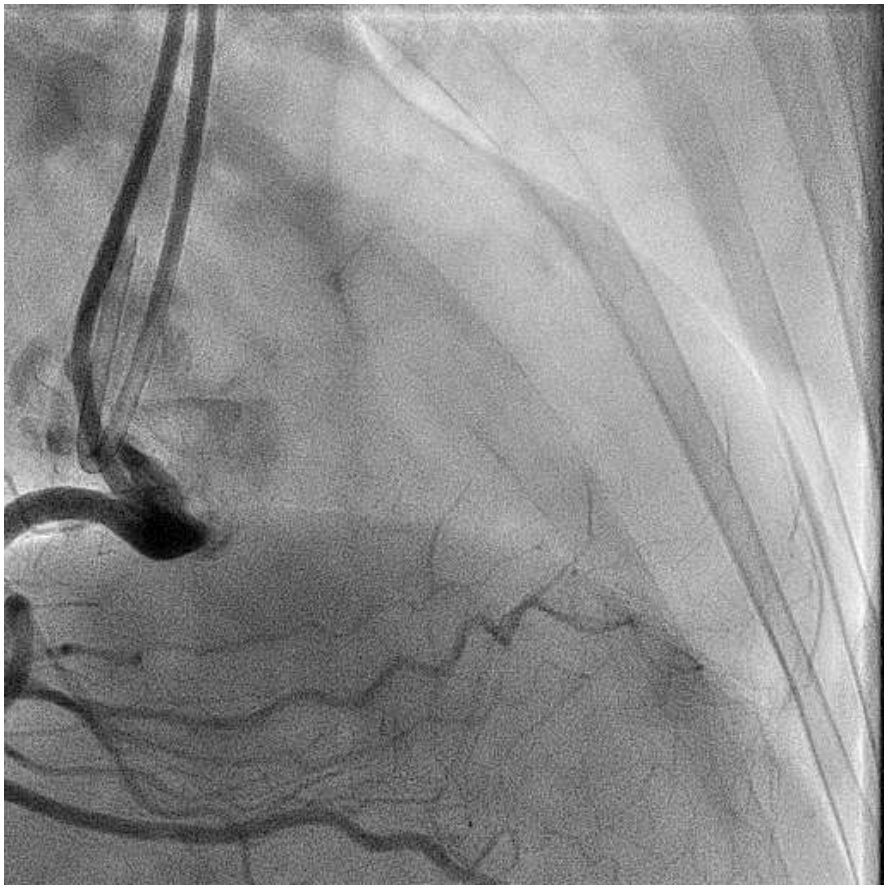




E-GFR 75.0, Cr. O.60, SYNTAX score 32, Eurocore 1.05

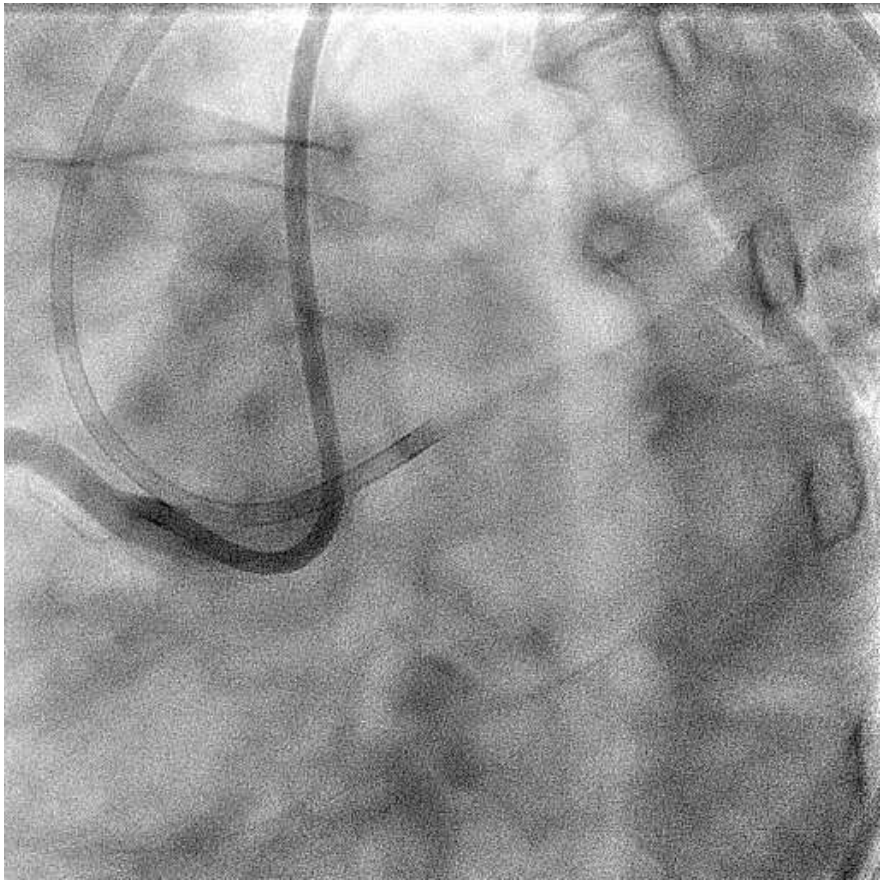
Case 2 : LAD CTO with LMT(LCX ost.) stenosis

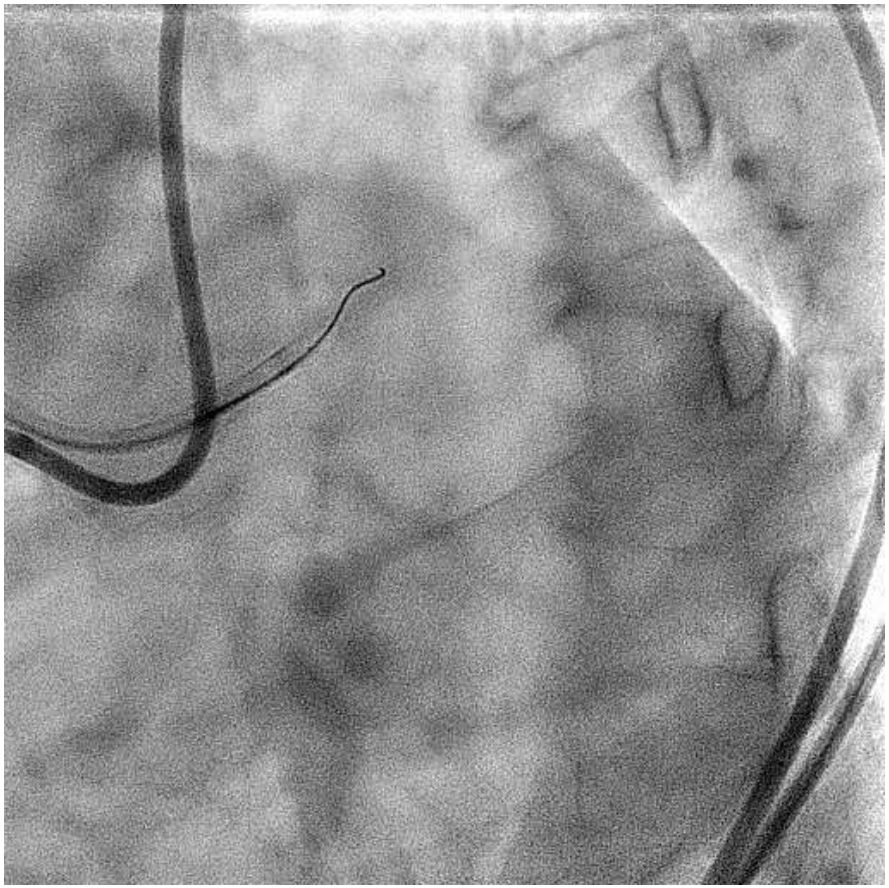




LAD CTO with LMT severe stenosis(LCX ost. stenosis)
Very nice collateral from RCA

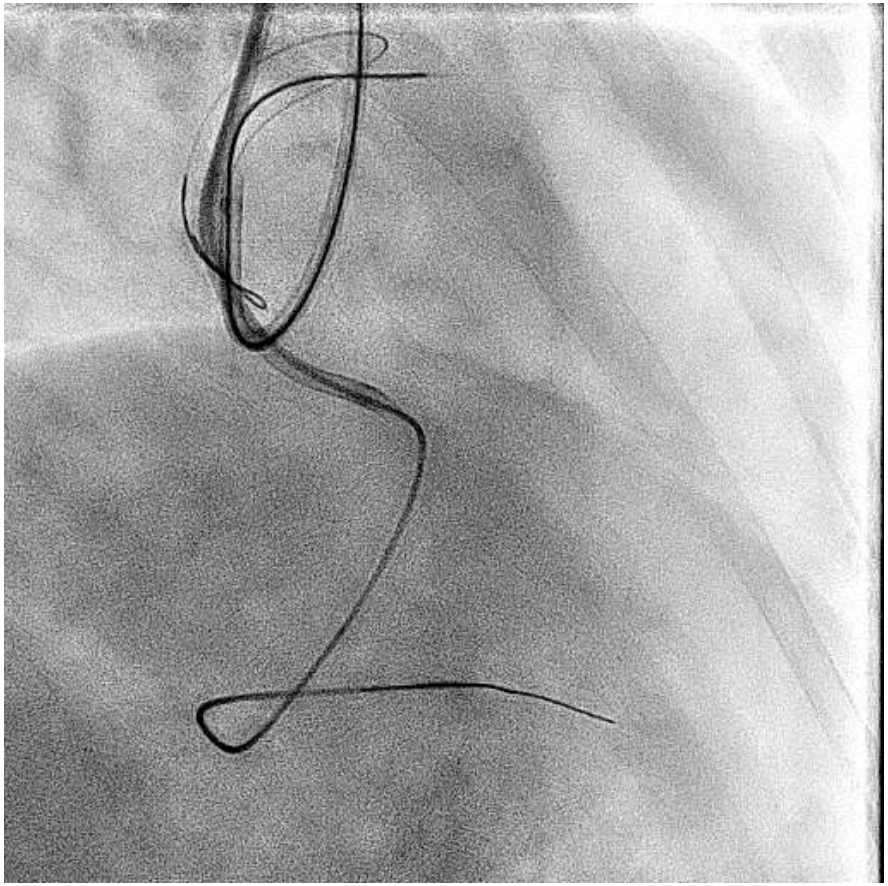
Case 2 : LAD CTO with LMT(LCX ost.) stenosis

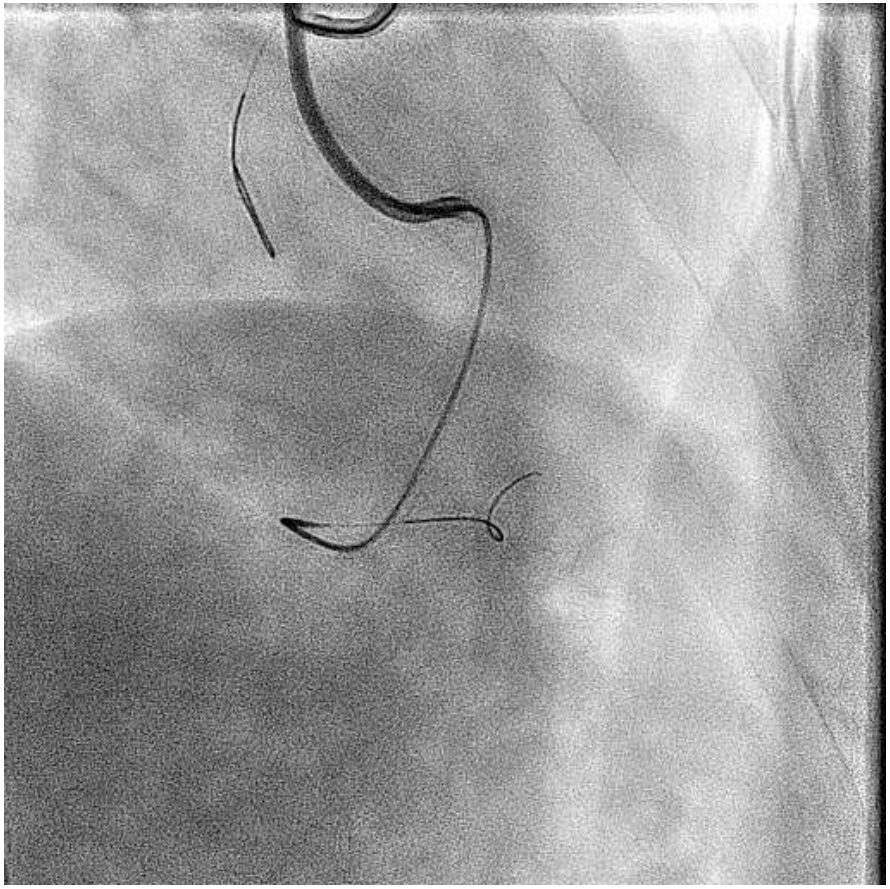




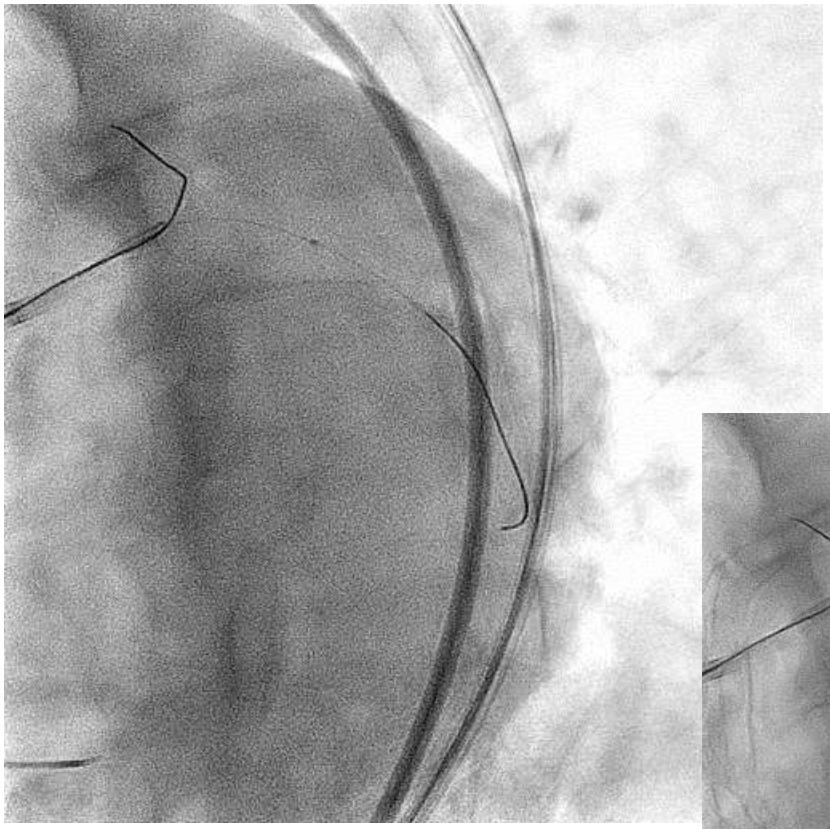
LAD CTO with LMT severe stenosis(LCX ost. stenosis)
At first, attempting Antegrade Approach, but no guarantee

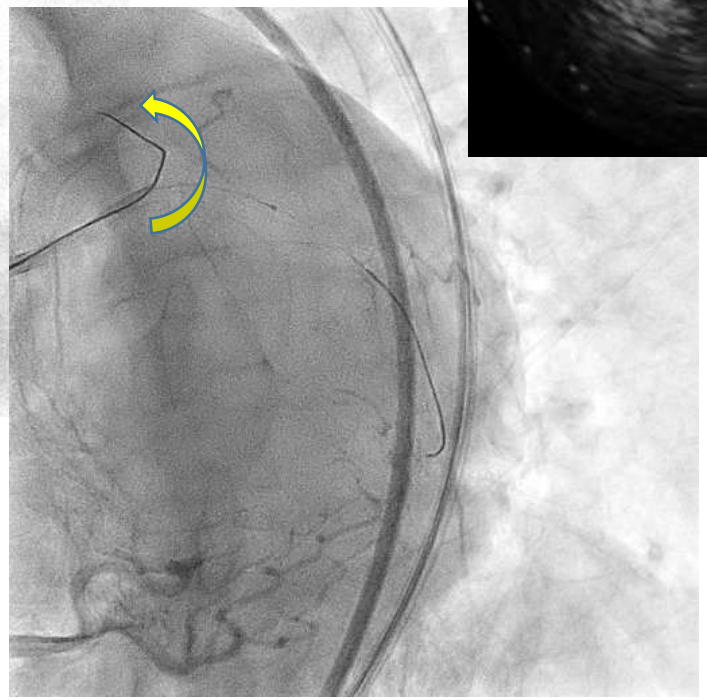
Case 2 : LAD CTO with LMT(LCX ost.) stenosis

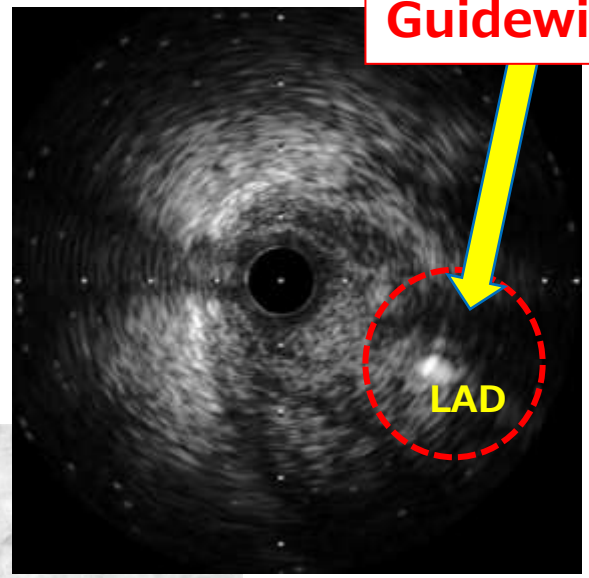




Started Retrograde Approach, seemed to have a appropriate collateral channel, but couldn't negotiate some corkscrew part.

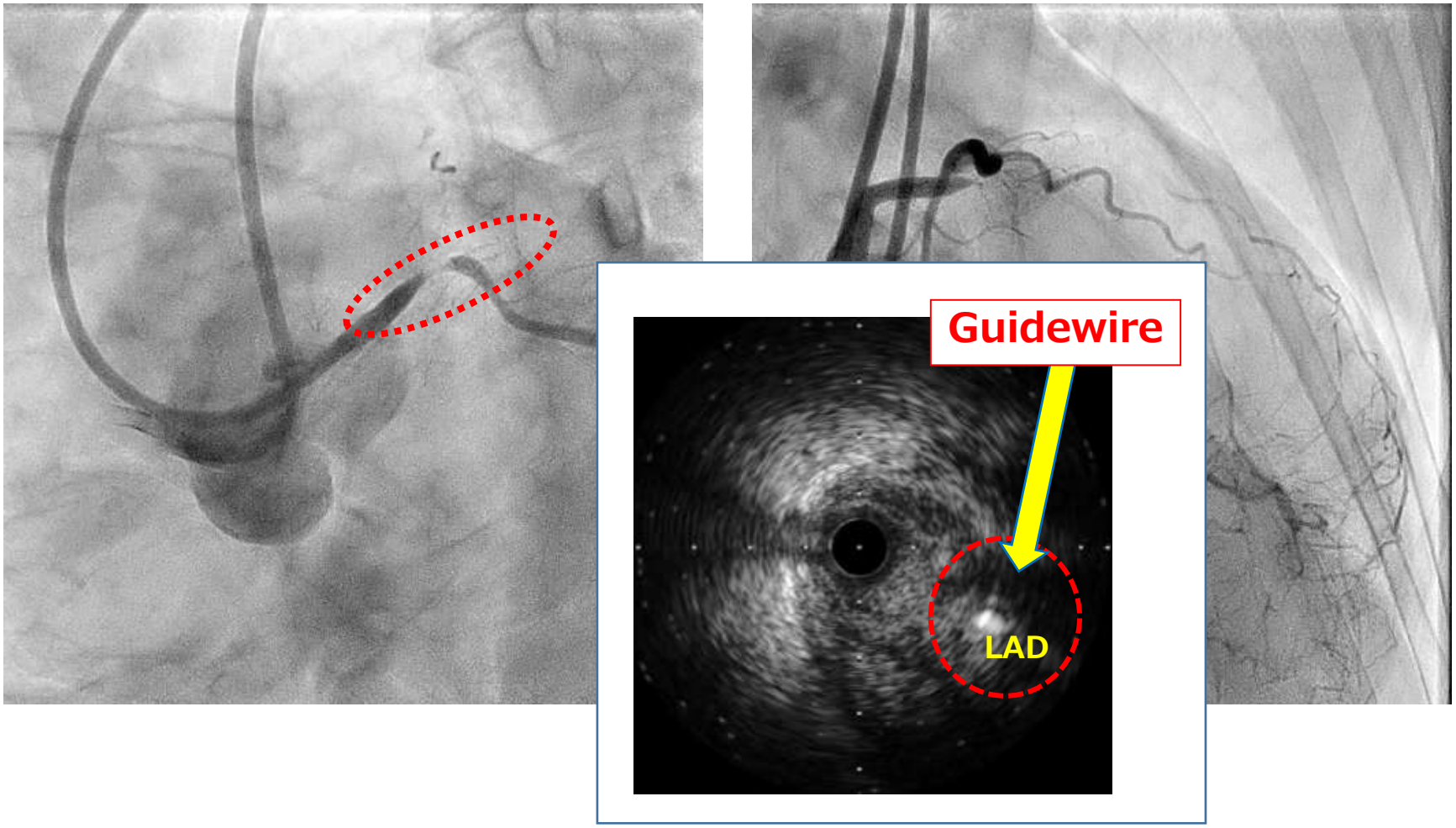




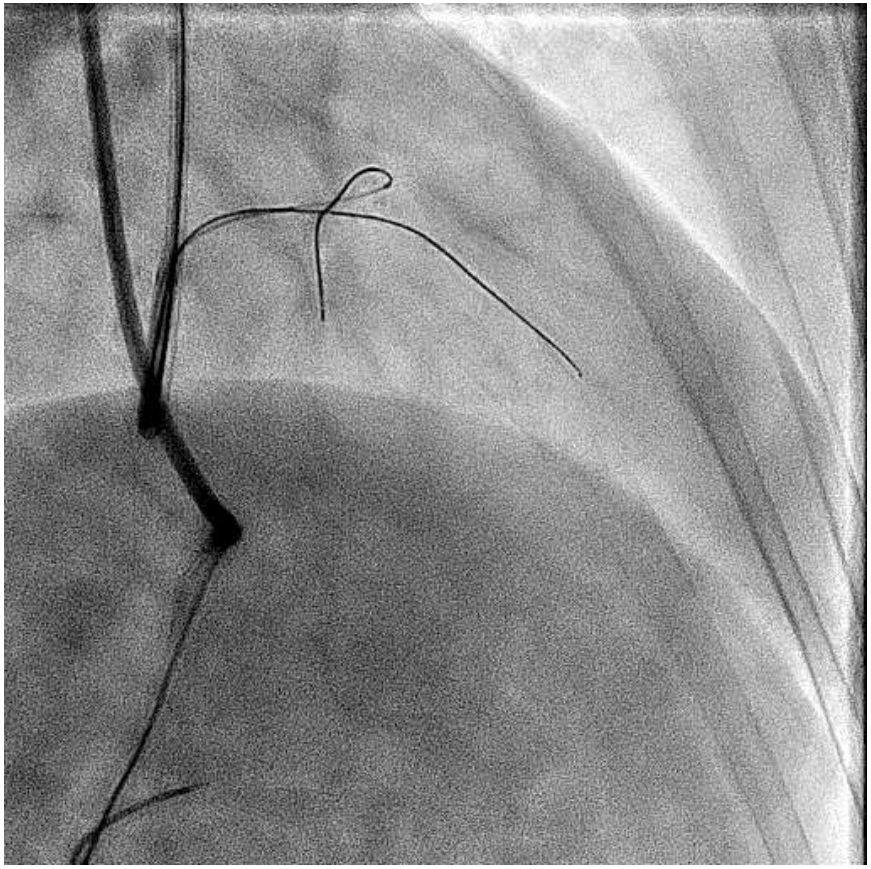


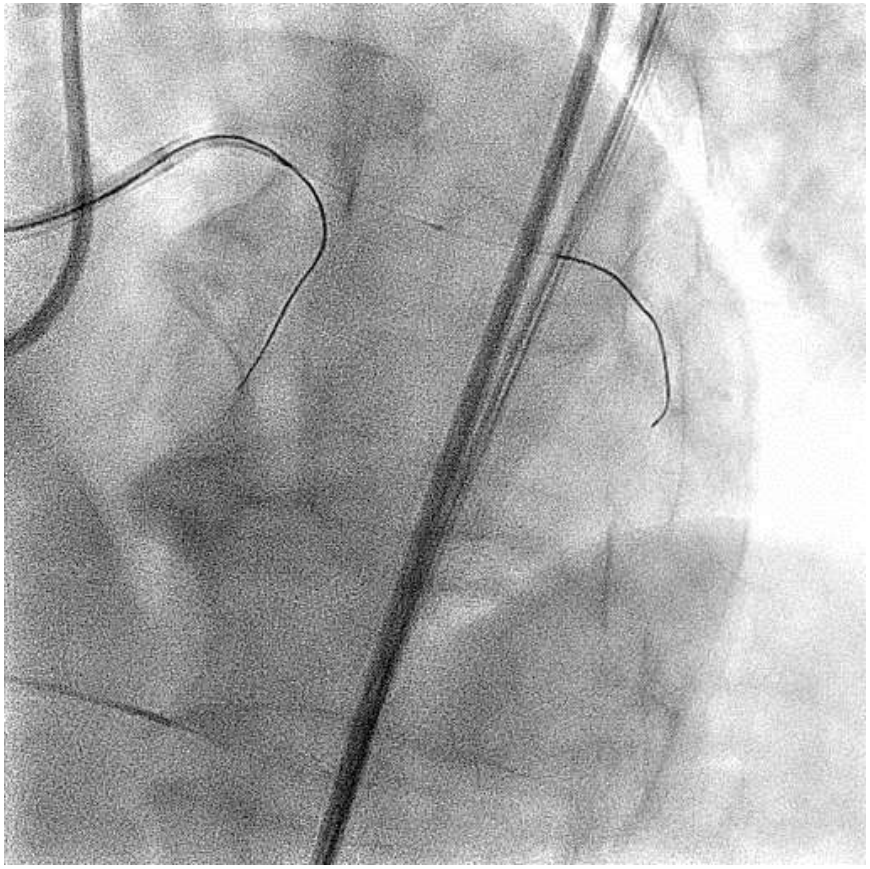
So we start IVUS guided guide-wiring for entering LAD CTO,
Usually, we couldn't, because of the big space of LMT.

Because of the narrowing of the LMT bifurcation area, we have a chance to find out ENTRY POINT of CTO



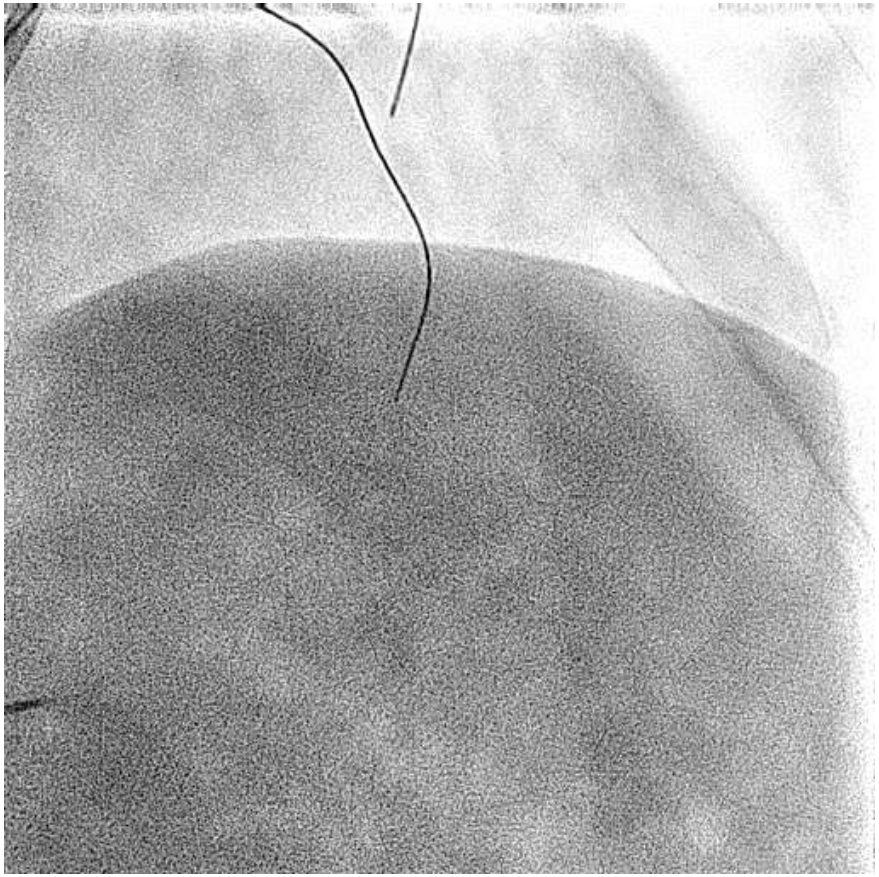
Case 2 : LAD CTO with LMT(LCX ost.) stenosis

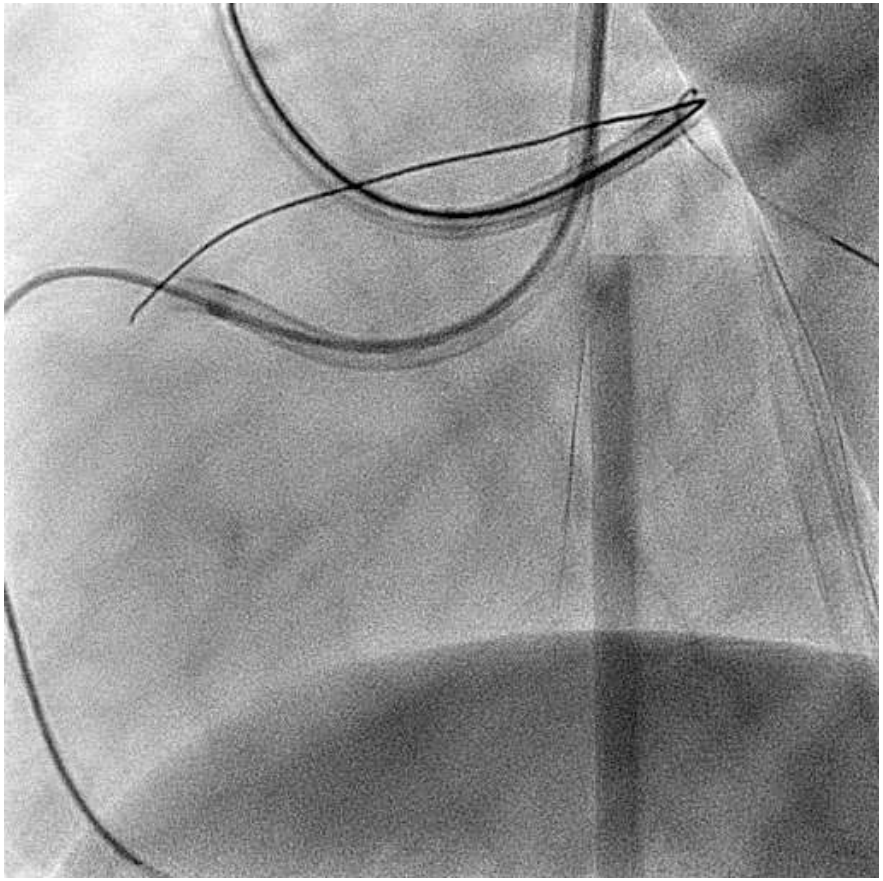




Of course, we need to check GW position by several projectopn.

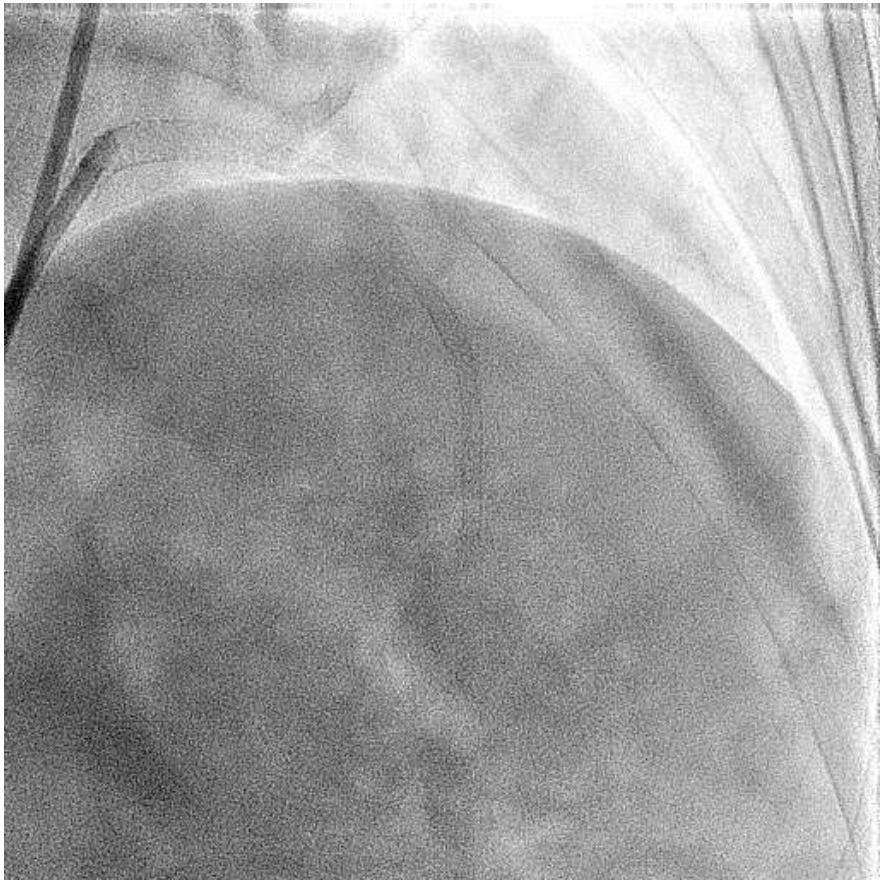
Case 2 : LAD CTO with LMT(LCX ost.) stenosis

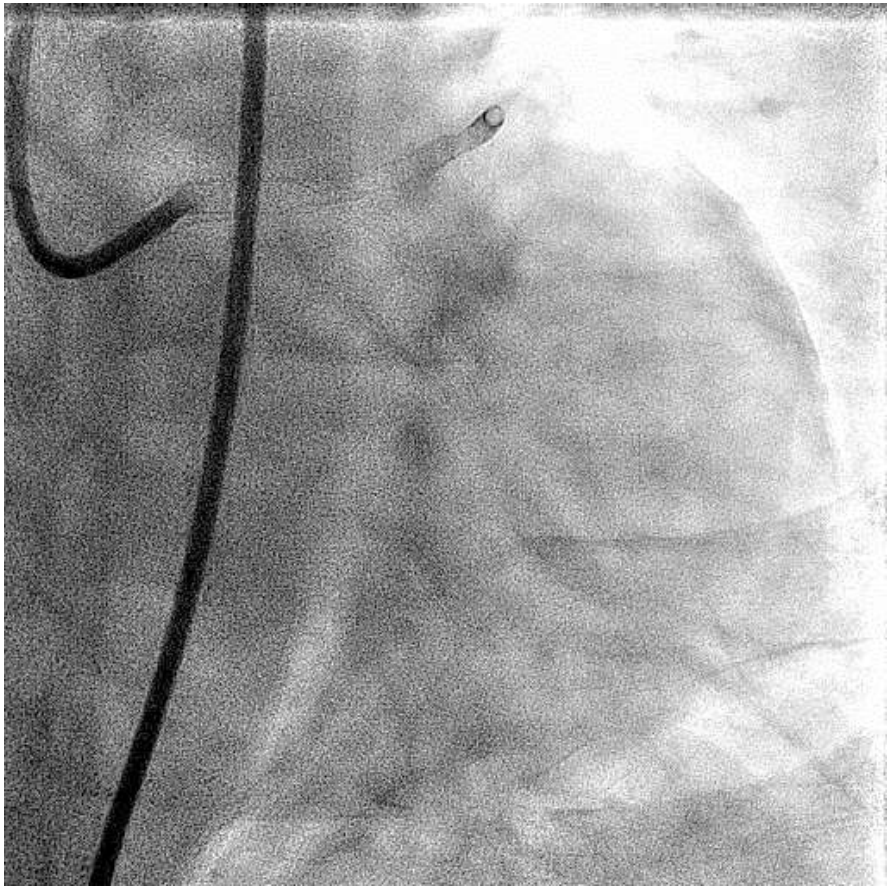




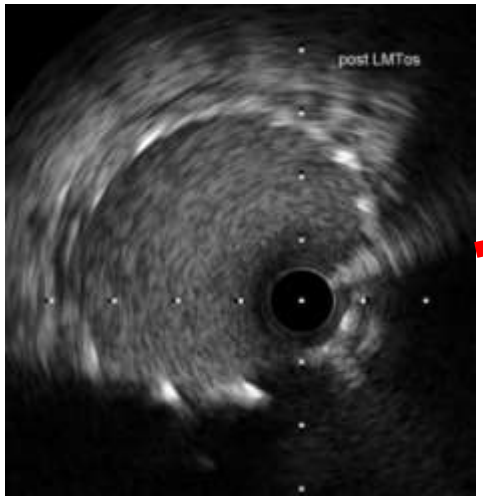
Point is... If we catch the accurate entry point of CTO, 99% of the case, we can track the true route.

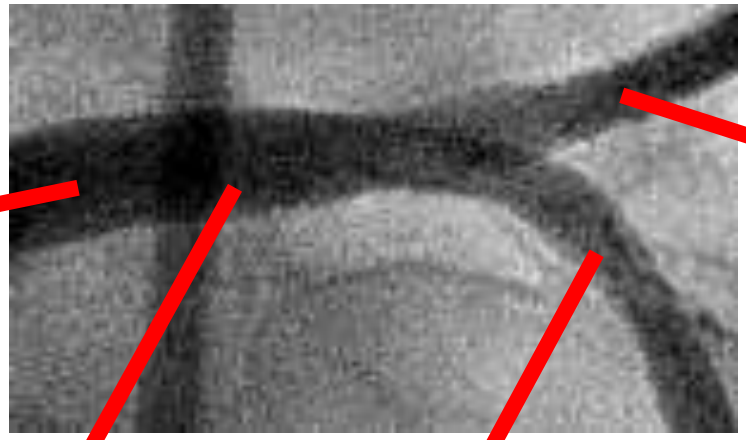
Case 2 : LAD CTO with LMT(LCX ost.) stenosis

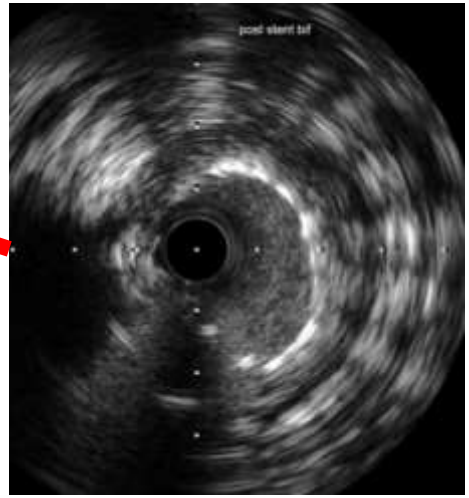




Finally... We are good enough to do TAP stenting in LMT


post LMTos

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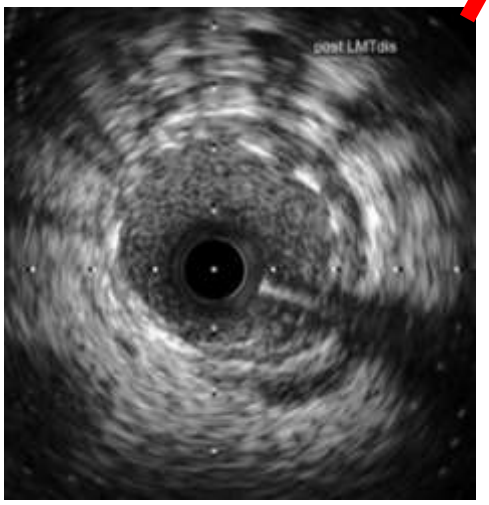
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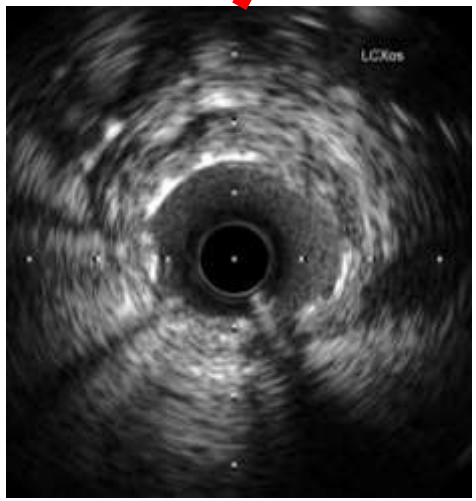

LCXos

Key Messages 2

In case of LAD no stamp CTO, usually,
we can not see the entry point by IVUS,
because of the big space of LMT.

However, if you have a narrowing of the
LMT bifurcation area(LCX ost. stenosis),
we have a chance to find out ENTRY POINT of CTO

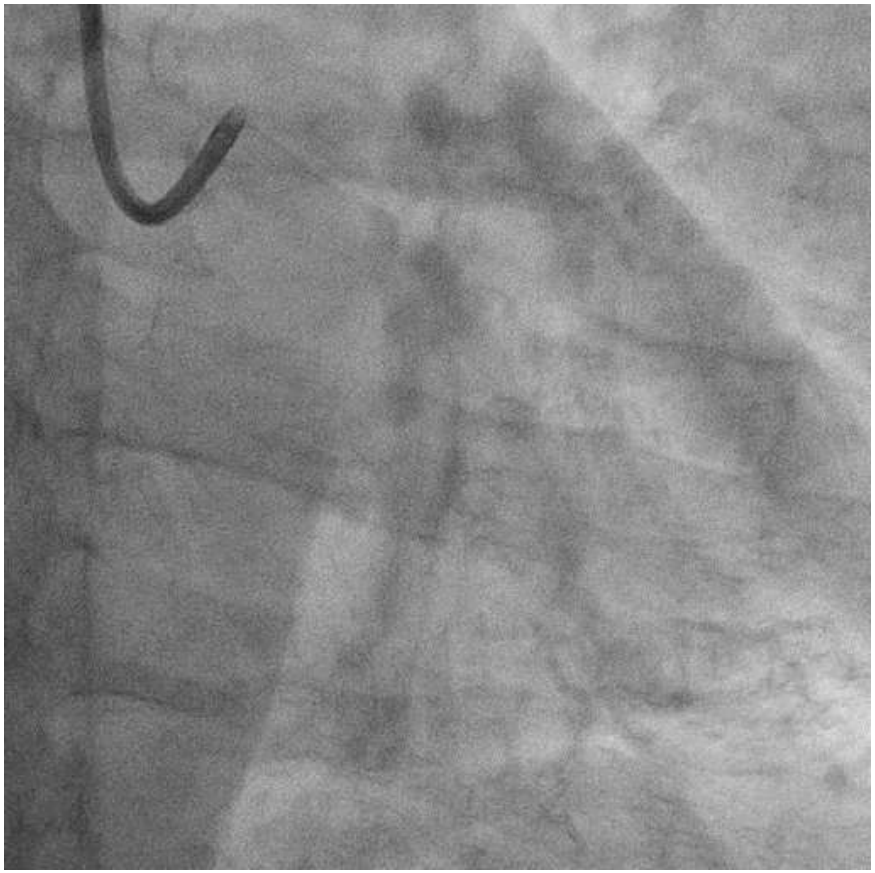
Case 3 ; If You are not good enough...
You will miss...

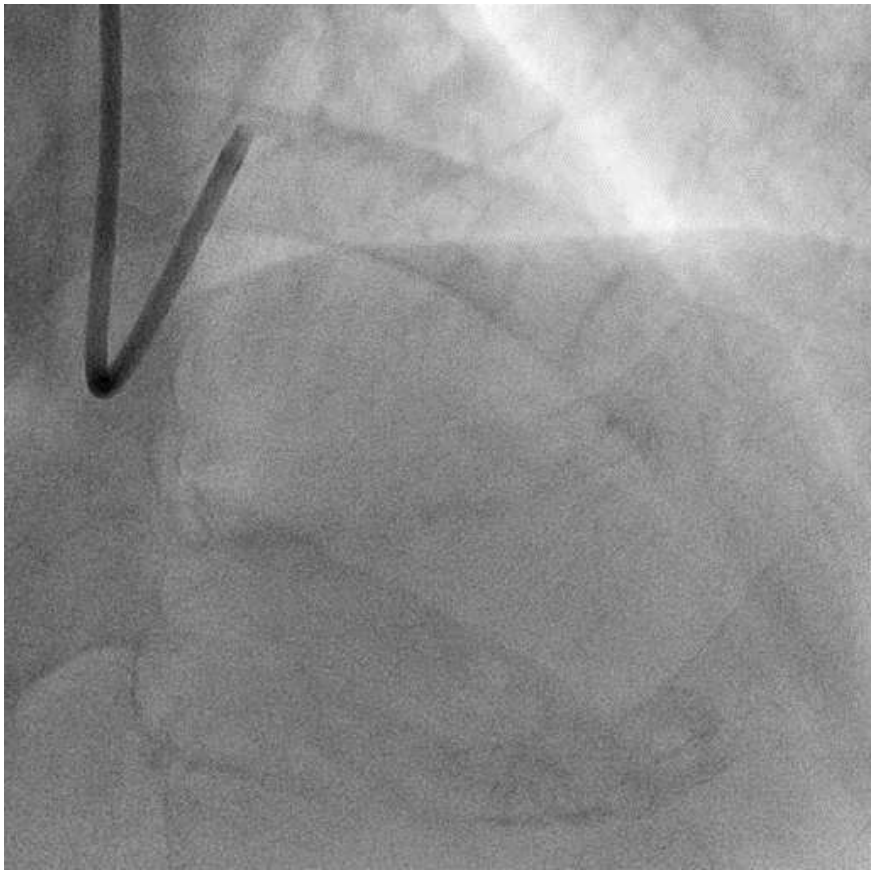
Even looks simple LMT case…

If you miss the rule, and miss the very important findings, you will lose the game.

Watch your steps to climbing route with your hand light.

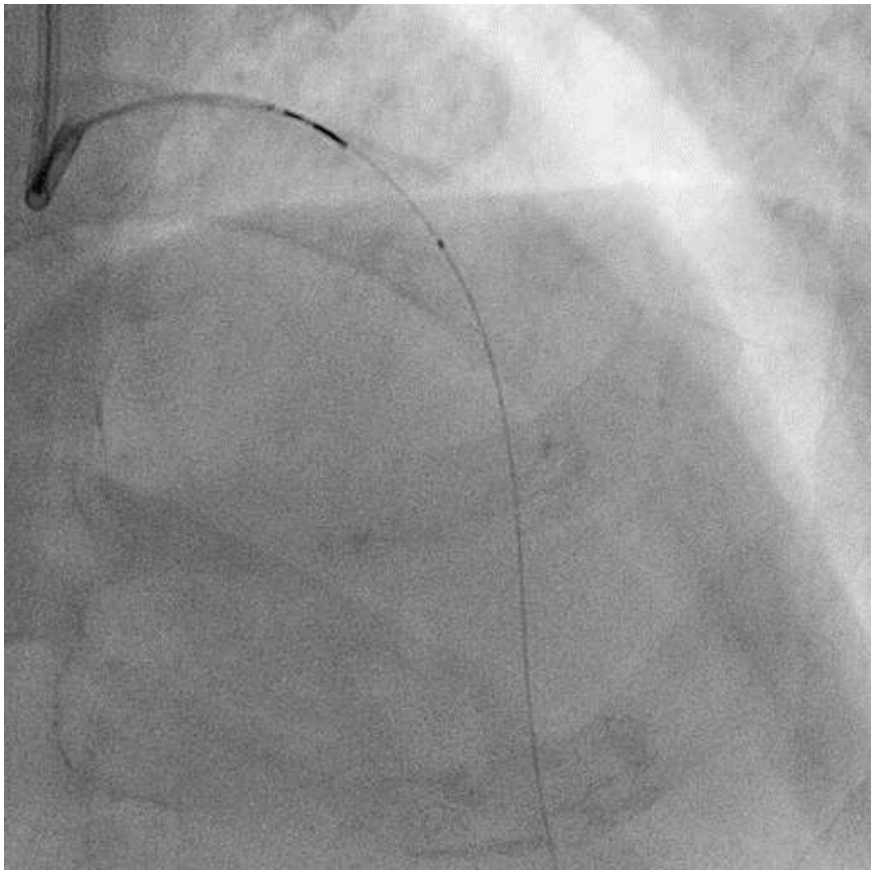
Case 3 : LMT body stenosis including....??

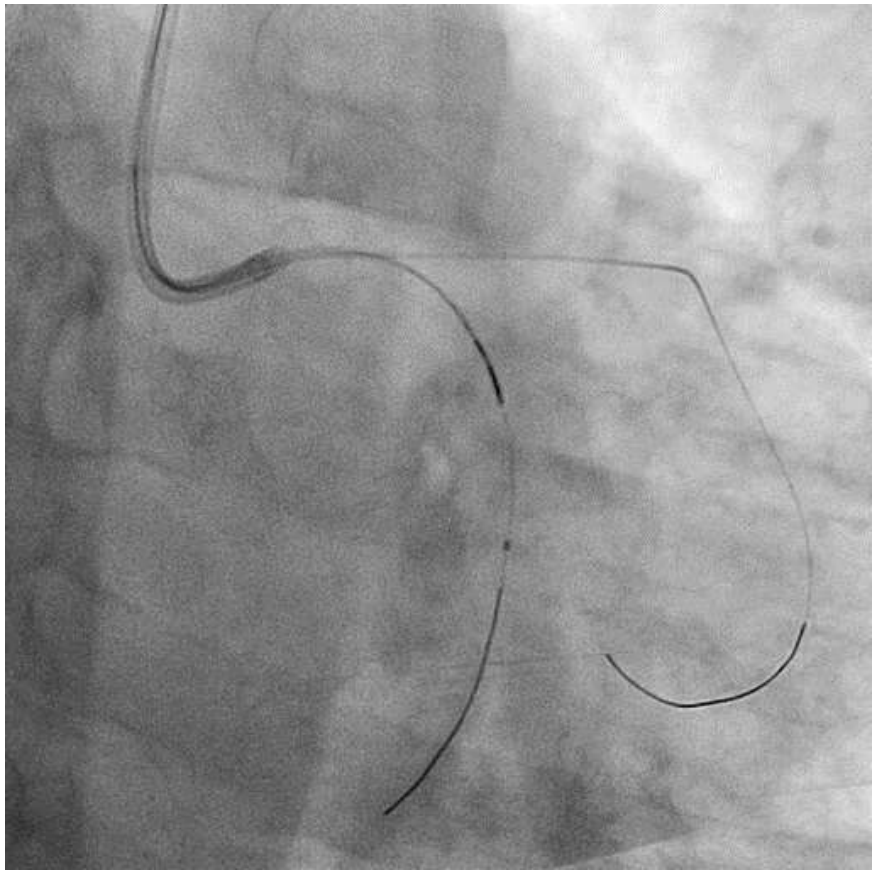




Looks like a very simple LMT body stenosis with some lesion of LCX ostium.

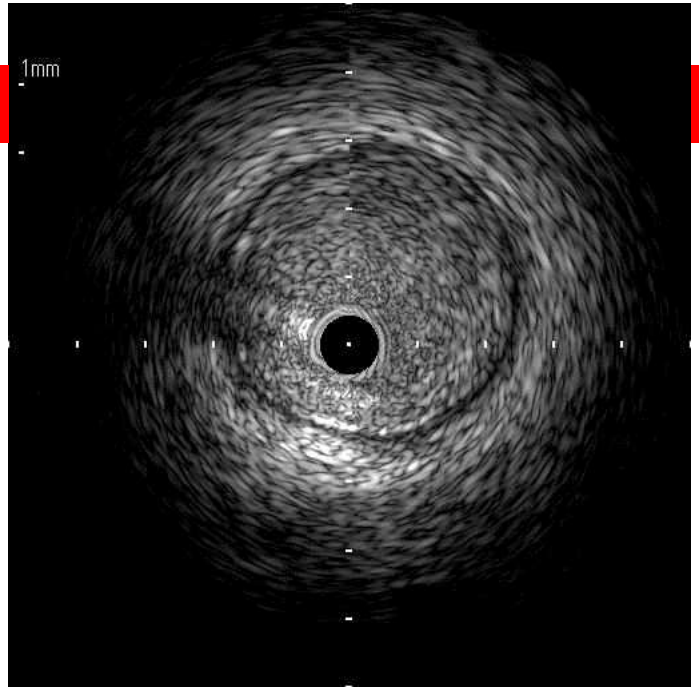
Case 3 : LMT body stenosis including....??



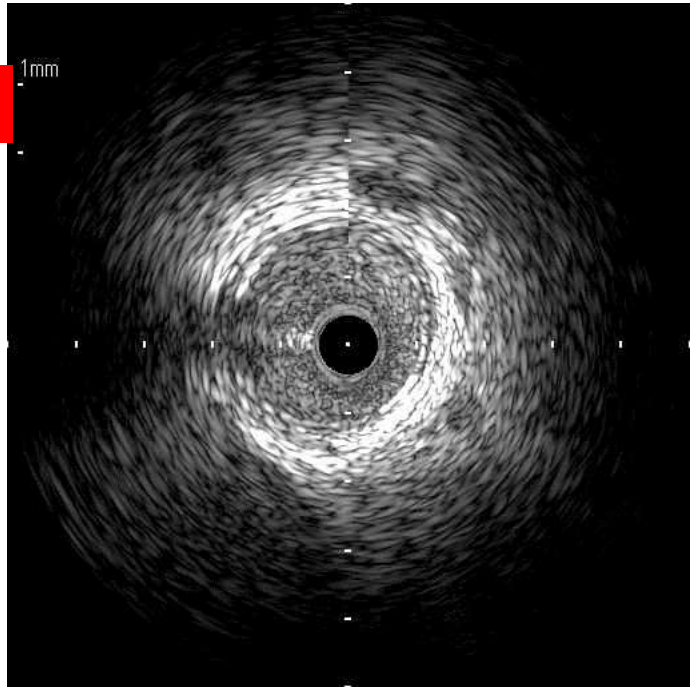


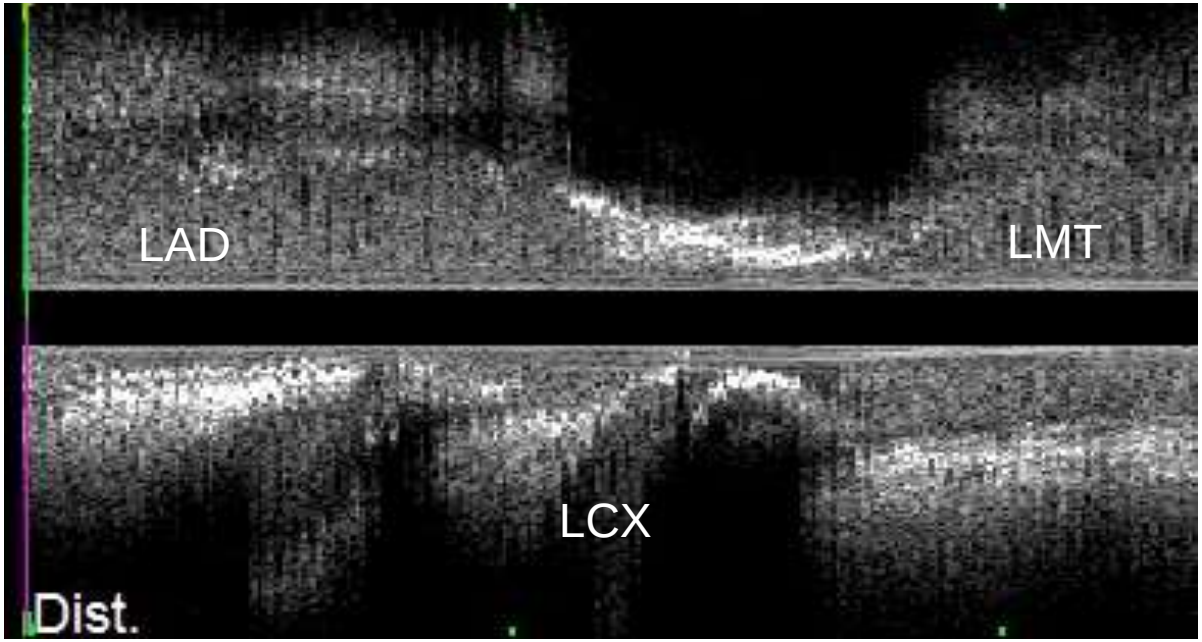
Actually, A/S Operator checked IVUS, but main operator didn't checked IVUS precisely... So They did not realize the situation...

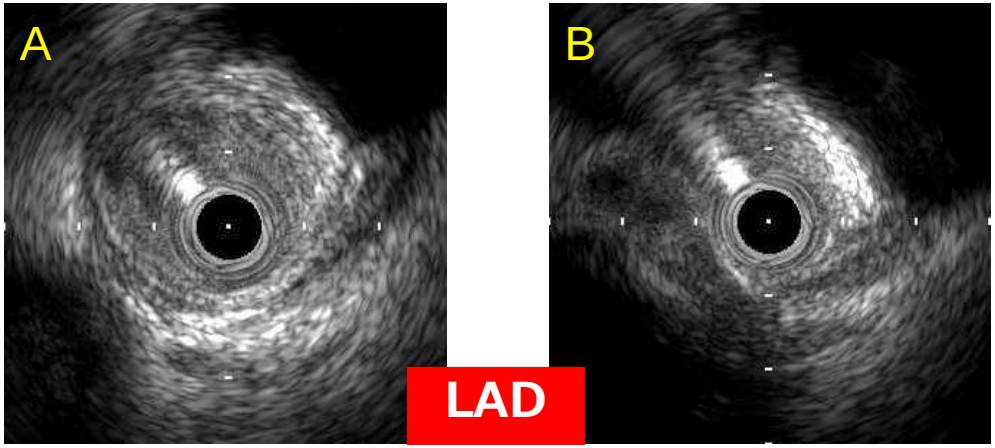
LAD

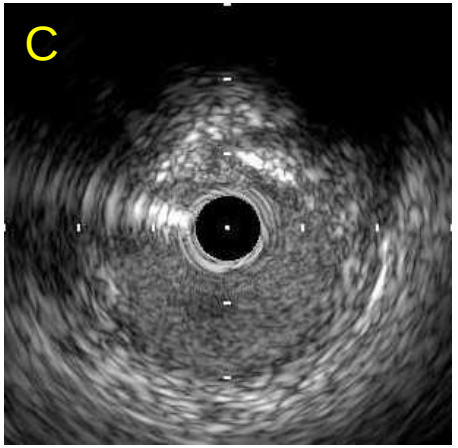


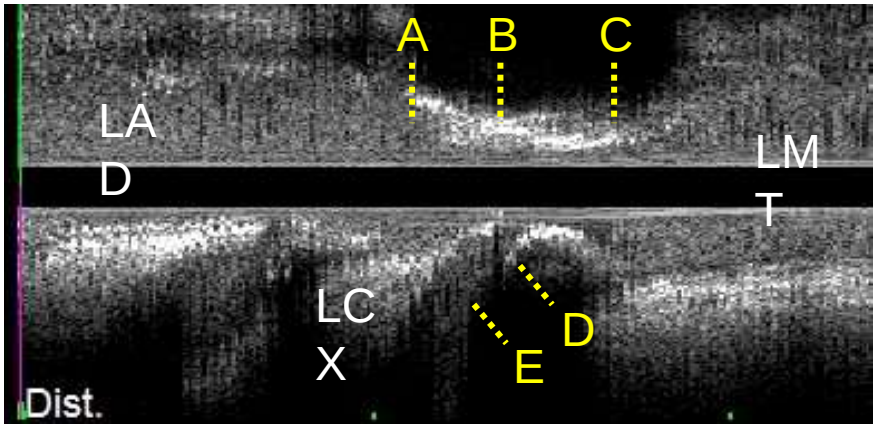
LCX

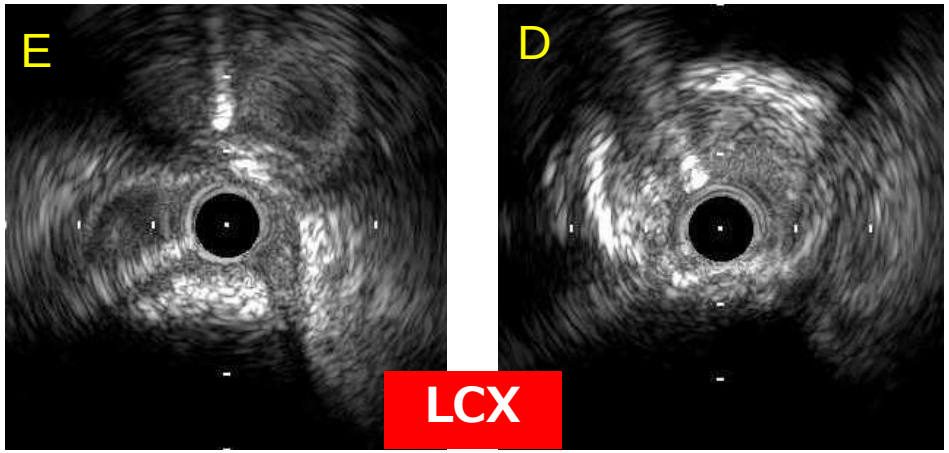




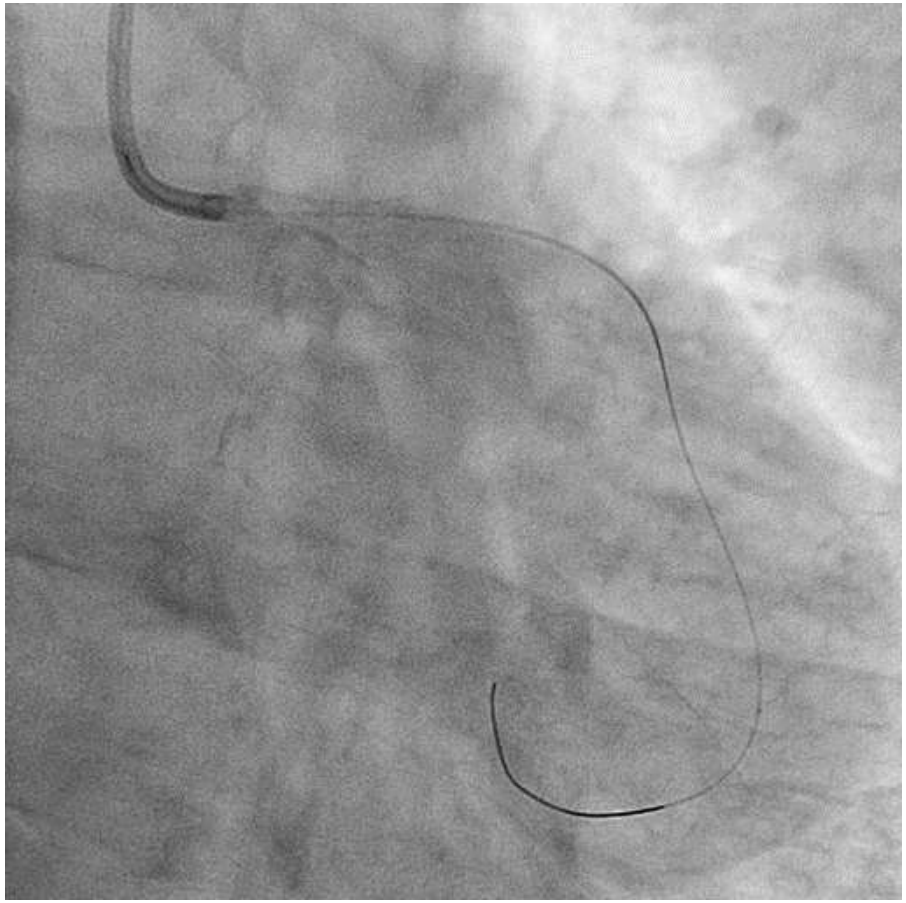

A
B
LAD


C


A
B
C
LA
D
LM
T
LC
X
D
E
Dist.


E
D
LCX

Case 3 : LMT body stenosis including....??

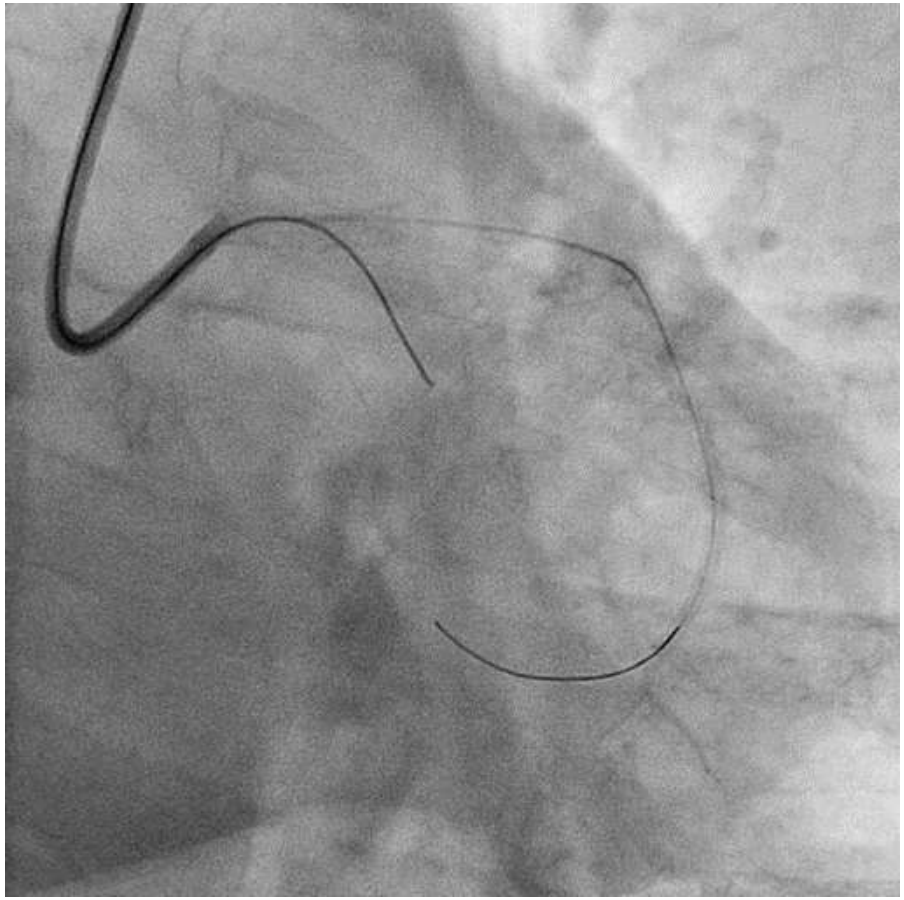


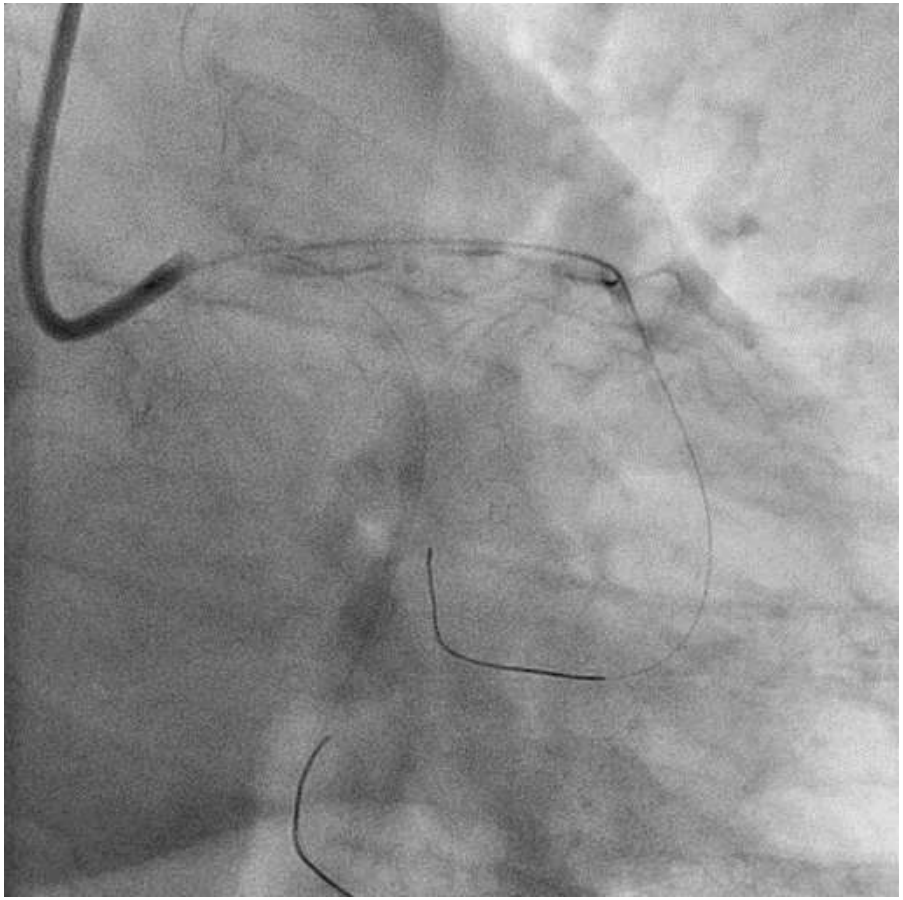
It never rains
but it pours.

Troubles never come
singly.

During the procedure, especially the timing of just implantation stent in LMT, Protection GW in LCX accidentally come out. And, we could see the disaster.

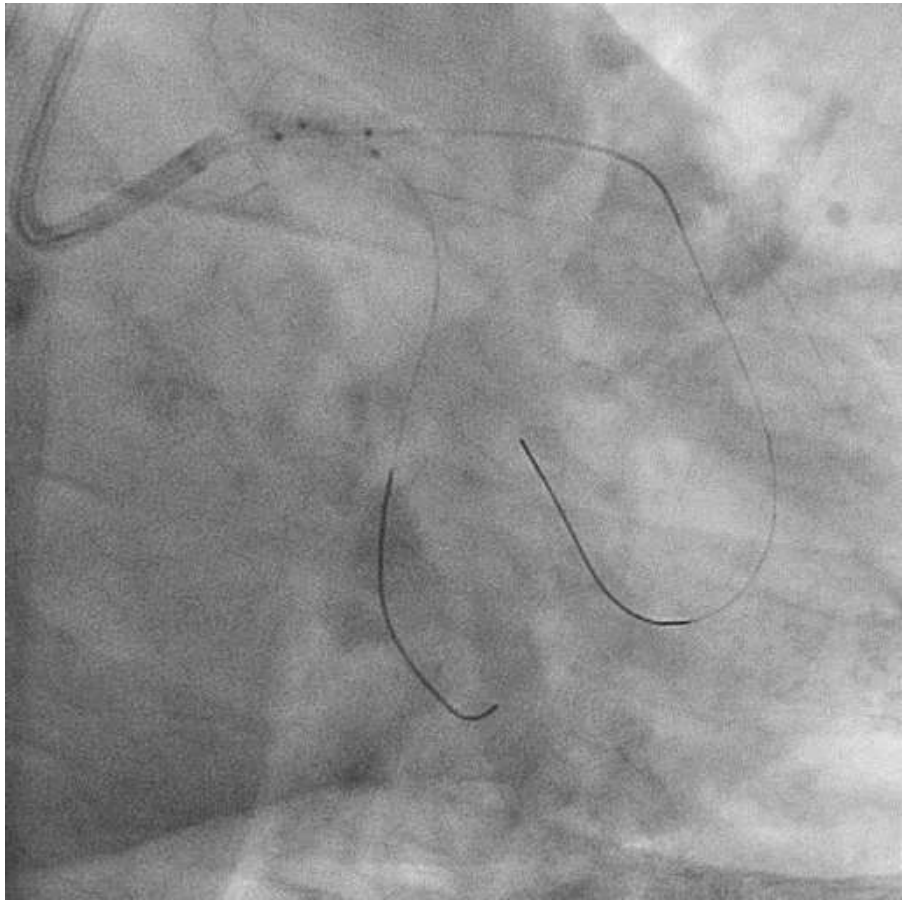
Case 3 : LMT body stenosis including....??

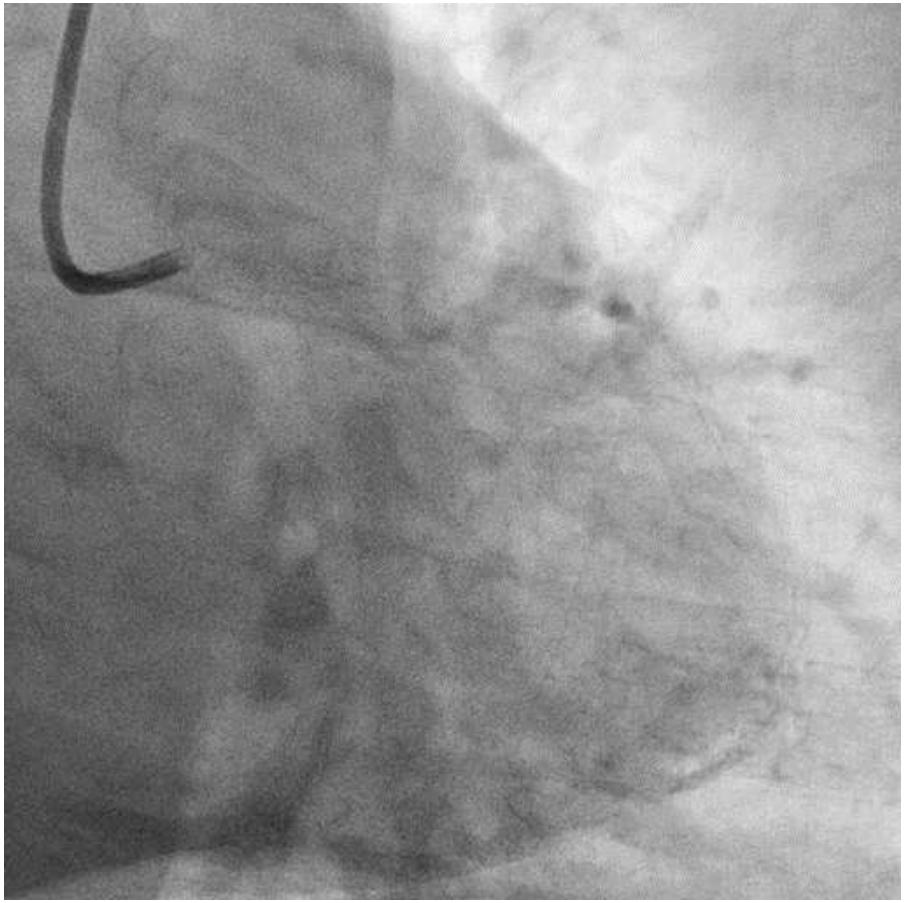




Thanks to the technique of CTO from my 30 years experience, successfully recanalized with CTO GW within 10 min. and situation cleared.

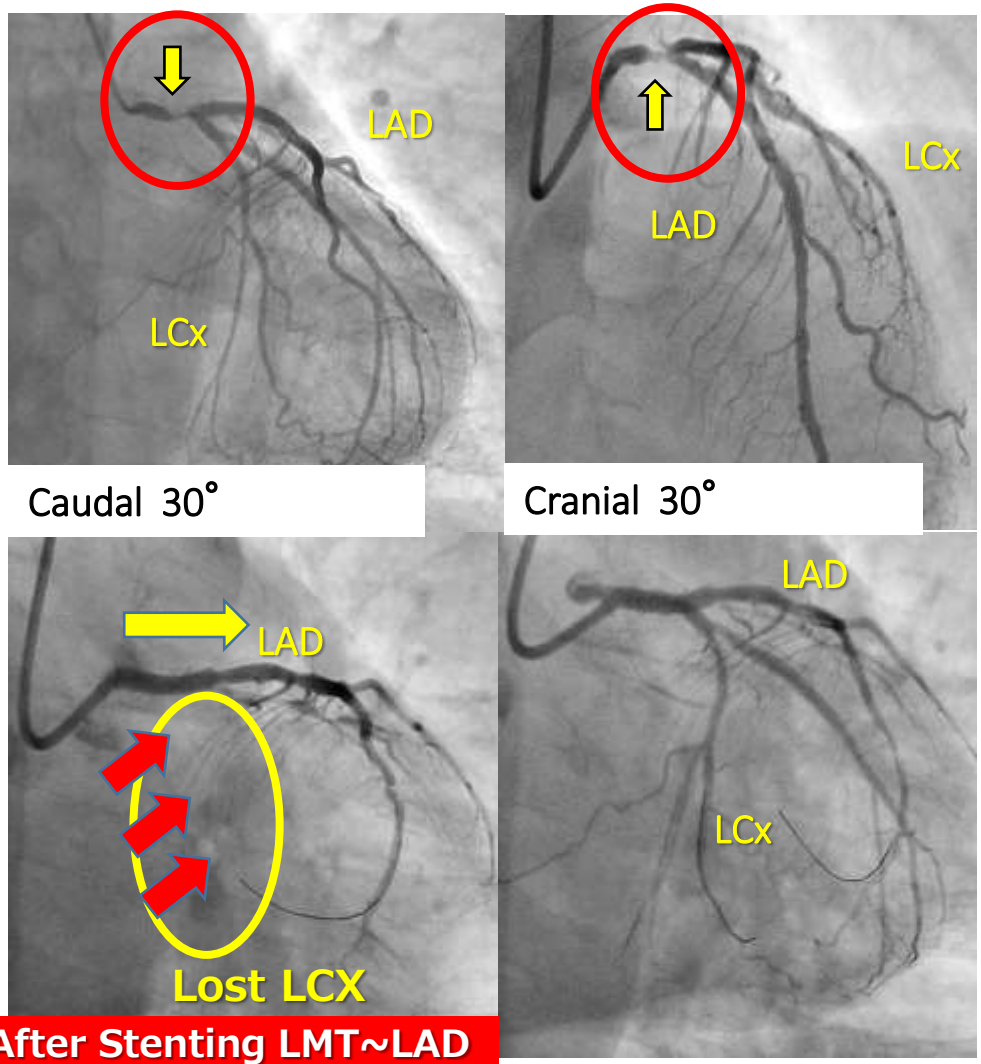
Case 3 : LMT body stenosis including....??





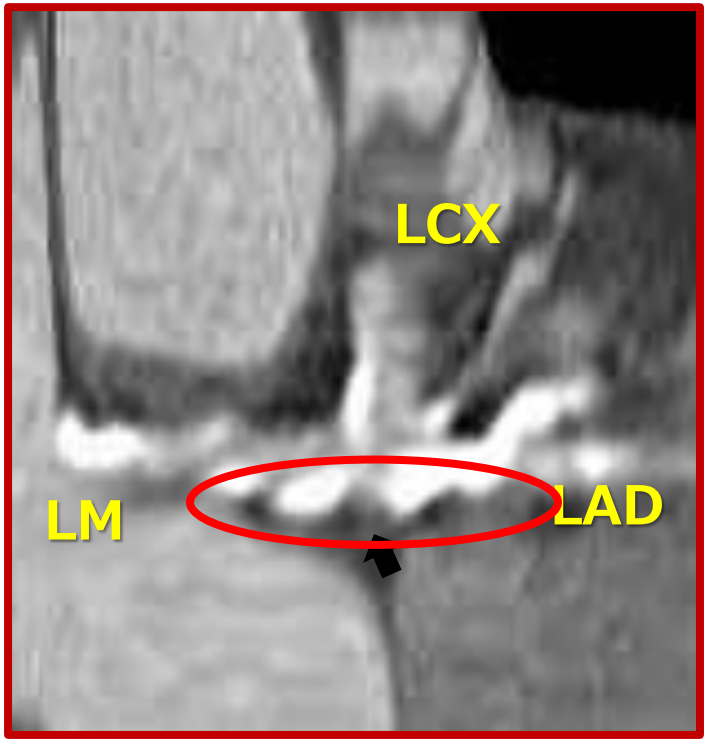
Finally we did TAP stenting technique to get beautiful angiogram.

Calcified plaque of bifurcation lesion might be the predictor of side branch stenosis



After Stenting LMT~LAD

Without protection GW in LCX .... And LOST LCX



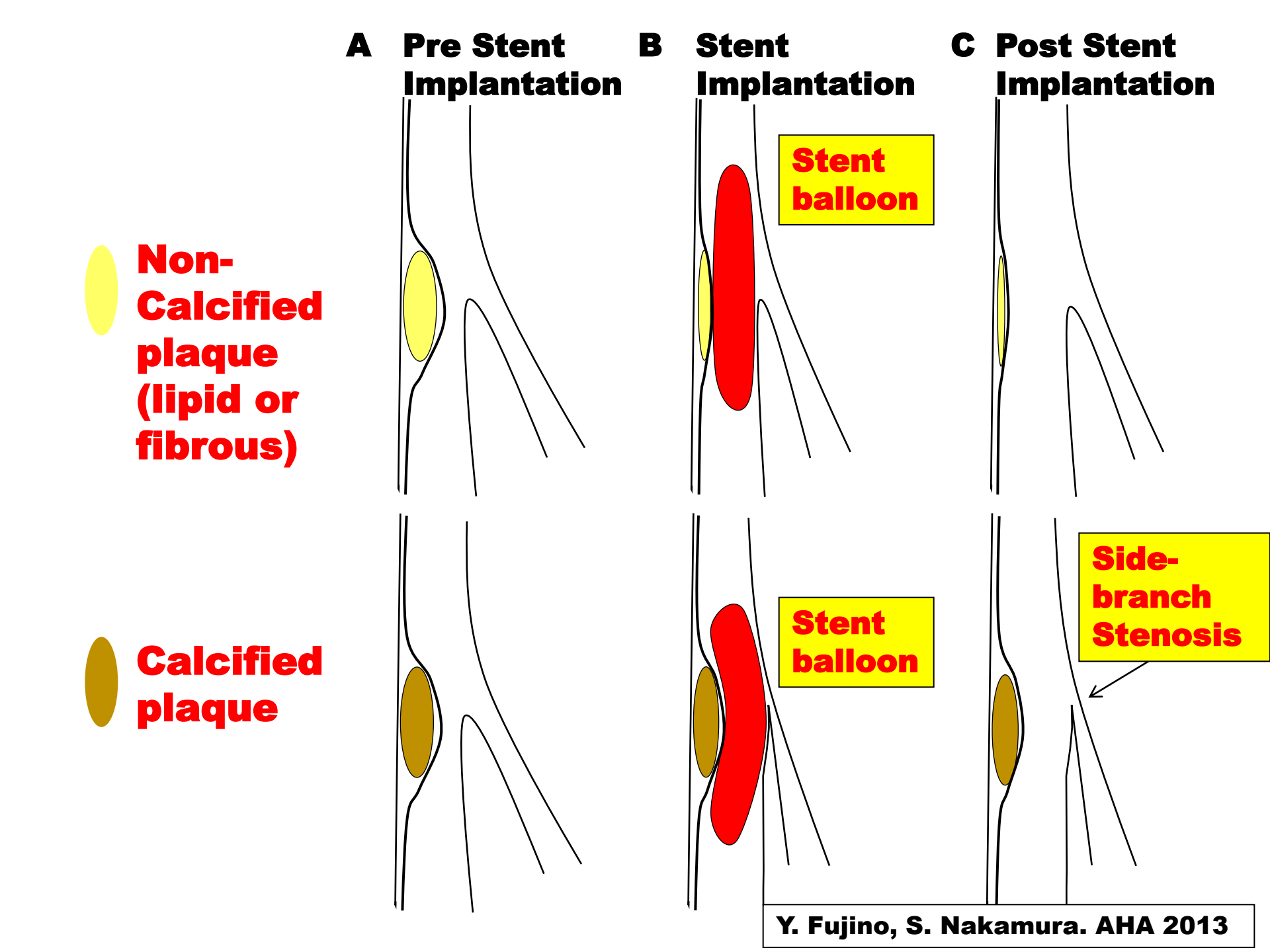
Acute and chronic total occlusion of the left circumflex artery following unprotected left main stenting: two contrasting cases. Watanabe K. Takagi K. Nakamura S. Coron Artery Dis 2015

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

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

Predictive Risk Factor of Side Branch Occlusion

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	**11.83**	**2.00-70.02**	**0.007**
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	**1.07**	**1.02-1.13**	**0.012**
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	**12.32**	**2.58-58.83**	**0.002**


A Pre Stent Implantation
B Stent Implantation
C Post Stent Implantation
Non-Calcified plaque (lipid or fibrous)
Calcified plaque
Stent balloon
Stent balloon
Side-branch Stenosis
Y. Fujino, S. Nakamura. AHA 2013

Key Messages 3

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

K.Takagi et al	Coronary Artery Disease 2015
Y. Fujino	Int J Cardiol 2014
Y Fujino et al	2014JACC Cardiovasc Interv 2012

Kensuke Takagi
M.D. FACC

Yusuke Fujino
M.D. FACC

Le plus important est invisible

Something precious is always behind the scene

Antoine de Saint-Exupéry
1900～1944

The Little Prince

It is only with the heart that one can see rightly.
What is essential is invisible to the eye.