Technical Aspect of CTO PCI
-Antegrade Approach-

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FACC, FAHA, FESC, FSCAI

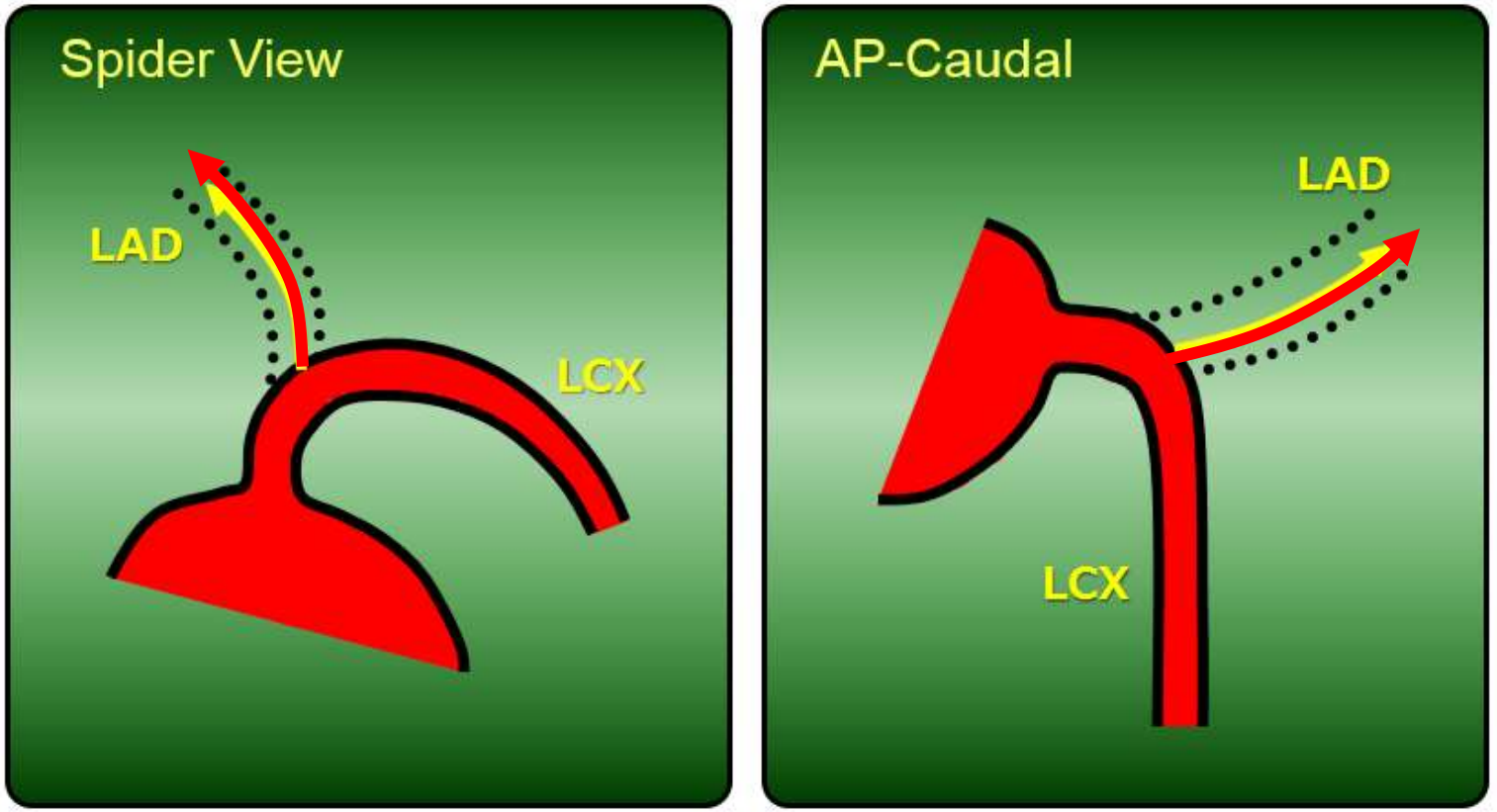
- 7 Important Factors -

Needless to say....we established...

1. Retrograde approach technique

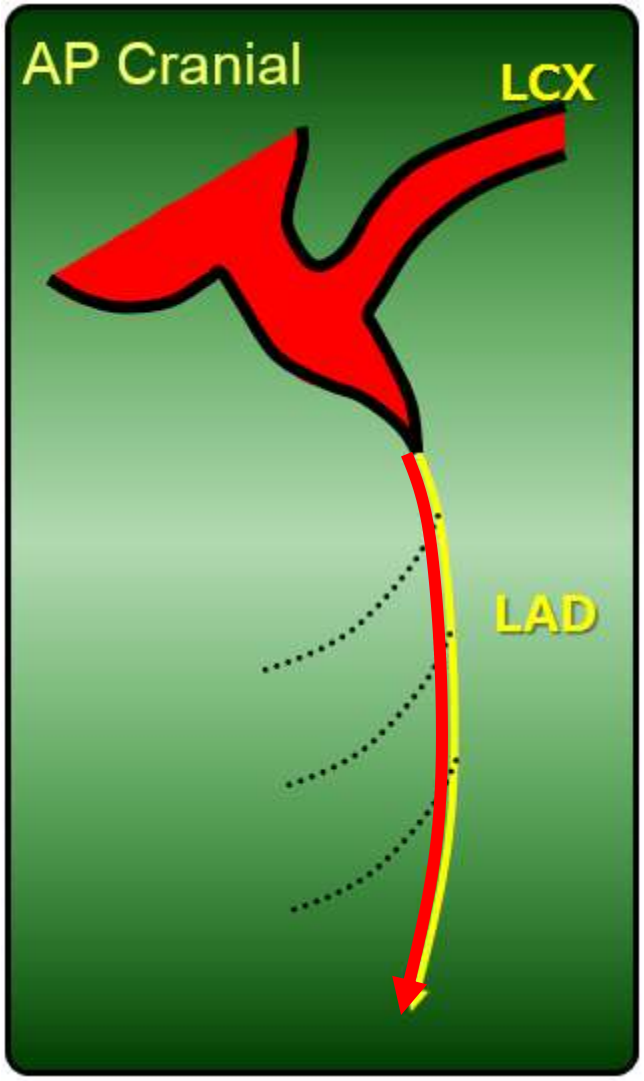
2. the way to ensure success in antegrade approach

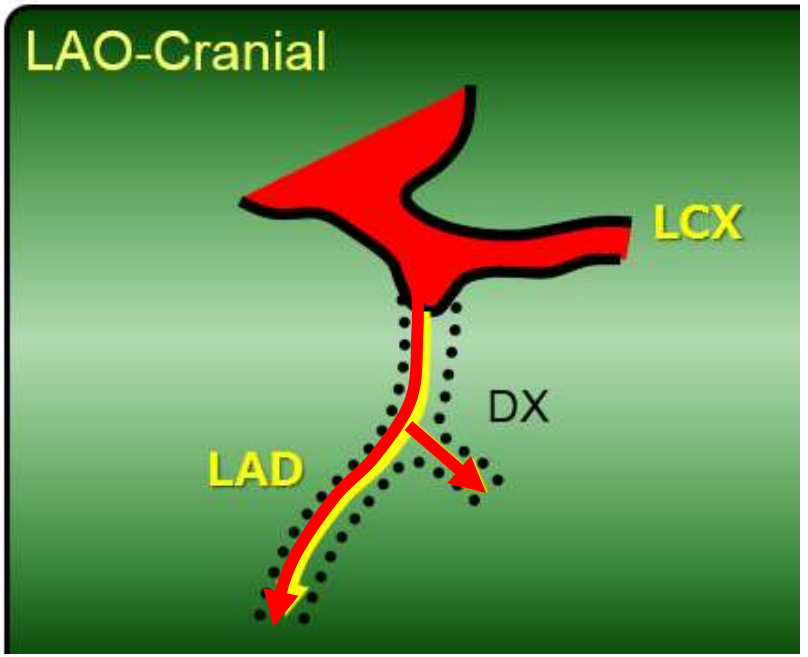
Factor 1: Be well-acquainted with anatomy of coronary artery ; LAD CTO

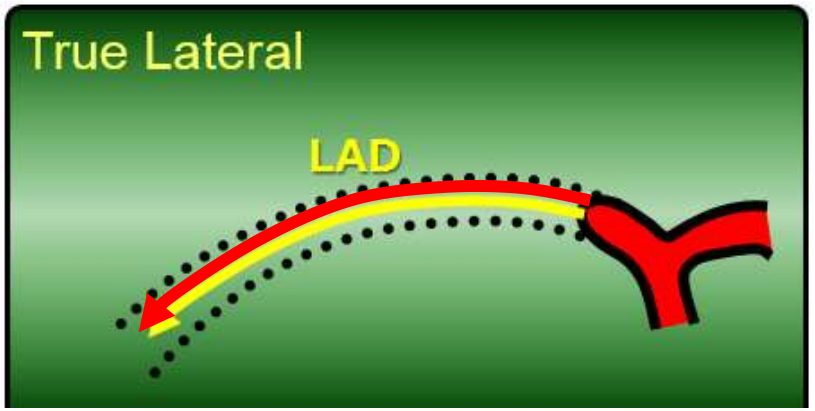


Be well-acquainted with basic rule of running route of coronary artery will be an very important support for your procedure success.

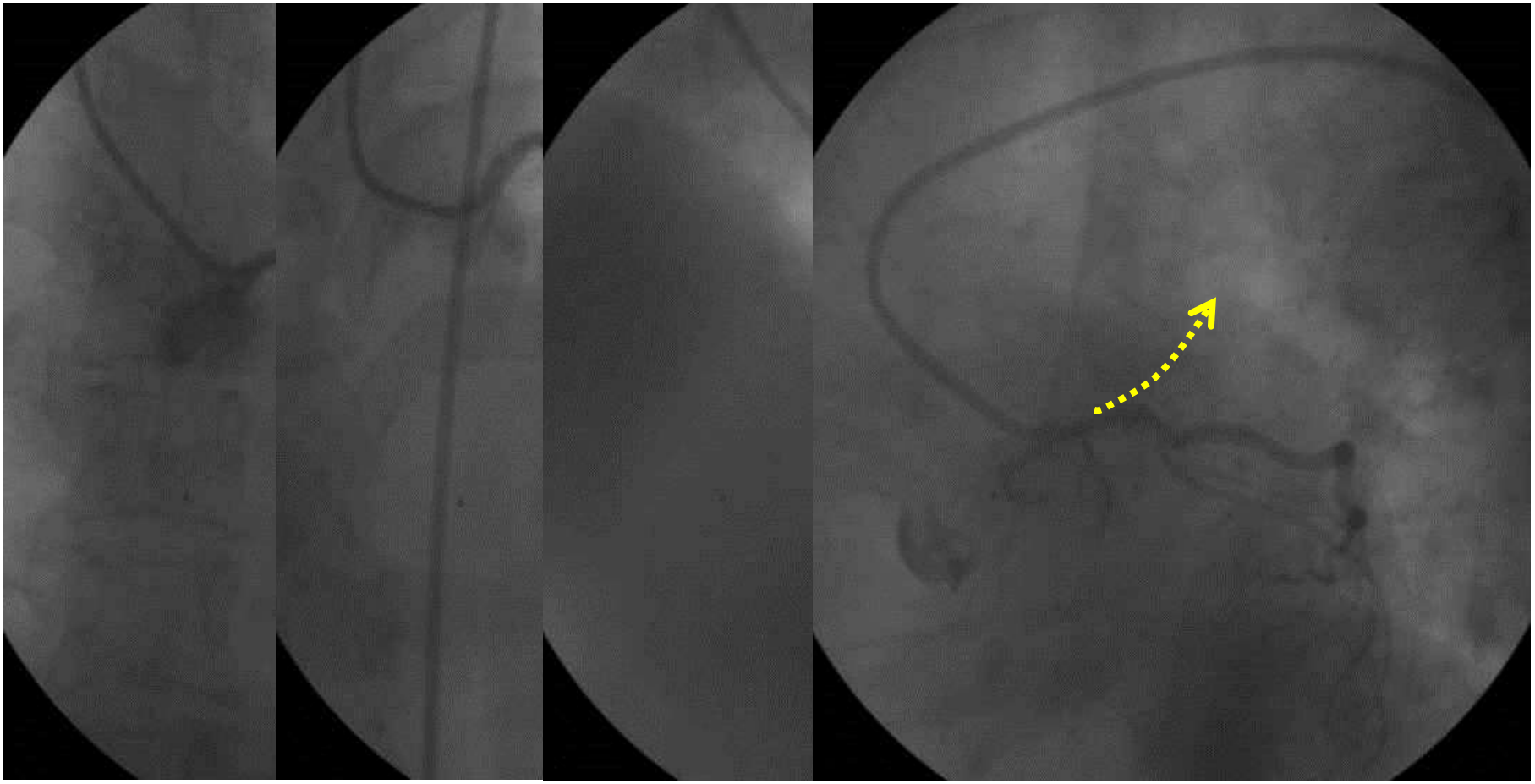
Distribution of coronary artery route is almost standardized determined by certain factors. Especially each different angle projection provides its own general route. Coronary artery route can be clearly observed at a certain angle projection.





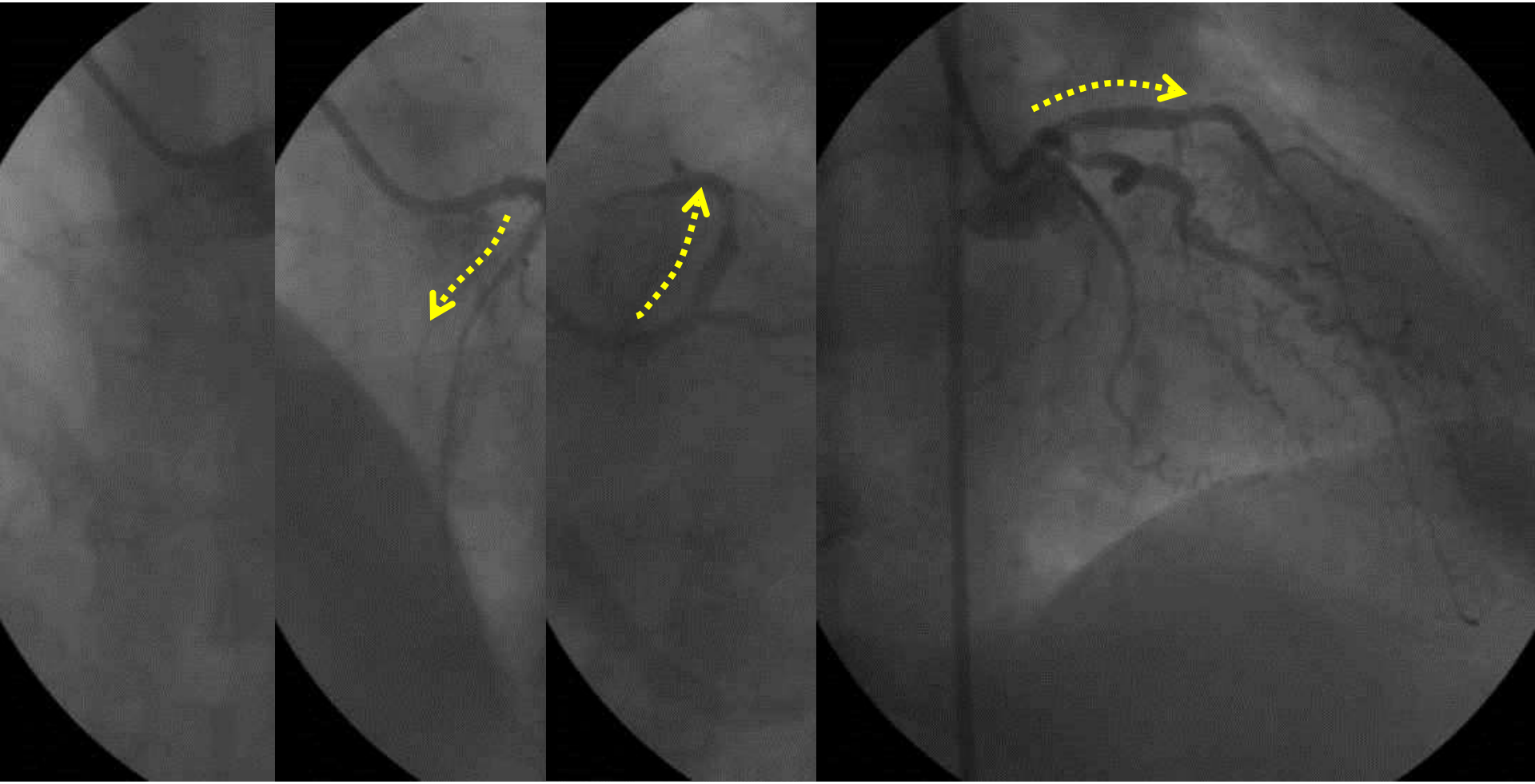


Factor 1: Be well-acquainted with anatomy of coronary artery ; LAD

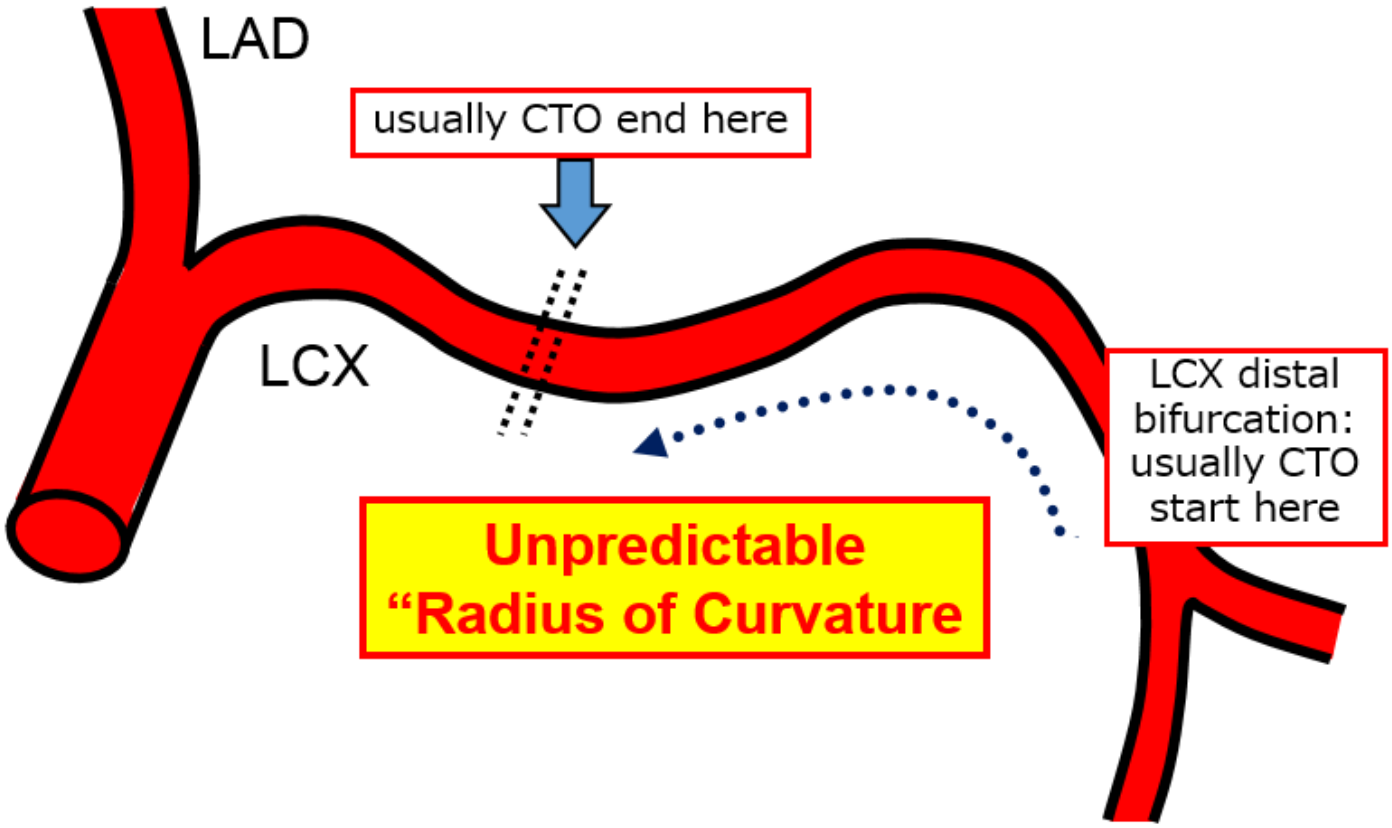


You cannot tell entry point or direction of this LAD-CTO at a glance.
But if you are fully aware of the general anatomy of coronary artery, you can predict its running route.

Factor 1: Be well-acquainted with anatomy of coronary artery ; LAD

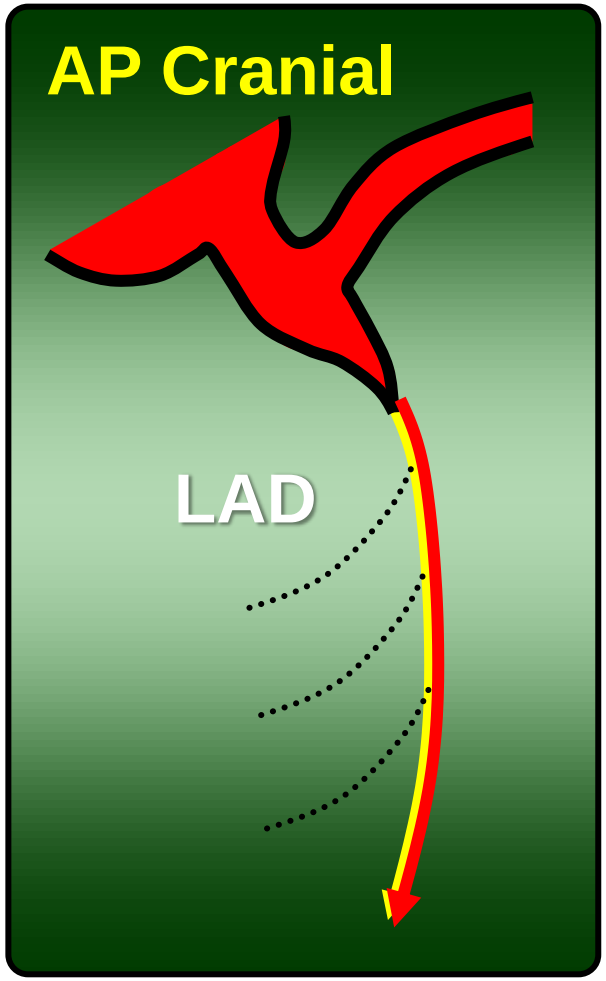


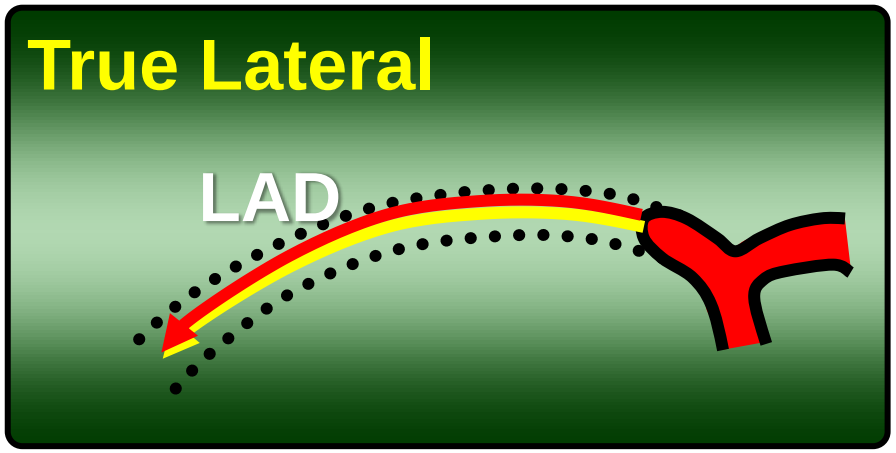
Factor 1: Be well-acquainted with anatomy of coronary artery ; LCX CTO



Success rate of LCX CTO PCI is relatively low, because running route of mid-LCX is unpredictable. We can not conject the route of LCX because of unpredictable "Radius of Curvature"

Factor 2: Select optimum angle of angiogram projection : LAD CTO

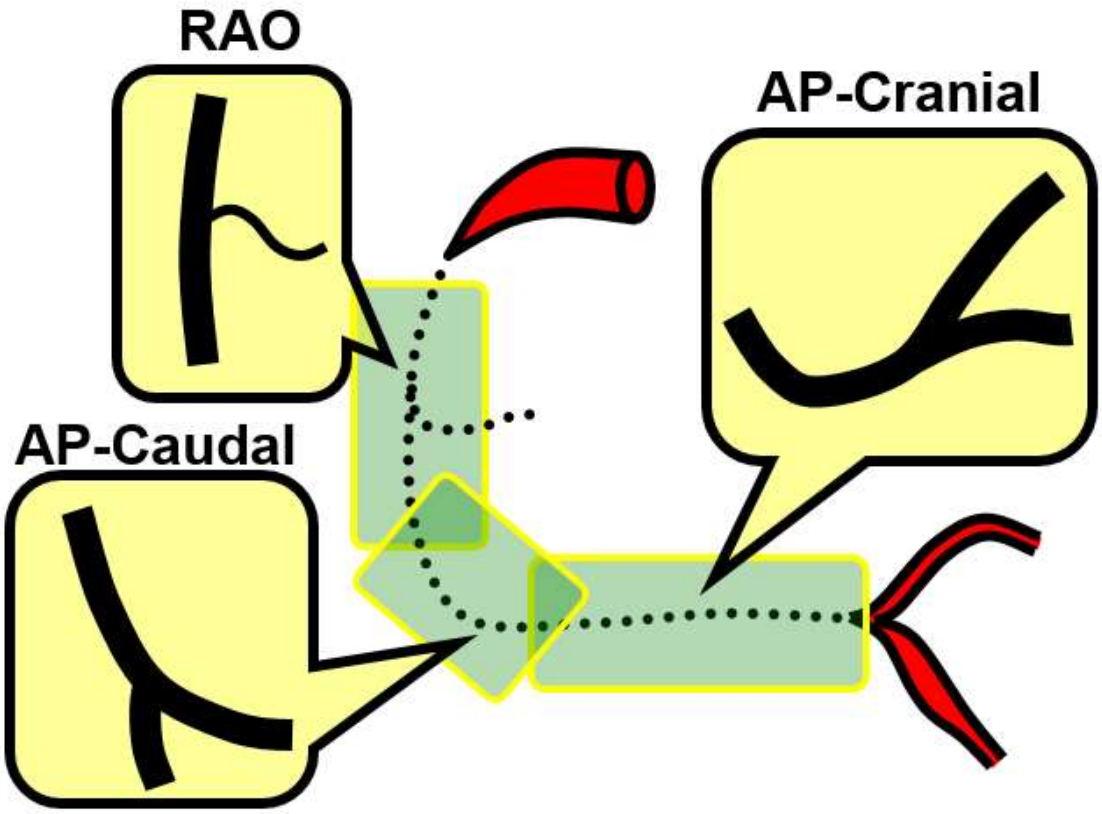




Start with optimum view and try to select 2-orthogonal projections to acquire 3-D image of GW position. Combining several angle projection information provides quite precise prediction of the route of a CTO.

Which angle that you select projection during procedure is a critical factor like the operating field for a surgeon.

Factor 2: Select optimum angle of projection : RCA CTO

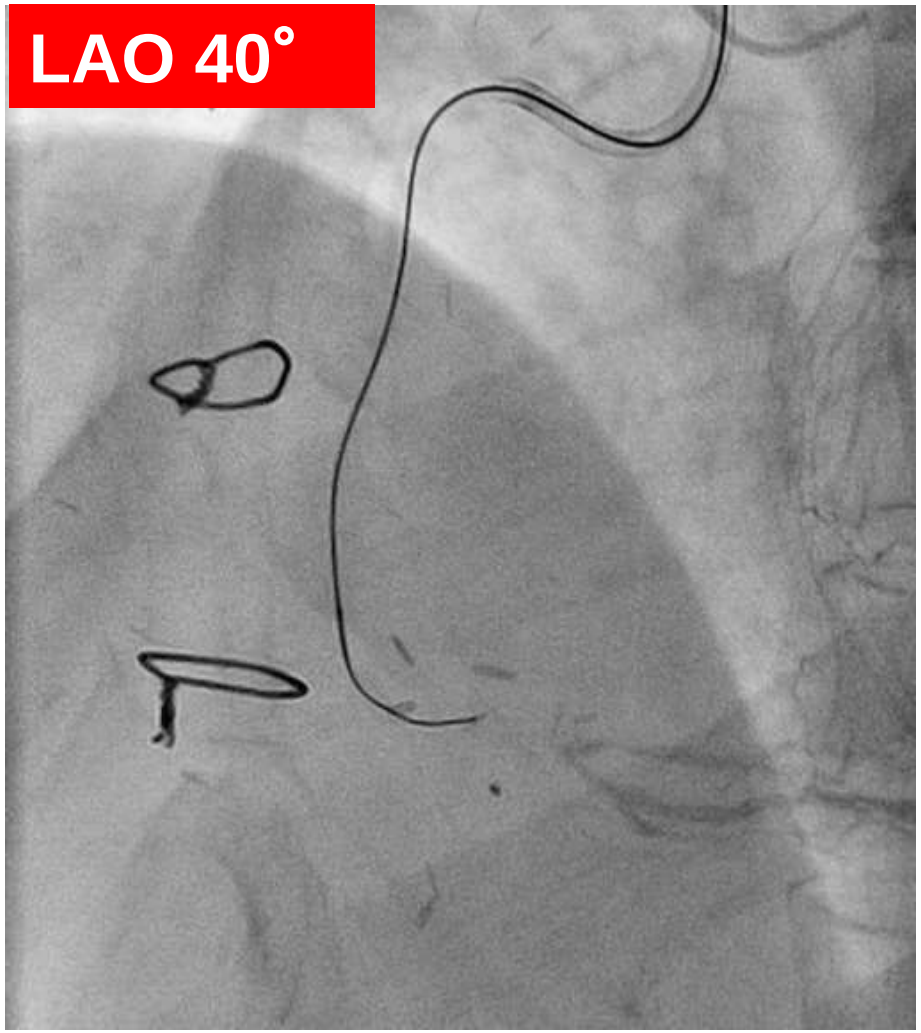


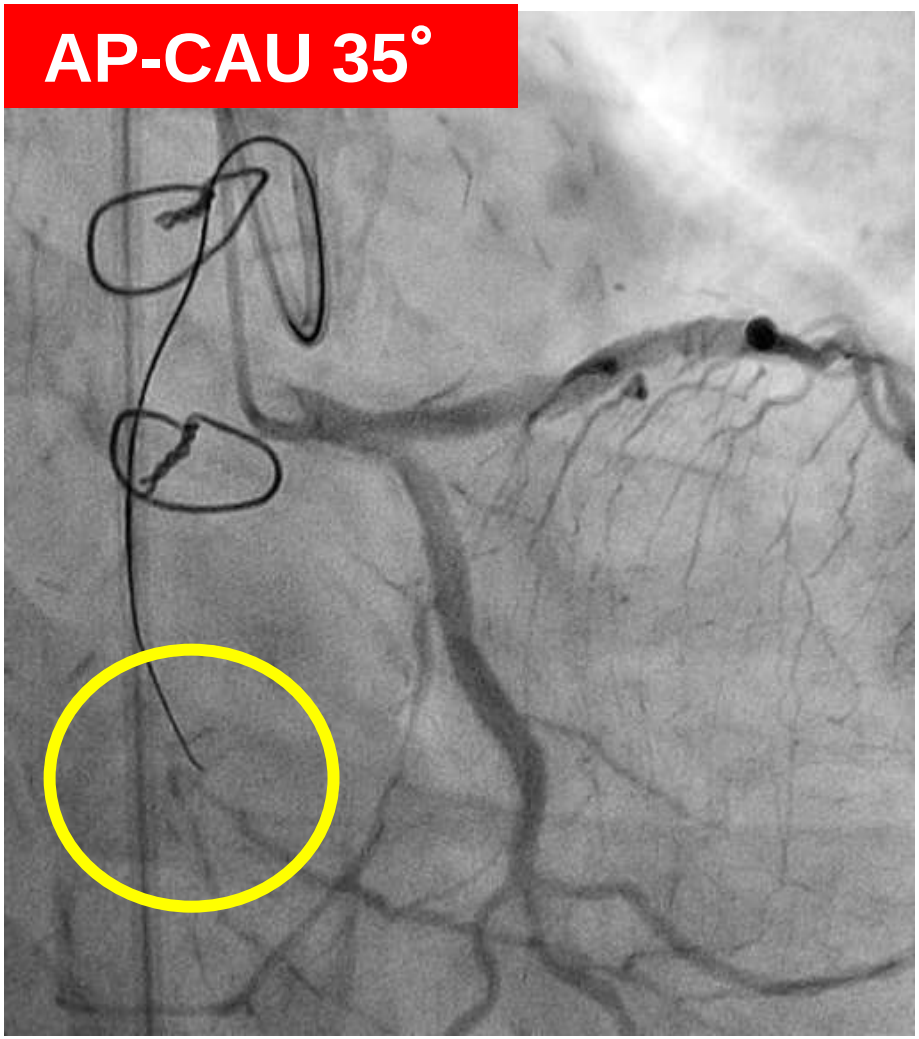
LAO + RAO,
LAO + AP-caudal…
Location of CTO lesion gives a rough idea of which view-angle is the best.

For CTO PCI, make sure to select orthogonal 2 angle projection to check the validity of GW advancement route during the procedure. By adding the orthogonal plane of that view, 3D location of a GW can be easily understood. Orthogonal two angle projection enhances the understanding the wire position

Factor 2: Select optimum angle :RCA long CTO

AP-Caudal view is a one of the most important projection to see mid-RCA

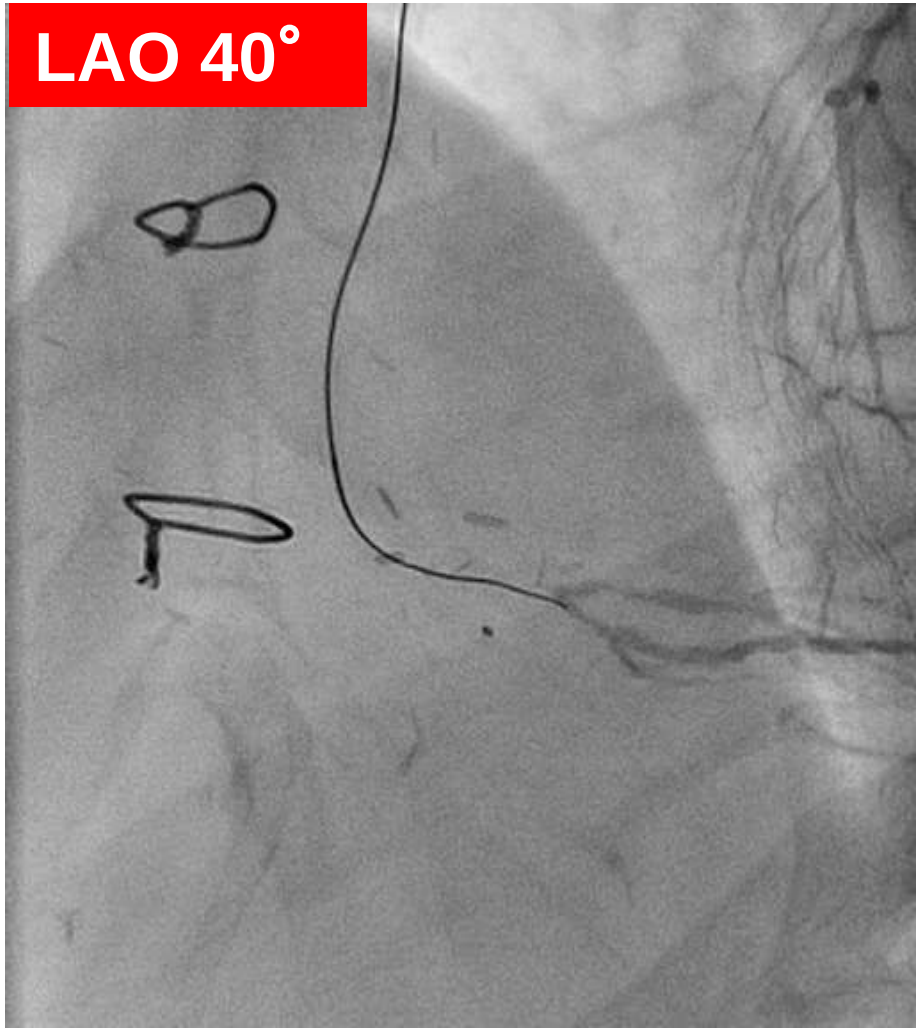


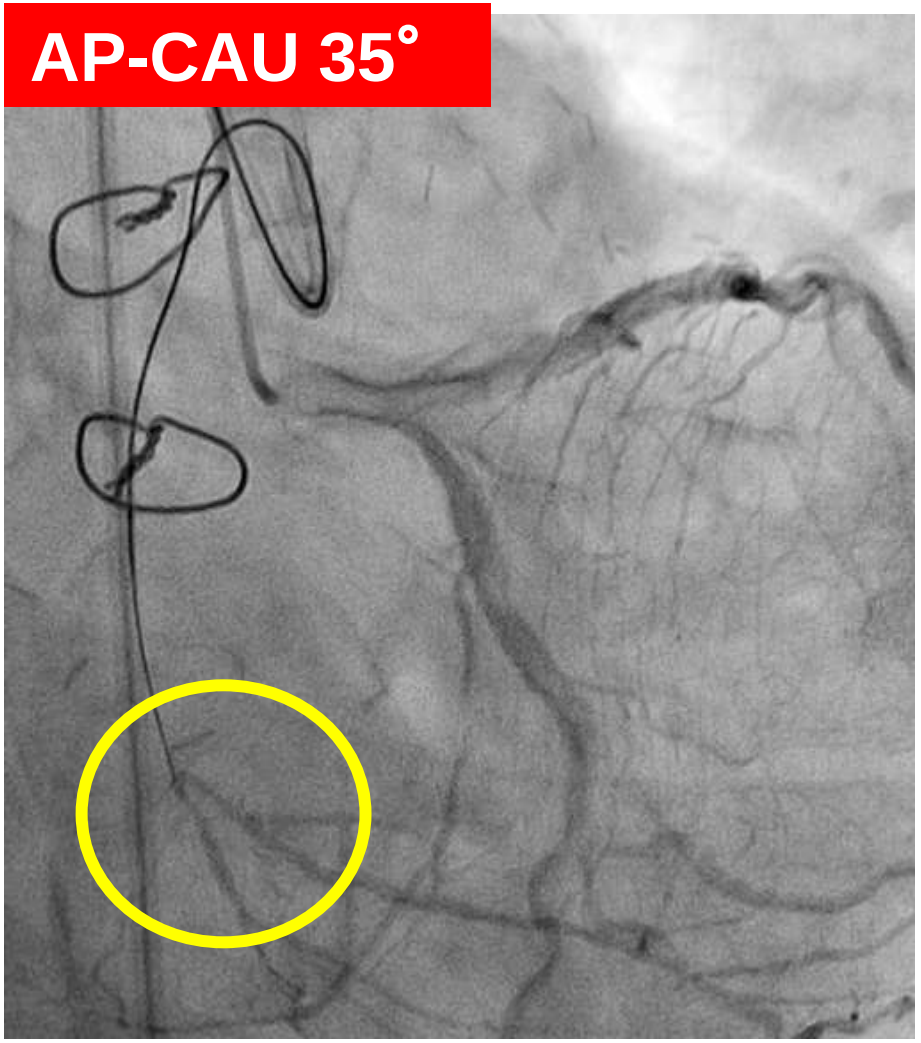


You can clearly understand the wire position in the middle part of RCA CTO

Factor 2: Select optimum angle :RCA long CTO

AP-Caudal view is a one of the most important projection to see mid-RCA

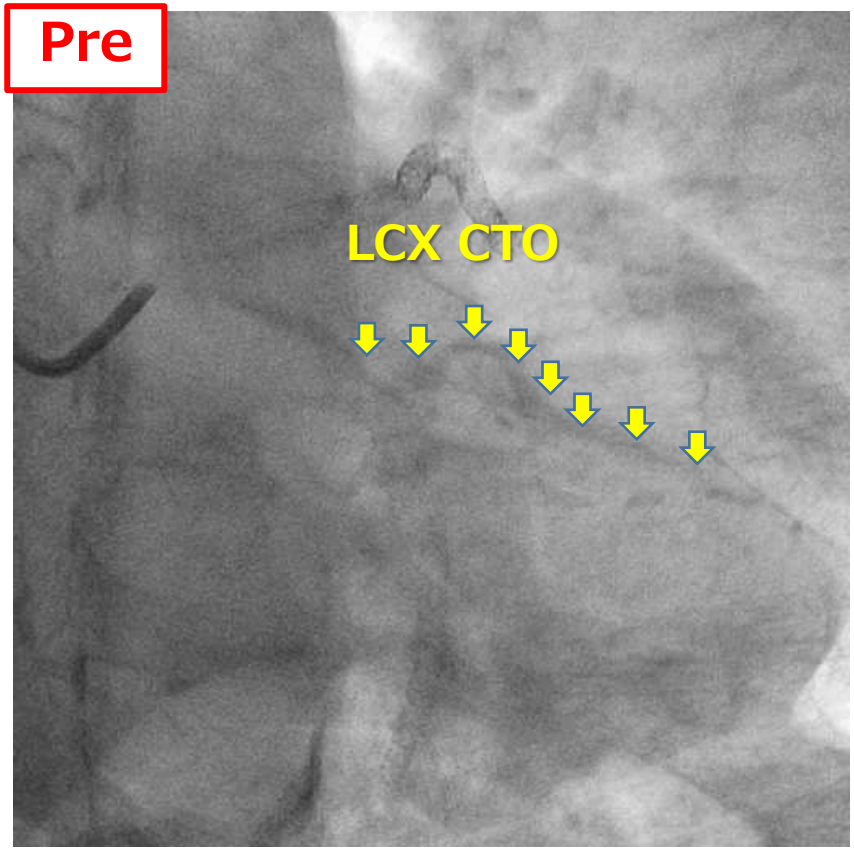


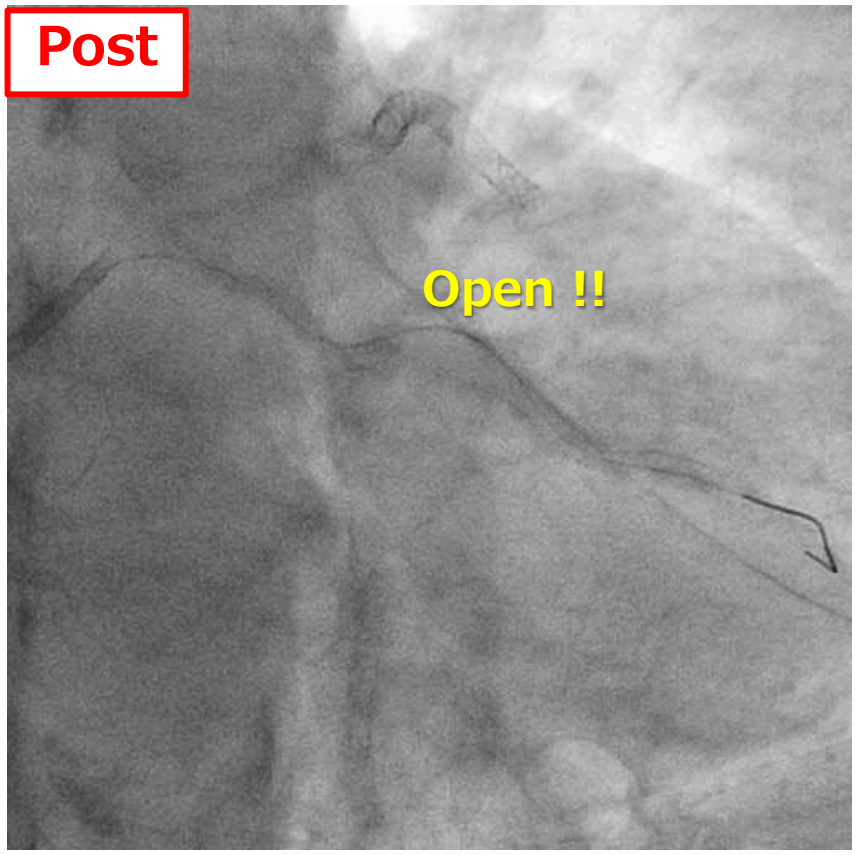


You can clearly understand how much the wire deviates !!!

Factor 3: Find clues of route of CTO on angiogram

Pay attention to hidden hints in the angiogram such as calcification,
delayed staining of contrast media to find a good reference for prediction of its route.





You may see severe calcification in CTO lesion clearly or contrast staining island on angiogram. Therefore careful observation of angiogram will show you the possible route of the vessel however it is tortuous and difficult to predict.

Factor 4: Use imaging modality appropriately

-You can conject the route of CTO-

In treating CTO cases, we form a conjecture of coronary artery route prior to the procedure utilizing not only IVUS but also CT and other imaging devices.
Of course, IVUS guided approach is indispensable for CTO PCI.
Additionally good understanding of basic utility of IVUS such as looking for entry points is essential.
However, careful observation of CT image of coronary artery is sometimes, more important than anything else.

Do not forget !! IVUS is very essential !!

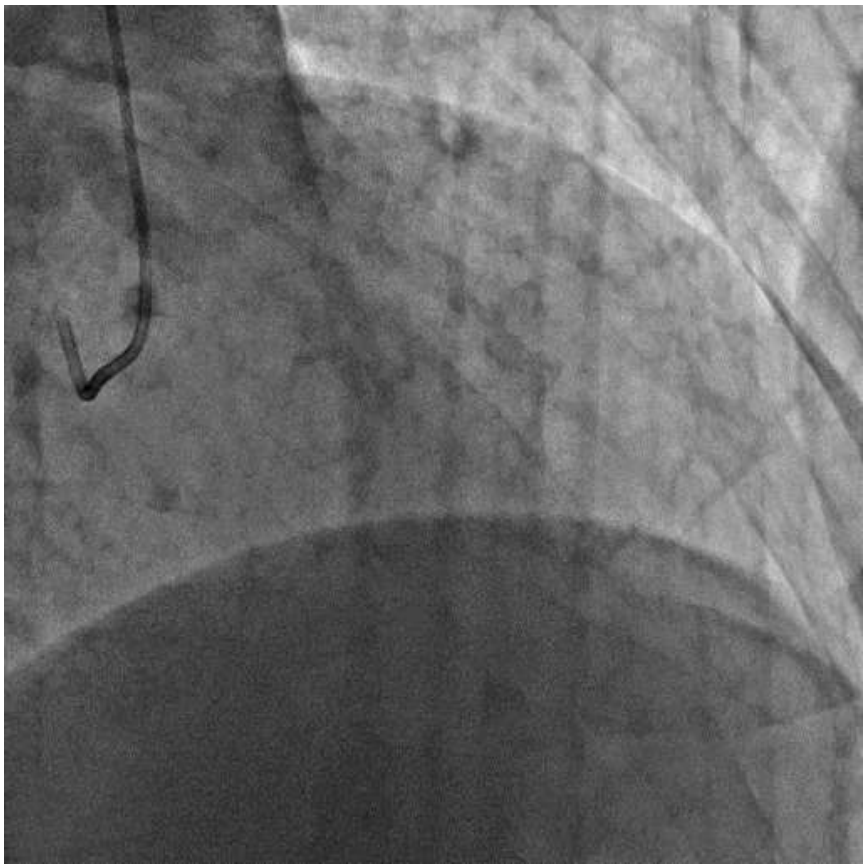
When CTO entry point is unclear or subintima space is enlarged causing collateral is blurred, utilize IVUS image to conject.
For this purpose, accumulate IVUS experiences and knowledge.

Factor 4: Use imaging modality appropri

-In case of complex LAD CTO-

Pre CAG: Very Complex LAD CTO

LAO 0°CAU 30°

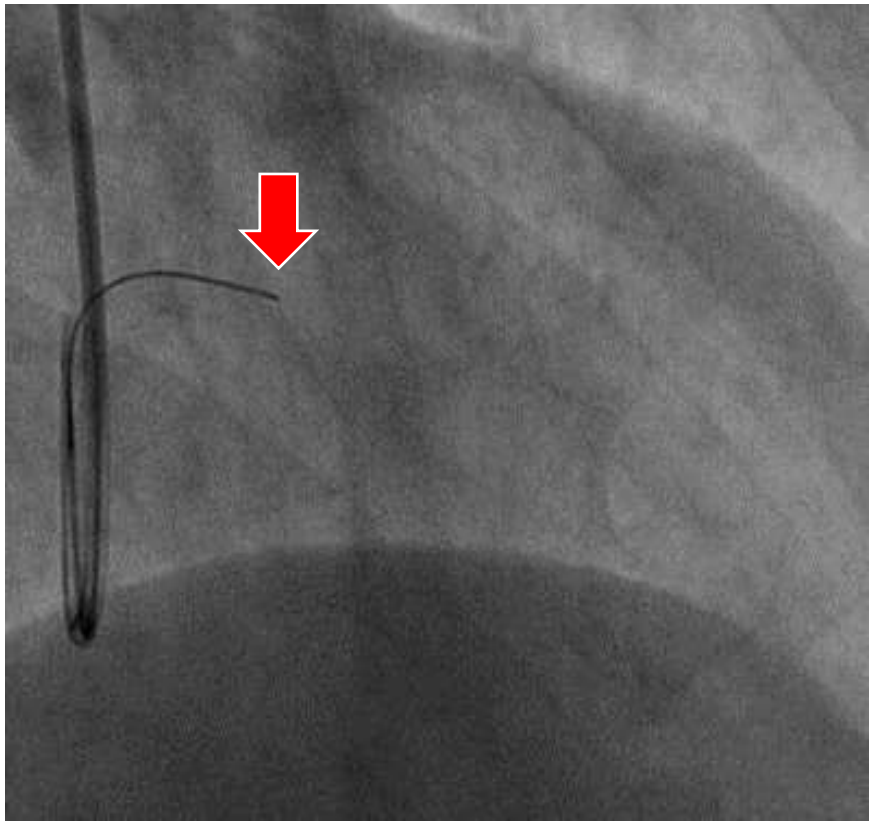


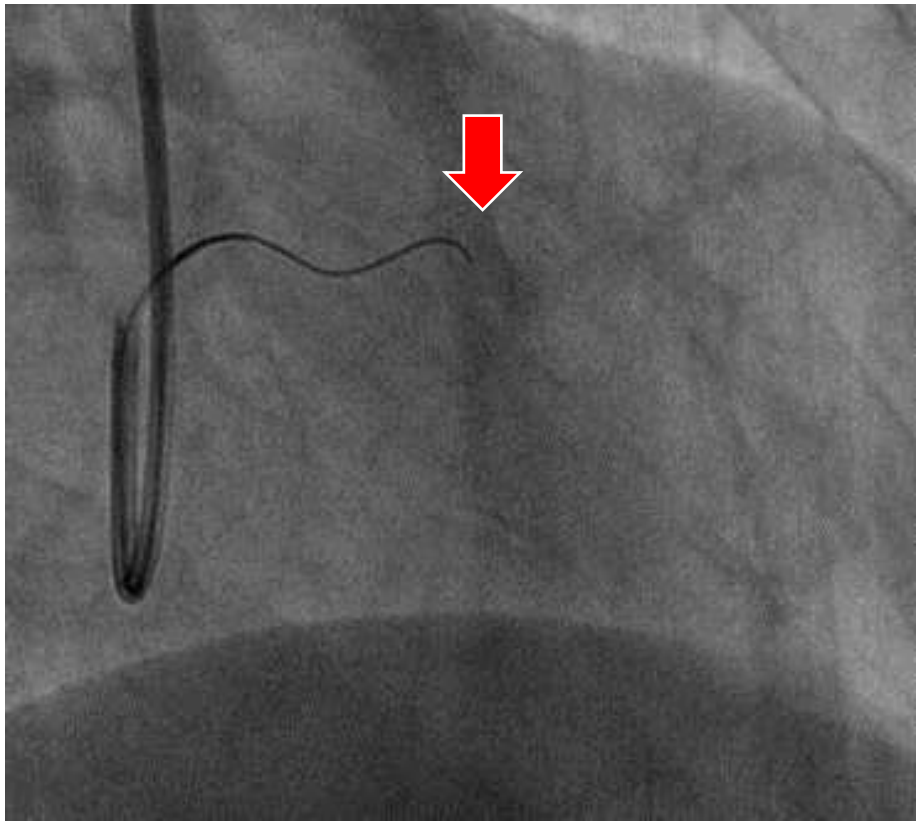
RAO 30°CRA 30°

Factor 4: Use imaging modality appropri

-In case of complex LAD CTO-

Tried both Stump(Which is a Right One ??)



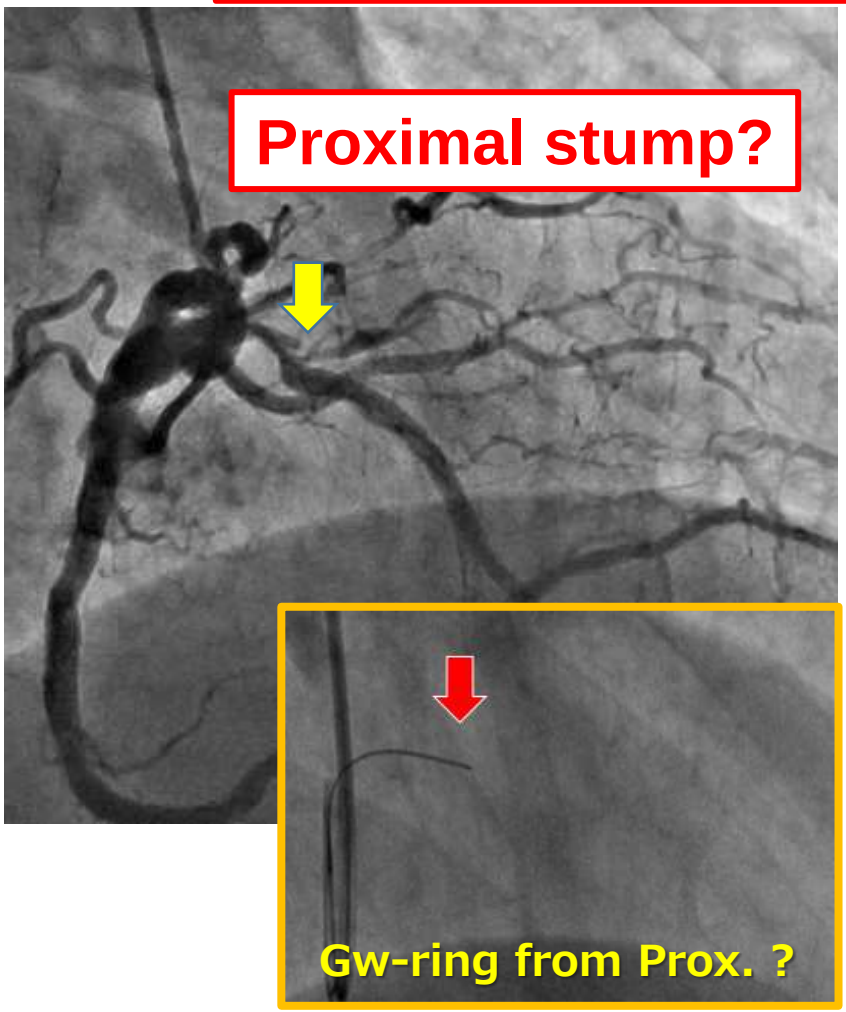


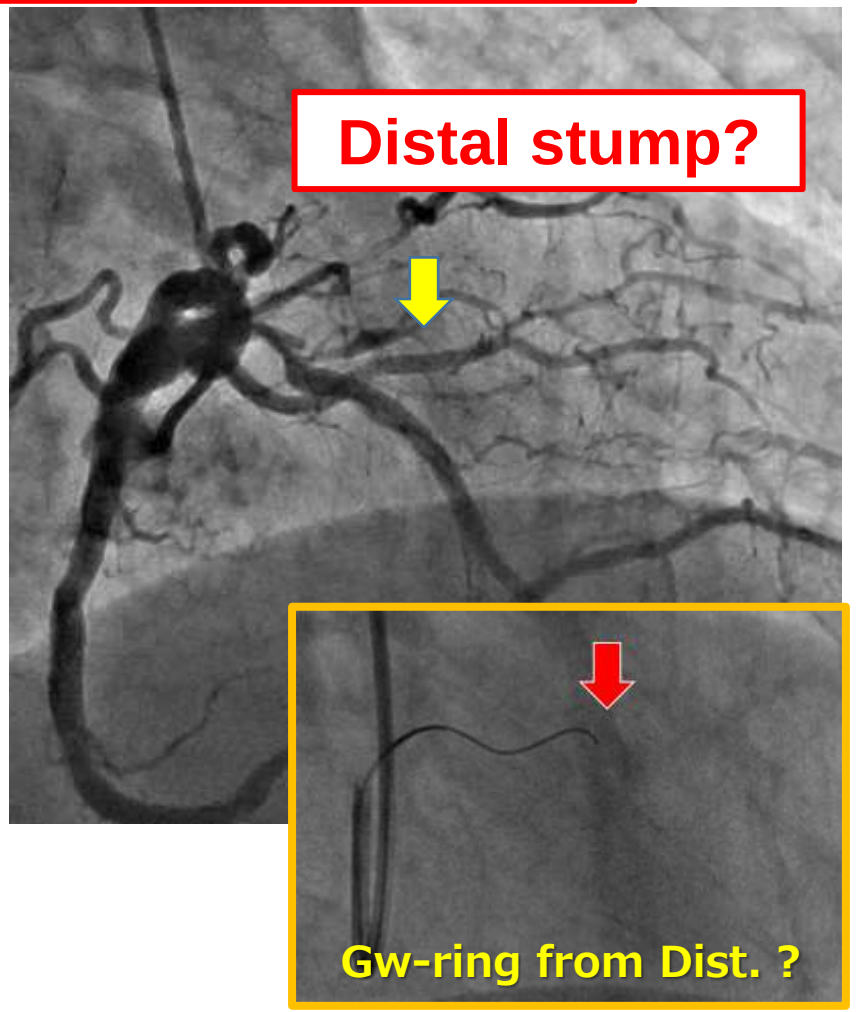
Advanced Fielder FC with Corsair ant TRY !! in each stump

Factor 4: Use imaging modality appropriately

-You can conject the route of CTO-

Case: LAD CTO; Where is the entry point ??

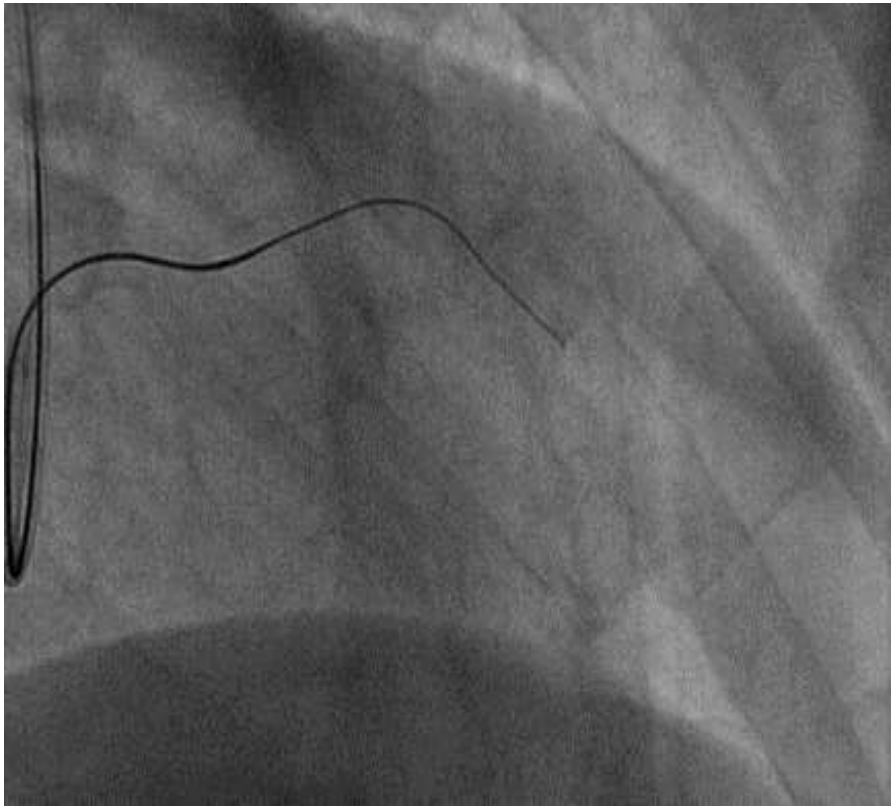


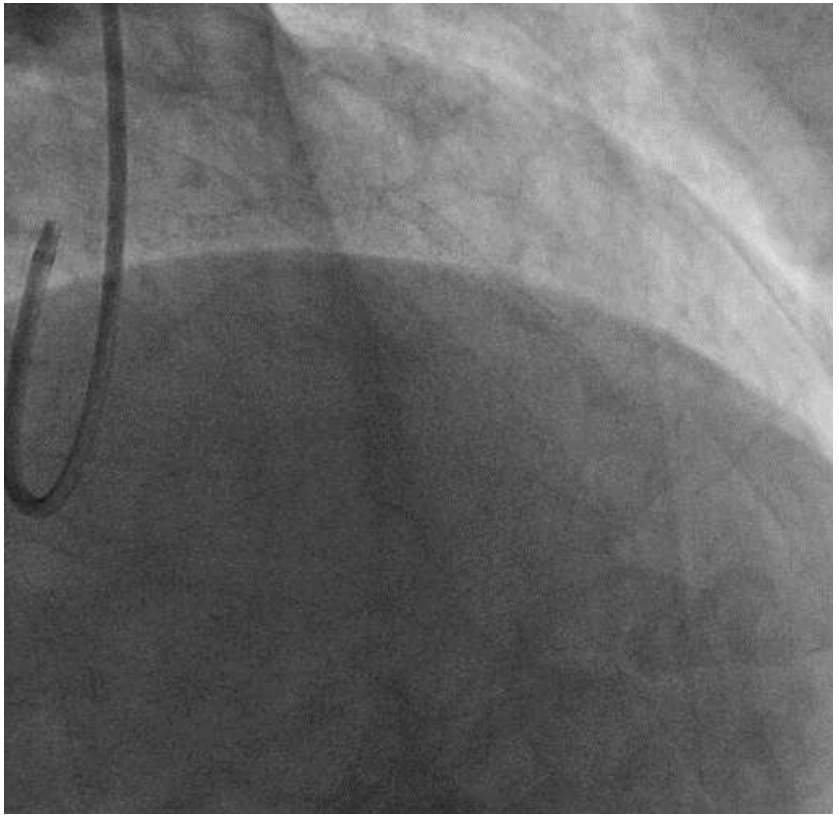


Factor 4: Use imaging modality appropri

-In case of complex LAD CTO-

Right Answer is Distal Stump.

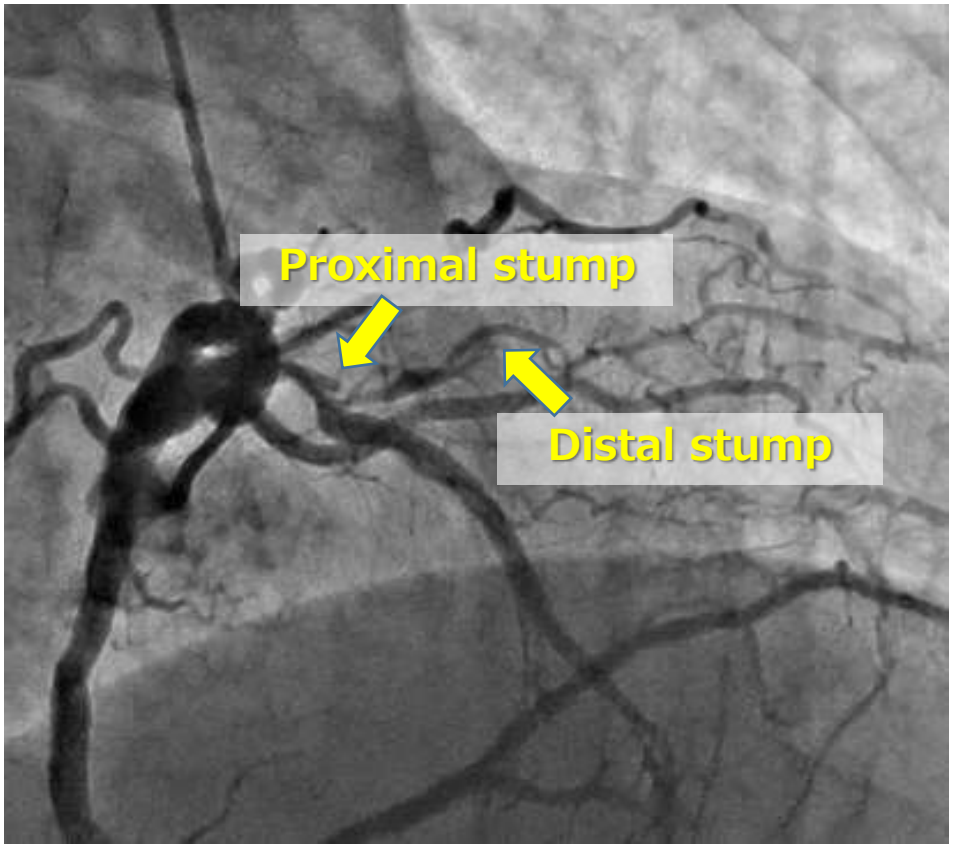


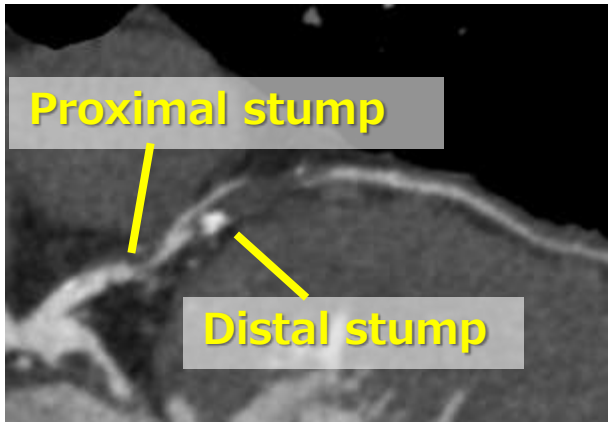


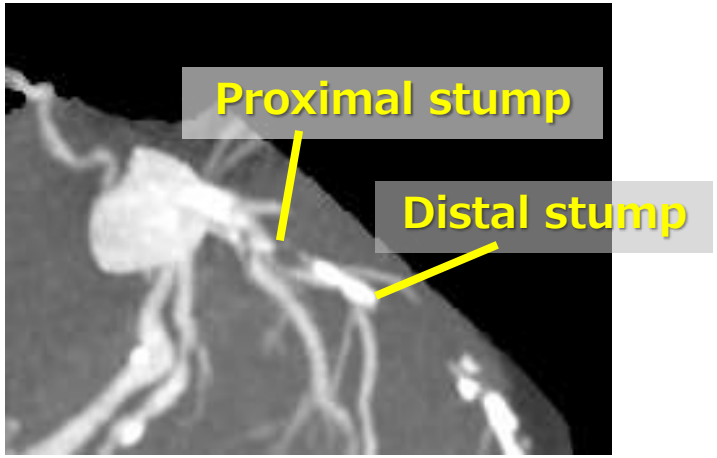
Factor 4: Use imaging modality appropriately

-You can conject the route of CTO-

MDCT could give us useful anatomical images.





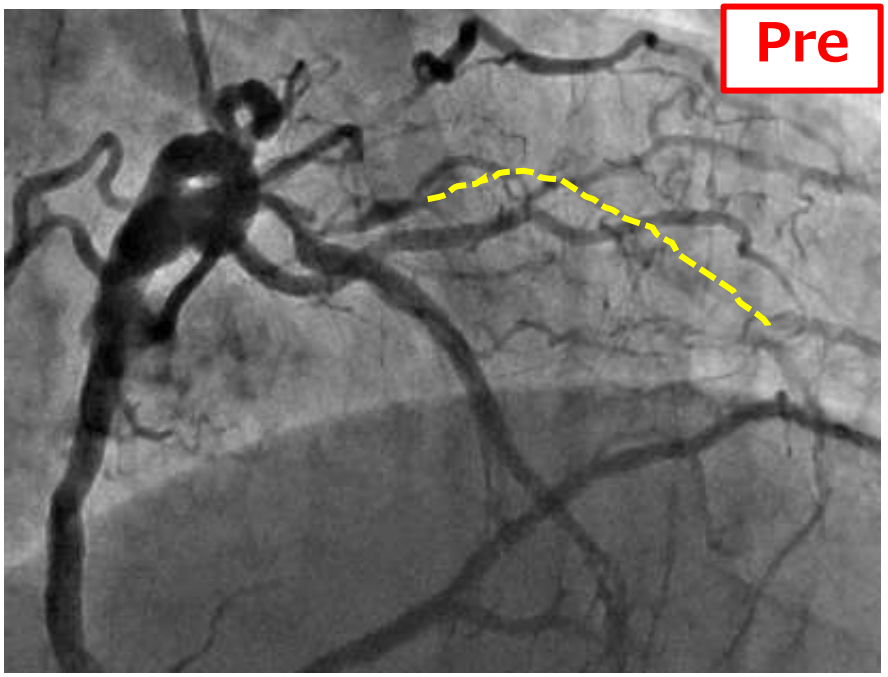


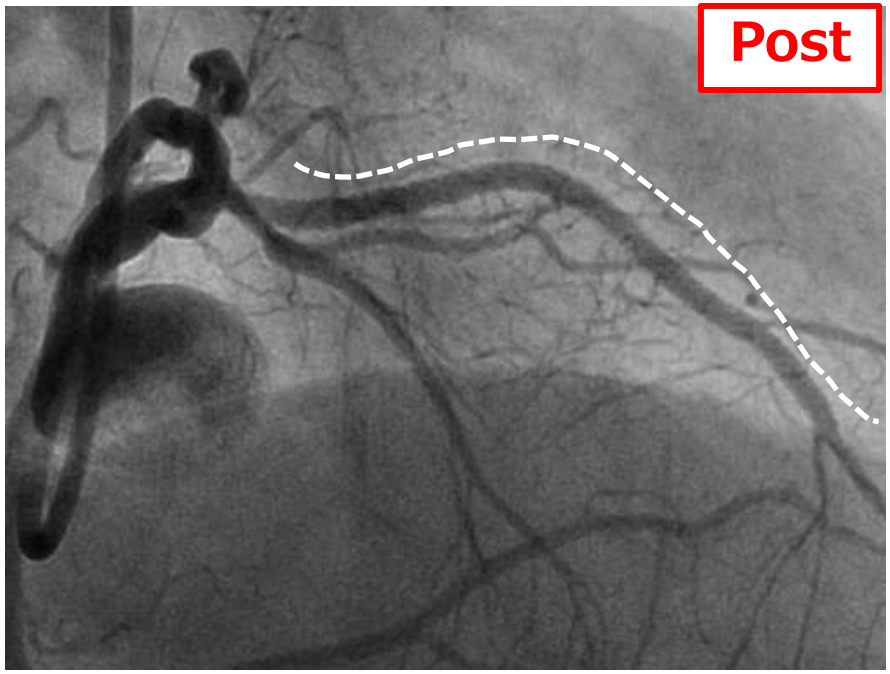
Distal stump is connected to LAD distal true lumen

Factor 4: Use imaging modality appropriately

-You can conject the route of CTO-

We could recognize the route of LAD before PCI !!

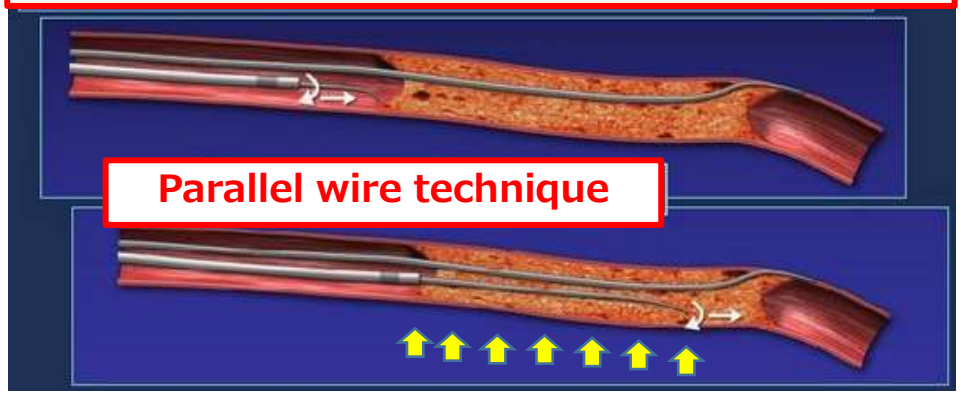


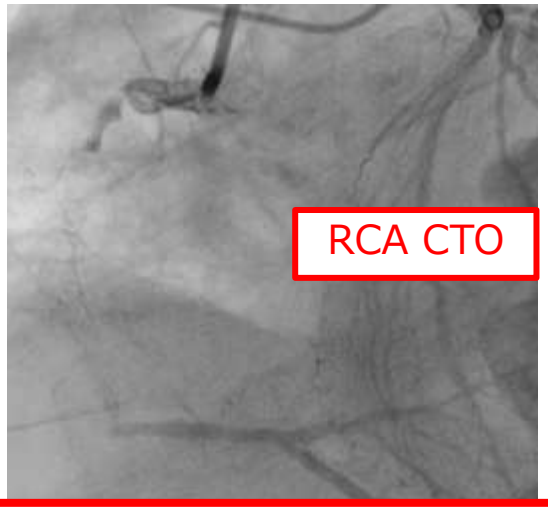


Right answer is “Distal Stump” !!

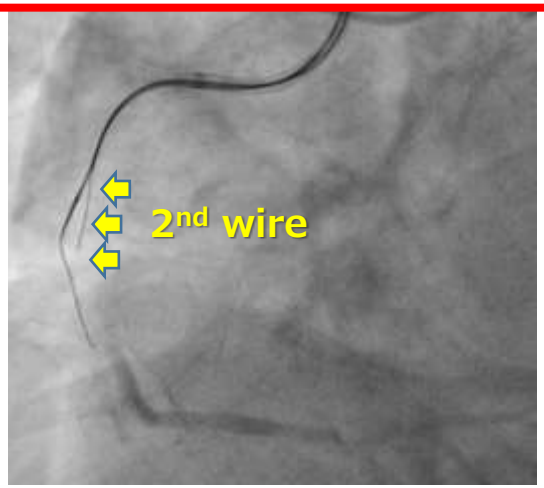
Factor 5: However various technique is developed,
Parallel Wire Technique is always the core centered technique

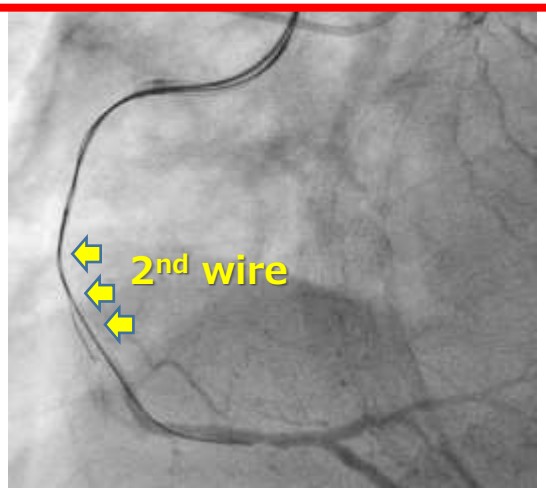
Keeping your sophisticated
Parallel Wire Technique is very important !!





Parallel wire technique; Use 2nd wire
to catch distal true lumen with a landmark of 1st wire





Factor 6: Familiarize yourselves with features and characteristics of all available guidewires.

We have so many guidewires !!
Knowledge of characteristics of all available guidewires is a step for success and command them properly is another step for success.

Hydrophilic series, Miracle series, Confienza series, etc and we had new special guide wire “Gaia” which is truly dedicated wire for antegrade approach.

But I want to say something different ….

My Thought

1000 years ago, there was a great monk named Saint Koubou (KOUBOU DAISHI) in Japan
He was also known for a master of calligraphy.

Saint Koubou

There is a saying which goes “Saint Koubou doesn’t have his preference in brushes.”
(“a good workman does not blame his tools”)
It is like a great baseball player doesn’t choose bats in hitting.

But I think that is not true.
Both Saint Koubou and a great baseball player select his own preferred brushes and bats and used only them.
That’s why nobody noticed that.

My Thought

Same thing can be said in GWs for CTO.
I recommend you to select ones that
you feel comfortable with, of course,
by knowing each wire characteristics.
I also have my own favorite ones.
Maybe there are 4 kinds of them
that I use for CTO PCI.

Saint Koubou:
Koubou Daishi

But what is most important is to understand
their characteristics and have your own image
of their movement and put confidence in them.

Factor 7; Trust your GUT FEELING !!!

Draw your image of a wire in the coronary artery
in your mind. GW is your arm and hand.
And wire tip is your finger tip.

Now your arm and hand is in the coronary artery.
Touch the CTO lesion with your finger tip.
Feel it and sense it. Slide your finger slowly
Finally be aware of how small that your battle field is.
For manipulating guidewire in such a narrow space,
accumulate experiences and knowledge and keep your
keen-edged senses **“GUT FEELING”**.

Again, your game court is very tiny.

And……Believe yourselves !!!

You have to tell yourselves;
“I can do it”, “I can do it” and “I can do it”.
And face with CTO cases seriously.
If you do so, definitely,
God will certainly send you a gift of success.

But if God is on vacation,
please contact to the followings: