

Modified Reverse CART technique in a near-ostial RCA CTO

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CART= Controlled Antegrade & Retrograde subintimal Tracking

Disclosure Statement of Financial Interest

I, Dr. On-Hing Kwok, DO NOT have a financial interest/arrangement or affiliation with one or more organizations that could be perceived as a real or apparent conflict of interest in the context of the subject of this presentation.

Case History

- **M/59yr**
- **Ex-smoker**
- **Hypertension and dyslipidemia**
- **Known ischemic heart disease with positive exercise thallium scan showing inferior ischemia 6 years before**
- **Defaulted further intervention and treatment**
- **Self-medicated with over-the-counter drug called “vessel scavenger”**
- **c/o increasing exertional dyspnoea and chest discomfort**
- **CT angiogram showed near-ostial RCA long-segment total occlusion**

320 CT Coronary Angiogram

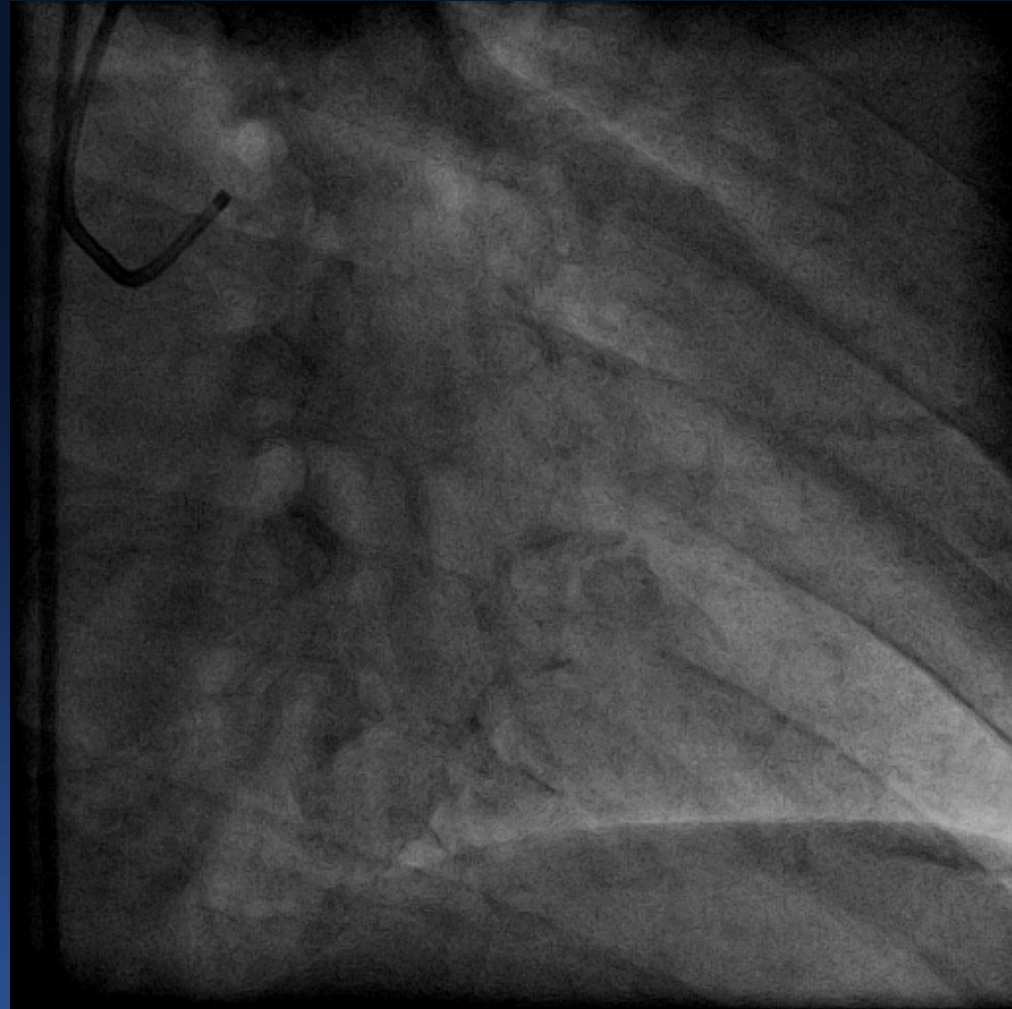


Coronary Angiogram

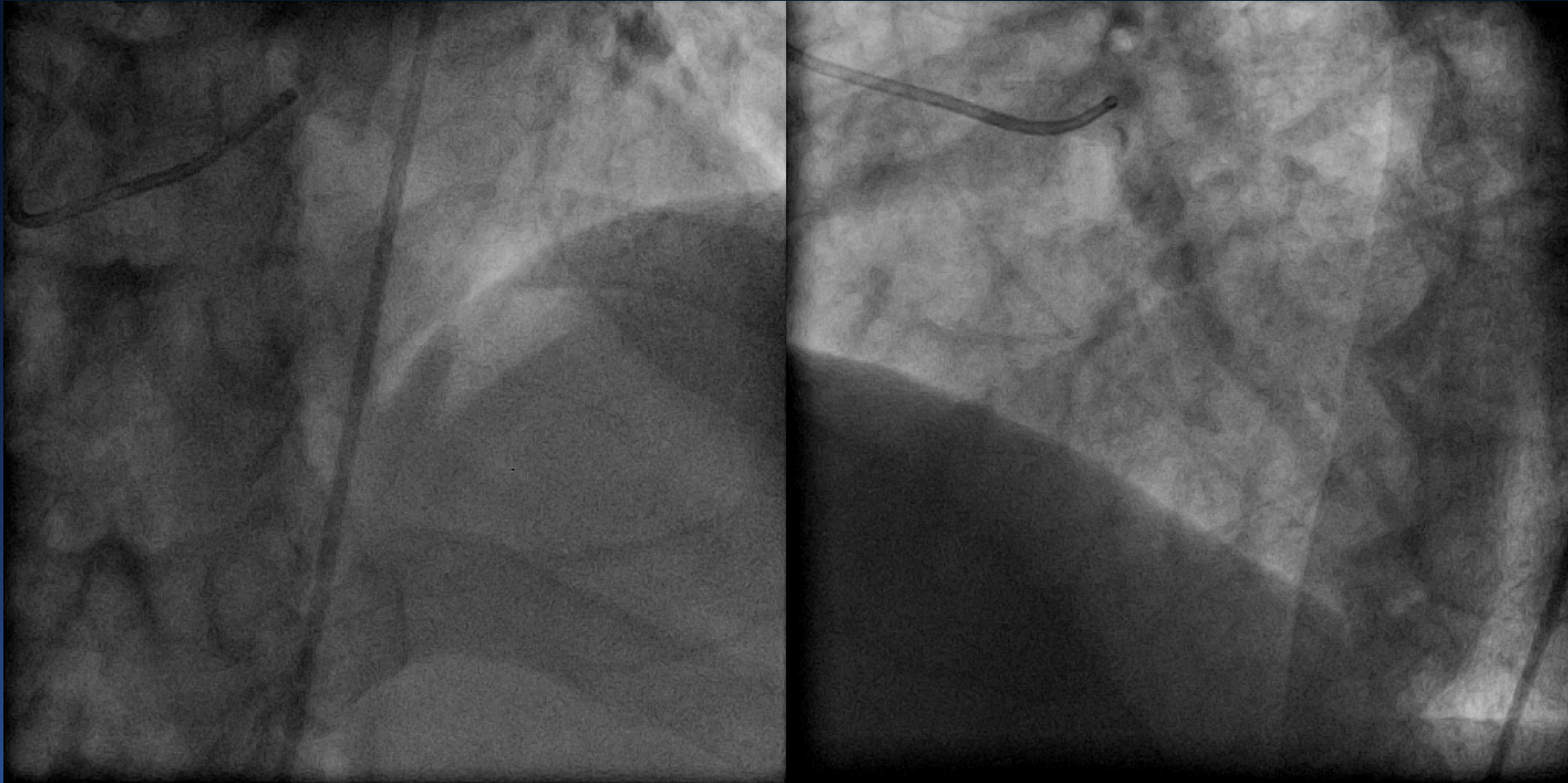
7Fr right femoral approach

6Fr JL4 Diagnostic catheter

Left-to-right collaterals



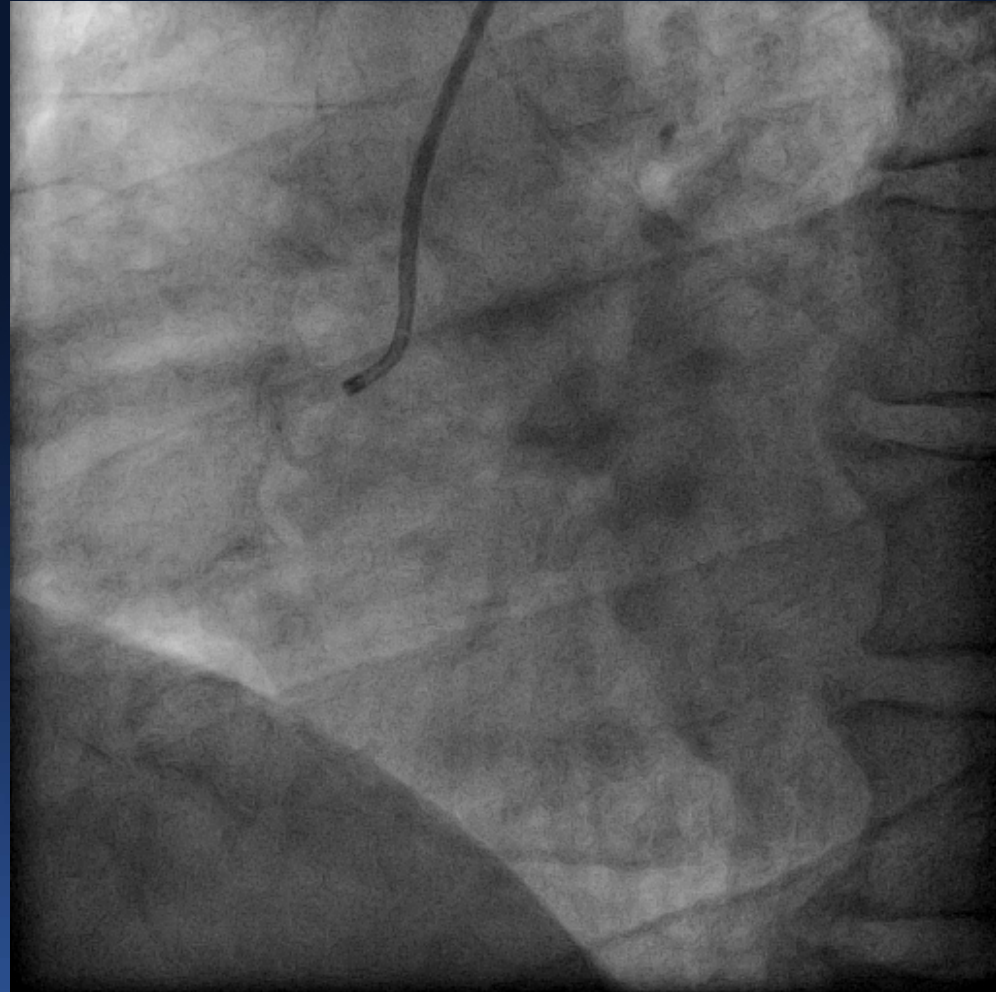
Coronary Angiogram



Right Coronary Angiogram

Challenges:

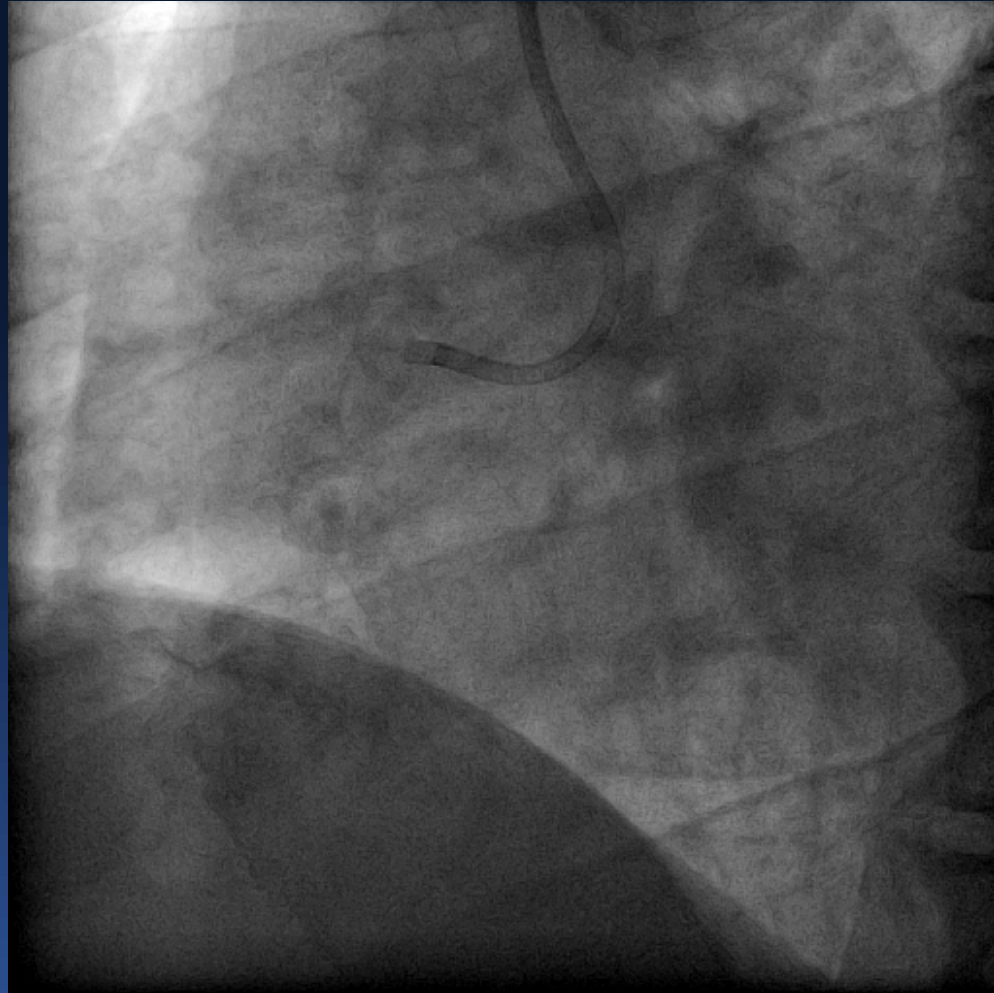
- *Near-ostial RCA long-segment total occlusion*
- *Faint right-to-right collateral*
- *Blunt occlusion stump*
- *Side-branch at entry & exit of total occlusion*
- *Advantage: not much calcification*



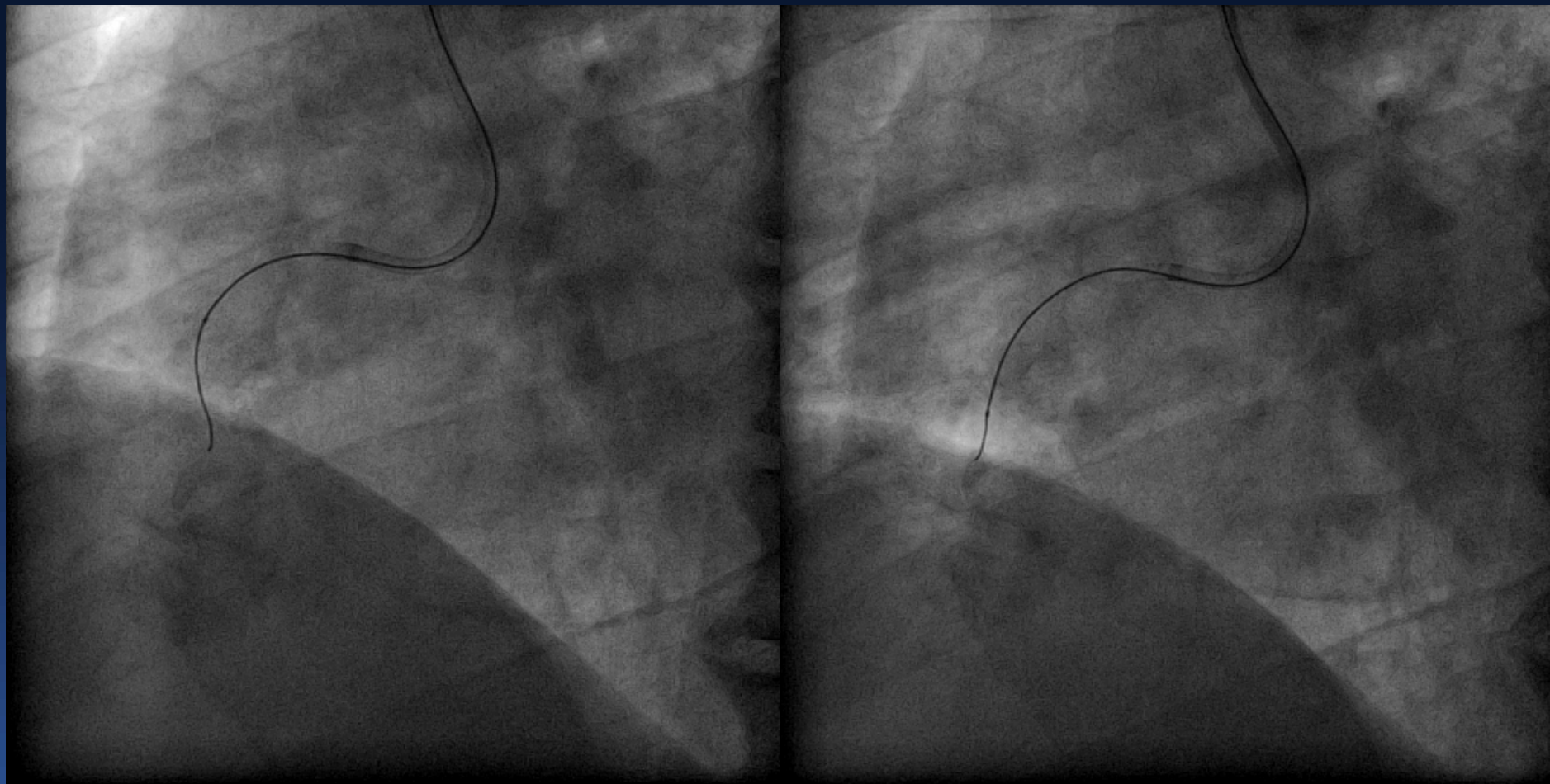
Attempt antegrade approach

*7Fr AL1.0 SH (90cm)
Medtronic guiding catheter*

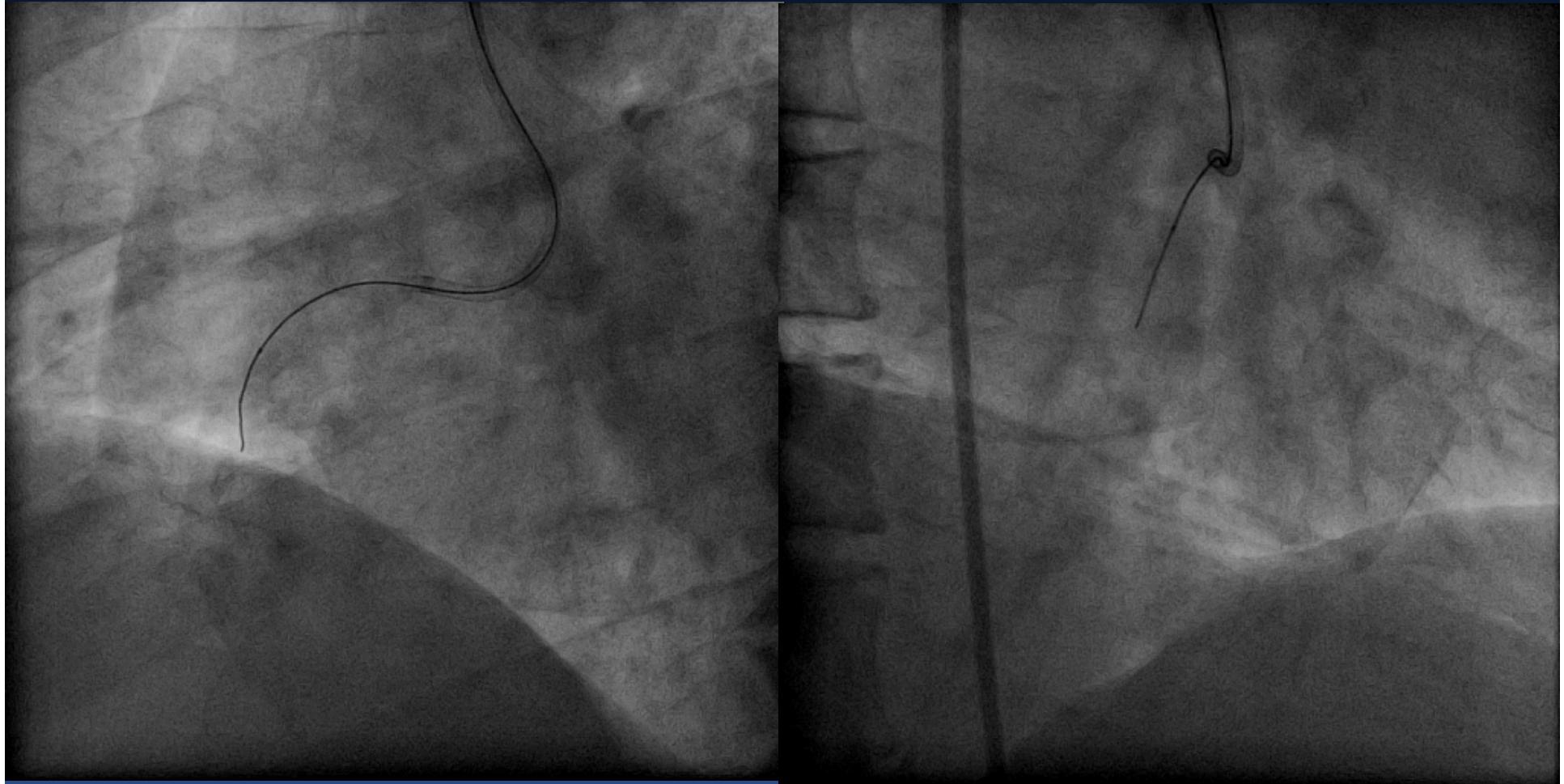
*Miracle 3 gm loaded on a
Finecross microcatheter*



Failure to traverse through the intra-luminal pathway

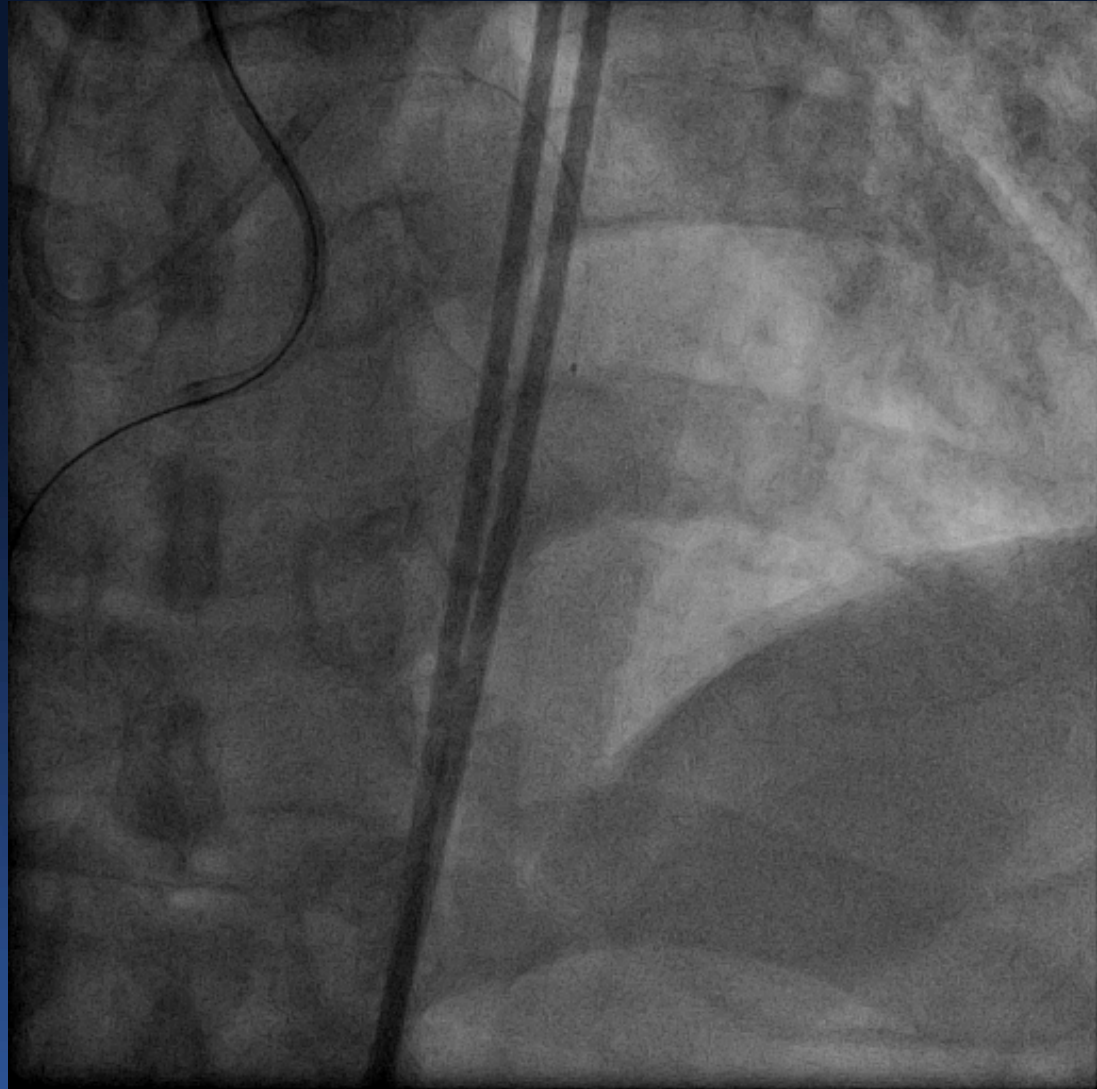


Still subintimal...

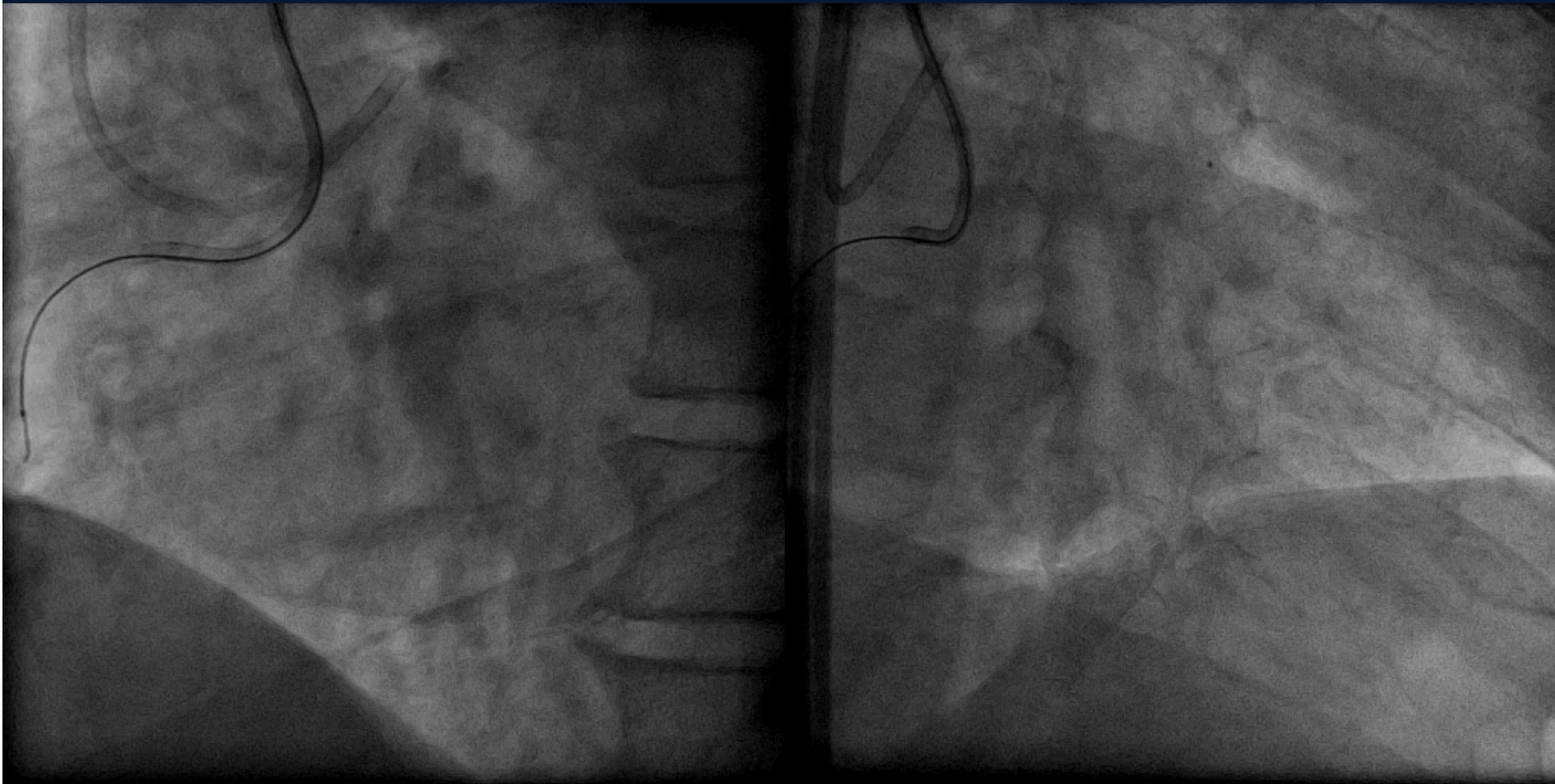


Retrograde approach

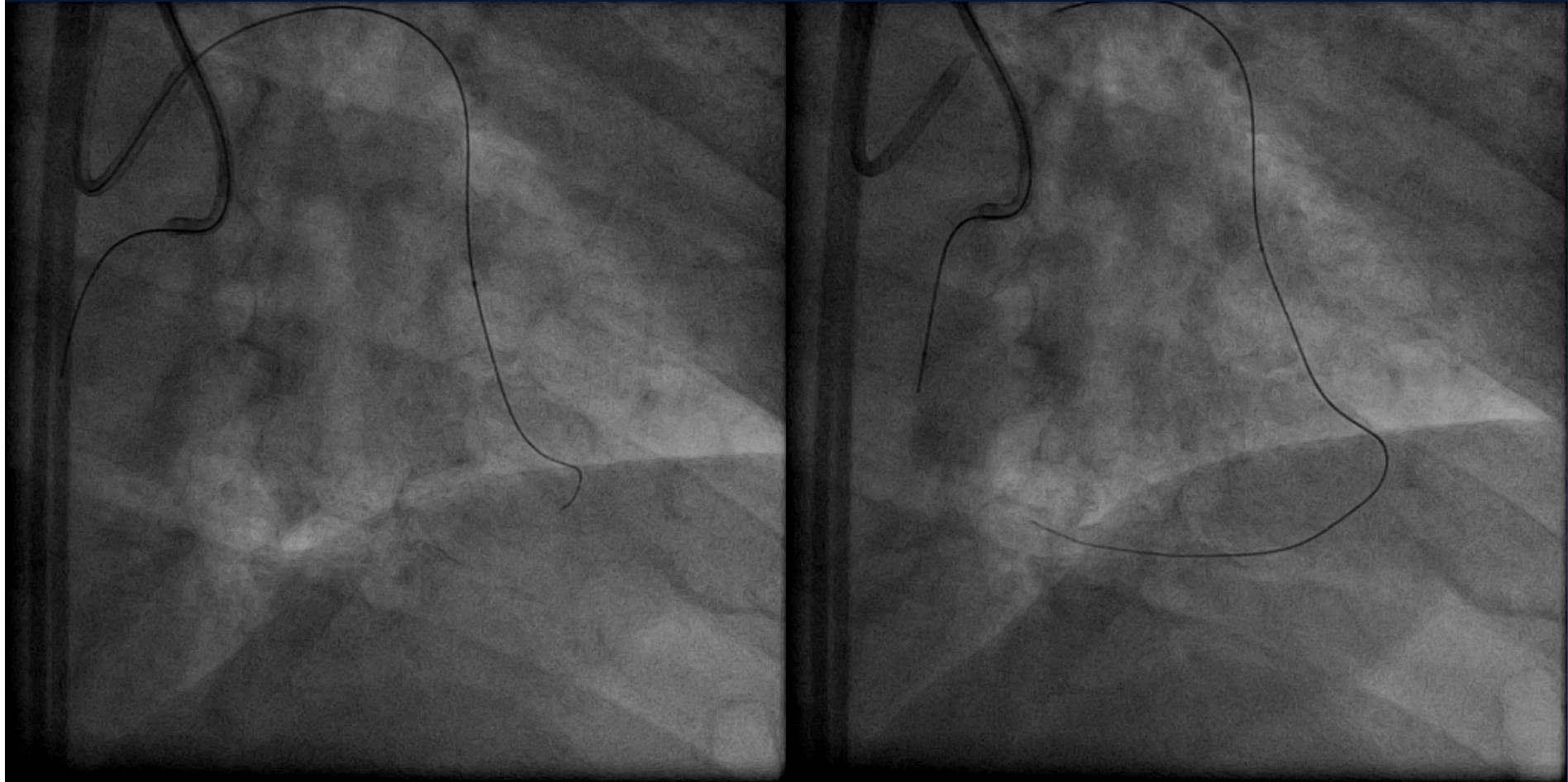
- **7 Fr Left femoral approach**
- **7Fr EBU 3.5 (90cm)
Medtronic Guiding catheter**
- **0.014" Fielder XT guidewire**
- **Finecross microcatheter**
- **Selective septal angiogram**



Selective Septal Angiogram



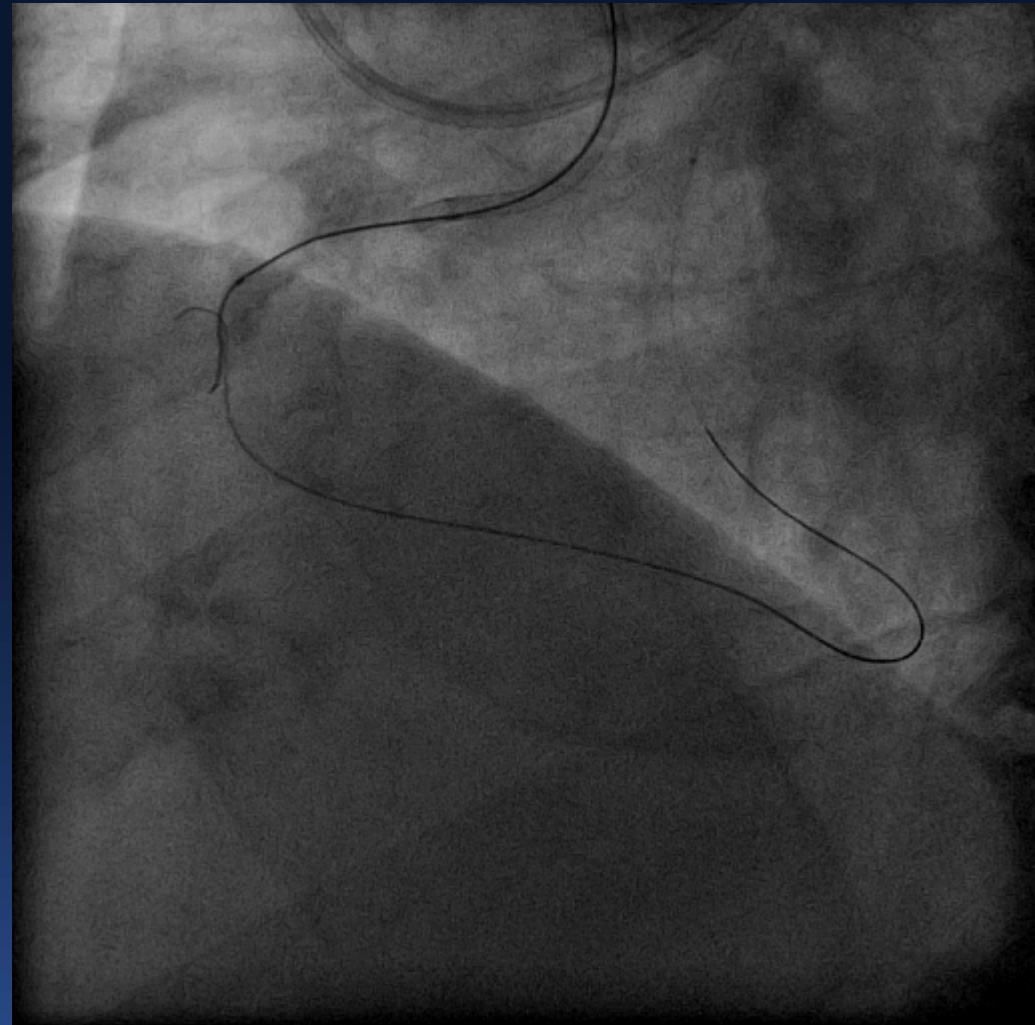
Advancing the Fielder XT



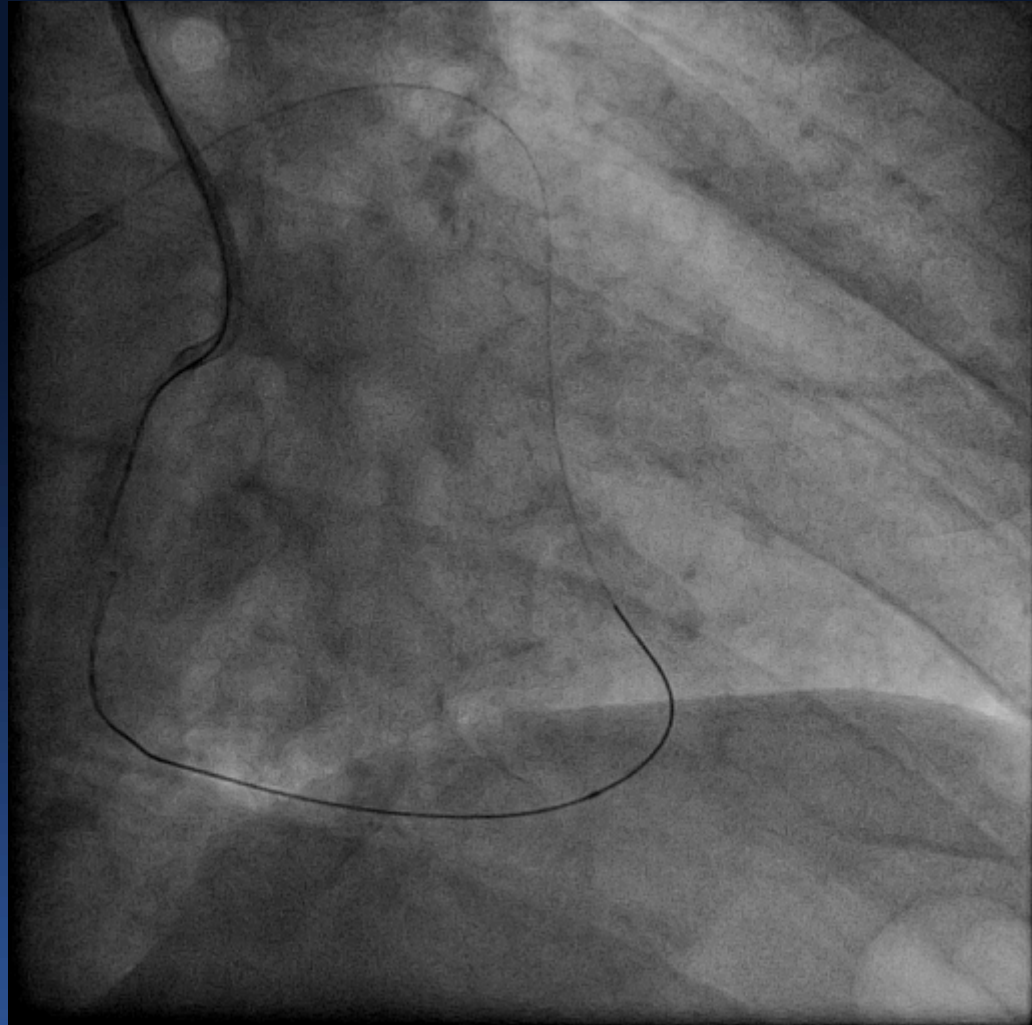
- *Fielder could not advance further*

- *Tortuous bend also precluded the advancement of the Finecross microcatheter*

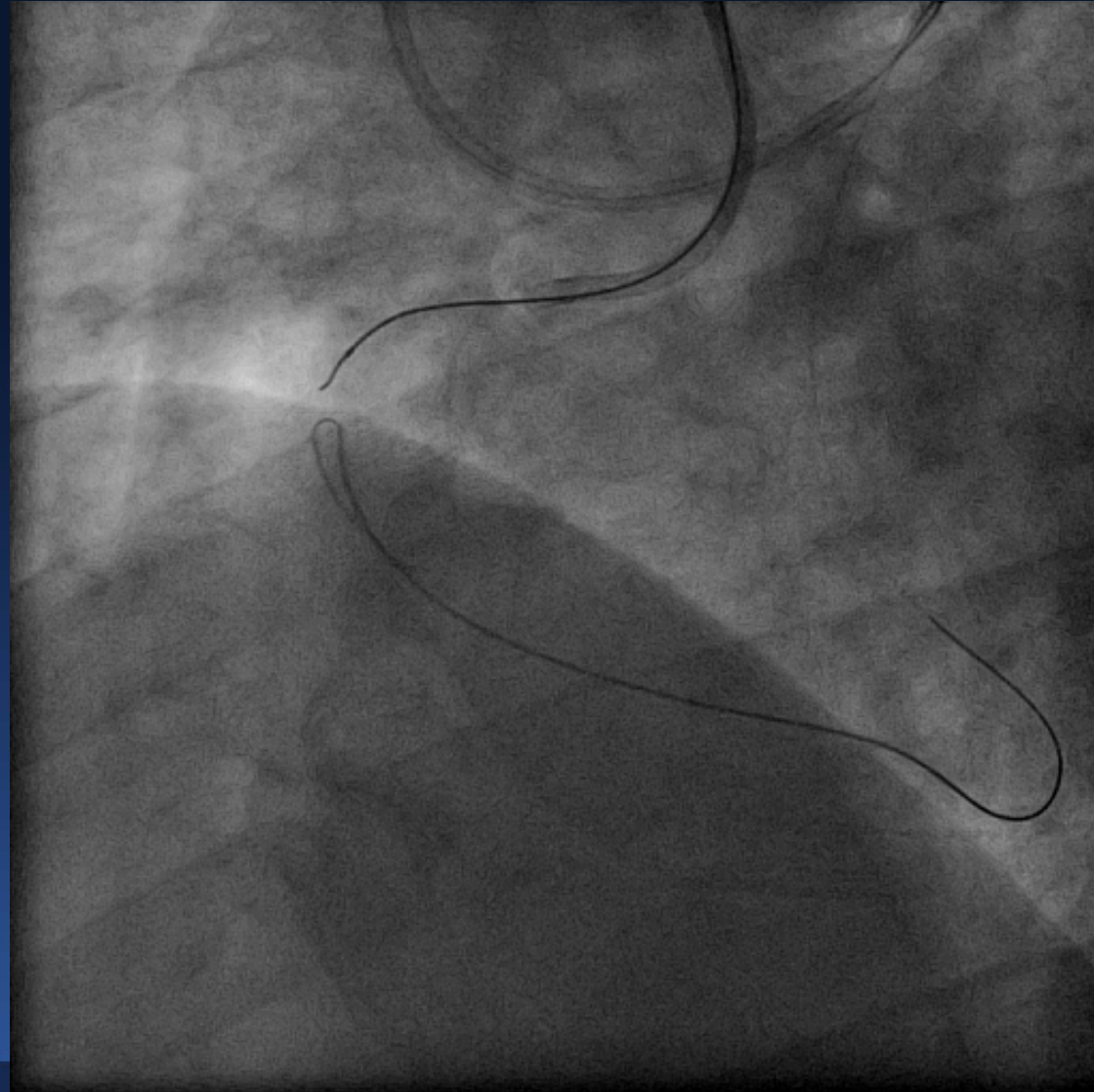
- **Corsair micro-channel dilator not available**



***The micro-channel was
gently dilated with a
1.3x10mm Lacrosse balloon
at 4-6 ATM***

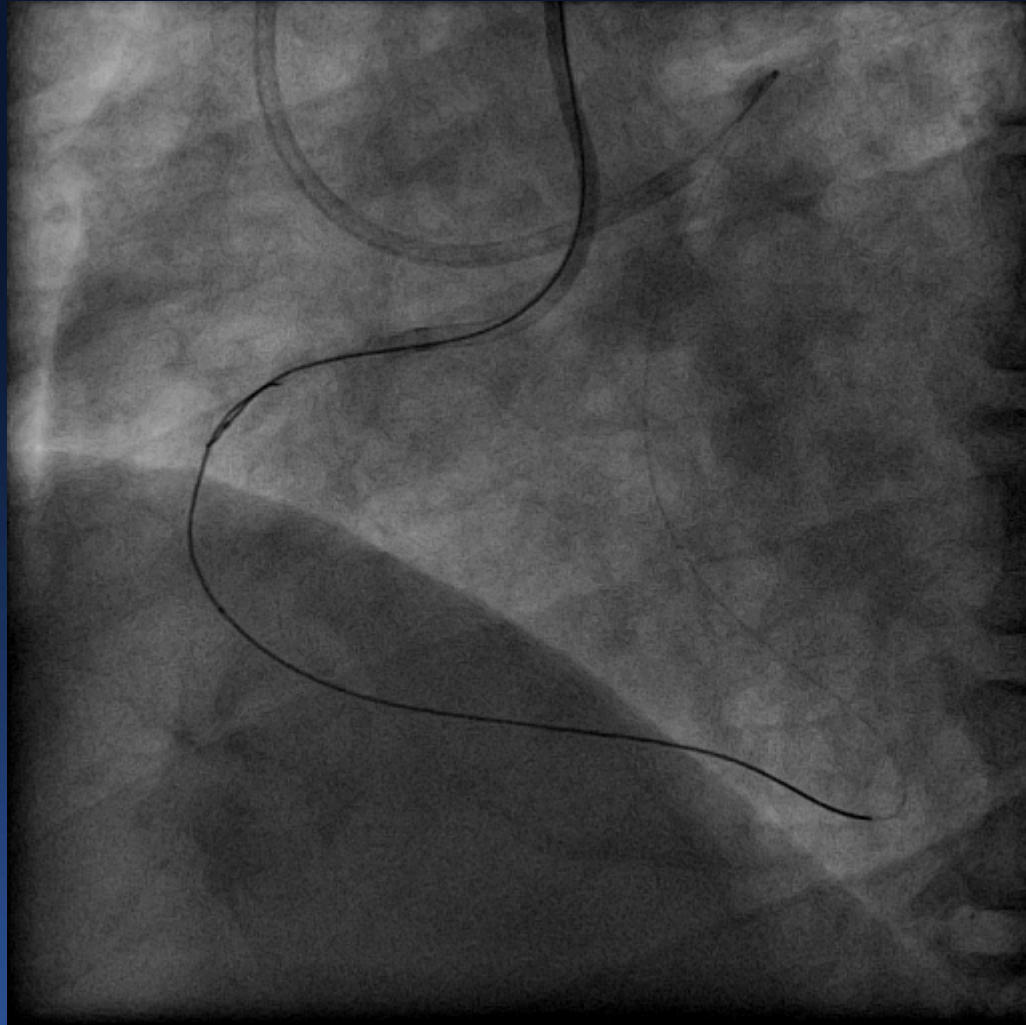


Finecross was advanced

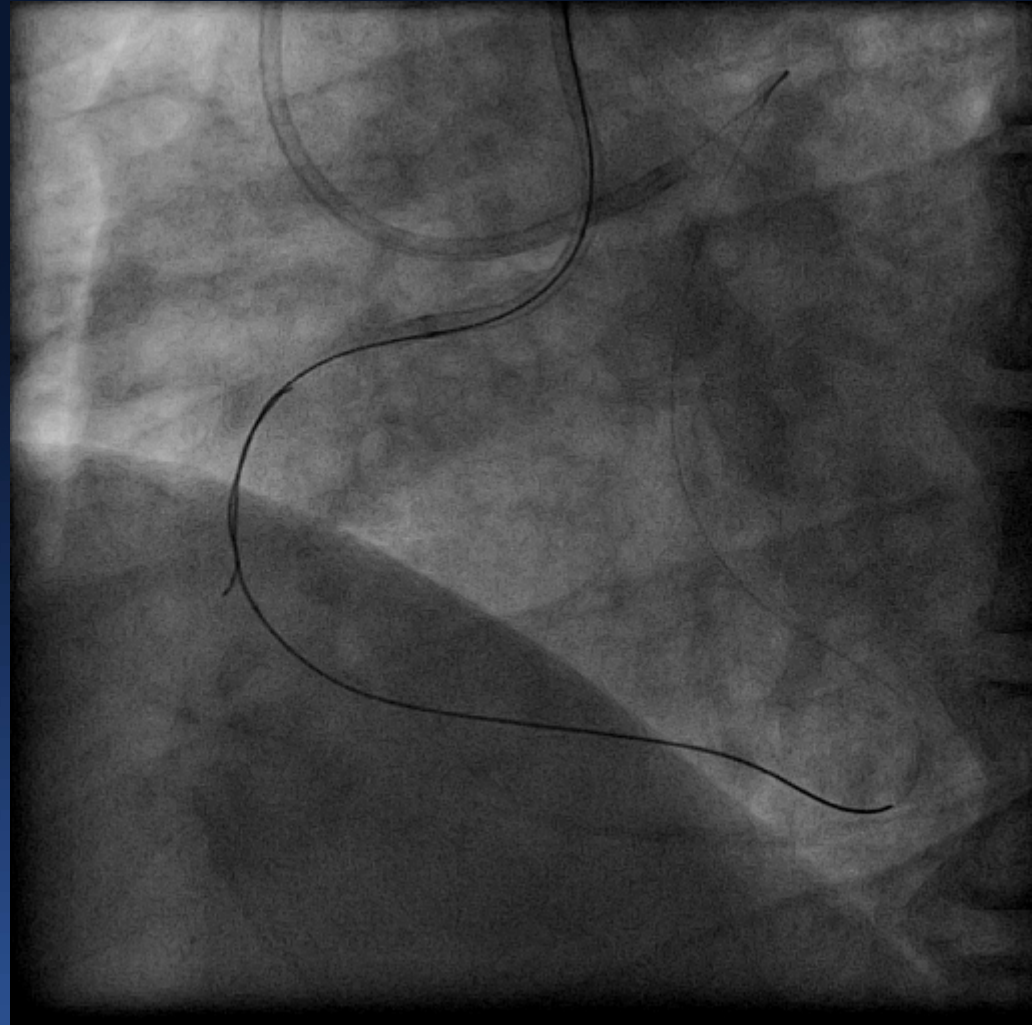


Retrograde wire: Miracle 3 gm

Guidewires Kissing inside
same subintimal space

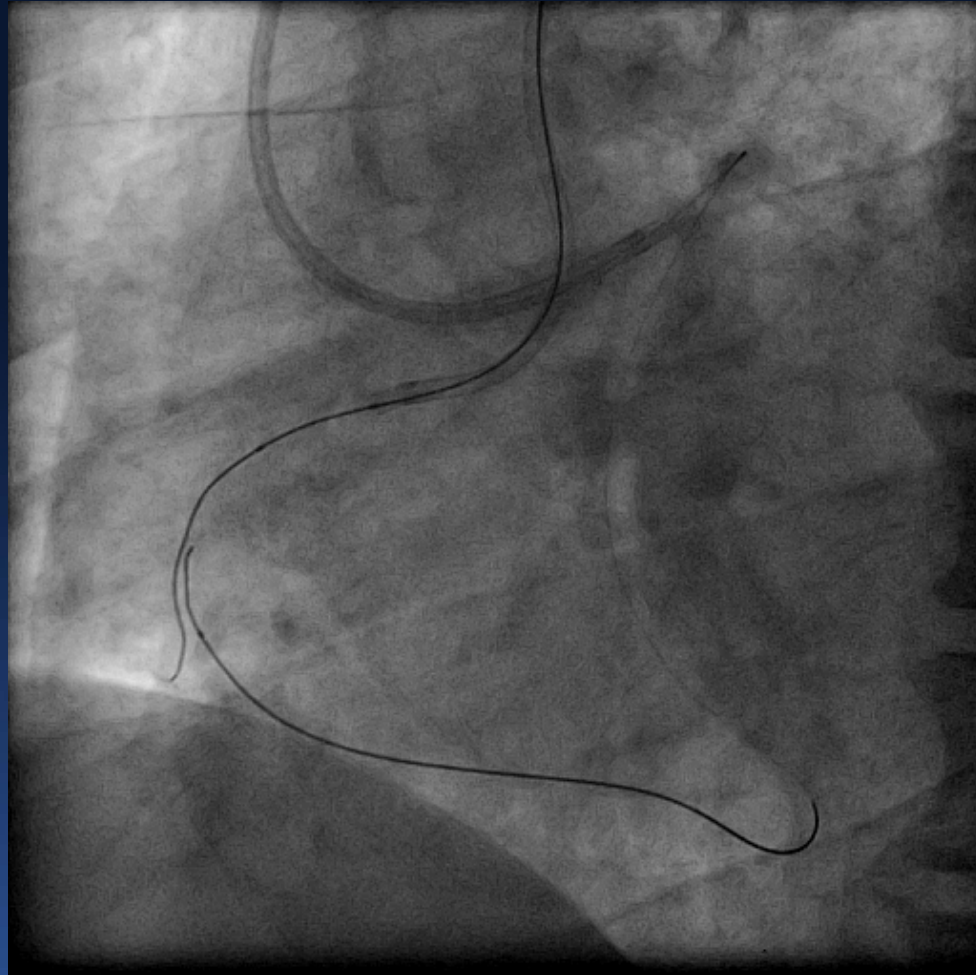


- ***Subintimal space expanded***
- ***Spiral dissections more obvious***
- ***But antegrade and retrograde wires both could not be advanced further***



Contained perforation

- *Antegrade wire 'exit' through the false lumen*
- *A contained perforation/hematoma was noted*
- *Patient remained hemodynamically stable*

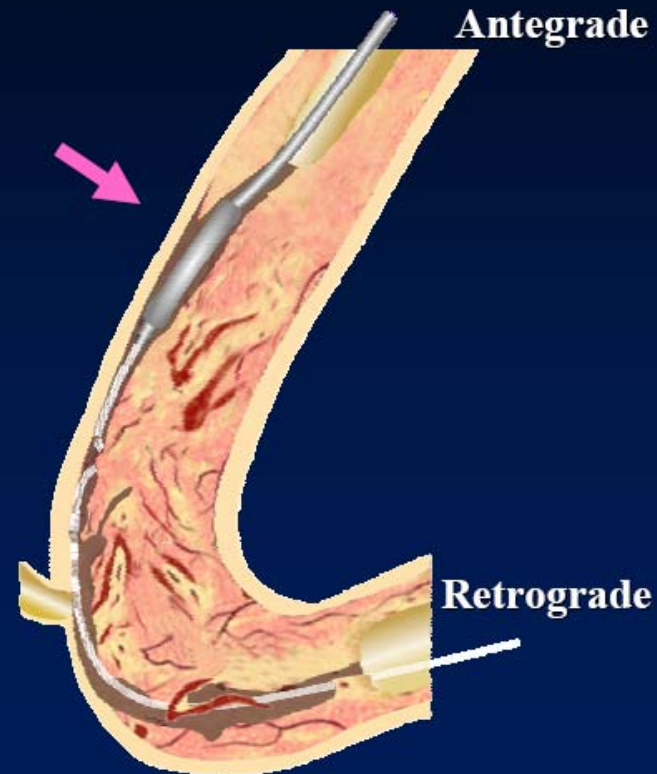


CART vs Reverse CART

Standard CART



Reverse CART



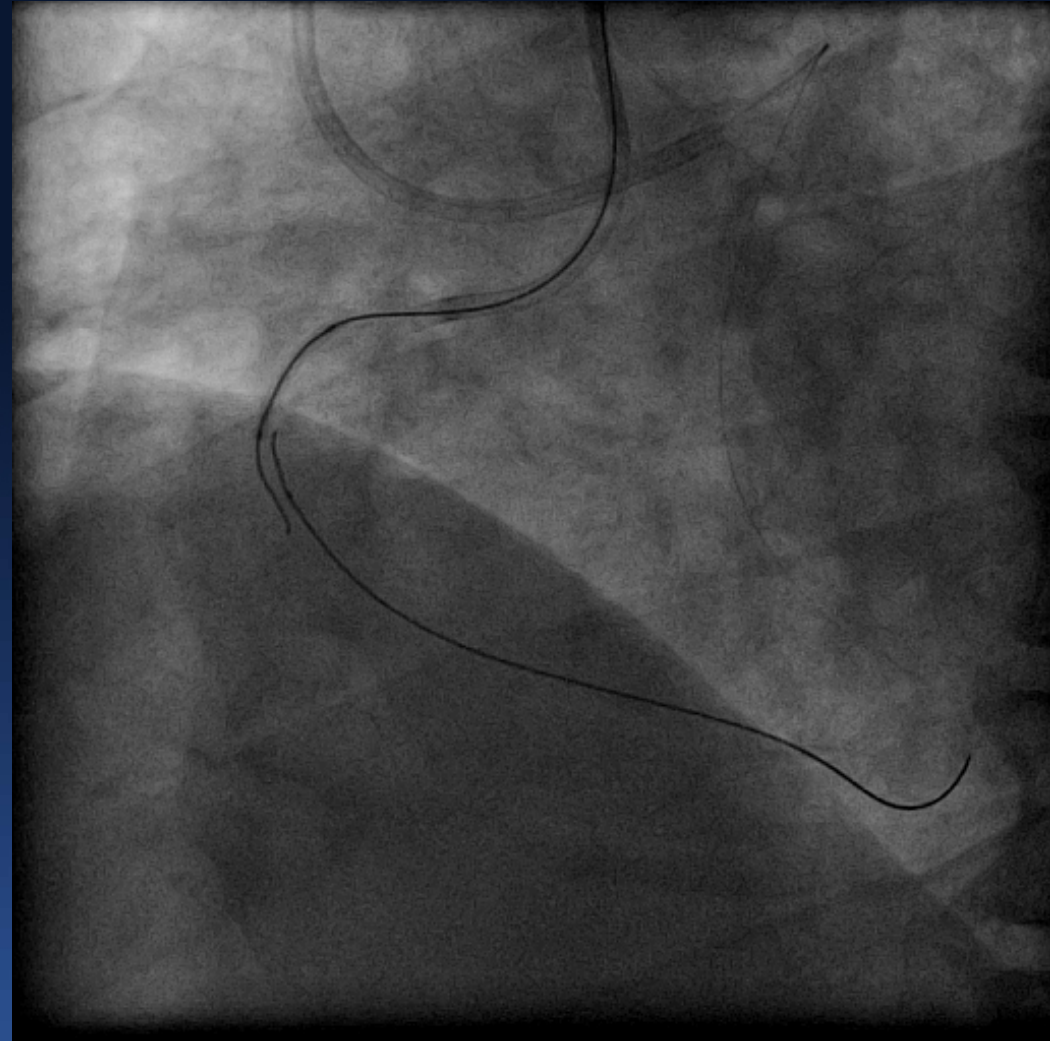
Limitation:

- almost always require septal channel dilatation
- Retrograde balloon passage is sometimes difficult even after septal dilatation
- Passage of long retrograde balloon may damage the septal collaterals, causing septal perforation or hematoma

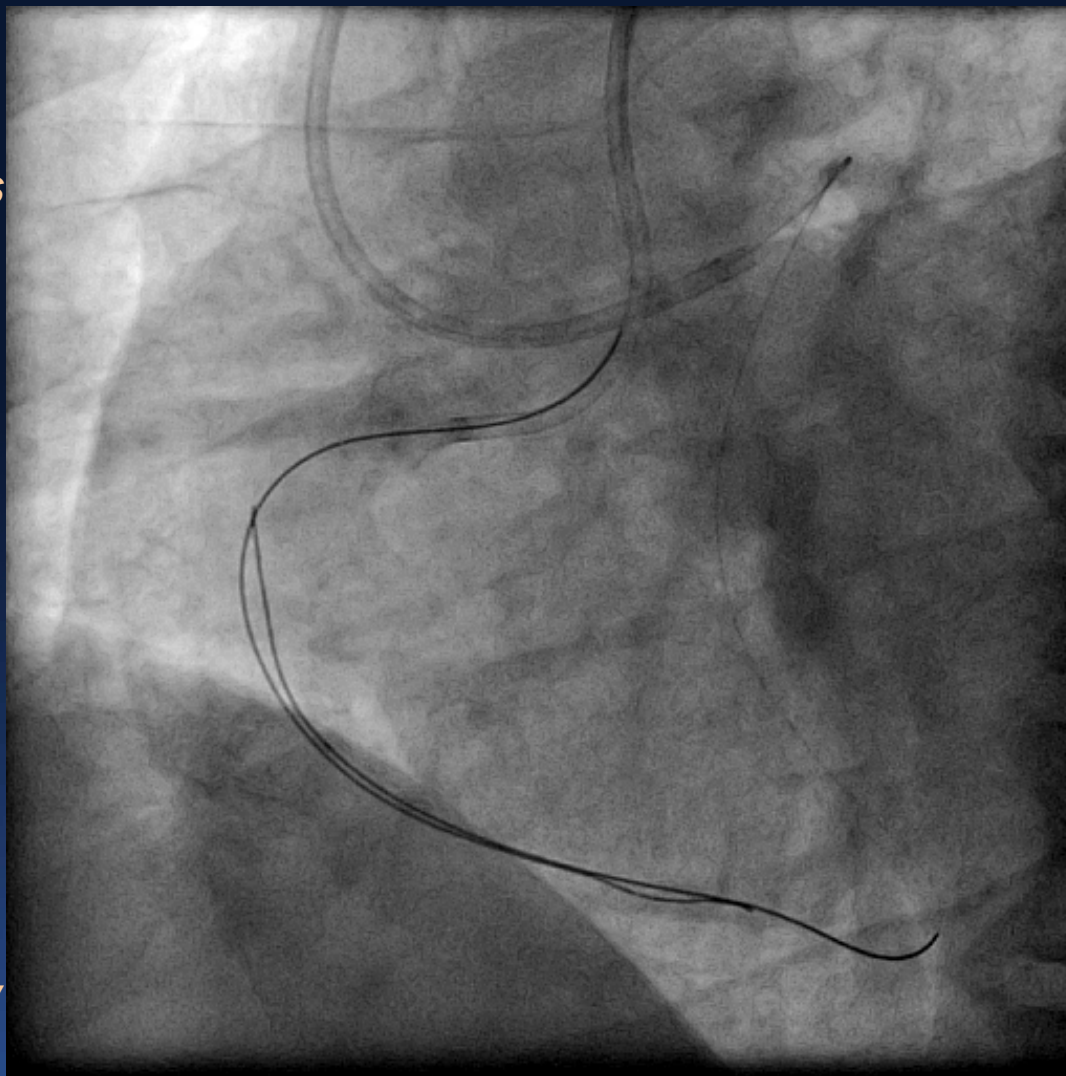
(J Invasive Cardiol 2006;18:334-8)

Attempt Reverse CART

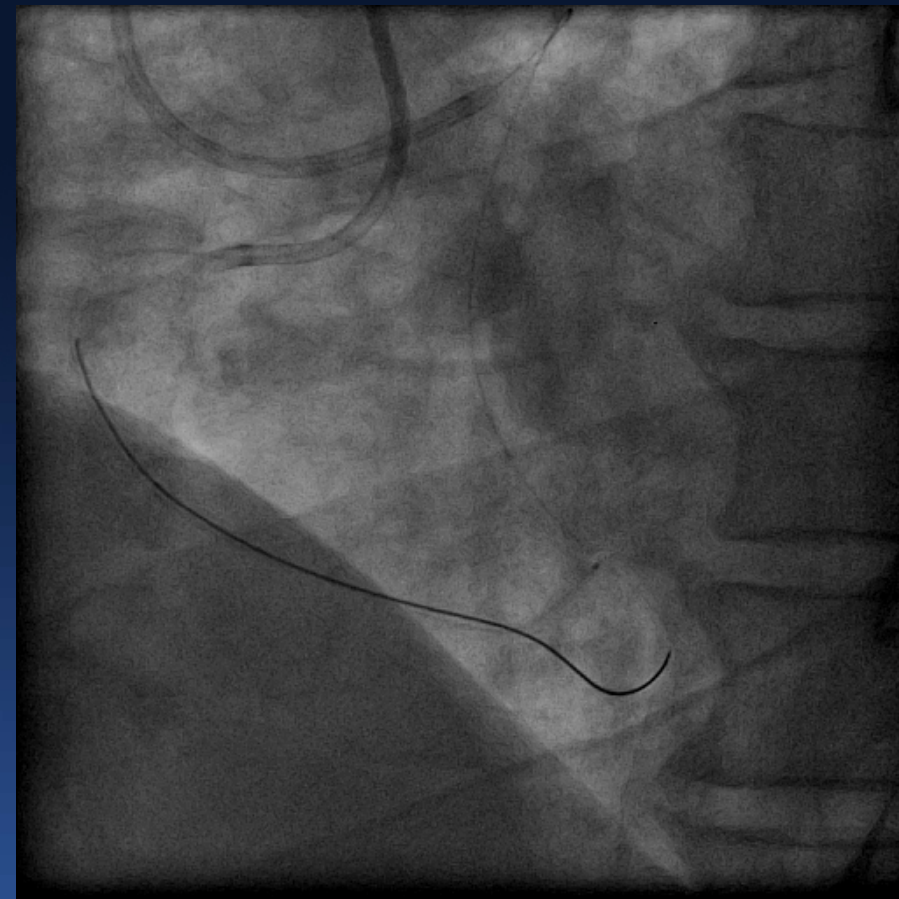
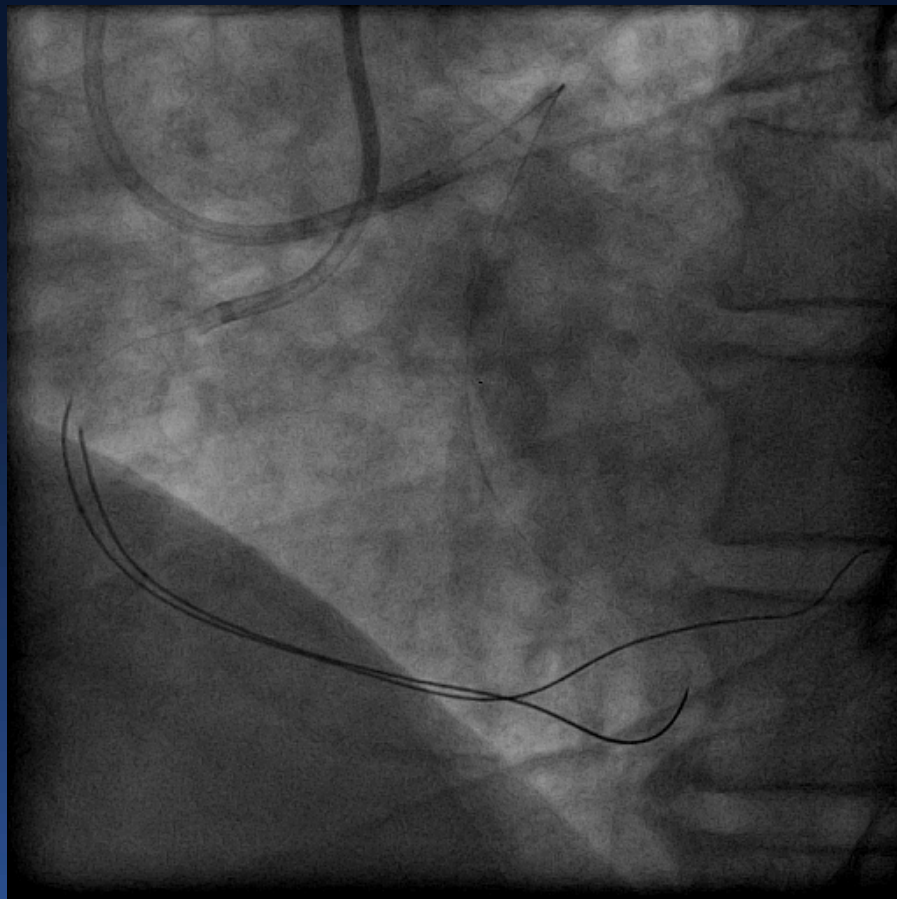
- ***2.0x15mm Apex balloon inflated at 6 ATM***
- ***The contained perforation precluded the use of IVUS as it may expand the spiral dissection/perforation***
- ***N.B. Solid-state Eagle-Eye IVUS catheter not available***



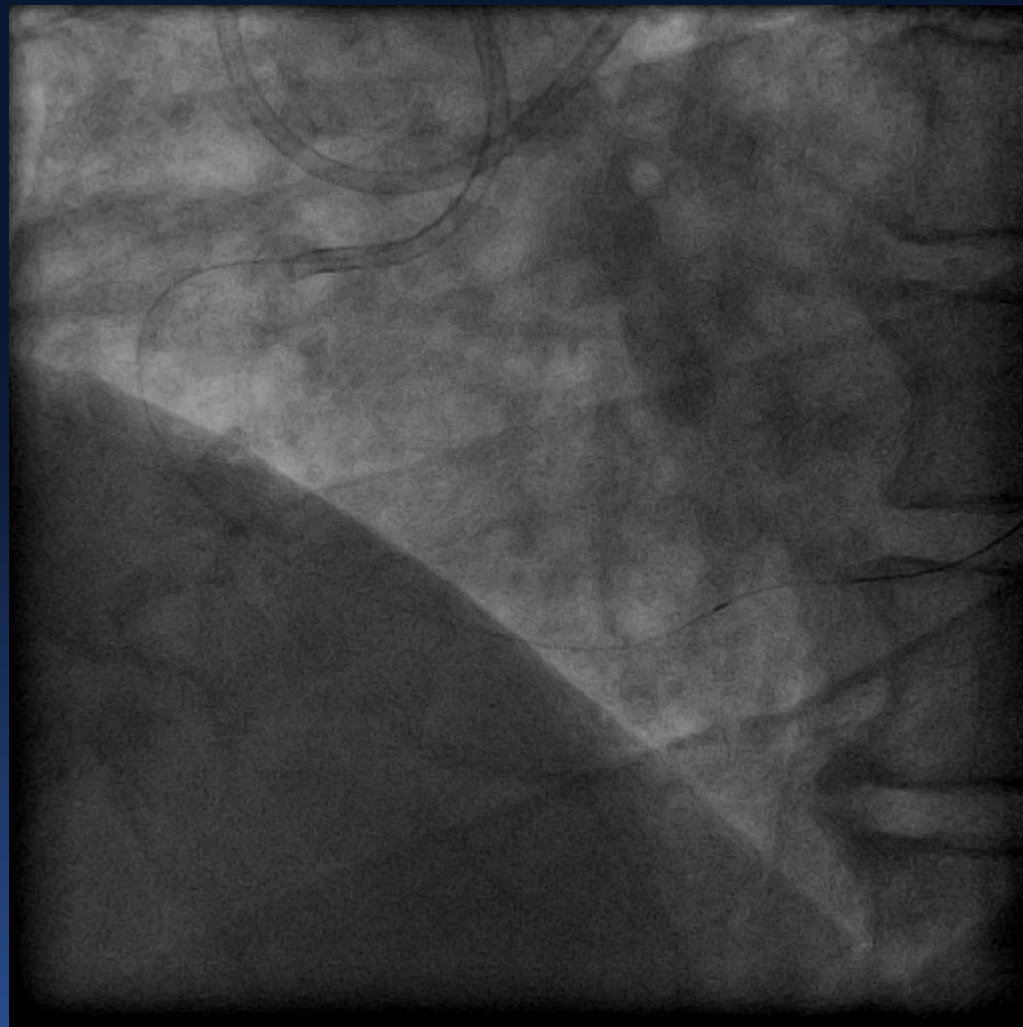
- **Failed to advance the Retrograde wire up, probably because of the tortuous bend...**
- **Instead, the antegrade wire was retrieved a little and re-advanced through the intraluminal pathway following the retrograde wire**
- **Risk: Collapsed “common subintimal space” and created another dissection/expanding distal dissection**
- **Alternatives: (Not available)**
- **Use of Corsair microcatheter to support the retrograde wire may help advance of the retrograde wire up**
- **Use of Snare-wire (Soutenir)**



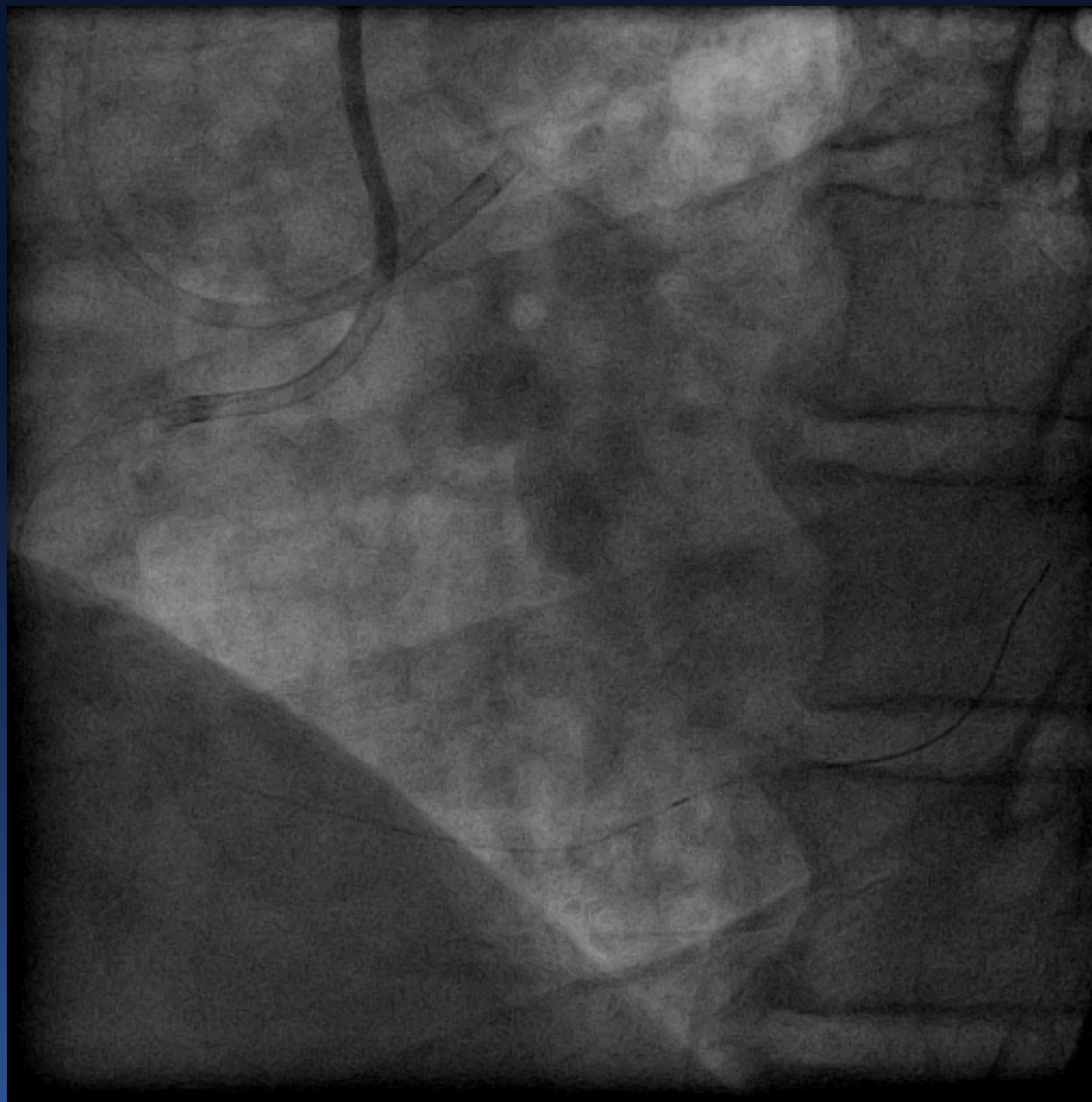
Antegrade Finewire catheter advanced down the PLV



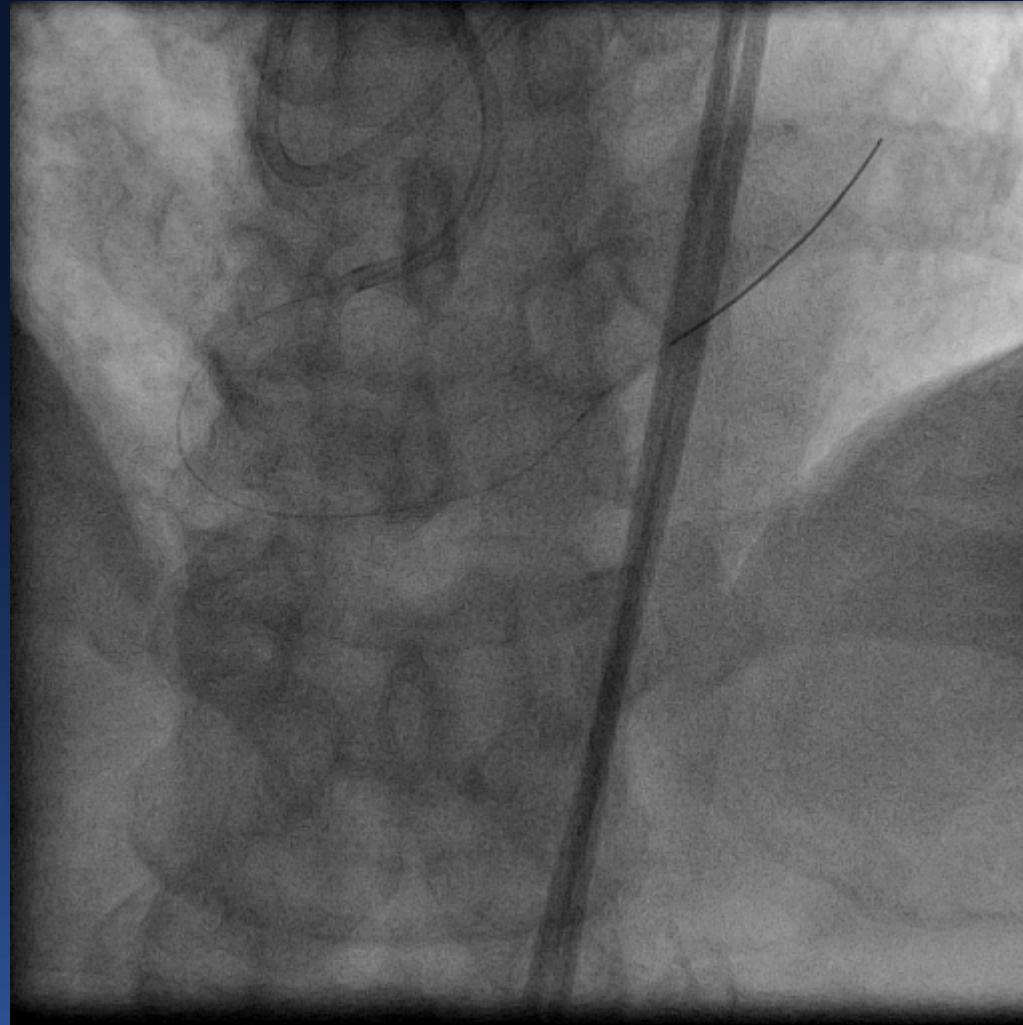
Diffuse RCA disease



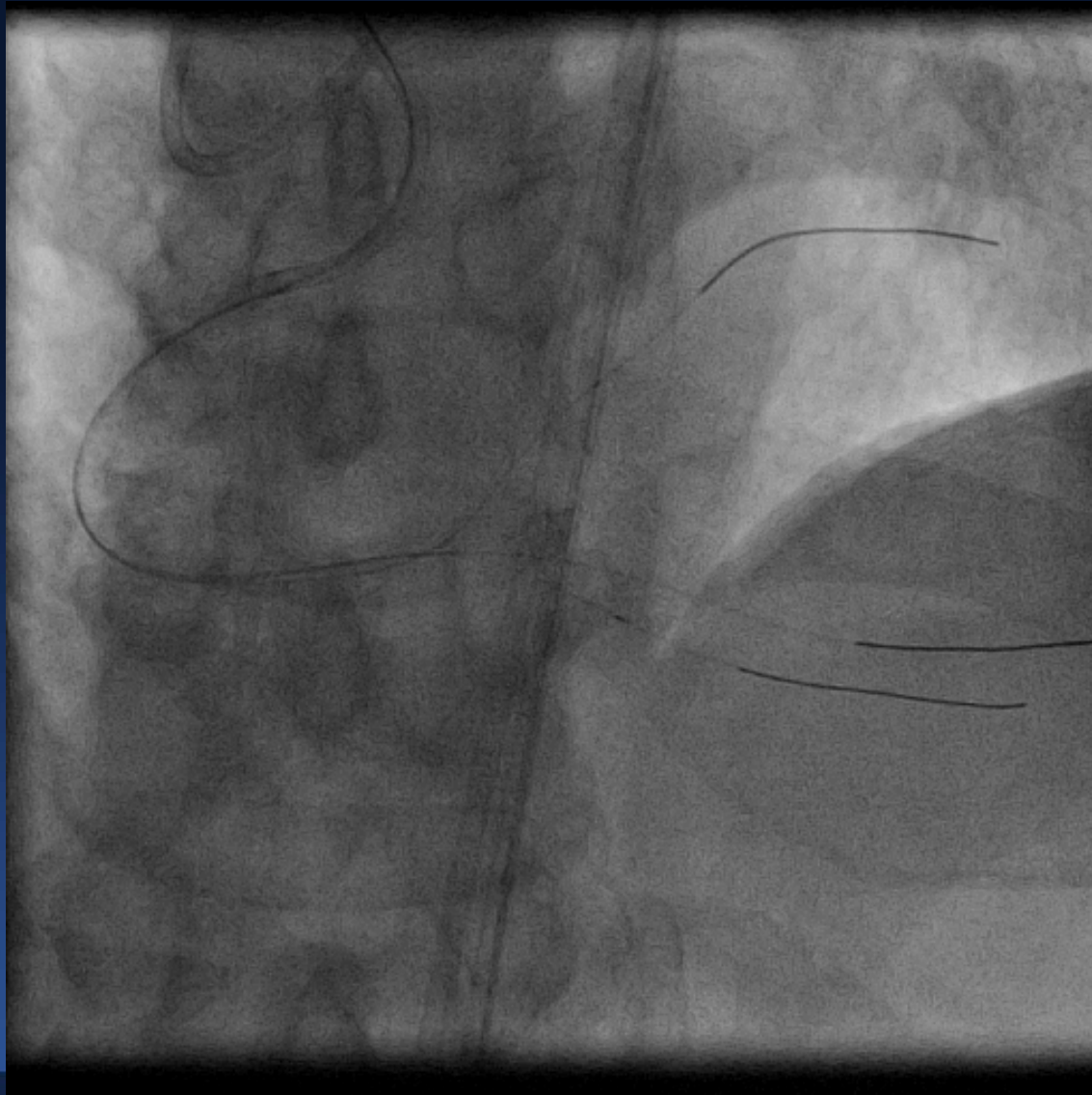
No damage done on the Lt System



Still a lot of work...

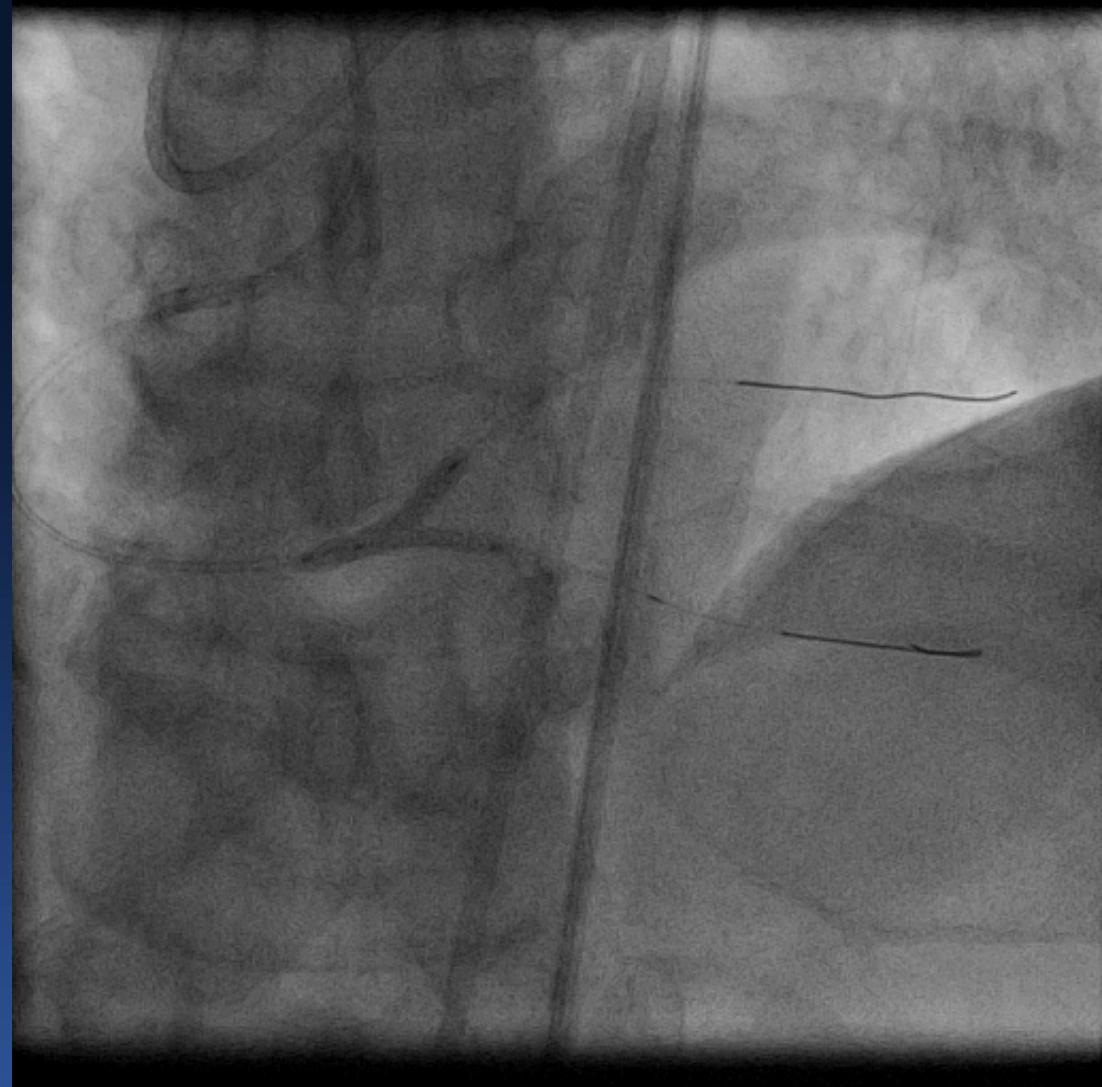


Triple wires...

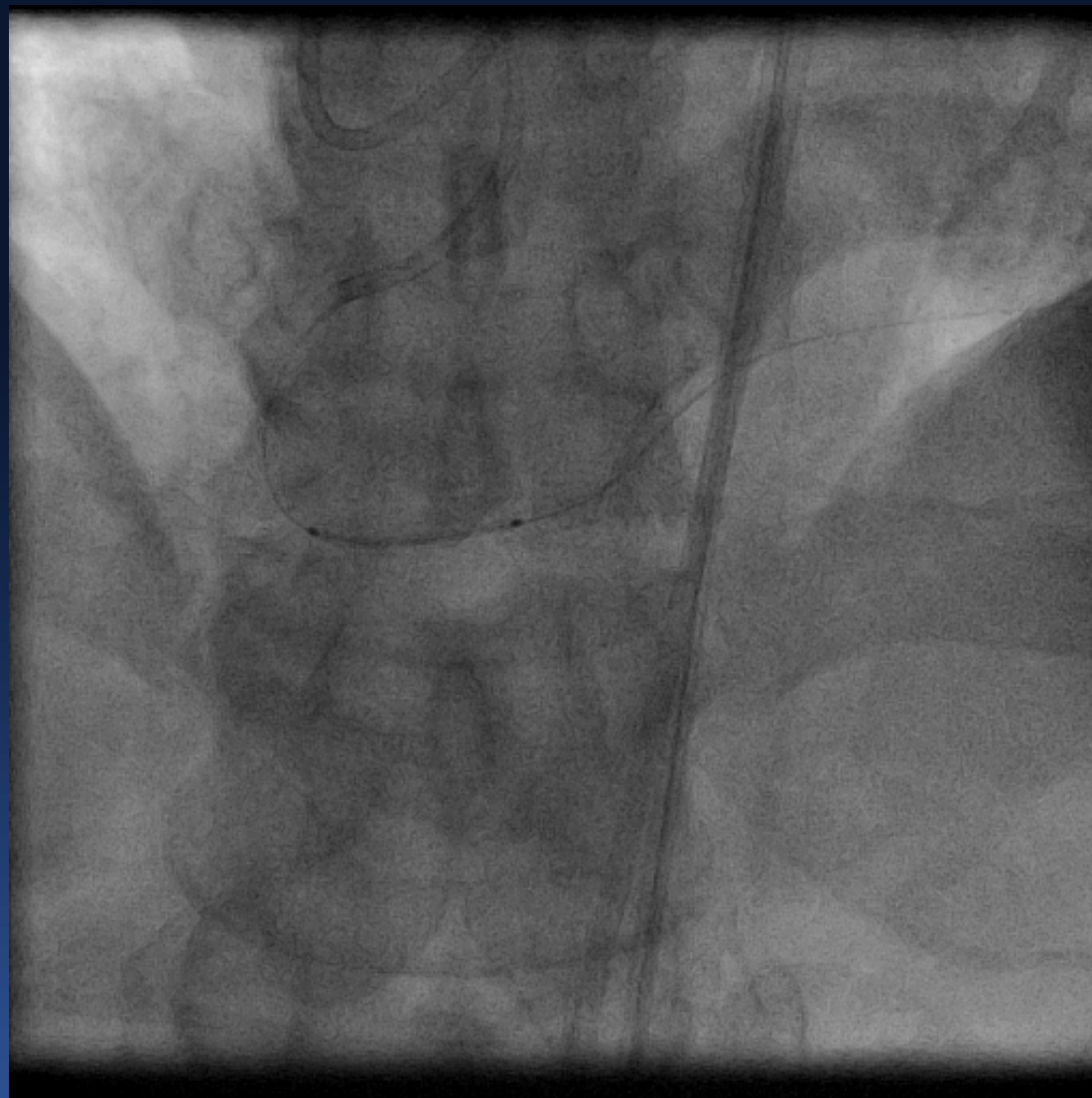


Fixing the bifurcation

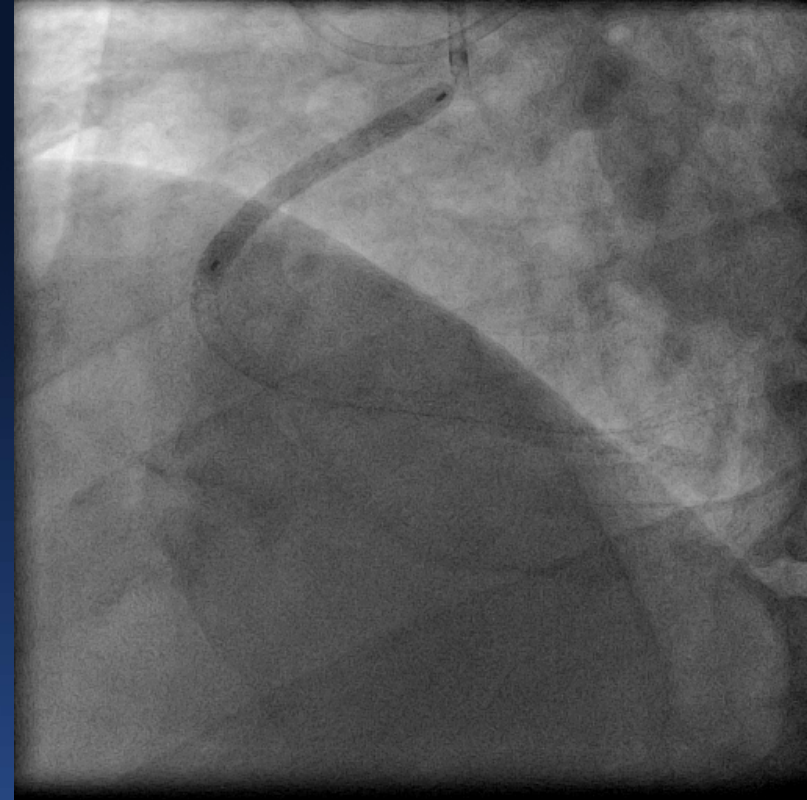
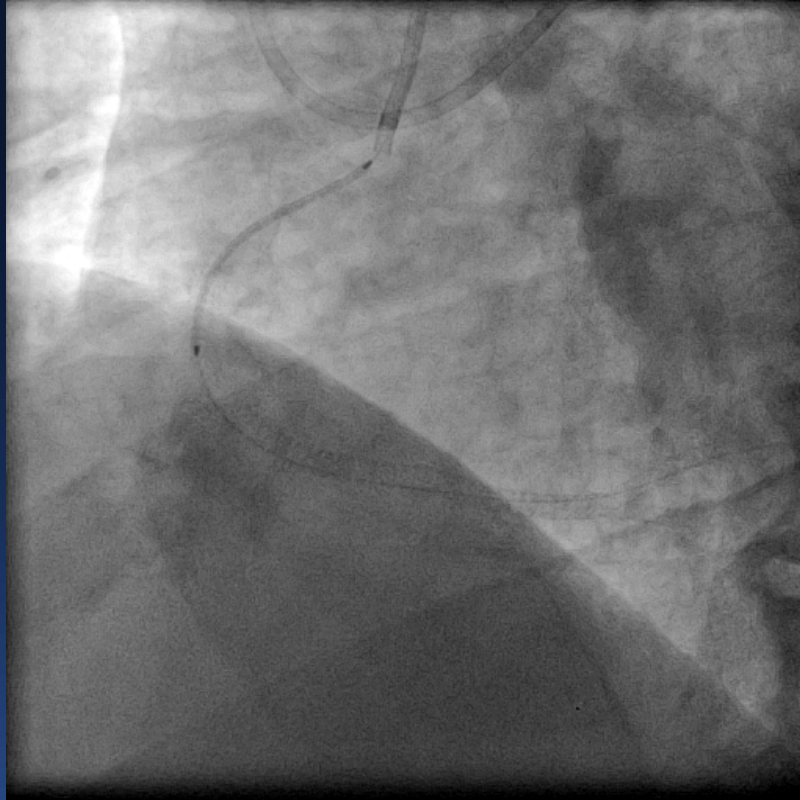
- *After aggressive pre-dilatation, the distal RCA-PLV was stented with a 2.5x33mm Xience Prime LL stent.*
- *A 2.25x18mm Xience V stent was deployed at the distal RCA-PDA in a culotte manner*
- *Final kissing with 2.5/2.5mm balloons.*



Xience Prime LL 3.0x33mm



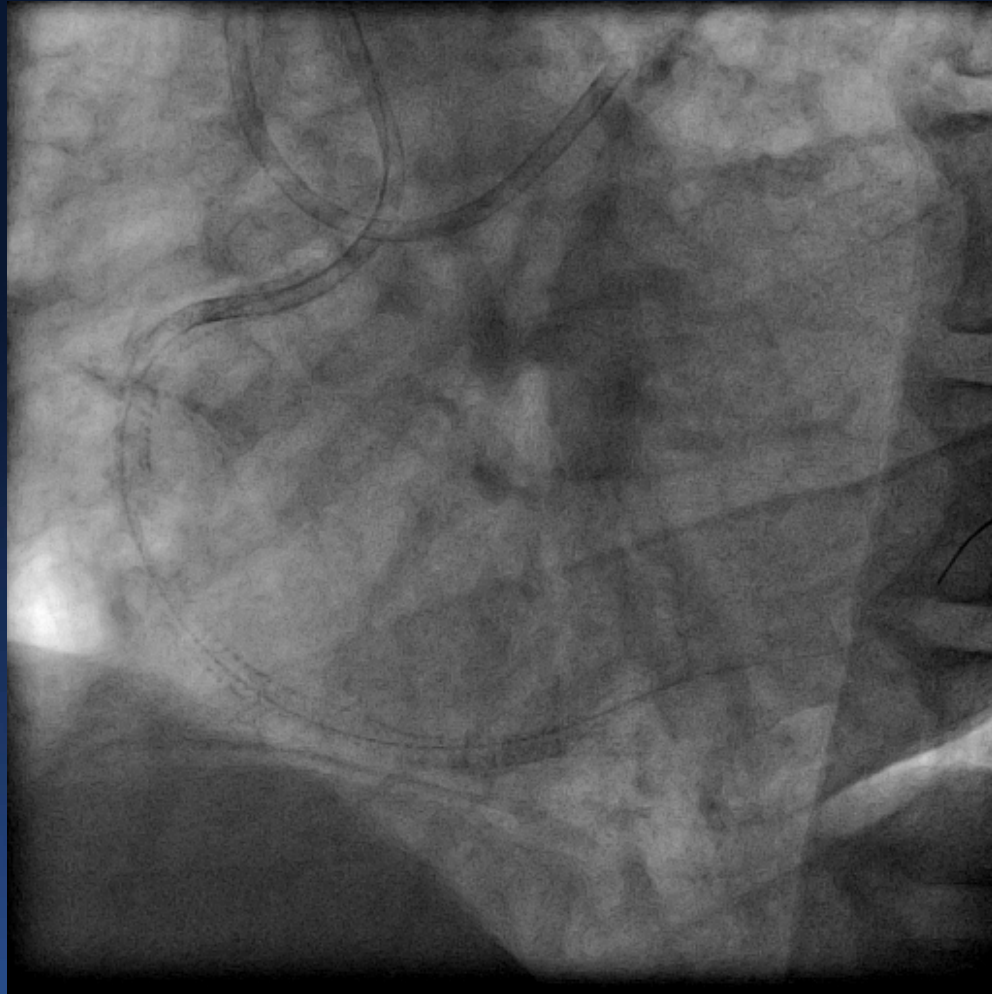
Full metal jacket!!



Full metal jacket!!

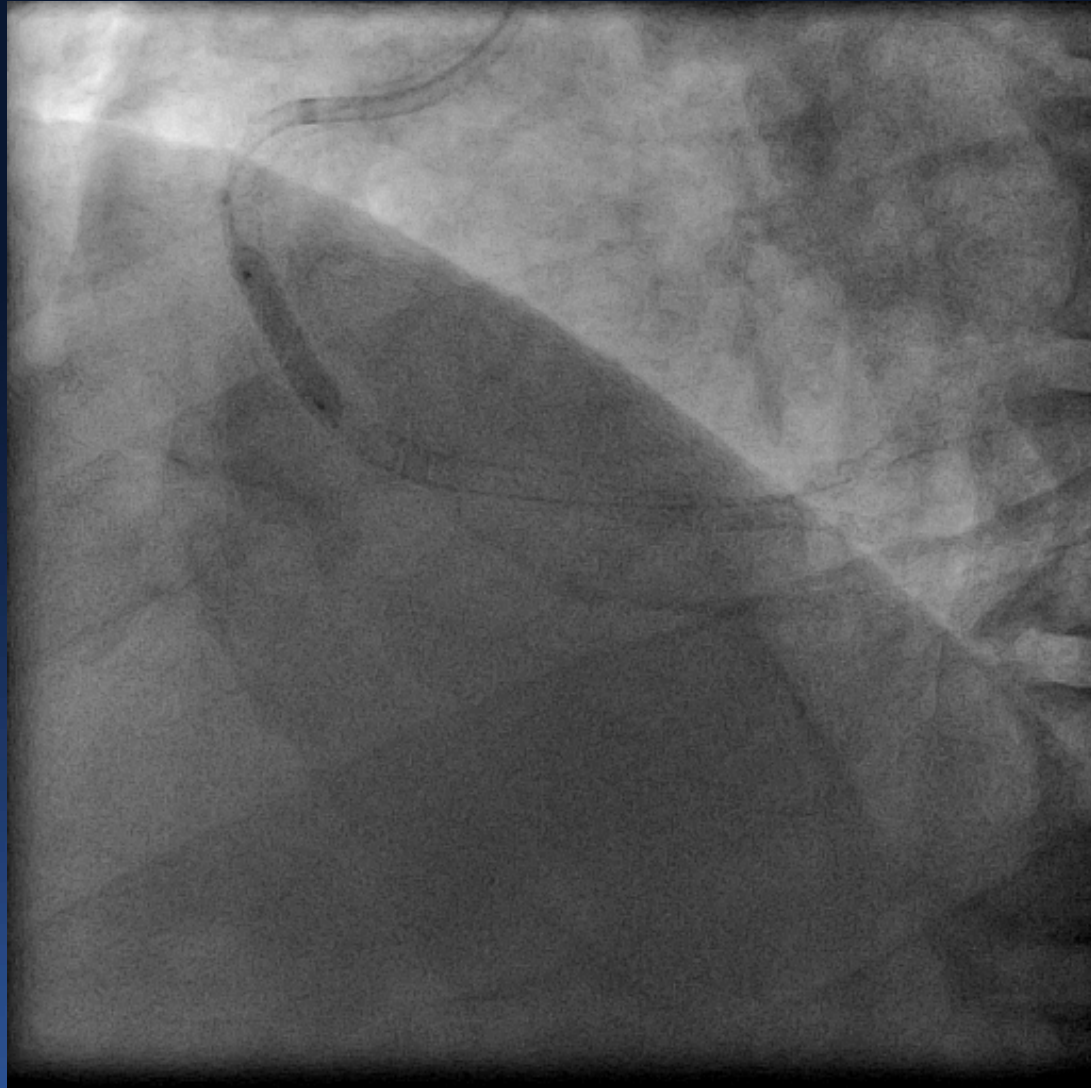
- **3.5x38mm Xience Prime LL**
- **3.0x38mm Xience Prime LL**
- **3.0x33mm Xience Prime LL**

- **All post-dilated up to 3.5mm**



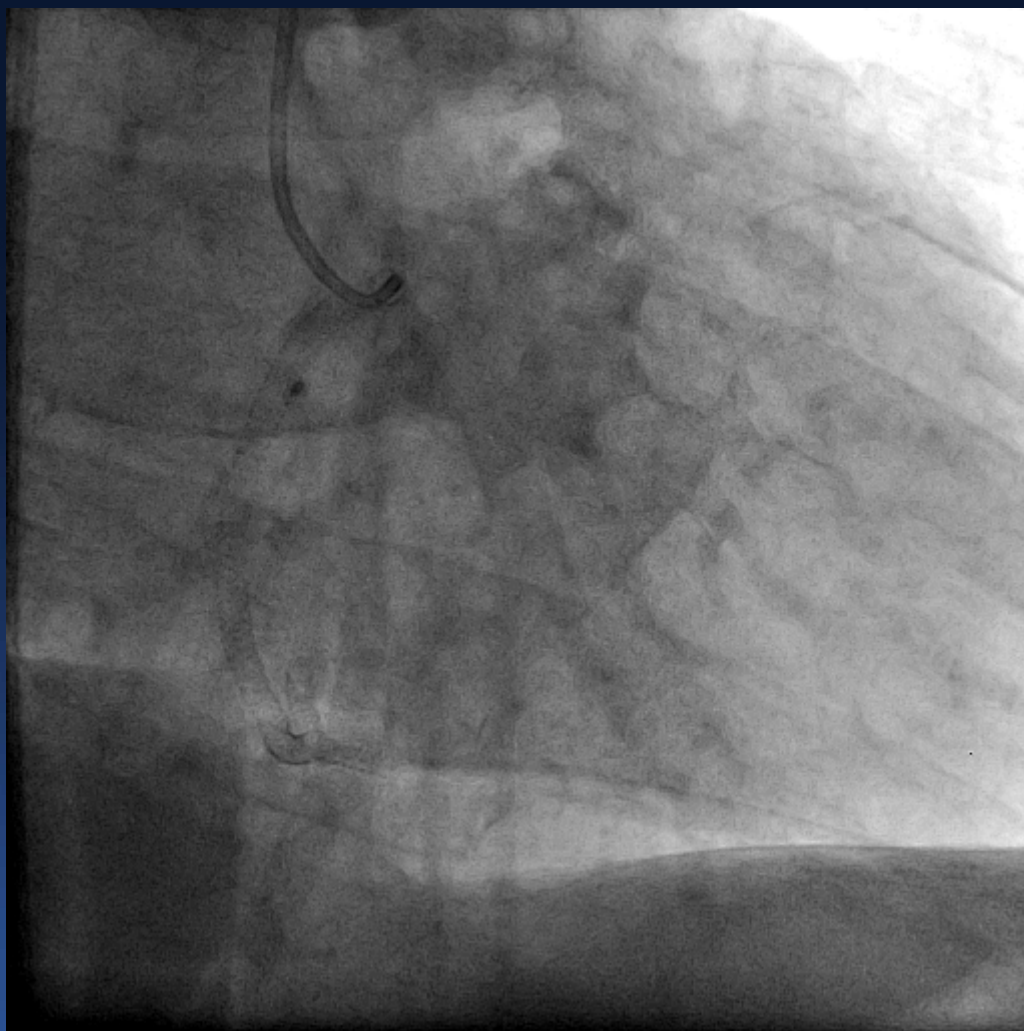
Post-dilation with NC balloon

3.5x15mm Voyager NC up to 18ATM

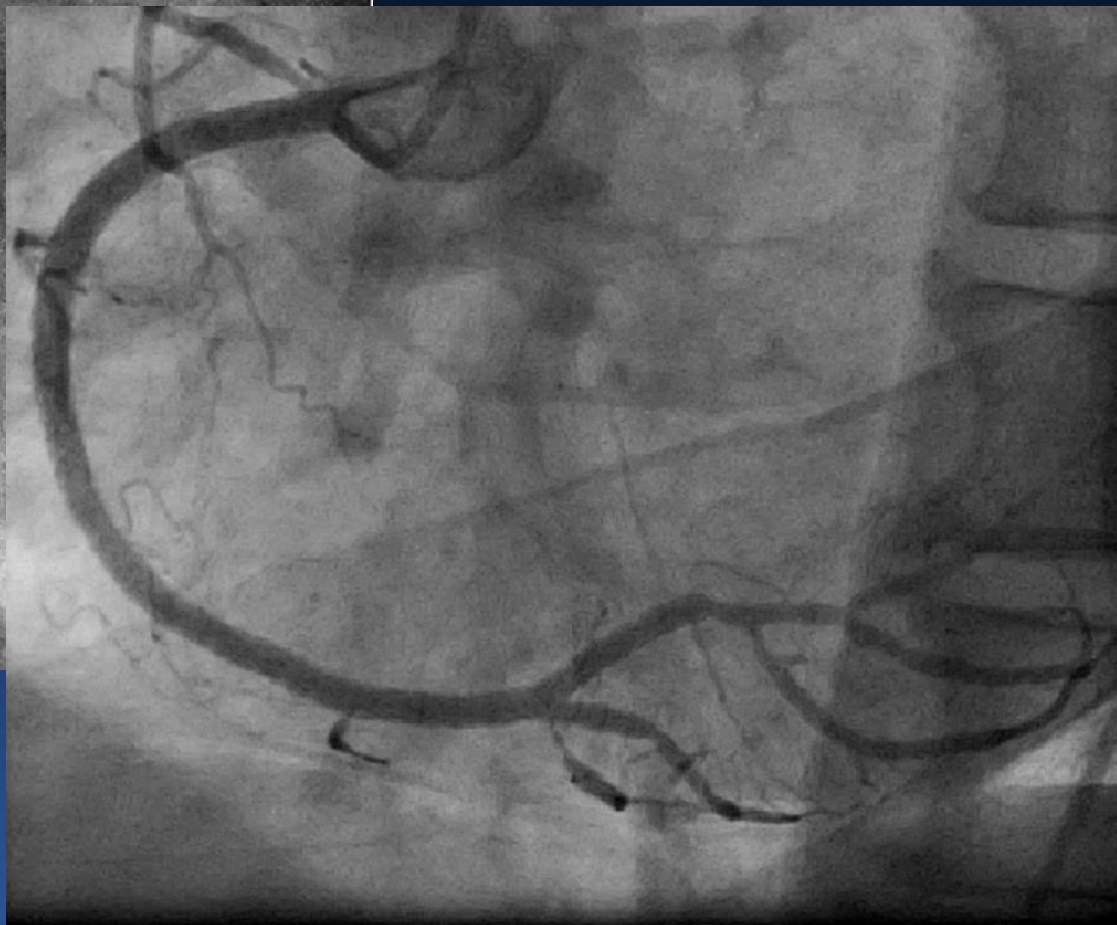
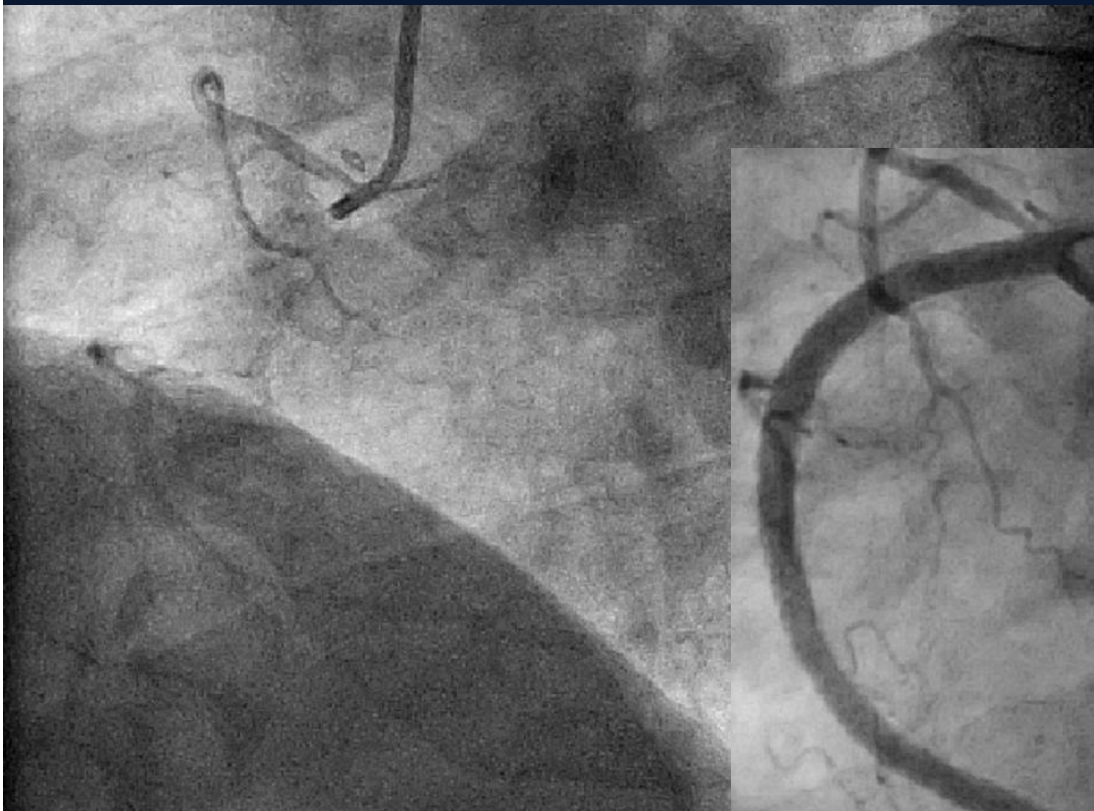


Final angiogram (Diagnostic JR 4)





Pre-PCI vs Post-PCI



*Sometimes this is how
we see ourselves as
interventional
cardiologists..*

***CTO Interventions:
Never Give Up!***

