Combined Use of Contact wire technique and Parallel wire technique for Complex CTO

Nae Hee Lee. MD. PhD.

Soonchunhyang University Hospital, Korea

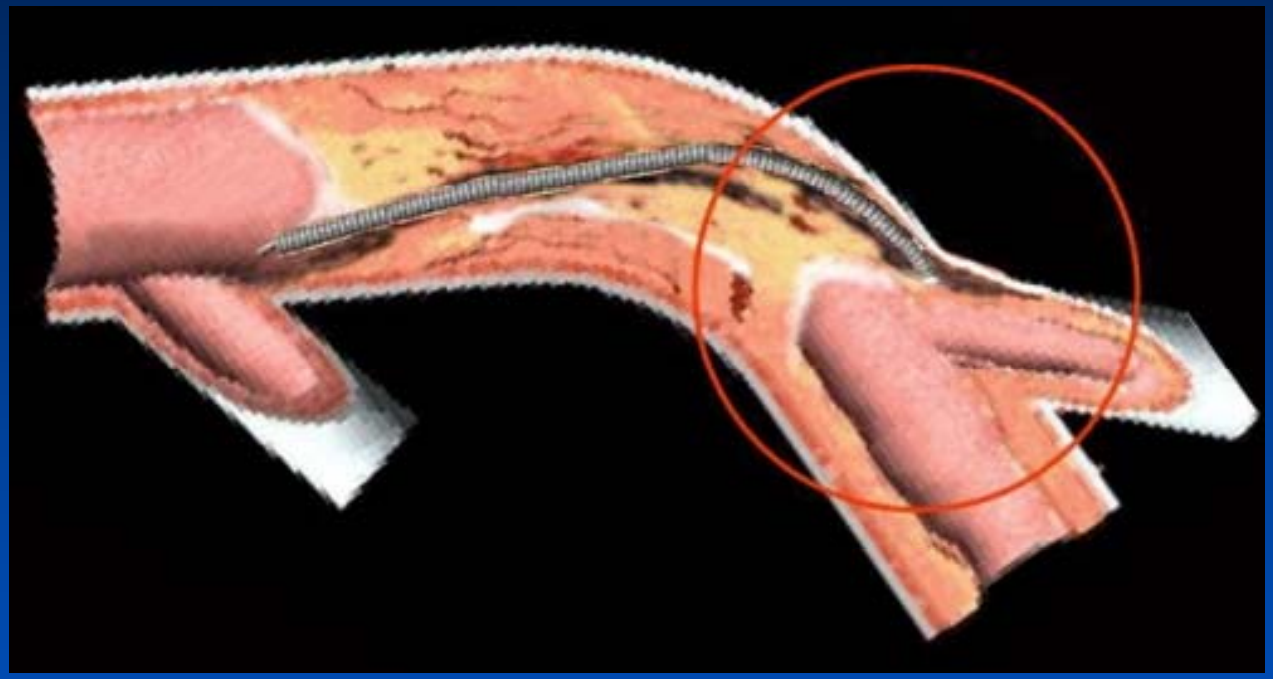
Evolution of CTO-PCI

- Contralateral angiography
- Dedicated hard CTO wires
- Two wires technique
- Retrograde approach

Evolution of CTO-PCI

- Contralateral angiography
- Dedicated hard CTO wires
- Two wires technique
- Retrograde approach

Parallel Wire Technique



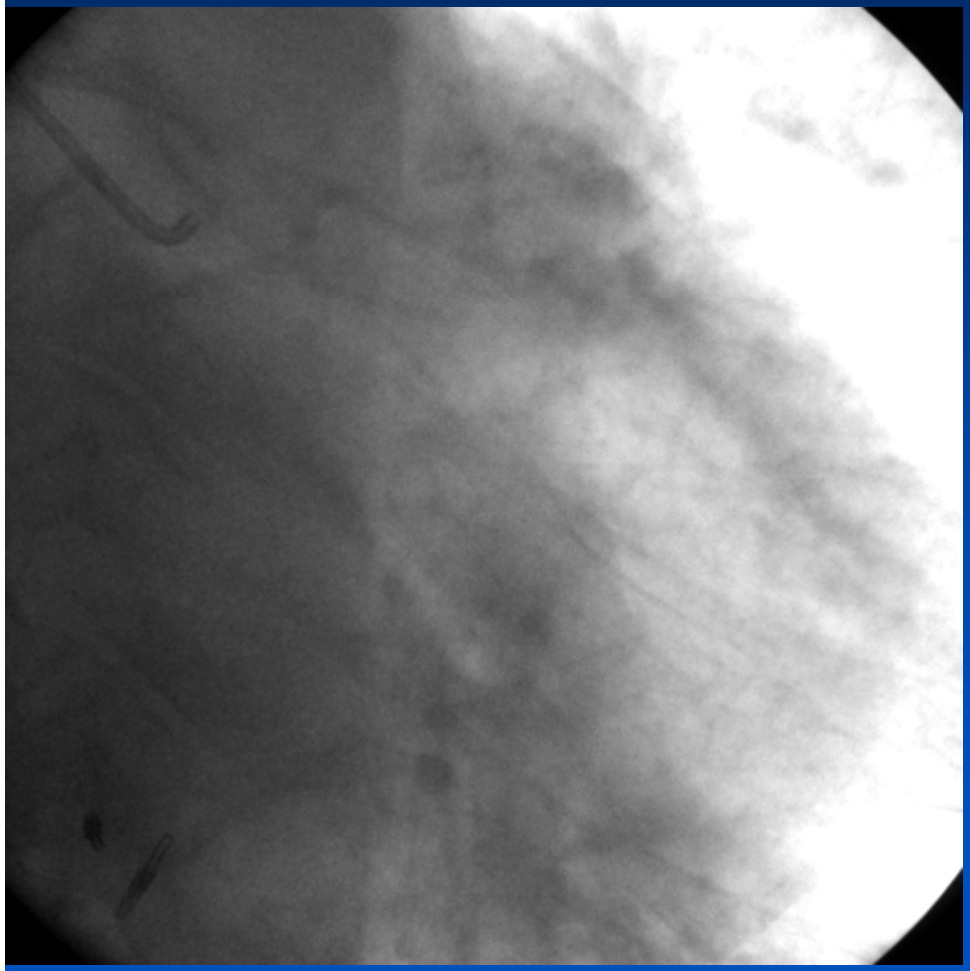
Parallel wire technique, which is a typical technique of two wires technique, is very useful when 1st wire get into the subintima and make a false lumen

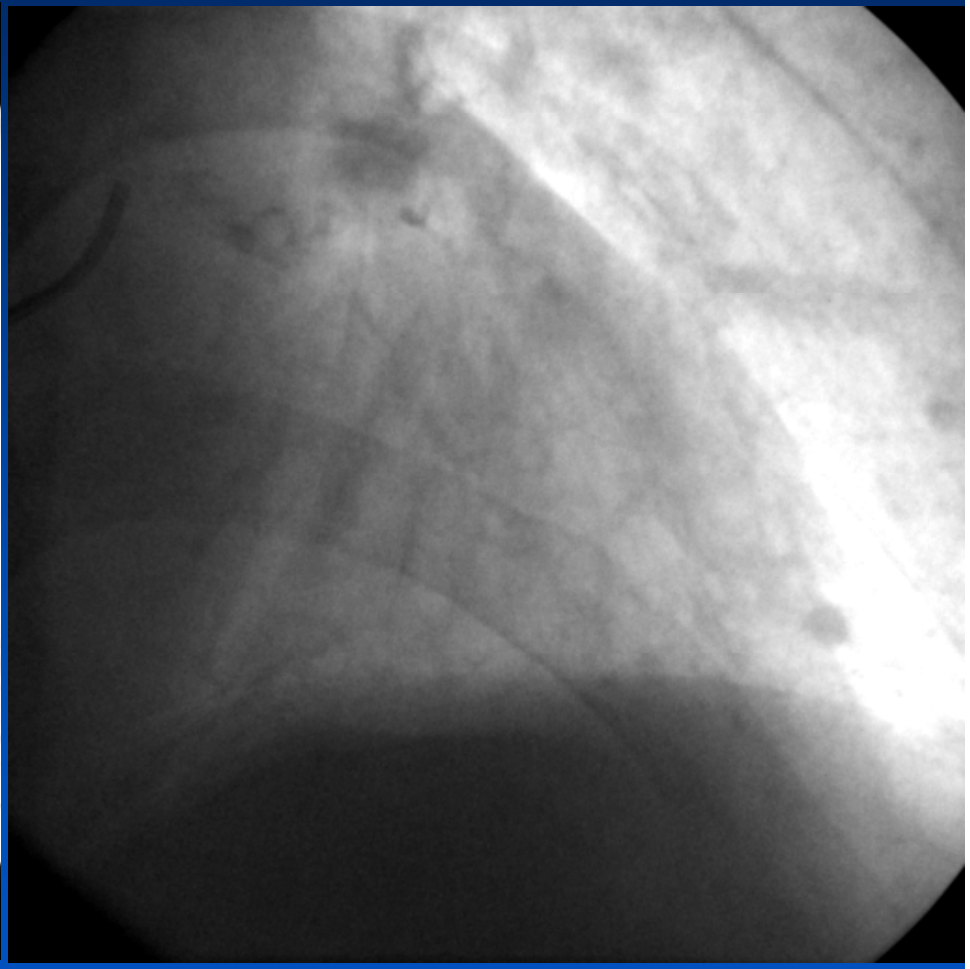
Parallel Wire Technique

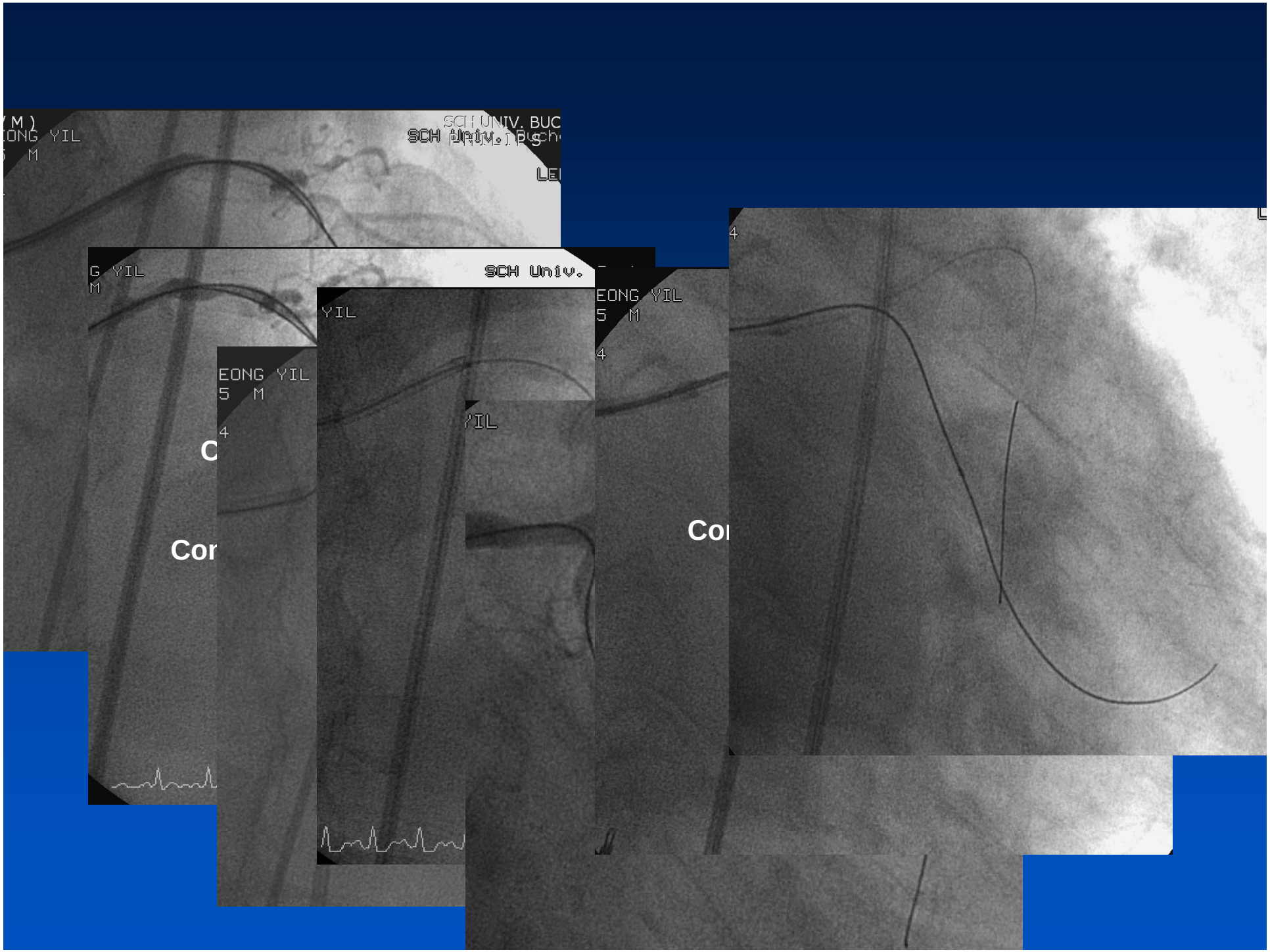
Selection of 2nd wire is dependent on the lesion characteristics or/and operator preference (I usually use Conquest pro series).

Example of parallel wire technique

M/72, pLAD / pLCX CTOs



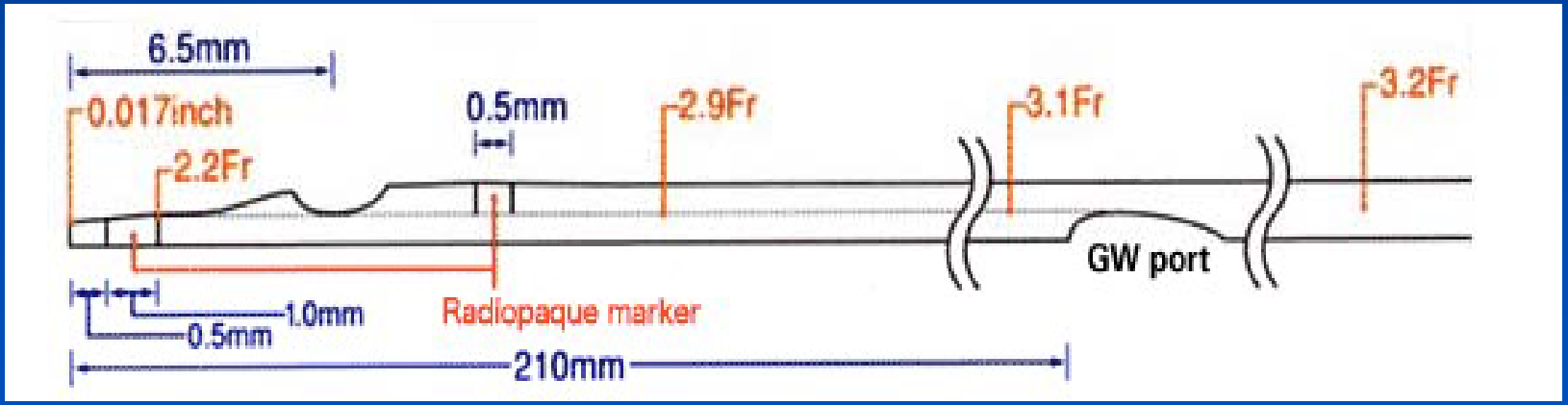



SCH UNIV. BUC
SCH Univ.
EONG YIL
5 M
4
YIL
SCH Univ.


YIL
YIL
YIL
SCH Univ. Buche
LEE

In parallel wire technique, delivery of 2nd wire to the CTO site is sometimes cumbersome or difficult

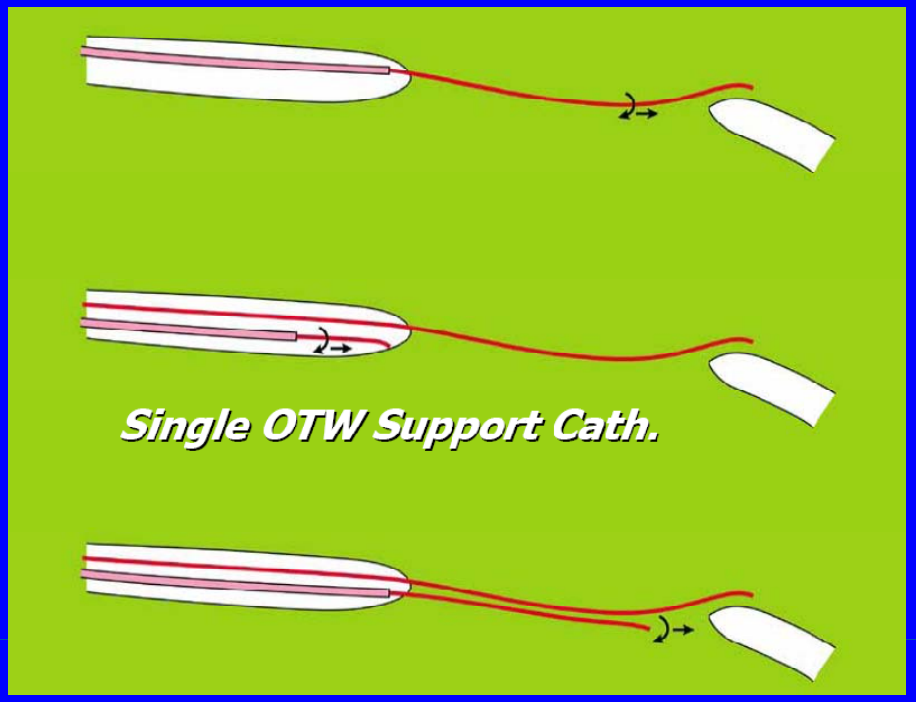
Double lumen MC (Crusade MC)



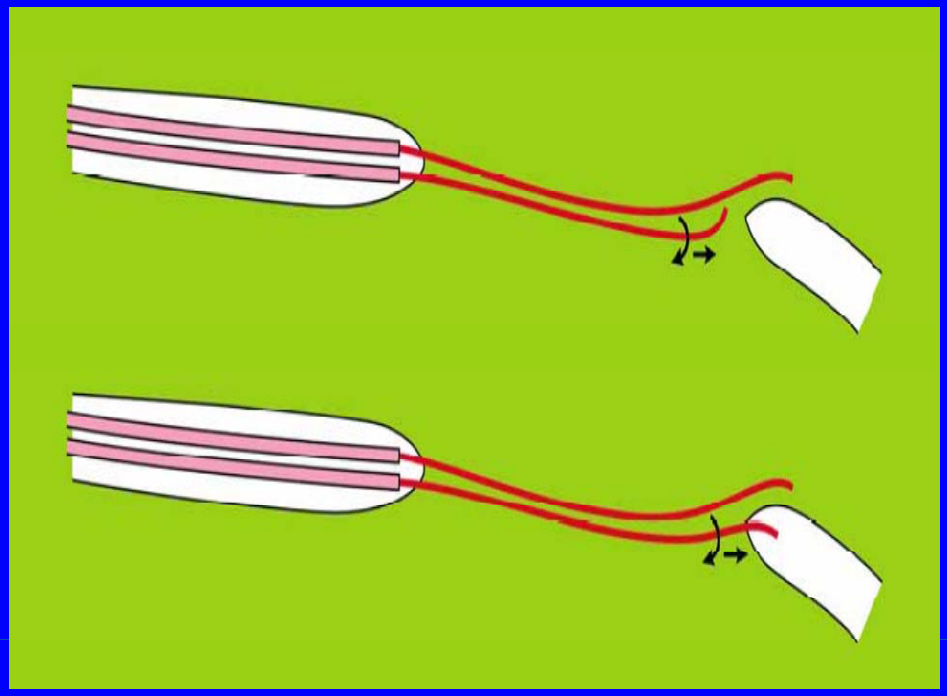
Guide wires movement through the "double layer lumen"

Double lumen (Crusade) Microcatheter

Parallel wire technique



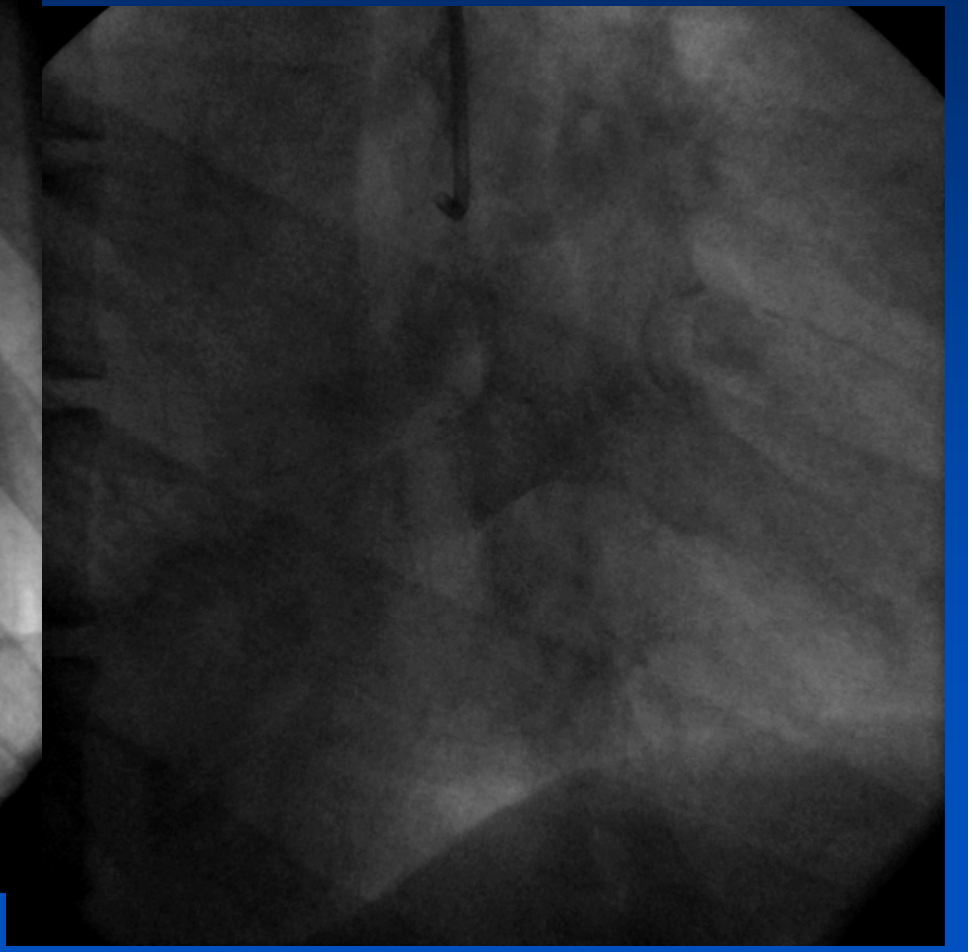
See-saw techniques



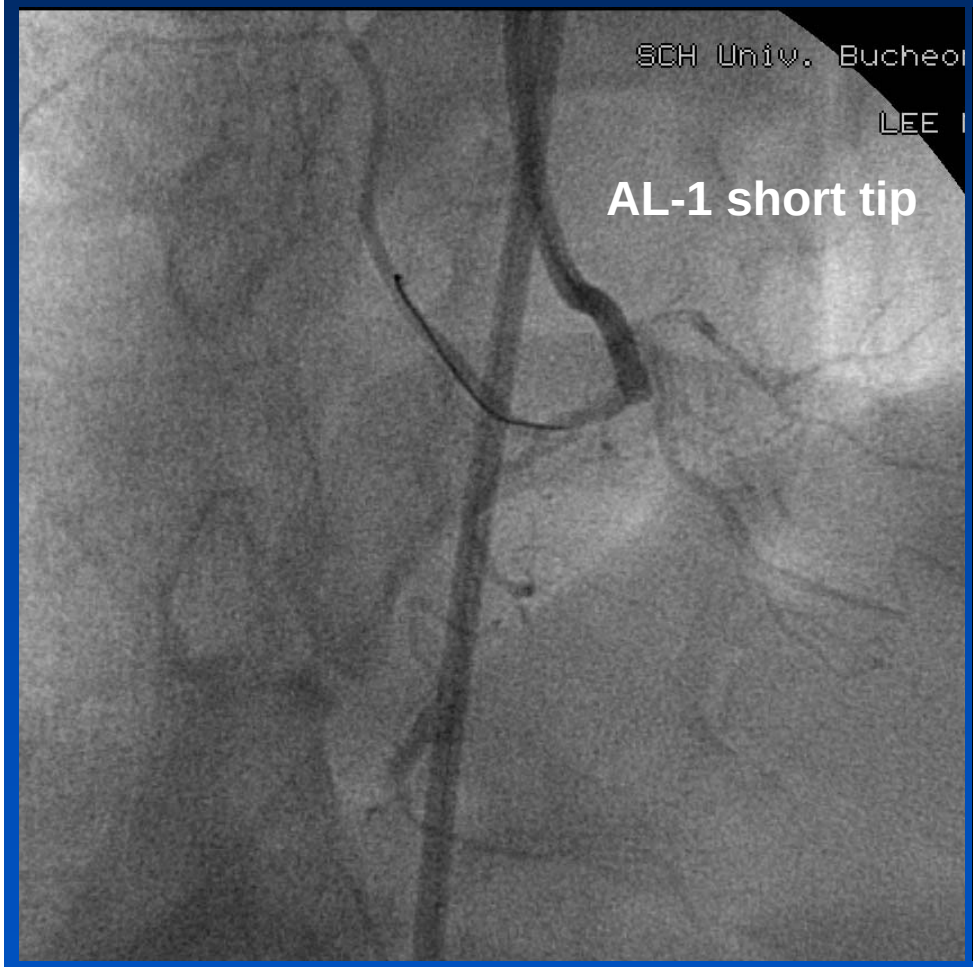
the wrong plane → ***Similar concept to See-Saw wire technique***

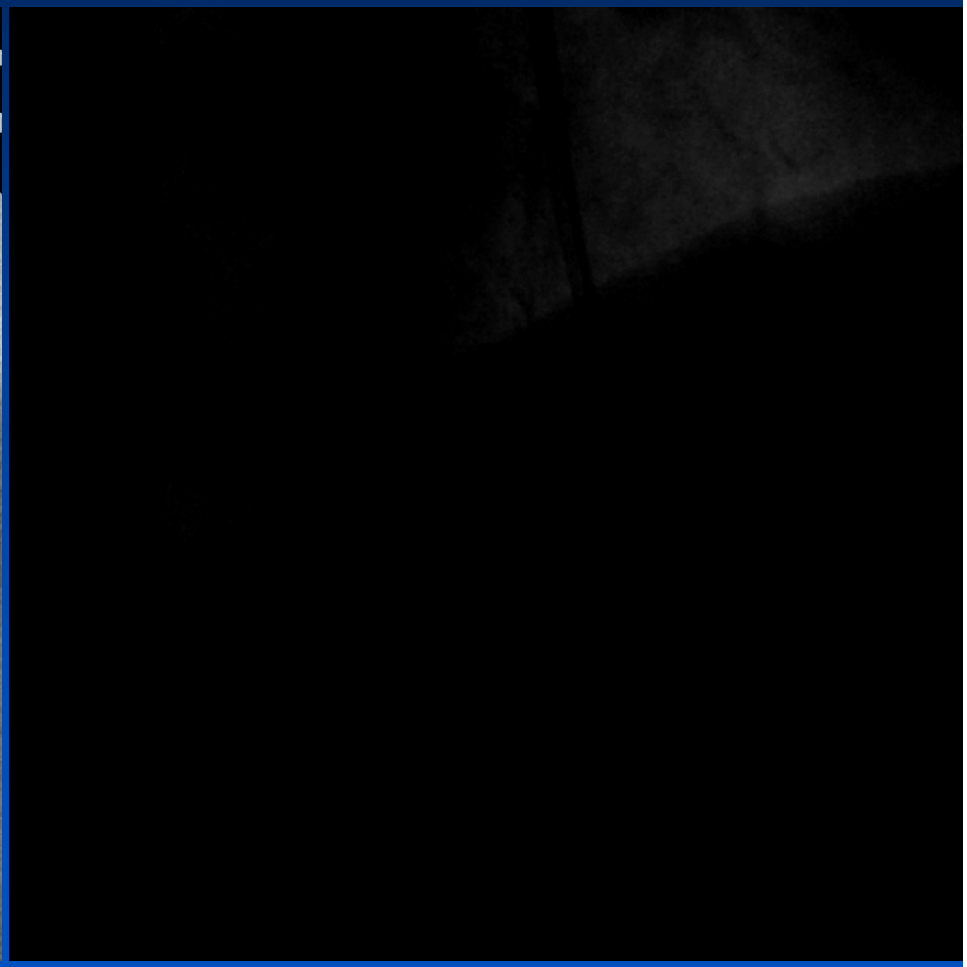
Example of double lumen catheter

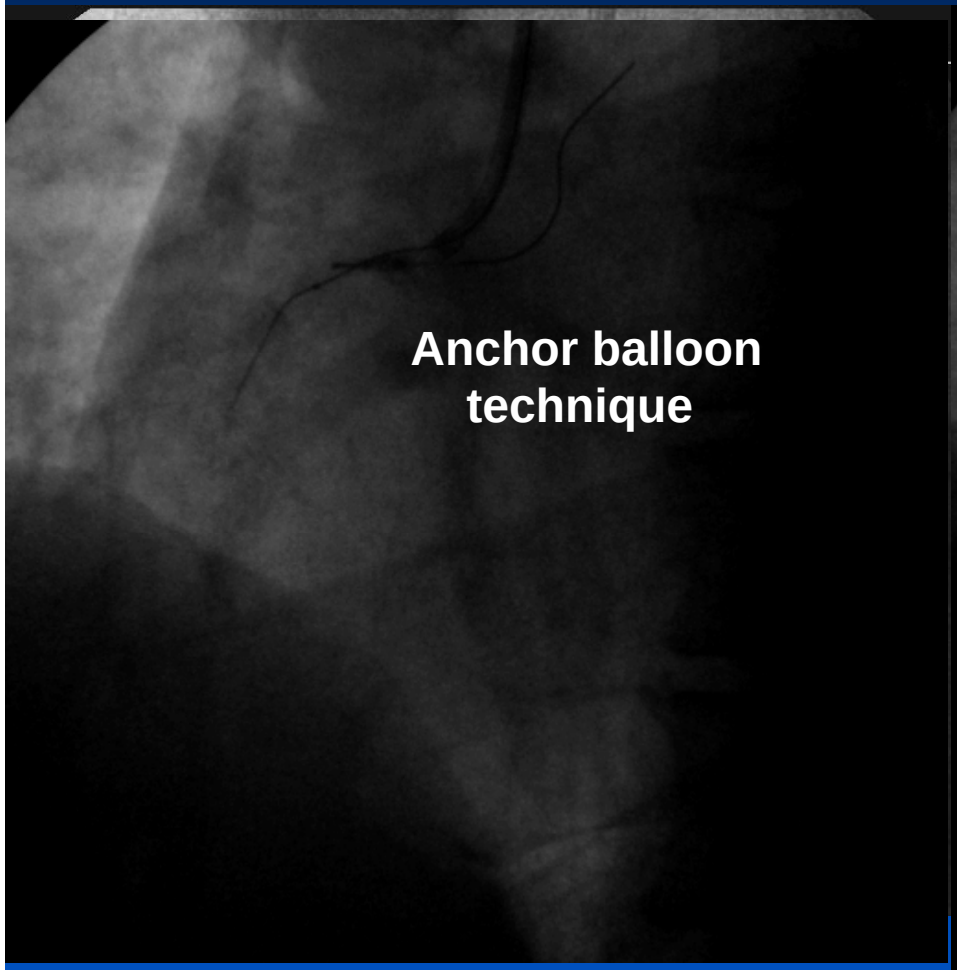
M/64, pRCA CTO, prior failed case

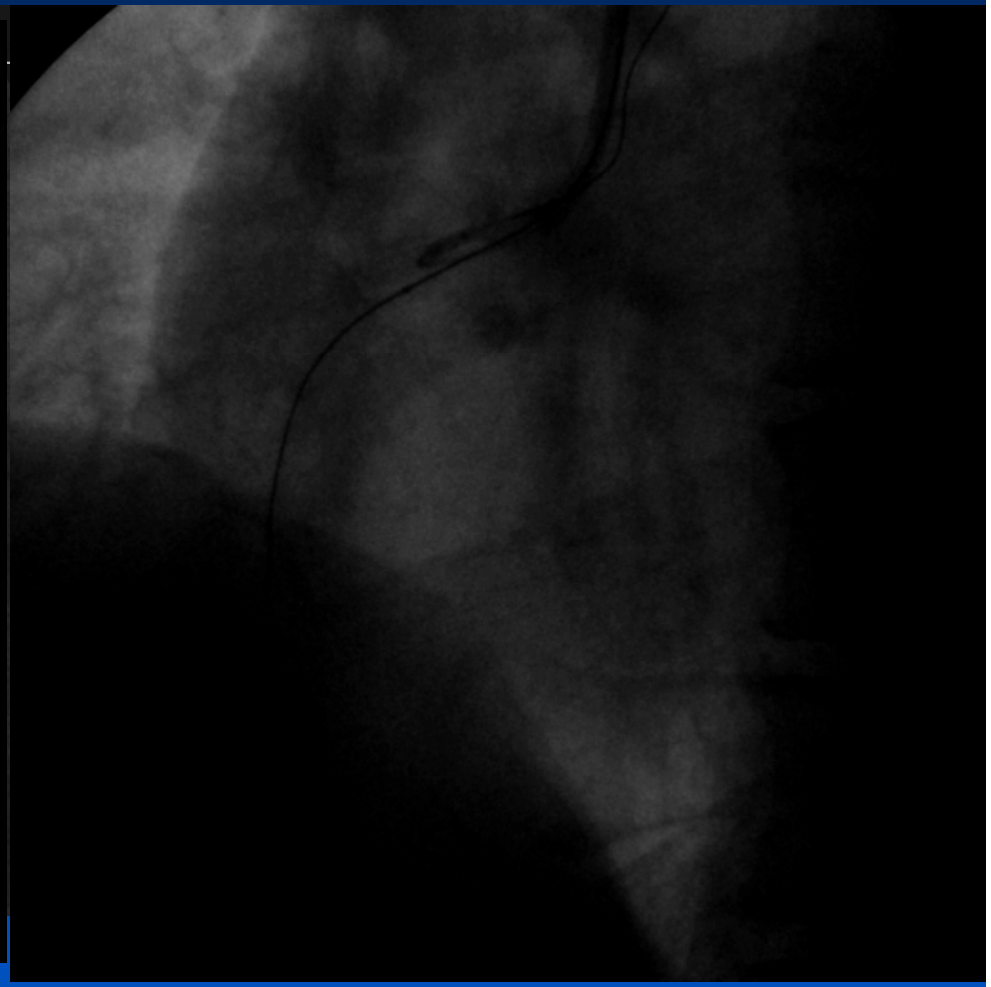


Very difficult to deliver the wire to the CTO site

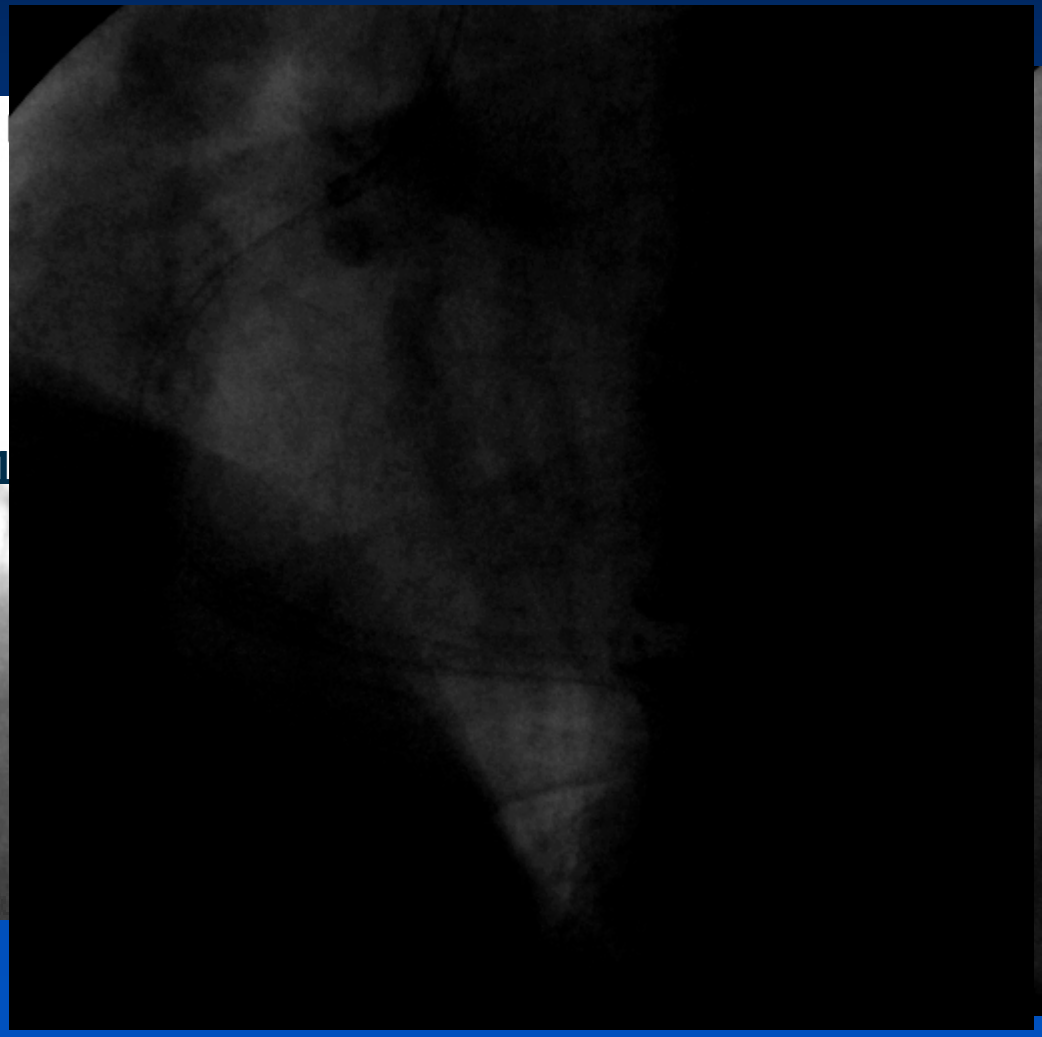


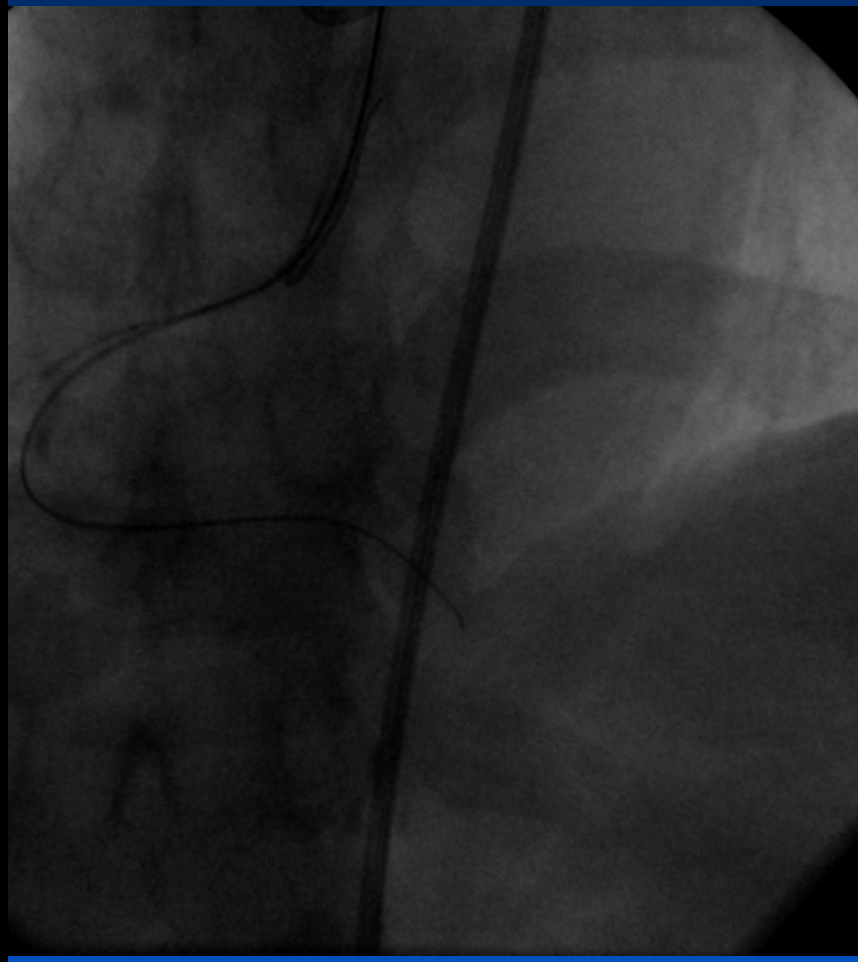



Anchor balloon
technique



Parallel wire technique with Crusade mc



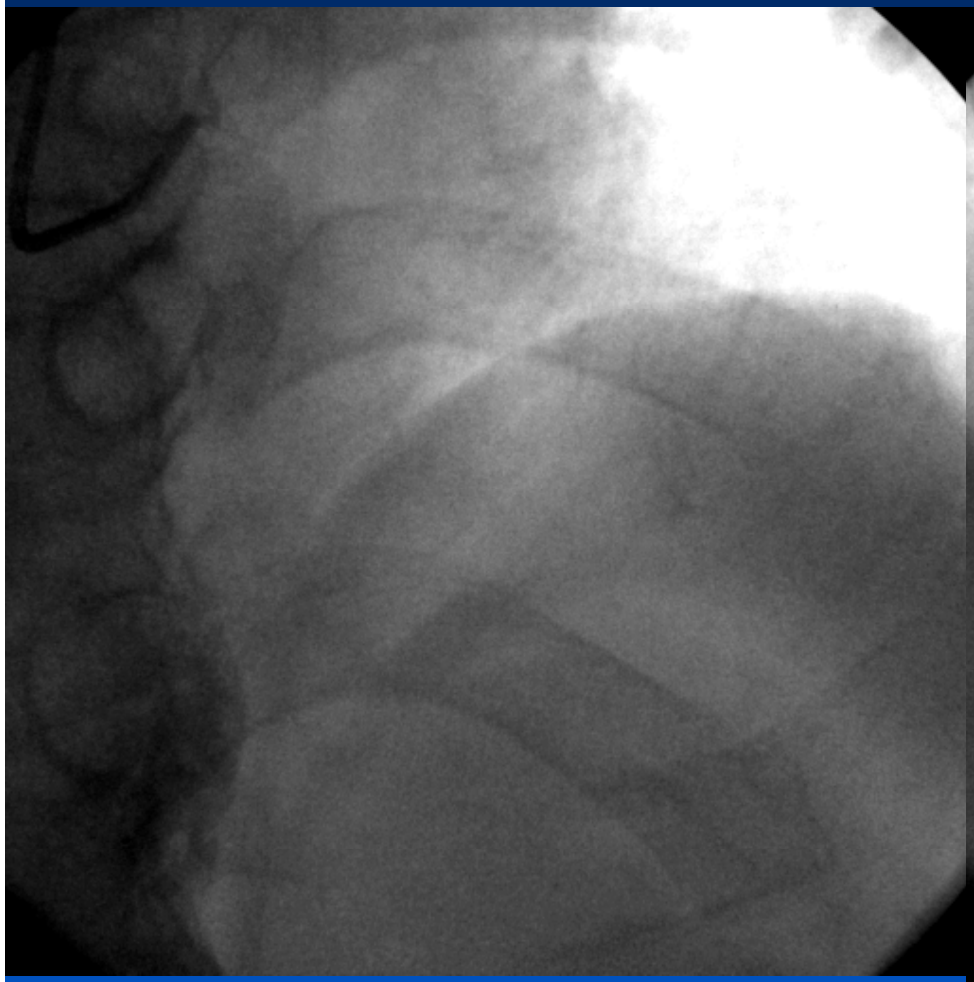


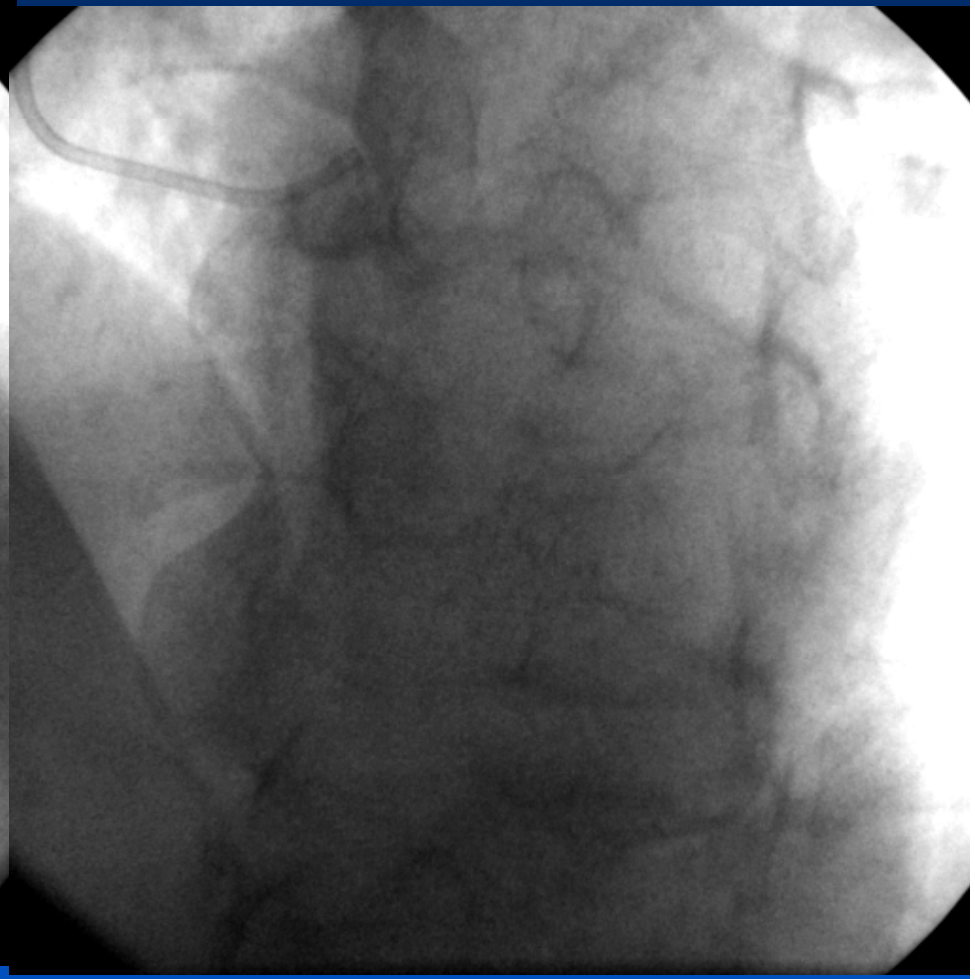
Patient Summary

- Patient : 61-yr-old male
- HTN, DM under medications
- EKG, cardiac enzyme: Non-specific finding
- Treadmill test: positive finding at stage II
- Echocardiography: Non-specific finding

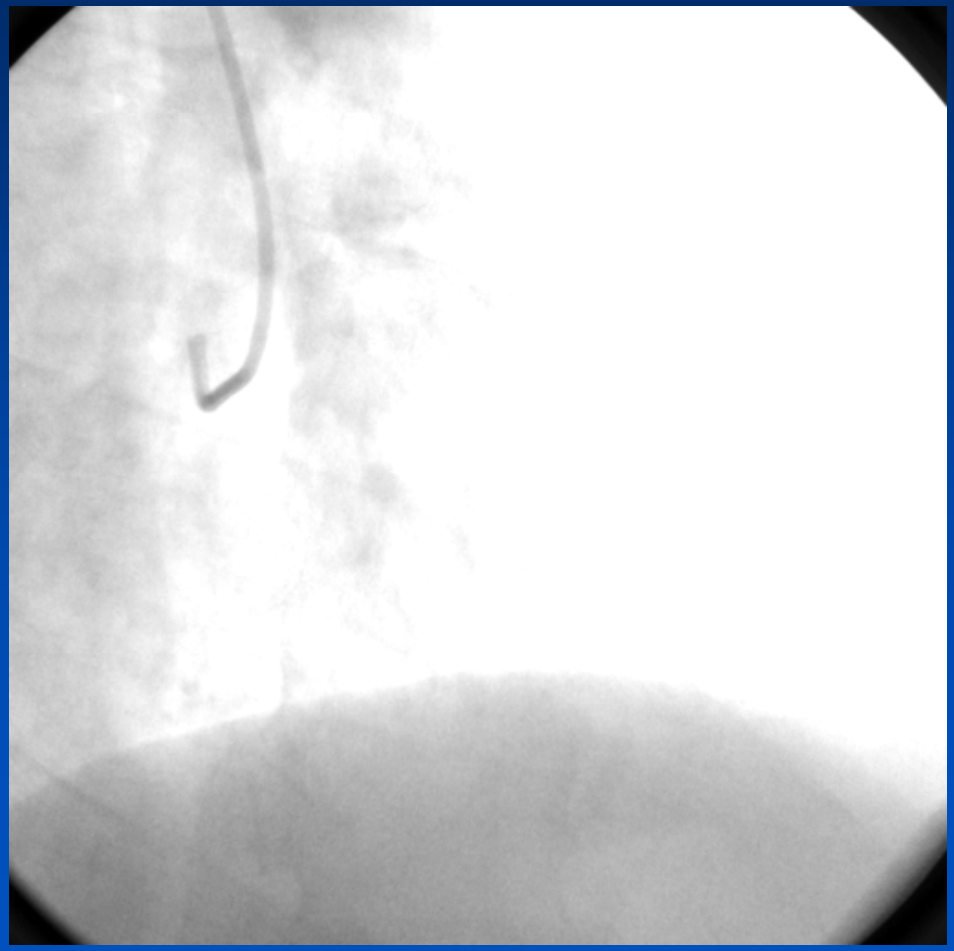
Dx: stable angina

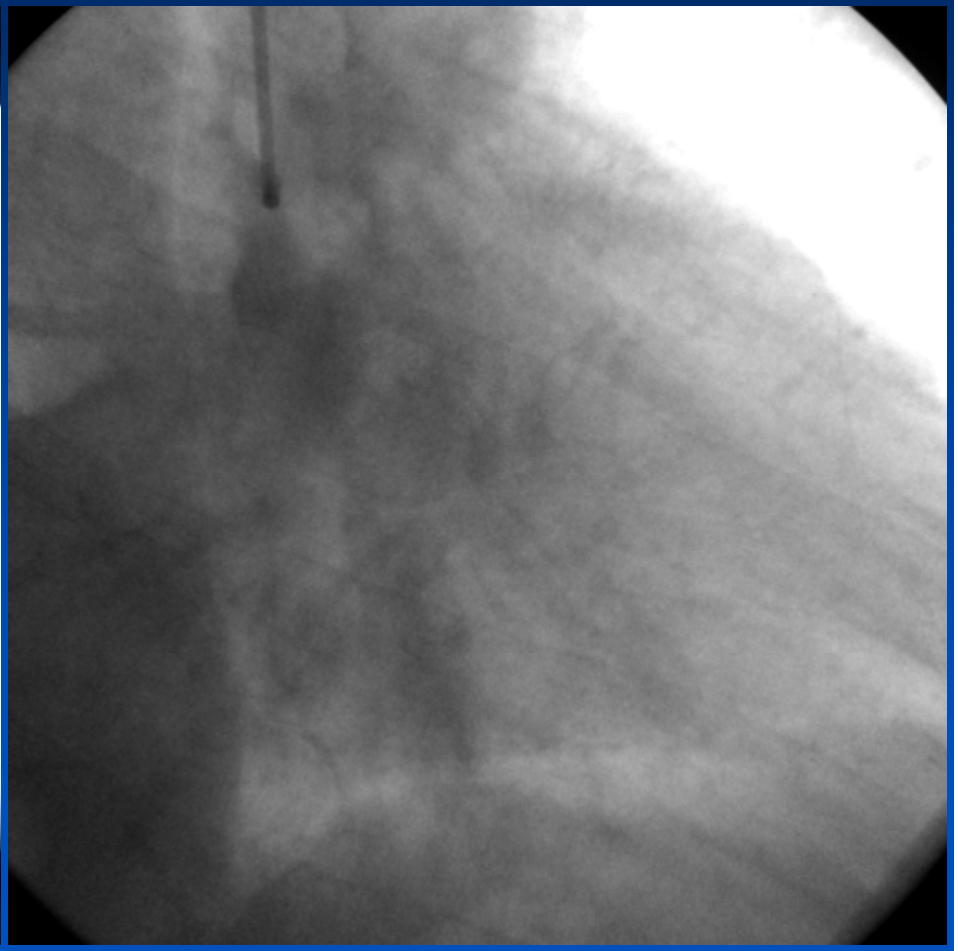
Baseline Angiography





Baseline Angiography



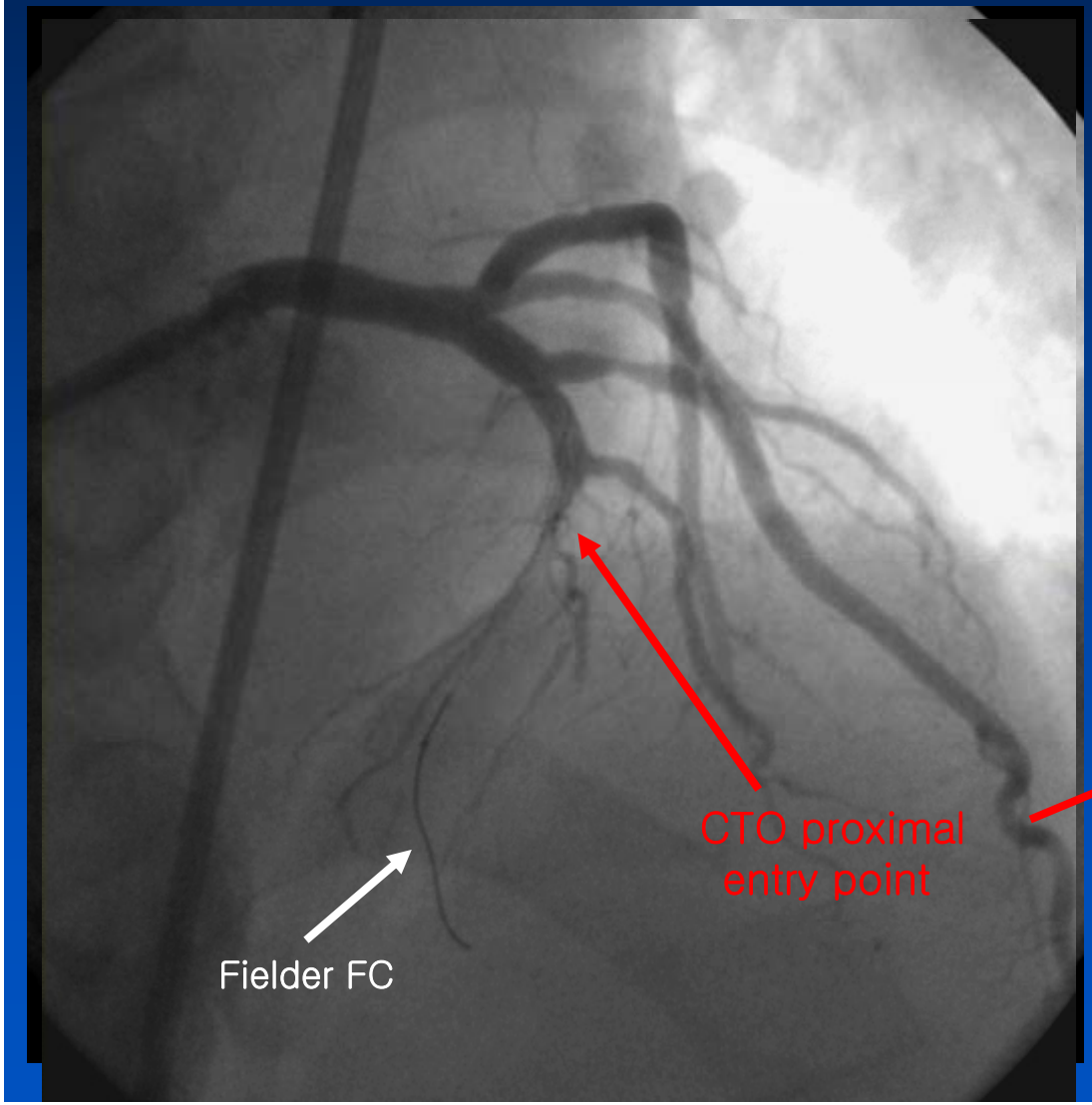


How should we approach this case?

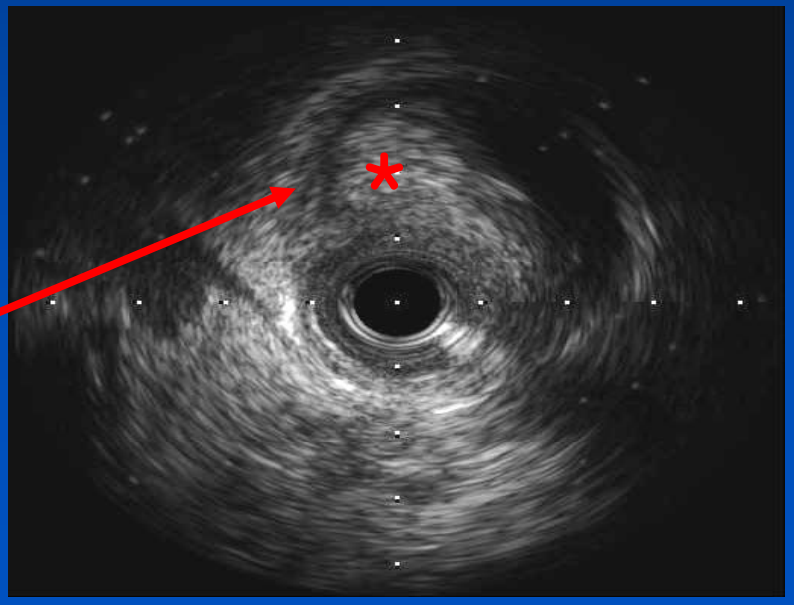
- **Bad signs**
  a) Can’t find any stump at any projection
  b) Two big side branch arteries at proximal occlusion site
  →Trifurcation stumpless CTO
  c) Collateral connections for retrograde approach
  →Possible, but not so good

- **Good signs**
  a) Relatively straight mid-LAD CTO lesion
  b) Not so long length of occlusion body
  c) Definite calcification is not seen

IVUS examination



- 8-Fr. EBU, 3.75 guiding catheter
- Filder-FC wire to septal branch
- IVUS examination



IVUS guided wire technique

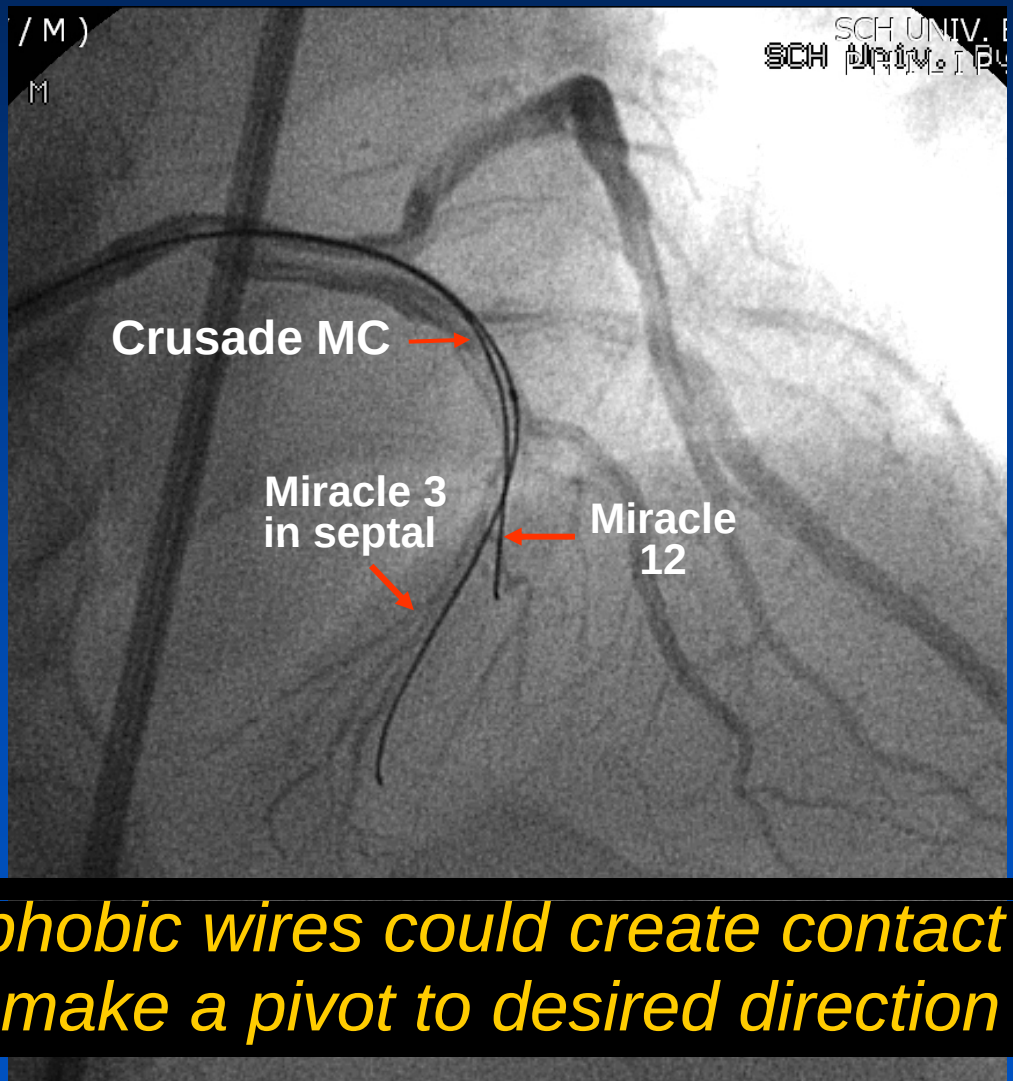
- After finding the entry point of proximal cap by IVUS, we attempted to enter the CTO body under the IVUS guiding
- But, Wire repeatedly entered the 1st septal branch
- Therefore, we removed the IVUS catheter with leaving the Fielder FC wire on septal branch, and then we tried to penetrate the proximal cap of CTO with variable wires.(fielder XT, Miracle 3g & 12g, Conquest Pro) with the support of Crusade double lumen microcatheter.

However, any wire couldn’t get into the CTO proximal cap and all of them repeatedly slipped into the septal branch (We couldn’t manipulate wires to intended direction due to acute angle of entry point).

What shall we do?

Contact wire Technique

Fielder FC in septal branch was exchanged for Miracle 3g, and then Miracle 12g was tried again to puncture the proximal CTO cap.



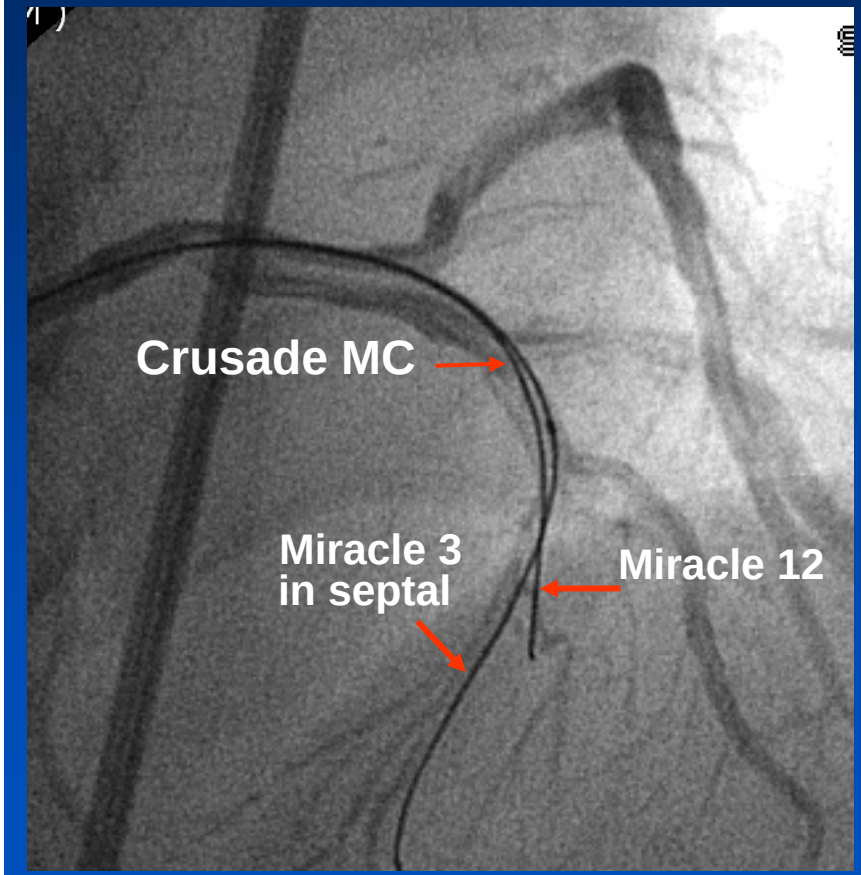
2 stiff hydrophobic wires could create contact resistance, which could make a pivot to desired direction

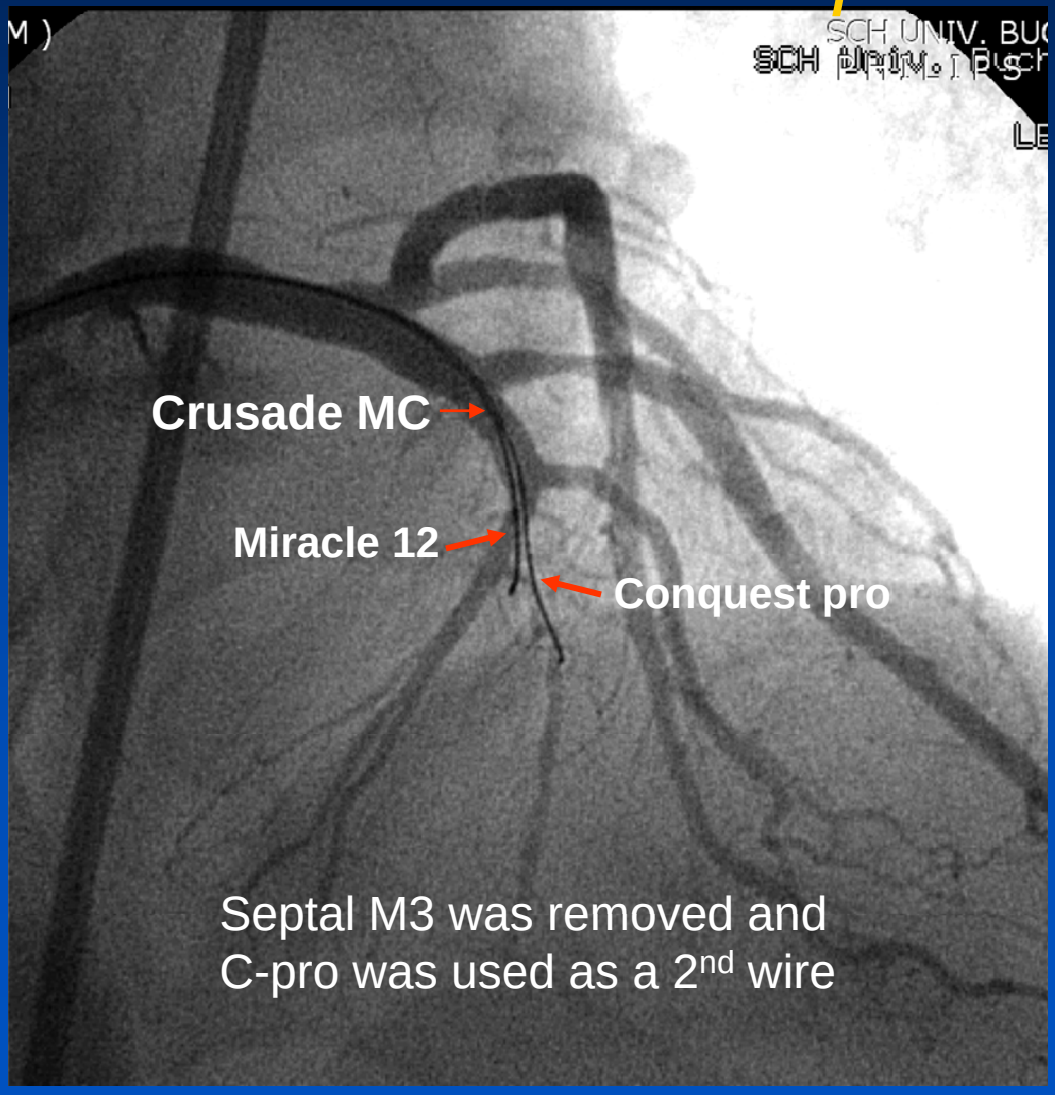
However, punctured M12 repeatedly got into the false lumen in CTO body.

Switching to Retrograde Approach?

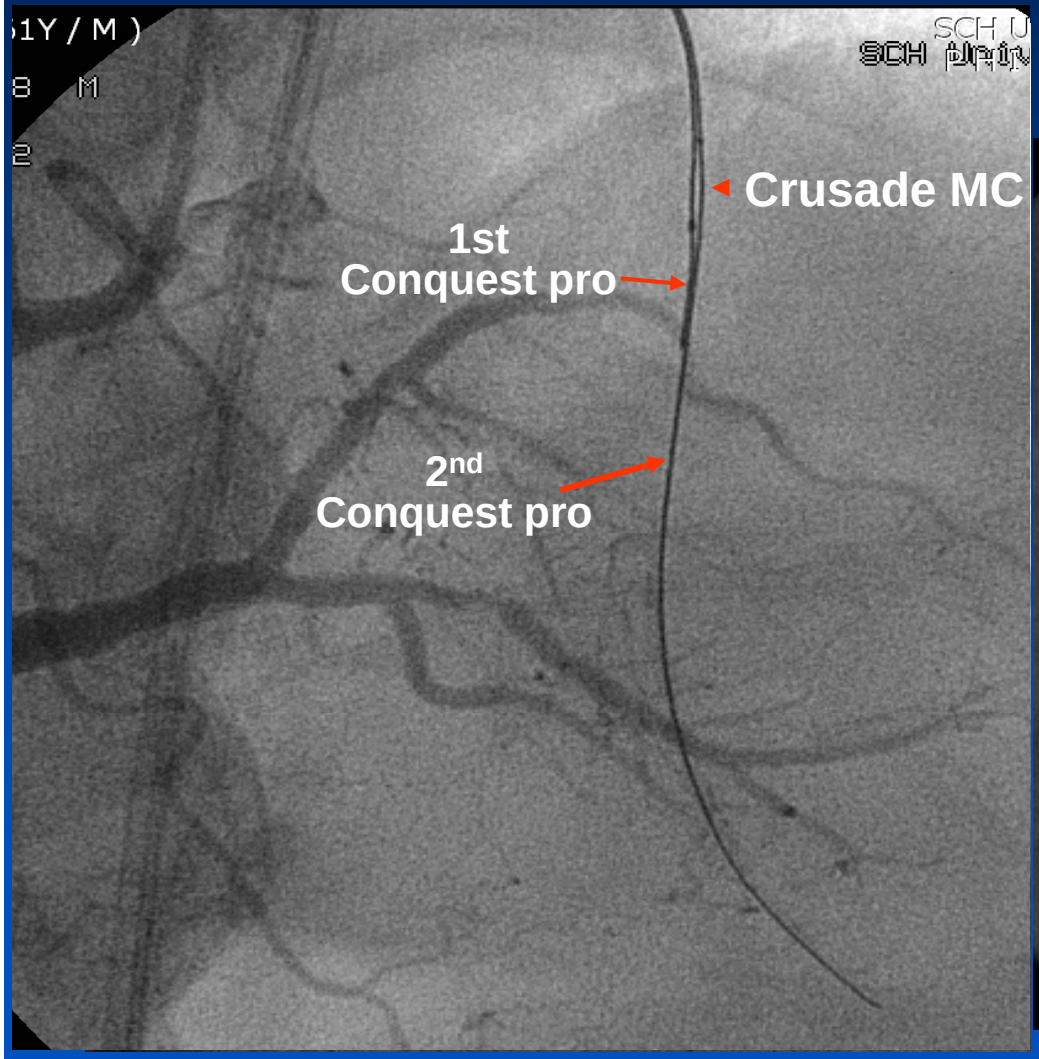
However, there was a possibility that the M12 altered the vessel axis, which could make handling of 2nd wire easier.

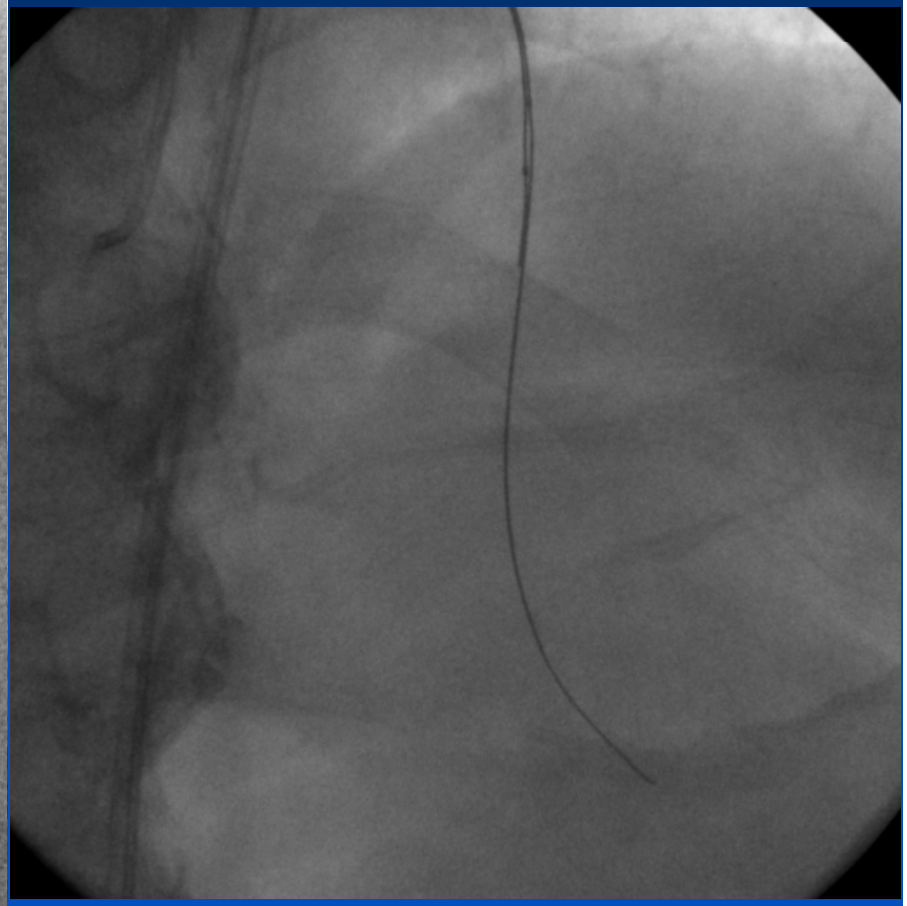
Parallel wire technique



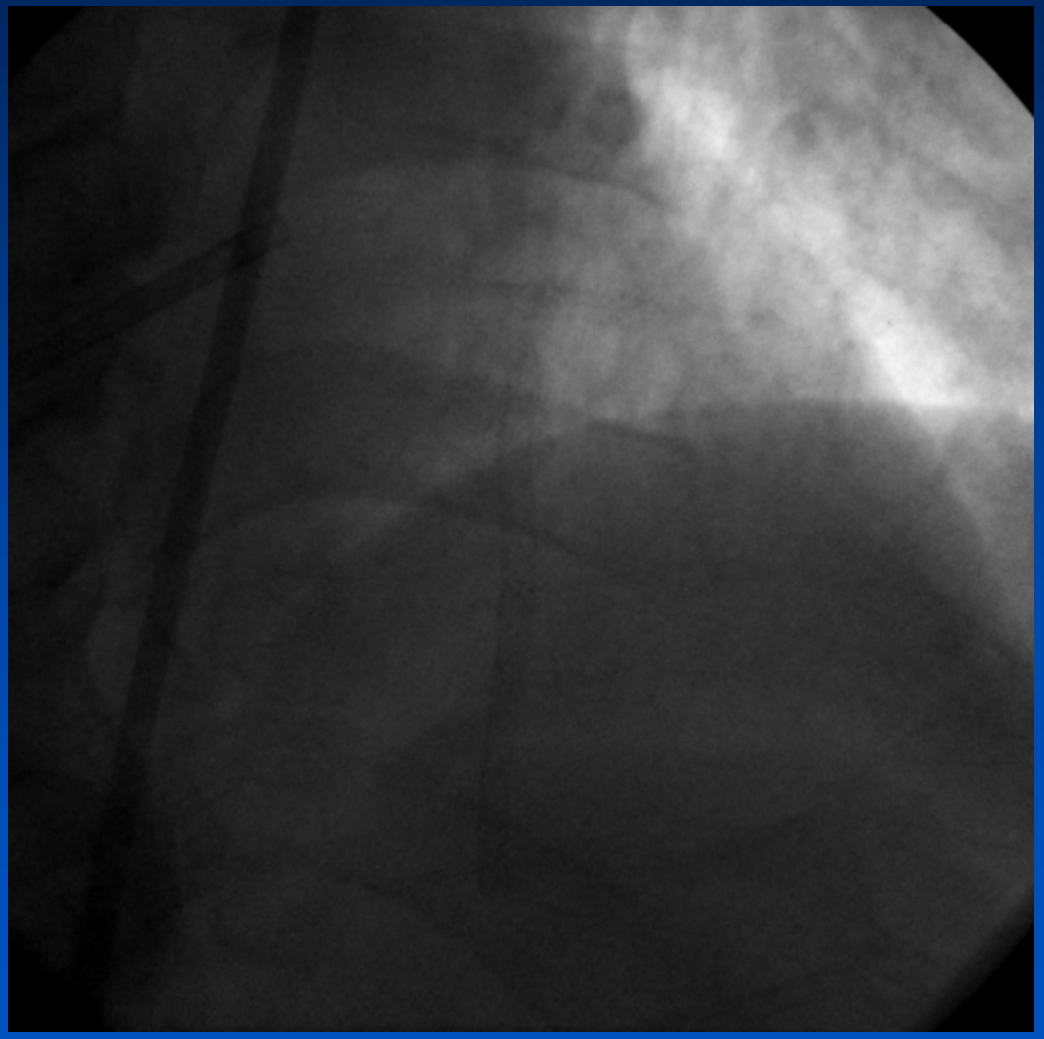


2nd Parallel wire technique

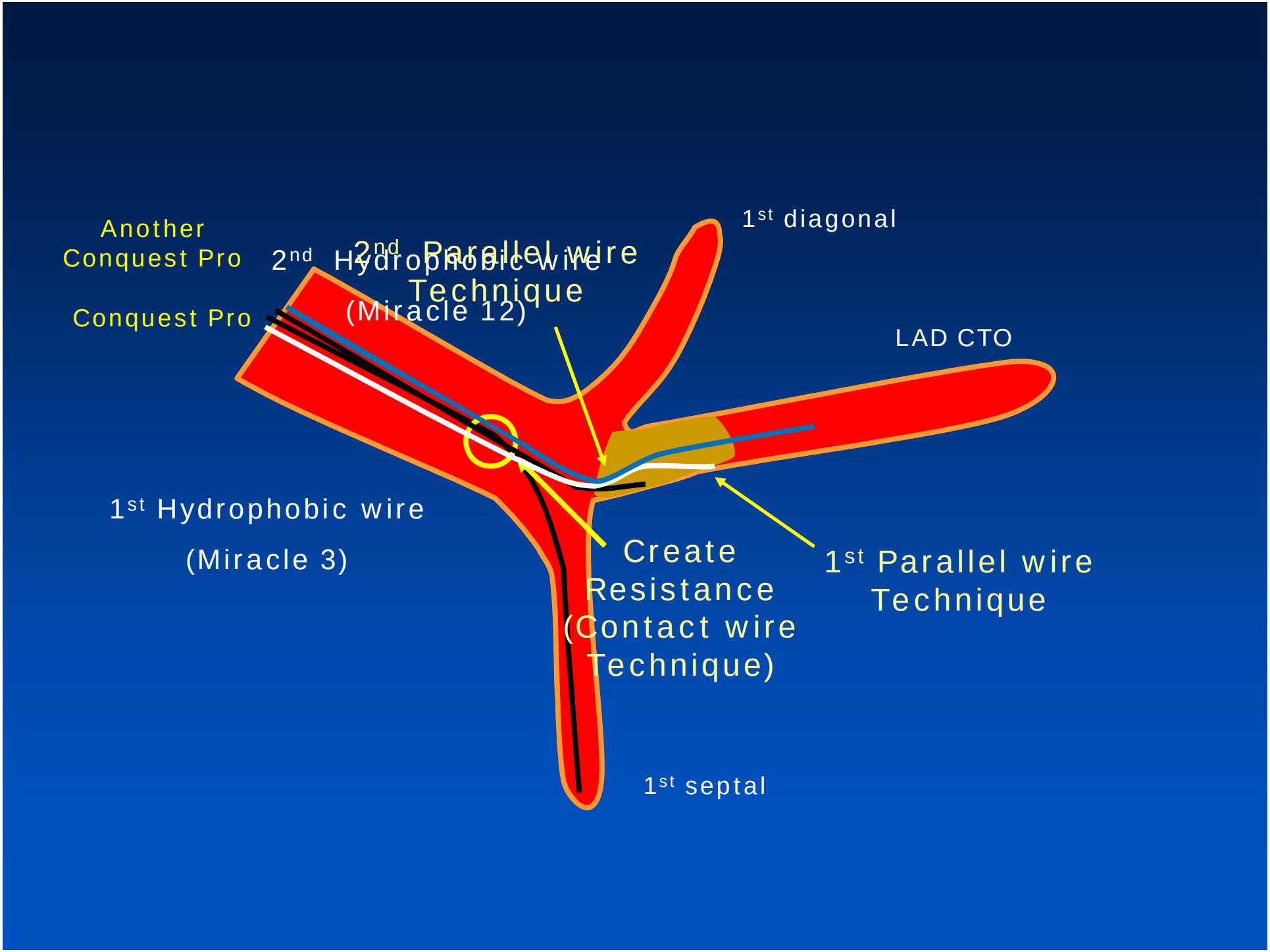




Final Angiography



How could we get over this stumpless big side branch CTO?


Another Conquest Pro
Conquest Pro
2nd Hydrophobic wire
2nd Parallel wire Technique
(Miracle 12)
1st diagonal
LAD CTO
1st Hydrophobic wire
(Miracle 3)
Create Resistance (Contact wire Technique)
1st Parallel wire Technique
1st septal

Message at home

- Various kinds of double wire technique play a important role for increasing the success rate of complex CTO-PCI.
- Contact wire technique, which takes advantage of wire bias (contact resistance), can be used for stumpless branching point CTO
- If the 1st wire is in trouble, you should not hesitate to early use the parallel wire technique before the false lumen compress the collateral flow.
- Double lumen MC, which make wire exchange easier and act like two microcatheters, is useful tool for double wire technique.