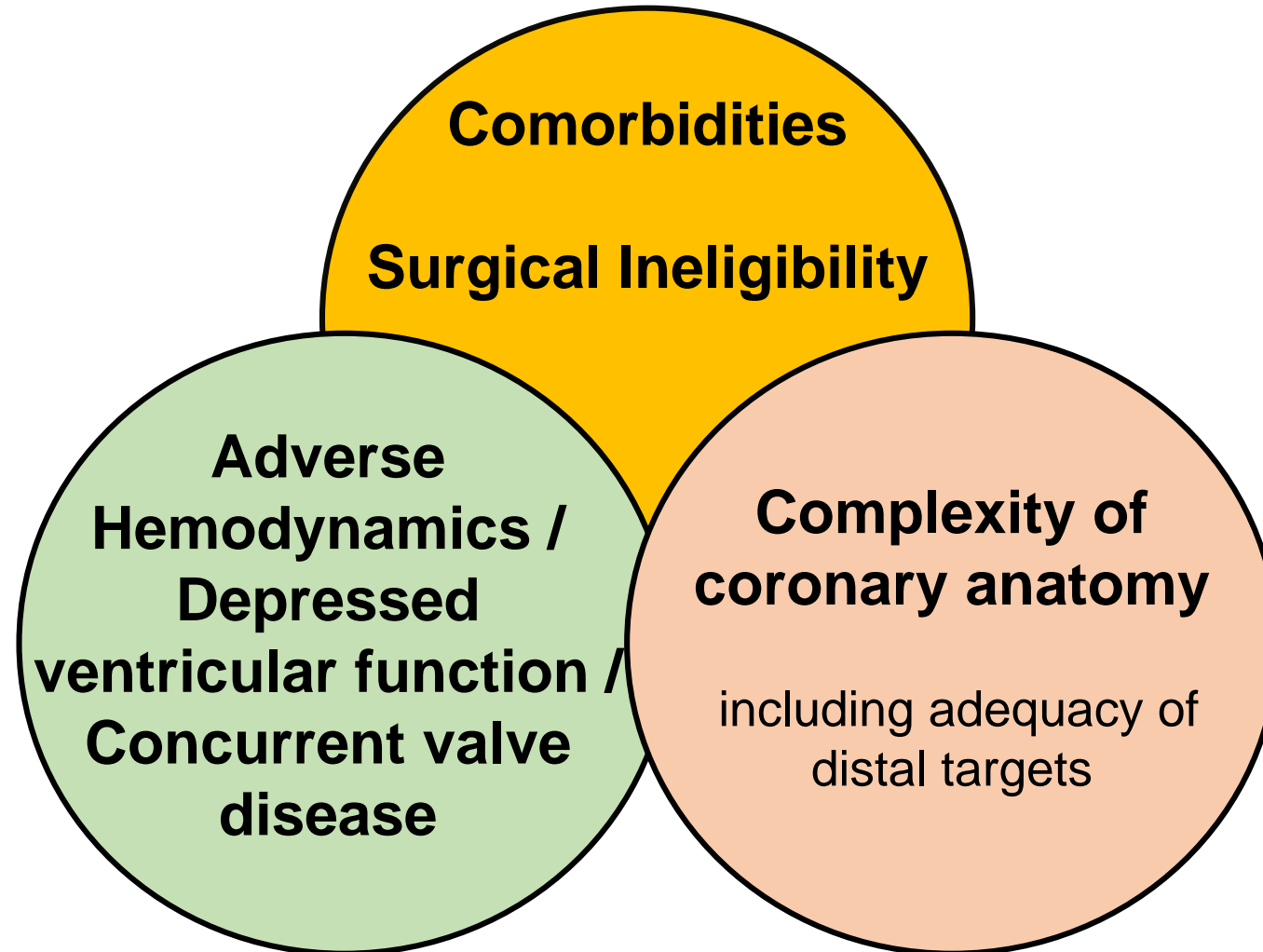


Experience of snuffbox approach for complex PCI

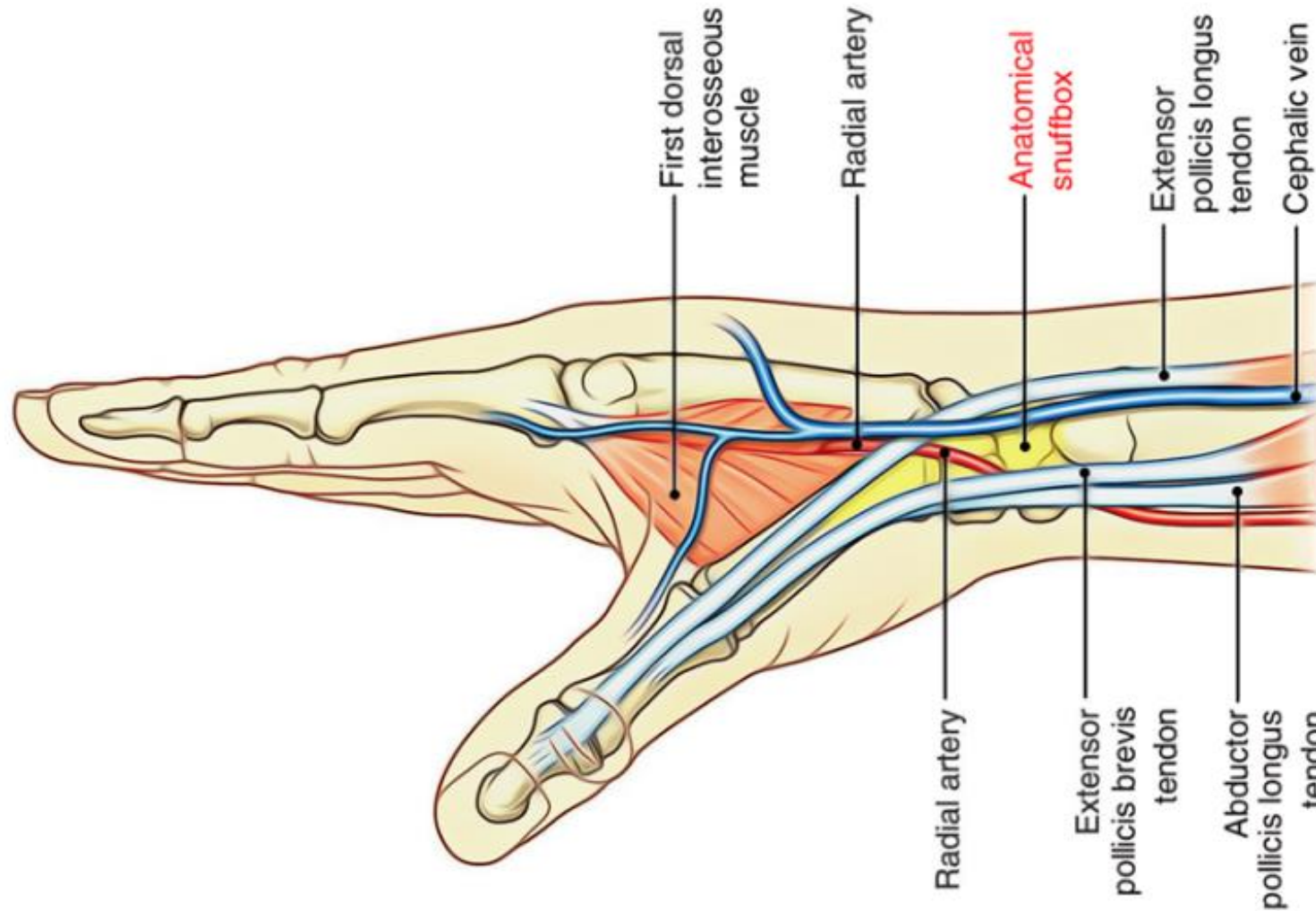
Jun-Won Lee

Wonju Severance Christian Hospital
Yonsei University Wonju College of Medicine

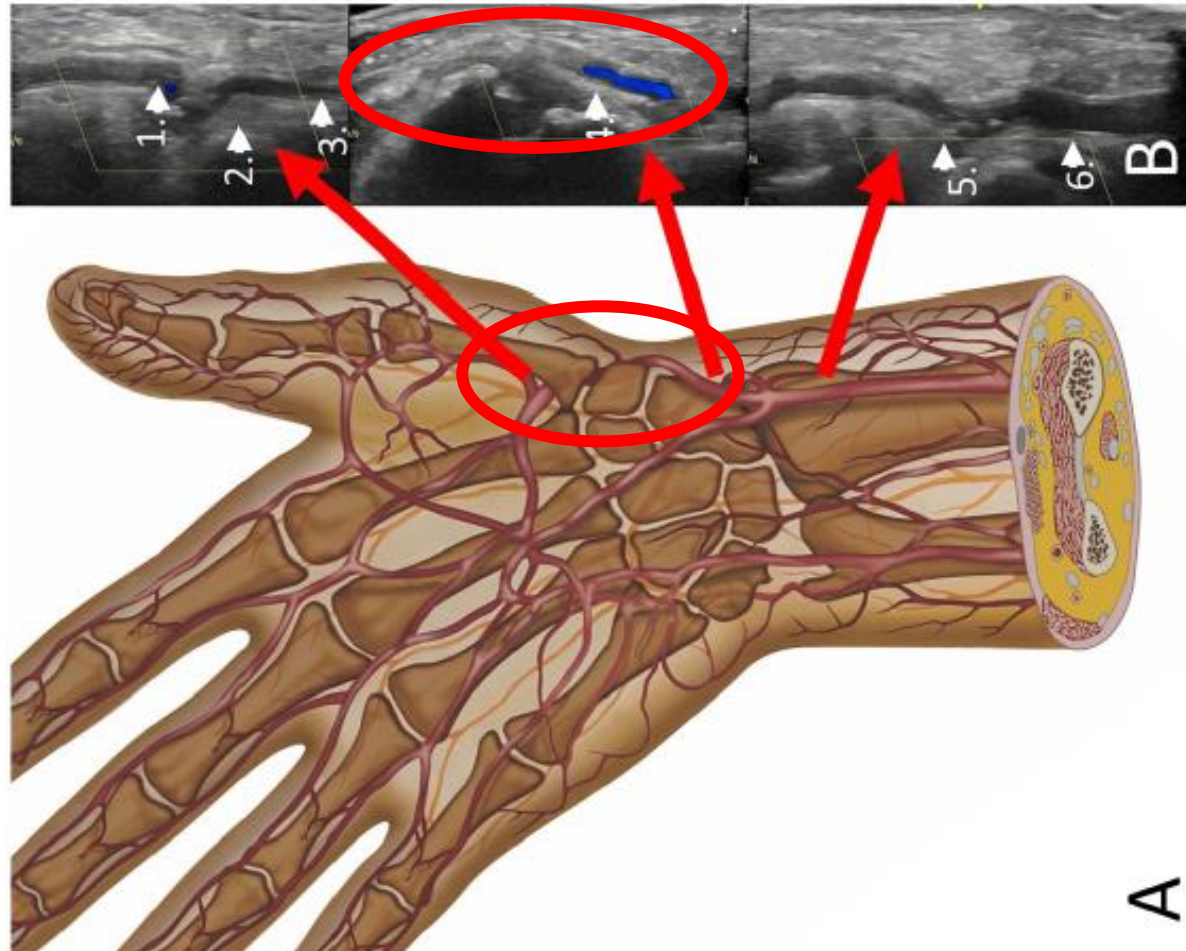
Concerns for successful CHIP



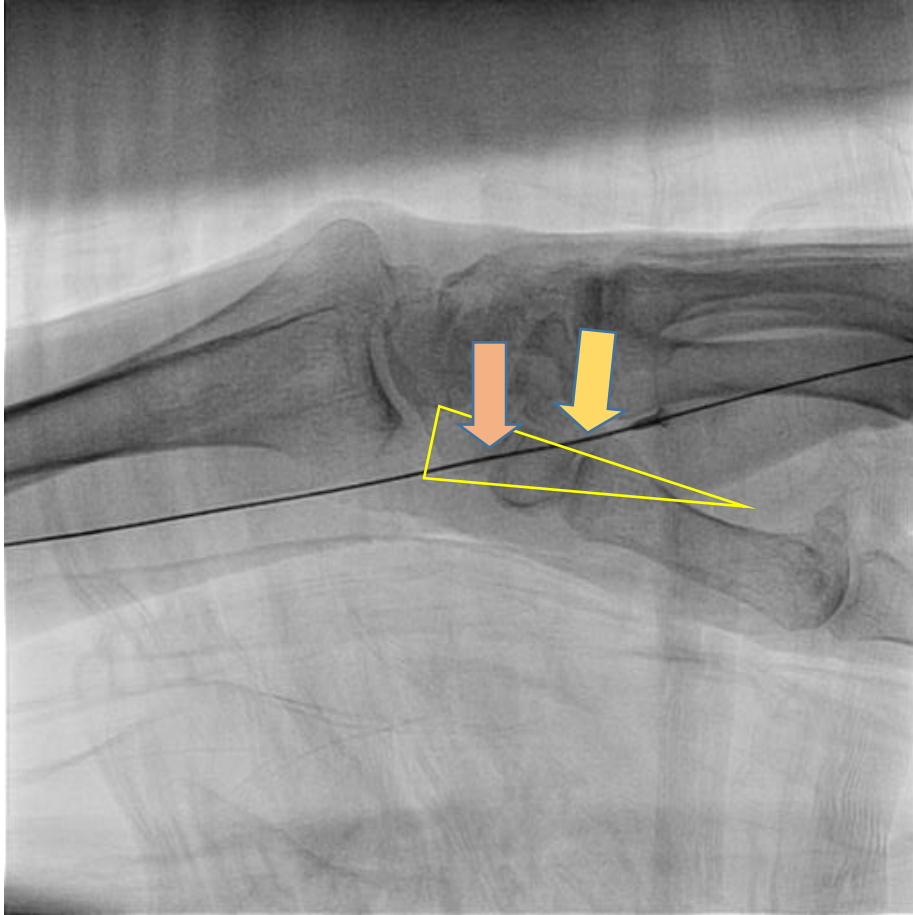
Anatomical Snuffbox



Anatomical Snuffbox



Available puncture site



Vascular access

| Recommendation | Class | Level |
|--|-------|-------|
| 2017 ESC STEMI guideline | | |
| Radial access is recommended over femoral access if performed by experience radial operator. | I | A |
| 2018 ESC guideline on myocardial revascularization | | |
| Radial access is recommended as the standard approach , unless there are overriding procedural considerations . | I | A |

Distal radial access: lack of evidence

| Randomized studies | Non randomized studies | Case reports |
|------------------------------------|---|---------------------------|
| 1. Koutouzis et al. 2018 (200 pts) | 1. Kiemeneij. 2017 (70 pts) | 1. Kontopodis et al. 2018 |
| | 2. Roghani-Dehkordi et al. 2018 (235 pts) | 2. Latsios et al. 2018 |
| | 3. Lee et al. LeDRA study. 2018 (200 pts) | 3. Pua et al. 2018 |
| | 4. Kim et al. 2018 (150 pts) | 4. Kim et al. 2018 |
| | 5. Coughlan et al. 2018 (94 pts) | 5. Berezhnoi et al. 2018 |
| | 6. Soydan et al. 2018 (54 pts) | 6. Sheikh et al. 2018 |
| | 7. Valsecchi et al. 2018 (52 pts) | 7. Bayam et al. 2018 |
| | 8. Ziakas et al. 2018 (49 pts) | |
| | 9. Gasparini et al. 2018 (41 CTO pts) | |
| | 10. Al-Azizi et al. (22 pts) | |

Real-world experience of the left distal transradial approach for coronary angiography and percutaneous coronary intervention: a prospective observational study (LeDRA)



Jun-Won Lee, MD; Sang Wook Park, MD; Jung-Woo Son, MD; Sung-Gyun Ahn, MD, PhD; Seung-Hwan Lee*, MD, PhD

Department of Internal Medicine, Yonsei University Wonju College of Medicine, Wonju, Republic of Korea

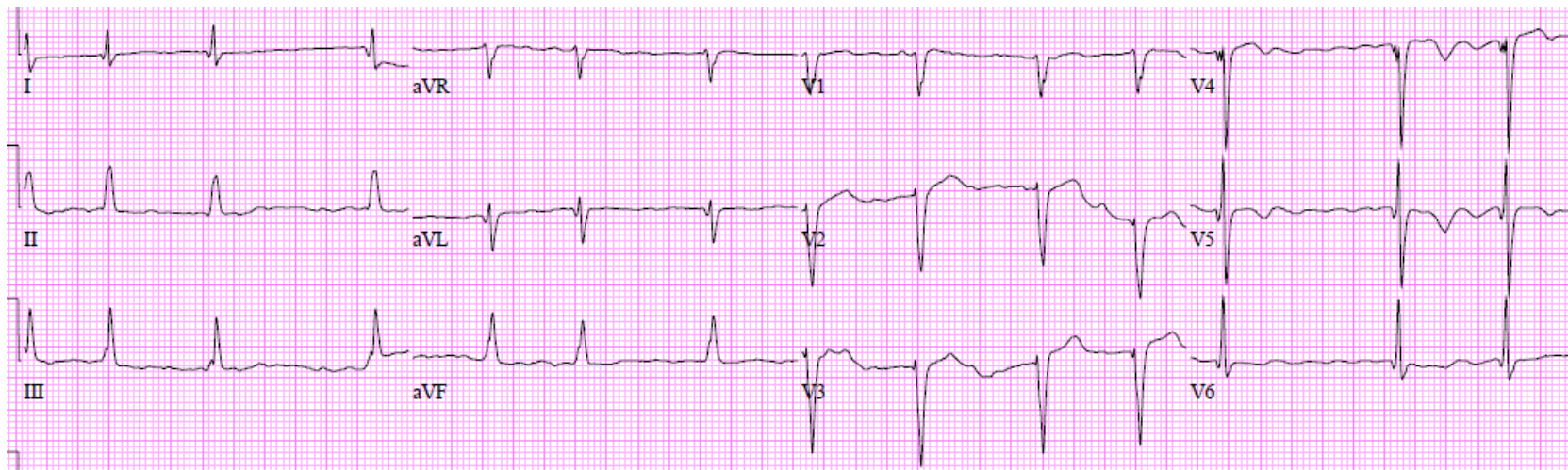
| Primary endpoints | | |
|--------------------------------------|-----------------|----------------|
| CAG success | | 187/187 (100) |
| PCI success | | 86/87 (98.9) |
| Secondary endpoints | | |
| Puncture success | | 191/200 (95.5) |
| Crossover | | 9 (4.5) |
| Left radial | | 7 (3.5) |
| Right distal radial | | 2 (1) |
| Clinical diagnosis | Stable angina | 38 (19) |
| | Unstable angina | 74 (37) |
| | NSTEMI | 45 (22.5) |
| | STEMI | 17 (8.5) |
| | Others | 26 (13) |
| At admission | | 15/191 (7.9) |
| BARC bleeding type 2, 3, 5 | | 0 (0) |
| Minor haematoma | | 14 (7.4) |
| Haematoma grade | <2 cm | 10 (5.2) |
| | 2-5 cm | 1 (0.5) |
| | >5 cm | 3 (1.6) |
| Distal radial artery occlusion | | 0 (0) |
| Perforation | | 0 (0) |
| Pseudoaneurysm | | 0 (0) |
| Dissection | | 1 (0.5) |
| Arteriovenous fistula | | 0 (0) |
| 1-month follow-up by ultrasonography | | 2/141 (1.4) |
| Distal radial artery occlusion | | 0 (0) |
| Neuropathy | | 2 (1.4) |

PCI for lesion complexity

| Patients who underwent PCI (n=87) | | |
|-----------------------------------|--------------------------|---------------|
| PCI performed | | 87/191 (45.5) |
| Ad hoc | | 78/87 (89.7) |
| Staged | | 9/87 (10.3) |
| Culprit lesion | Left main | 6 (6.9) |
| | Left anterior descending | 47 (54) |
| | Left circumflex | 6 (6.9) |
| | Right coronary artery | 28 (32.2) |
| Bifurcation | | 28 (32.2) |
| In-stent restenosis | | 9 (10.3) |
| Chronic total occlusion | | 8 (9.8) |
| Guiding catheter | 5 Fr | 5 (5.7) |
| | Sheathless 6.5 Fr | 19 (21.8) |
| | 6 Fr | 62 (71.3) |
| | 7 Fr | 1 (1.1) |
| Use of IVUS | | 55 (63.2) |

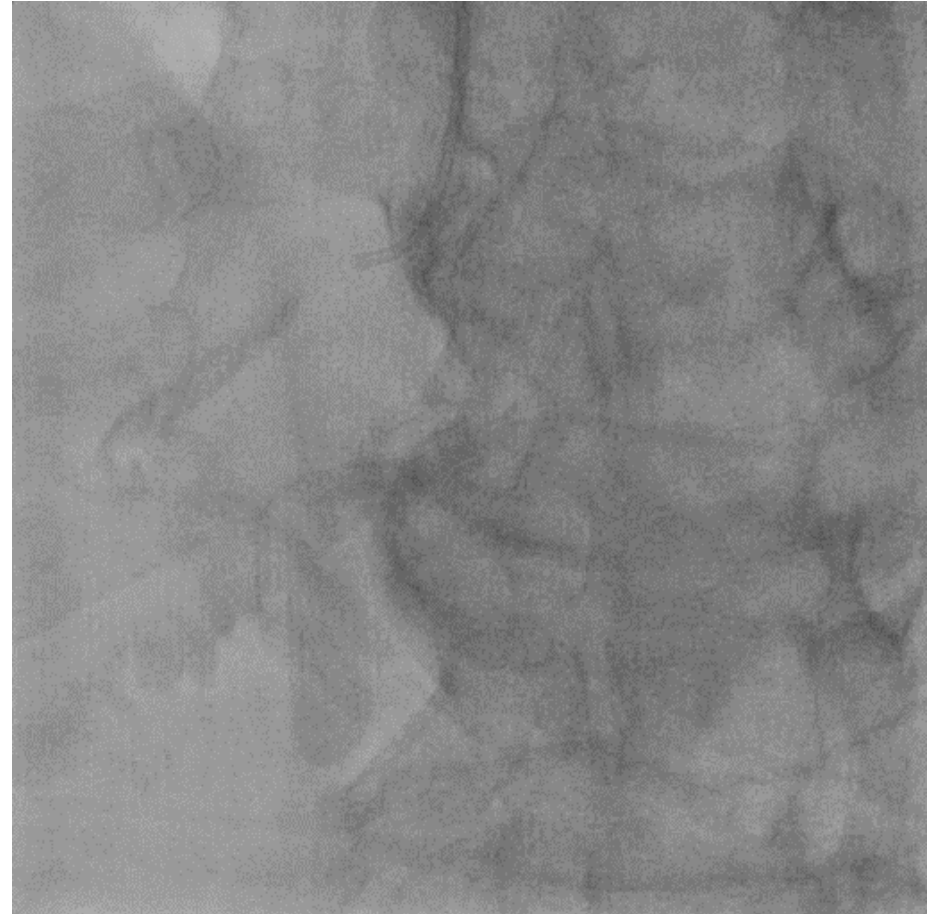
Case 1 : MVD with heavy calcification

- 92 year-old / Male
- Underlying A-fib, hypertension
- Dyspnea on exertion
- Echo: LVEF 48%, Akinesia on LAD territory

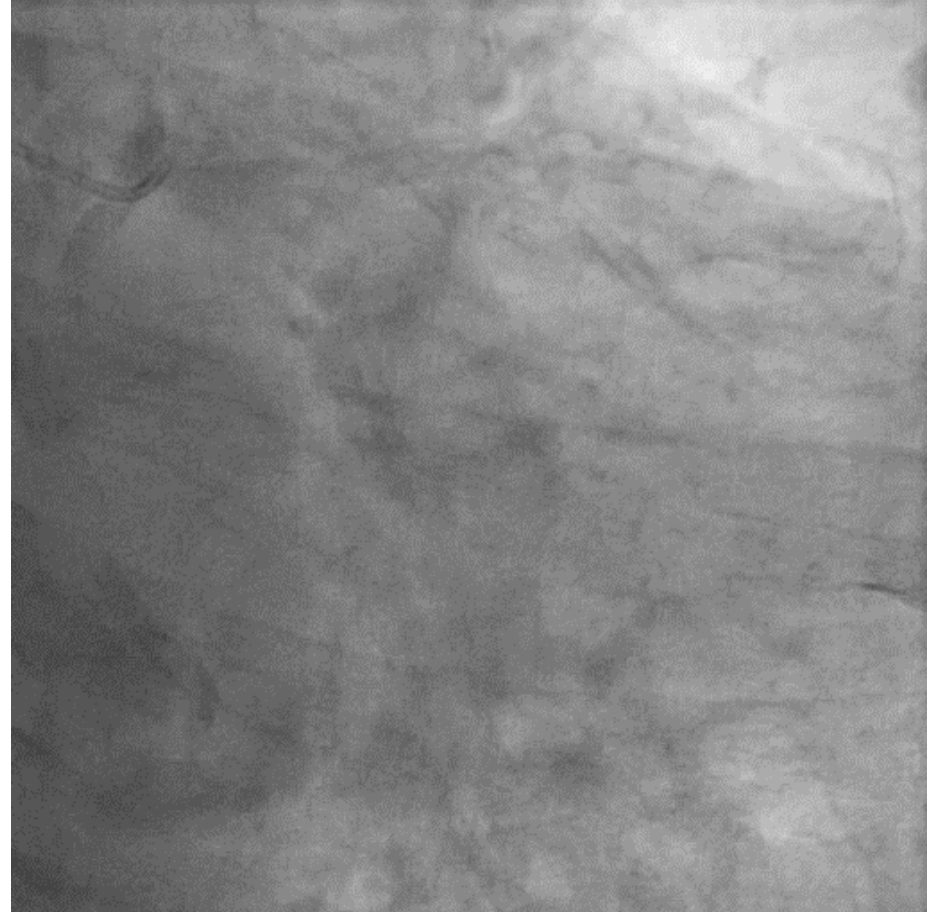
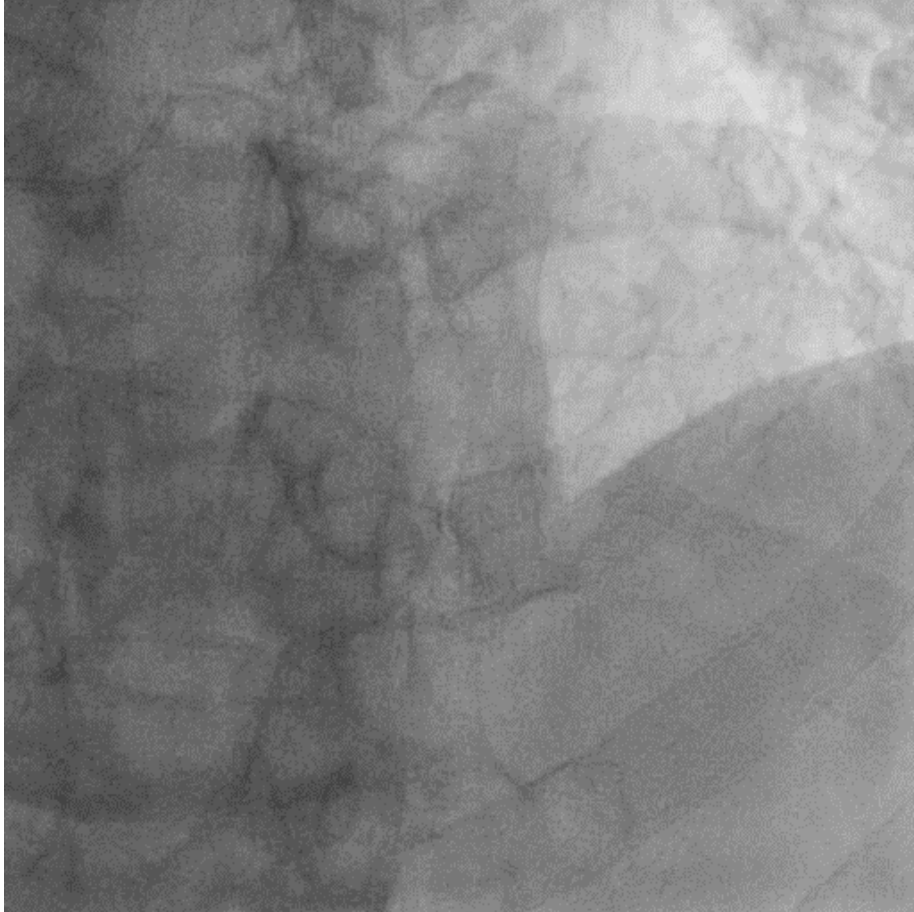


RCA

diffuse narrowing, calcification, recanalized thrombus



LAD, LCX: diffuse, calcified lesion



Strategy

- **CABG** recommendation: Patient refused
- He visited other hospital for **second opinion** and waited for scheduled PCI 2 weeks later.
- Patient visited out-patient clinic again because of **aggravated dyspnea**.
- **He wanted to perform PCI** in our hospital.

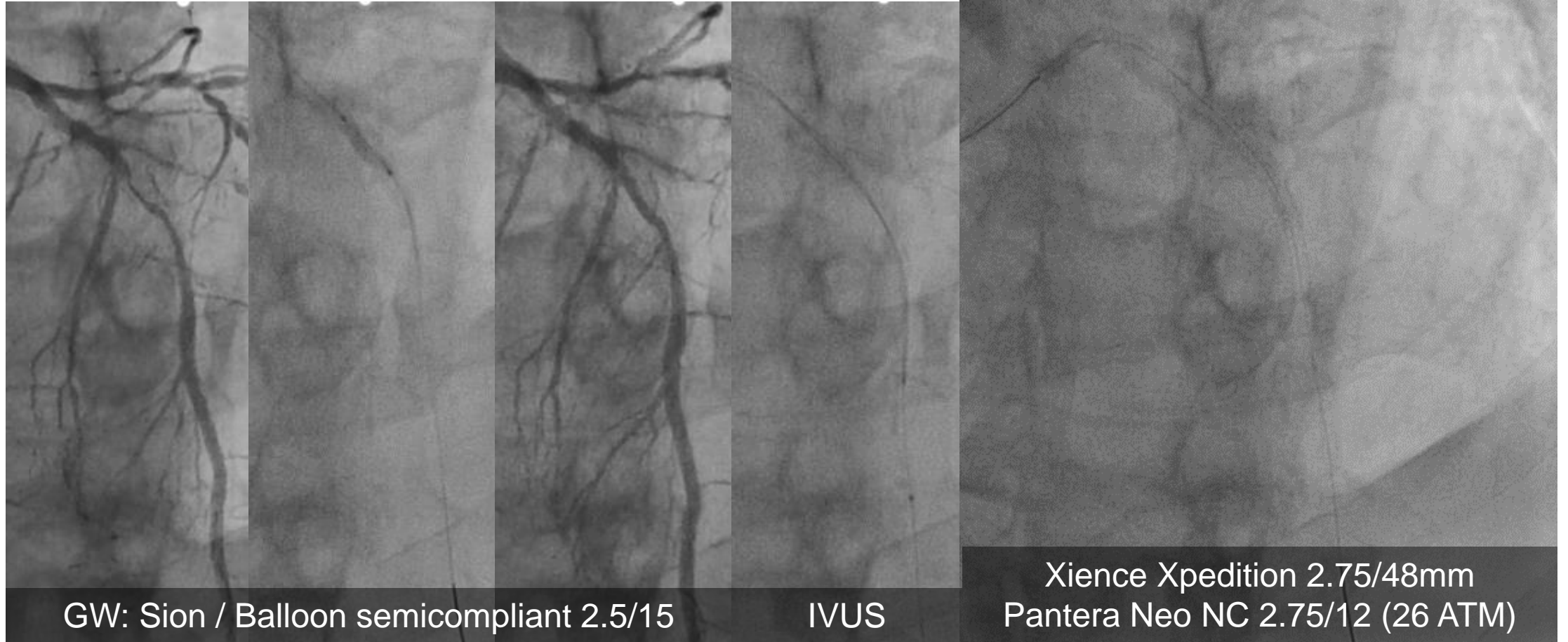
- **Comorbidities**: old age, fragile, A-fib, Hypertension
- **Hemodynamics**: LVEF 48%
- **Complex anatomy**: multivessel disease, heavy calcification.

- **ICU preparation**
- **Ready for emergent situations**: intubation, IABP, Rotablation atherectomy
- **Both femoral areas were disinfected**, then...

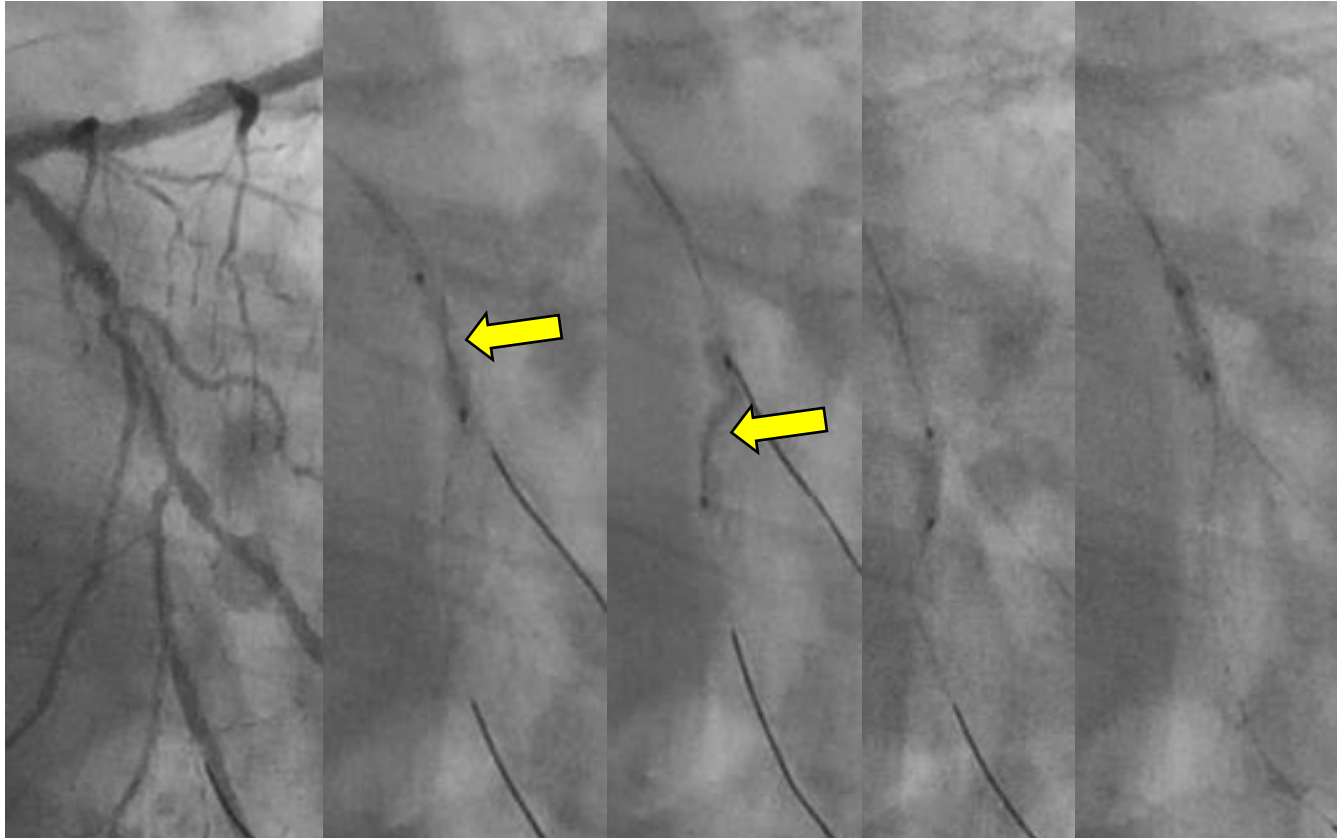
Distal radial approach (6Fr sheath)



LAD PCI (6Fr XB 3.5)



LCX PCI

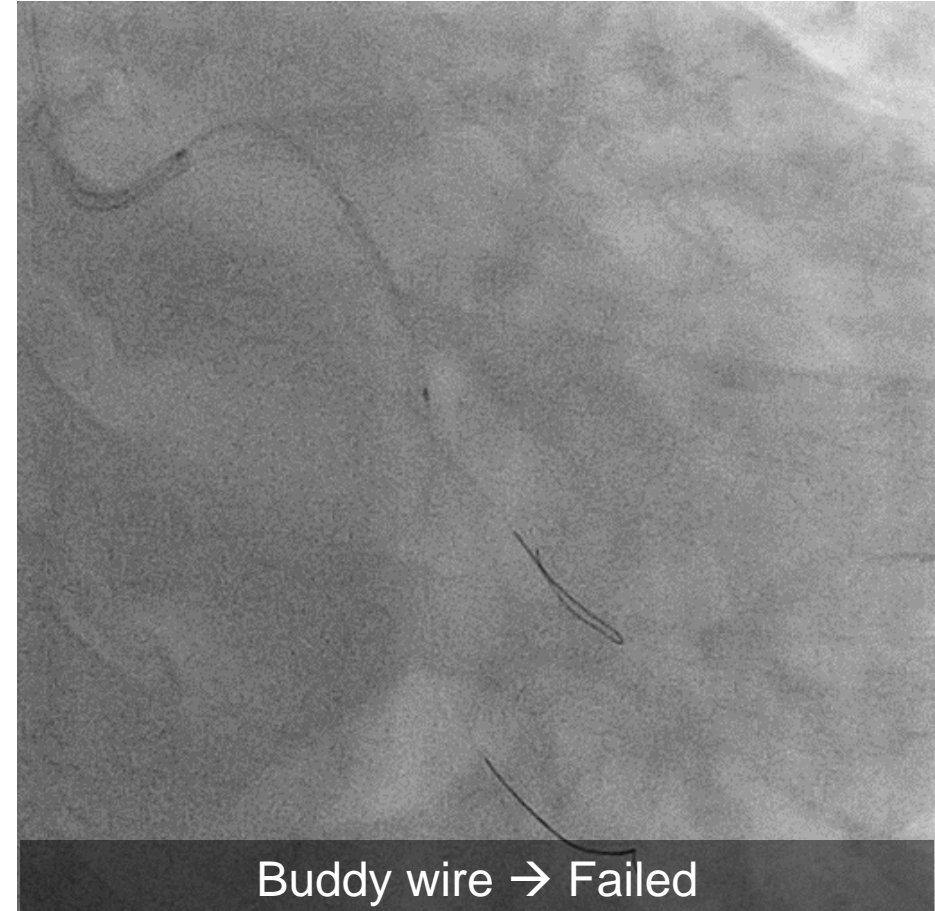
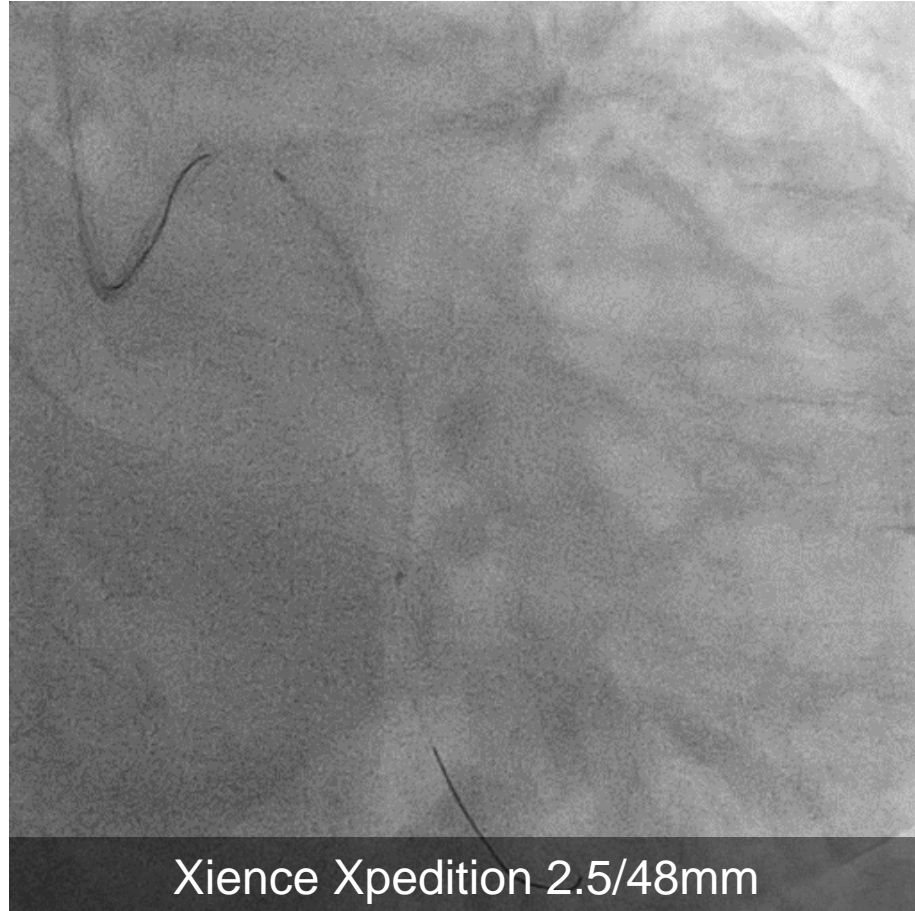


GW: Sion / Semicompliant 2.0/15 → NC 2.5/10

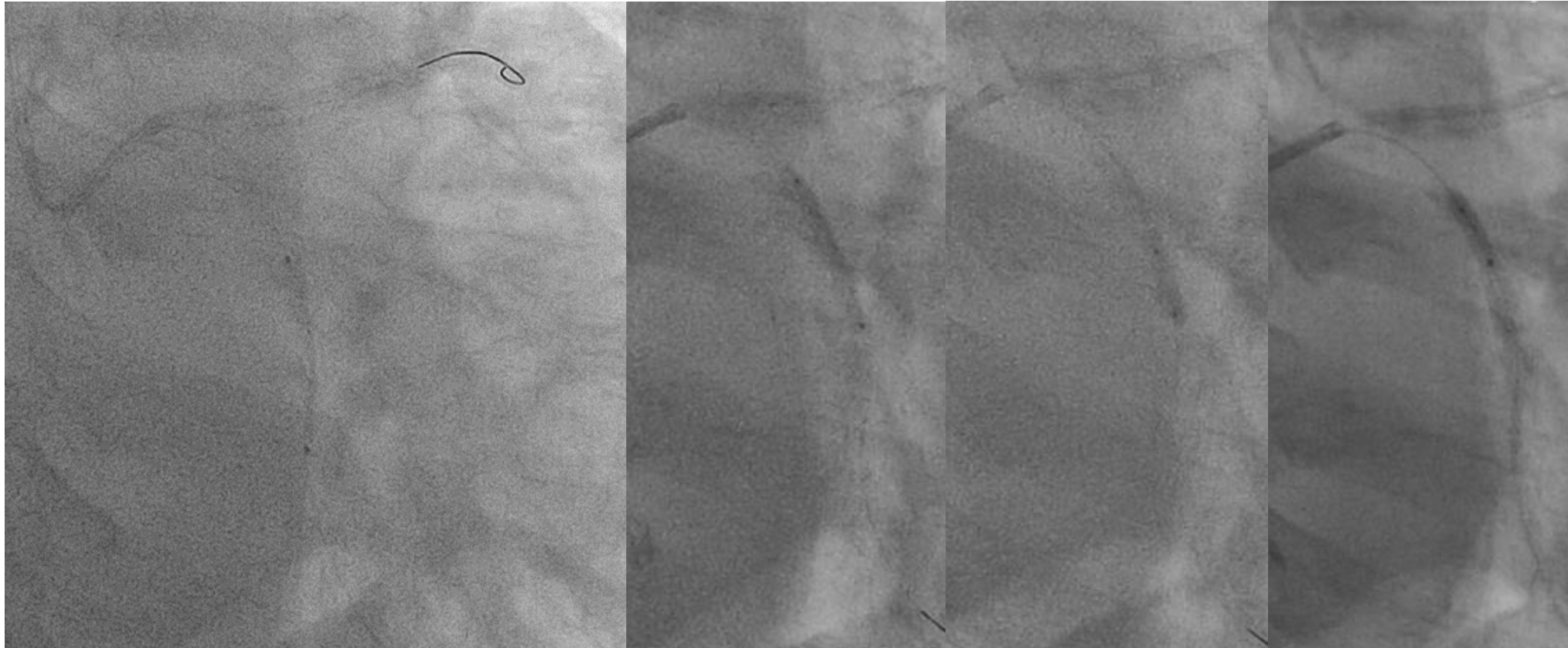


Balloon-induced dissection

Stent passing failure (buddy wire)



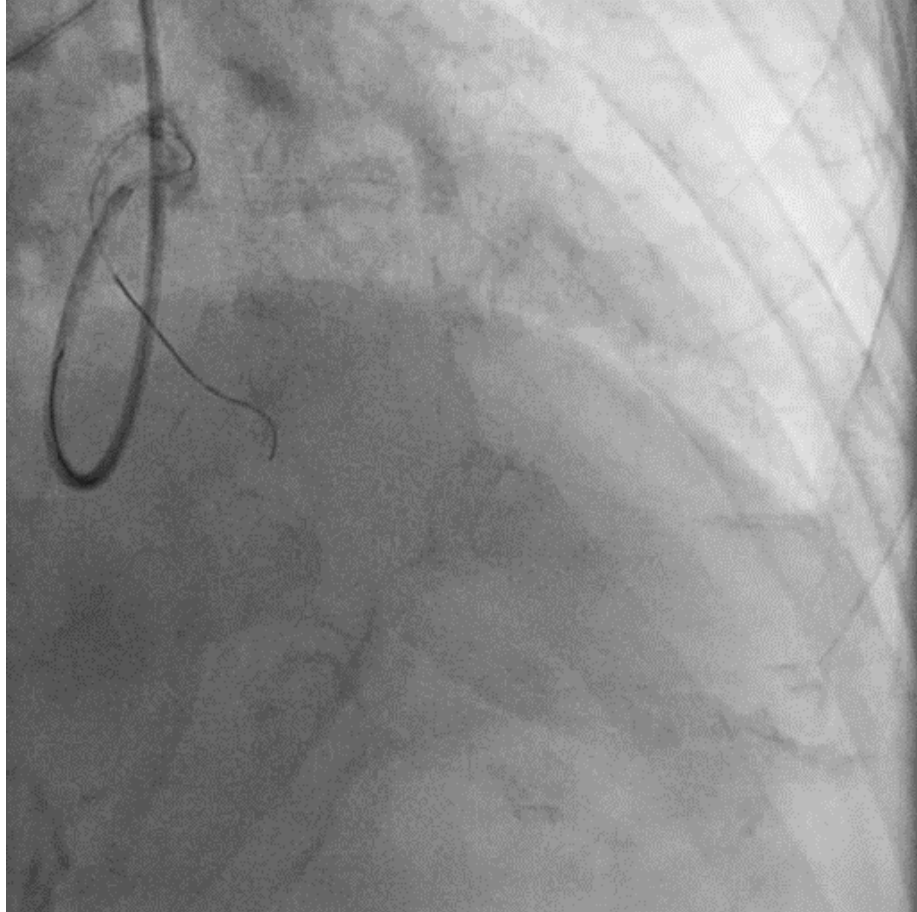
1. Extension Guiding catheter ?
2. Shorter & upgraded stent ?



Xience Sierra 2.25/28mm

Xience Sierra 2.55/23mm → Fine NC 2.5/10 (20 ATM)

Final angiography



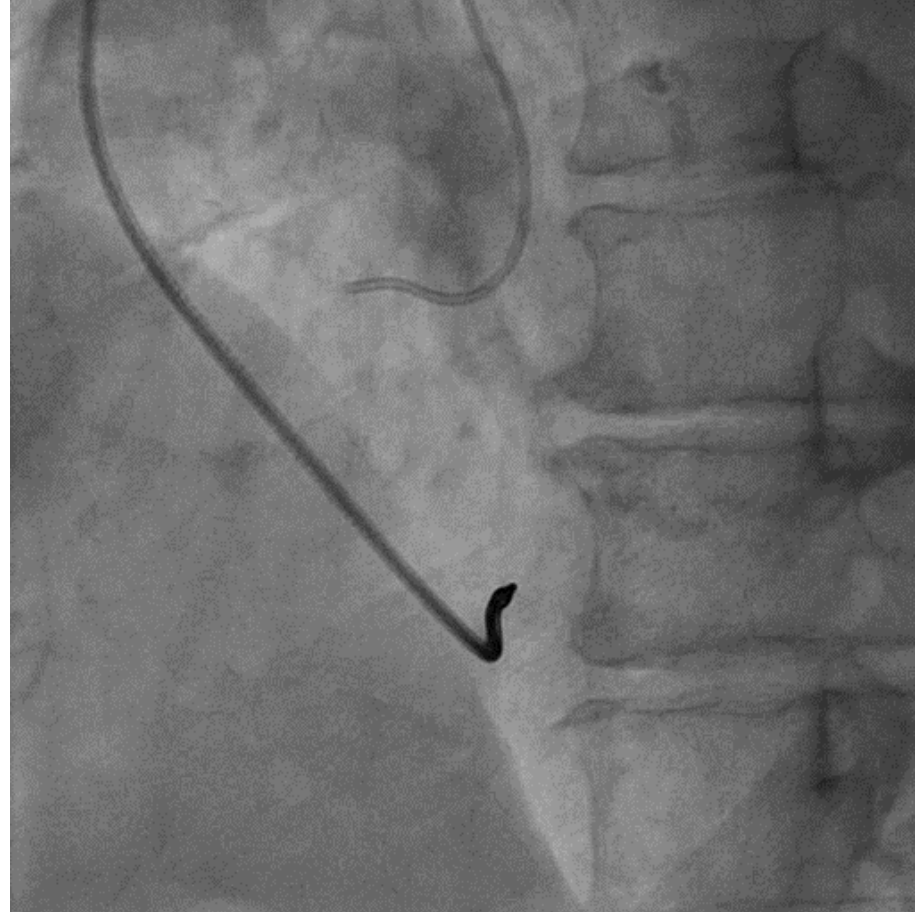
Case 2. Lt main bifurcation

- 79 year-old male
- Risk factors: Hypertension, Diabetes, Ex-smoker
- Jan 2009: PAOD (Right femoro-popliteal thrombotic occlusion: thrombectomy)
- Feb 2016: CAOD 2-VD (medical treatment), PTA at Rt. CFA, mid-SFA with stent
- Feb 2017: Complete heart block → DDD permanent pacemaker
- Feb 2017: Total occlusion at right internal carotid artery
- Jan 2018: Chest pain, dyspnea aggravation

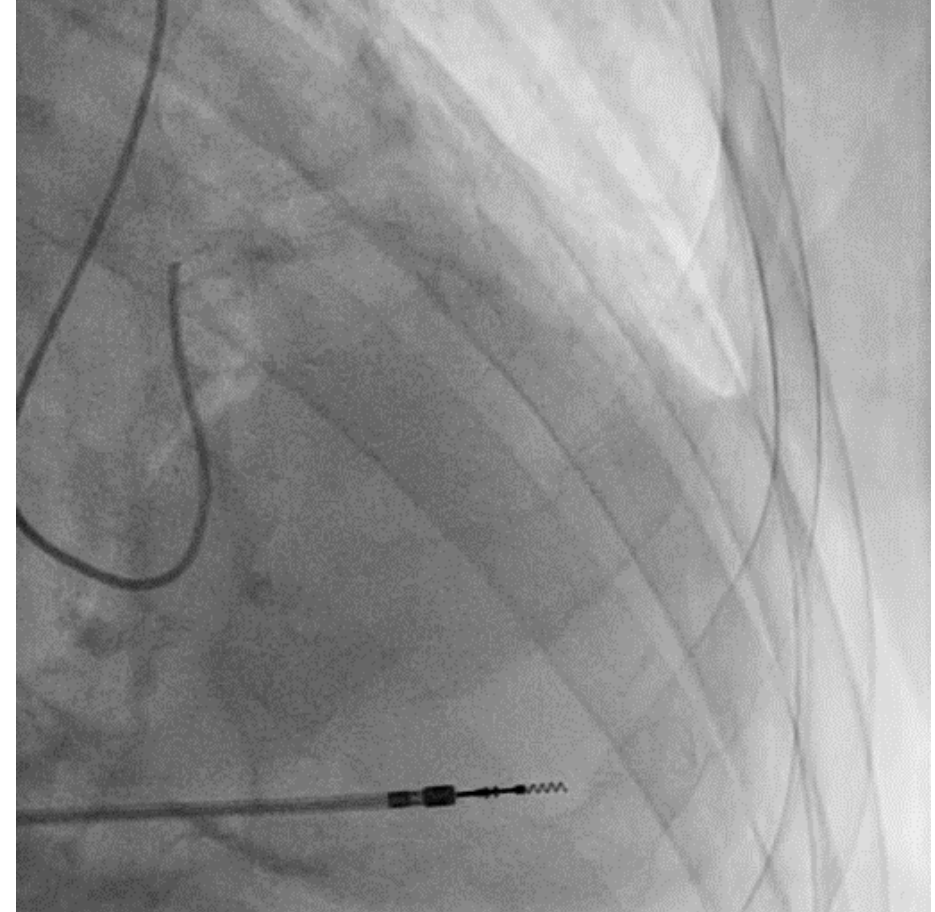
Left distal radial approach



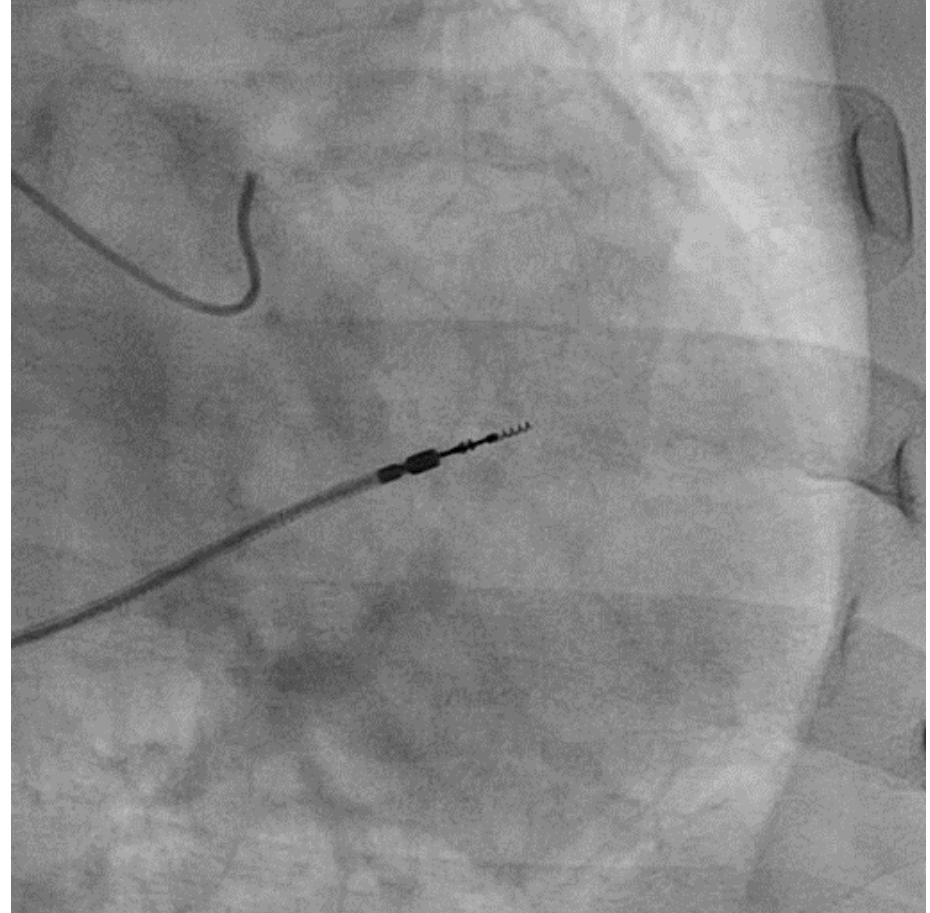
RCA



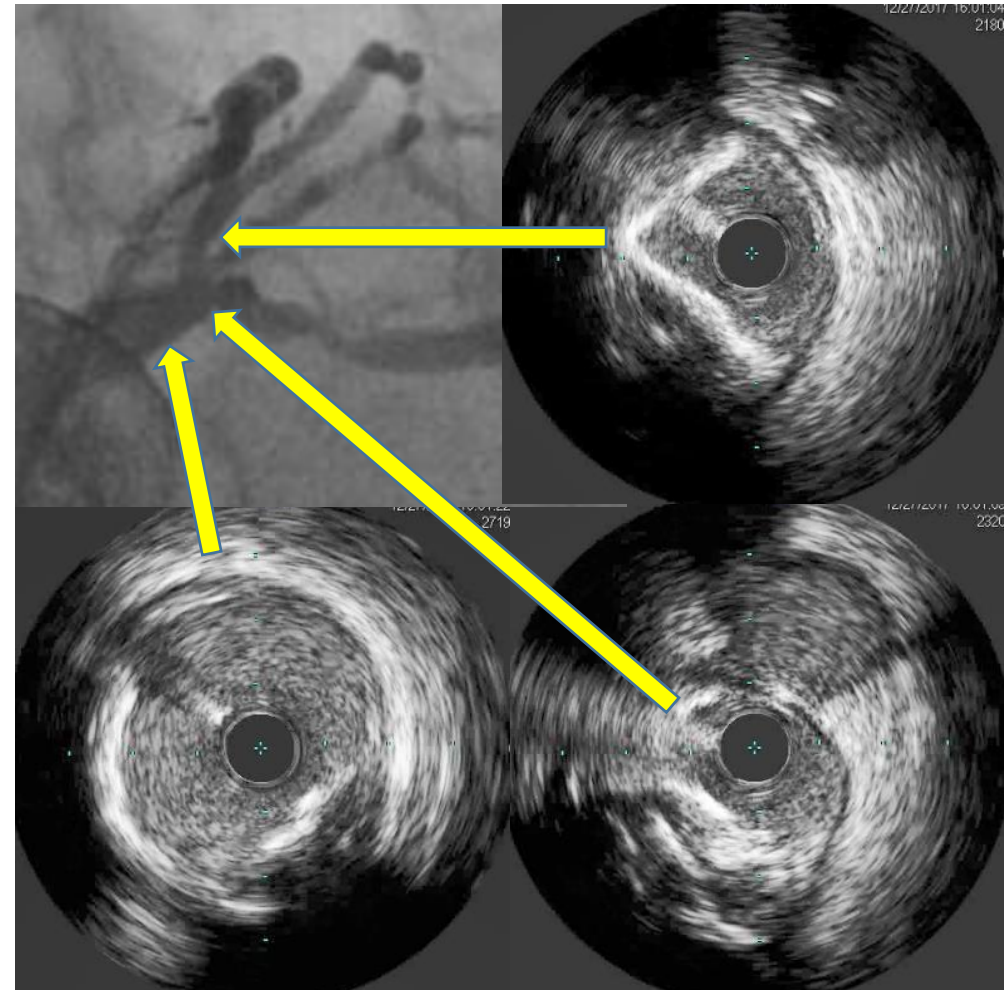
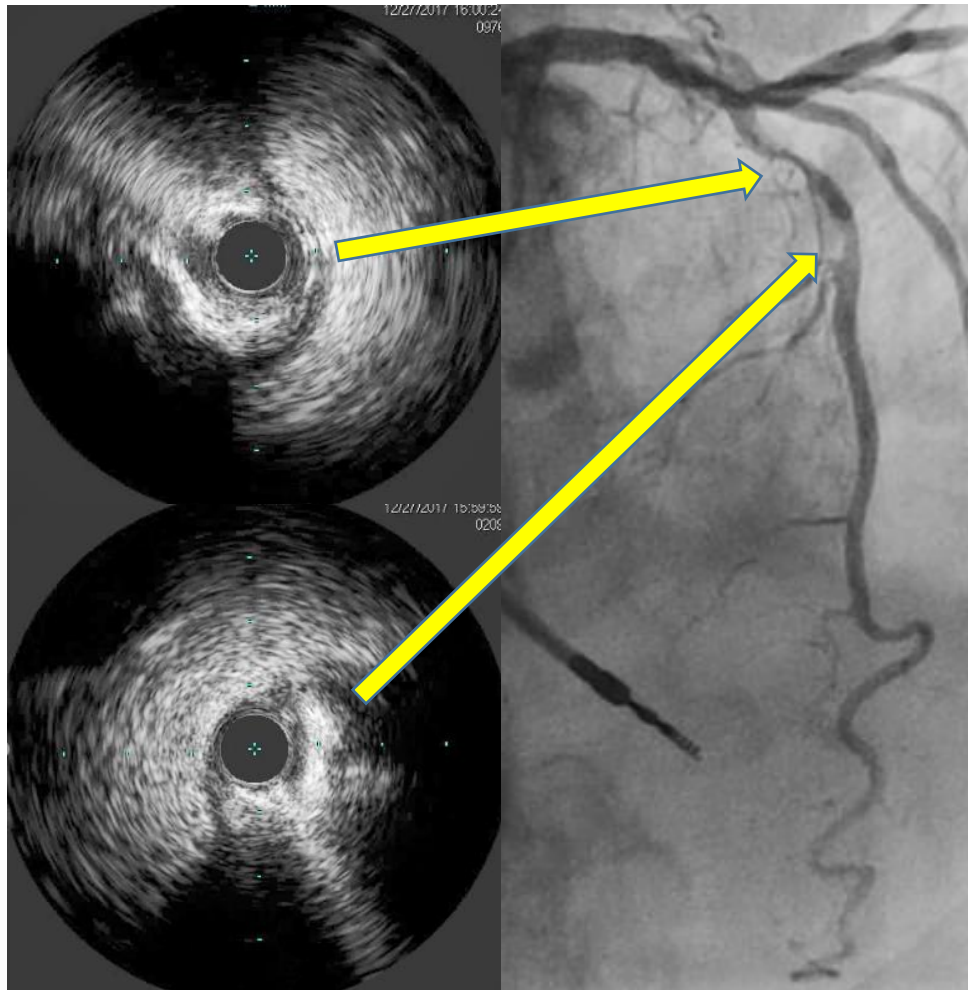
LAD



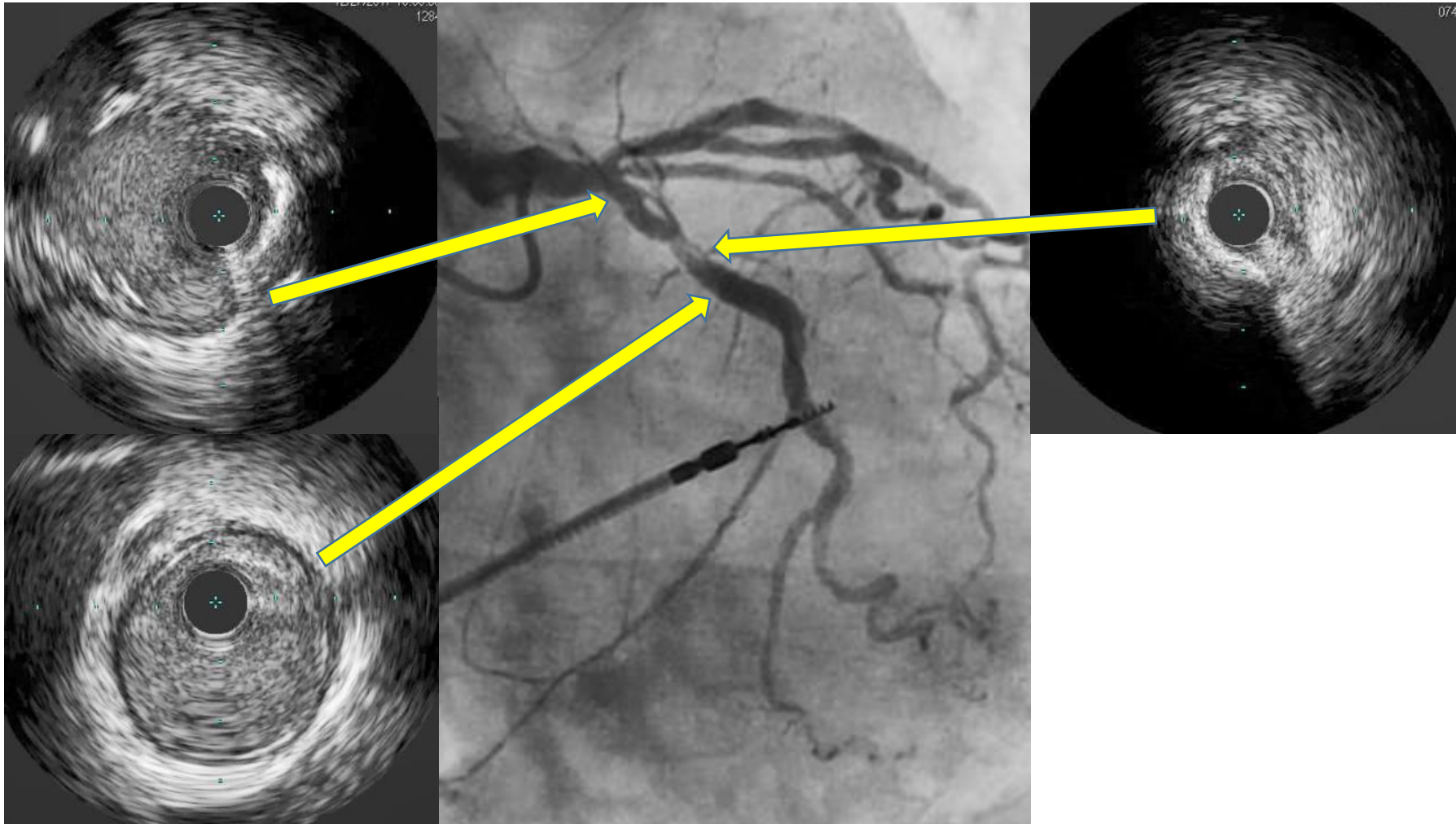
LCX



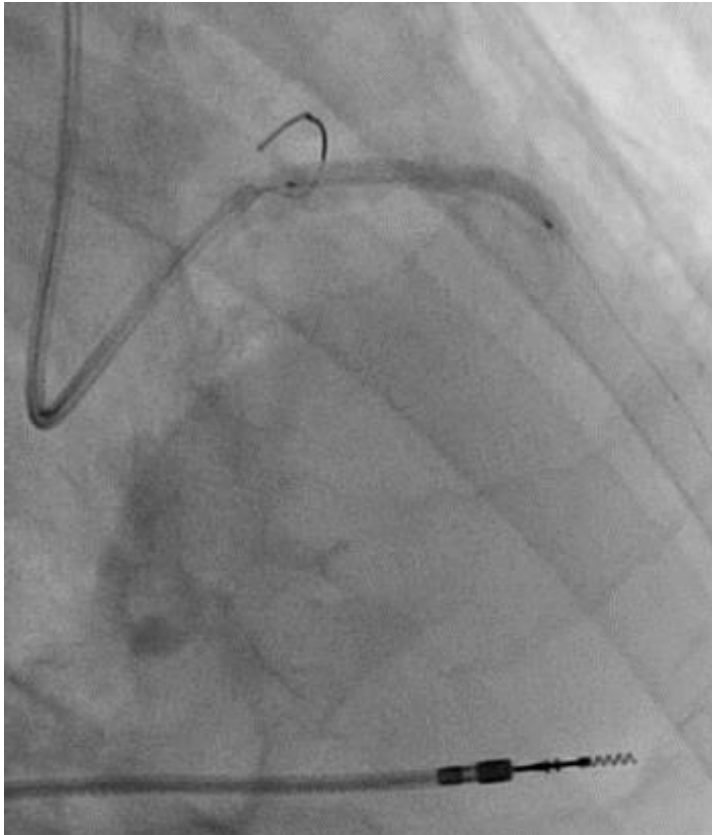
IVUS finding (LAD)



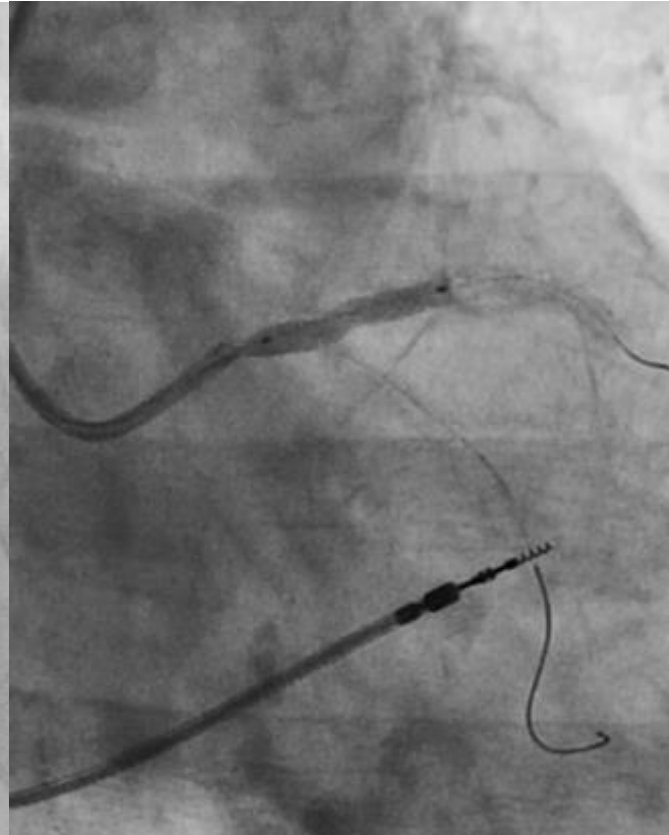
IVUS finding (LCX)



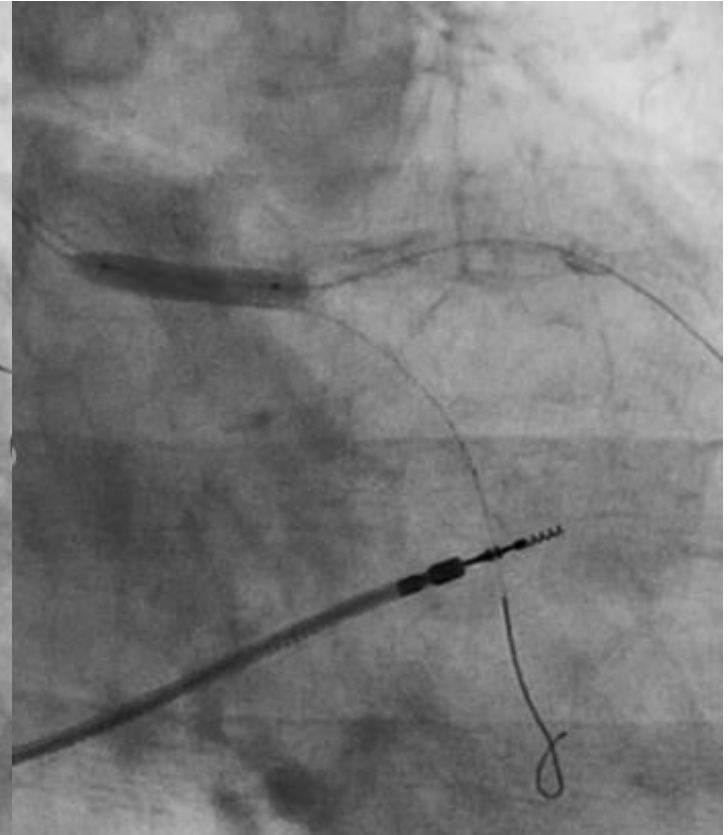
LAD PCI (6Fr XB 3.0)



Orsiro 2.5/26

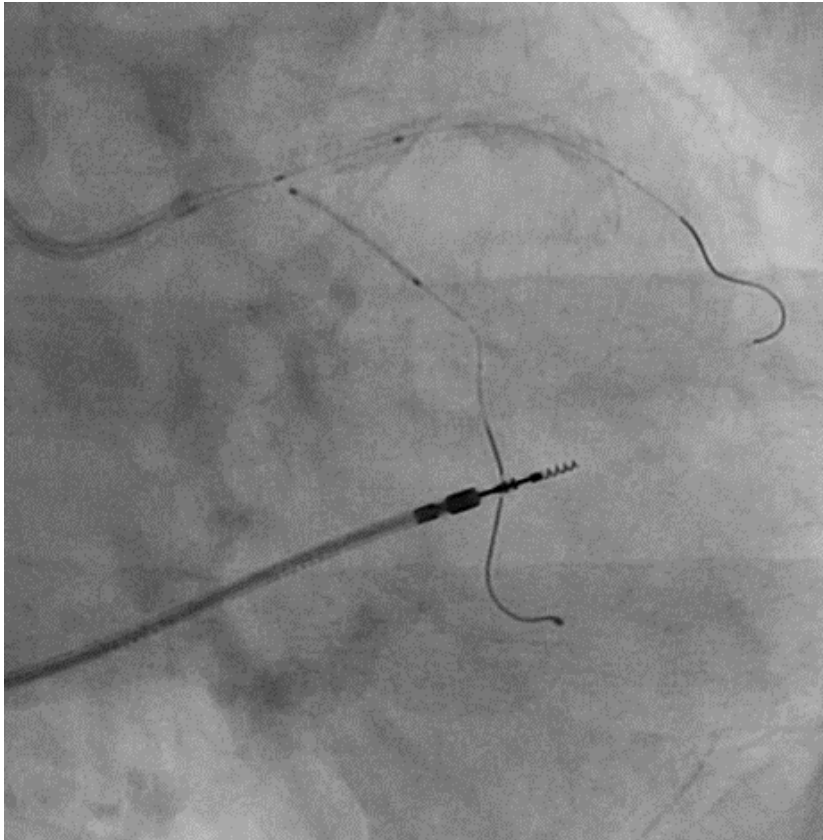


Orsiro 3.0/15

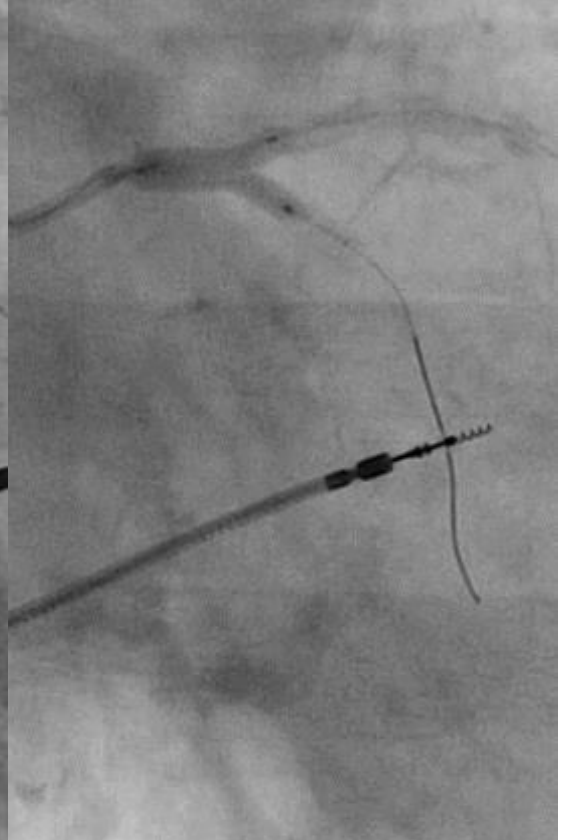
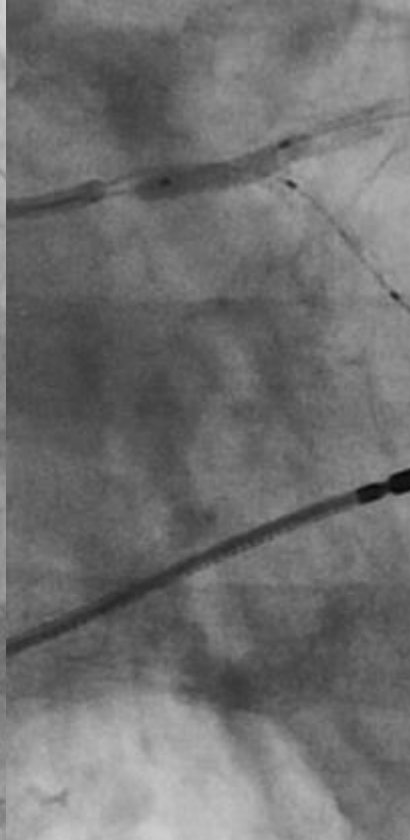
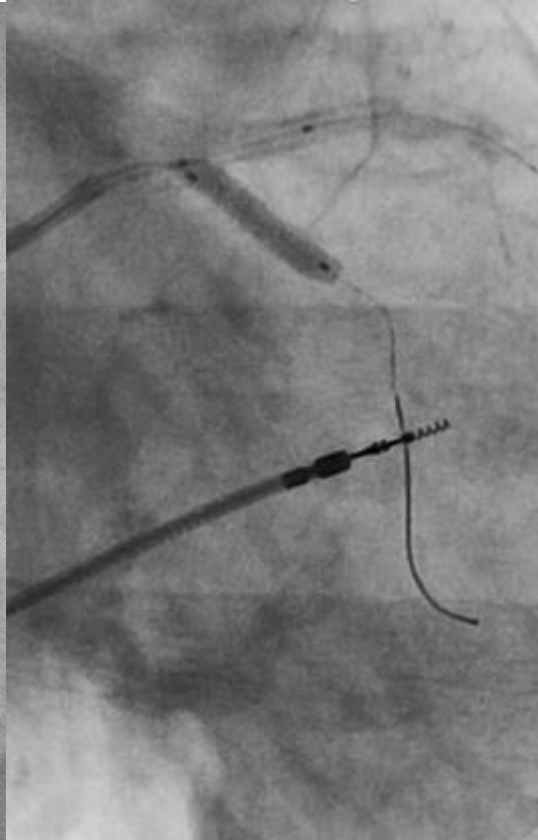


Proximal optimization

Provisional T-stent strategy

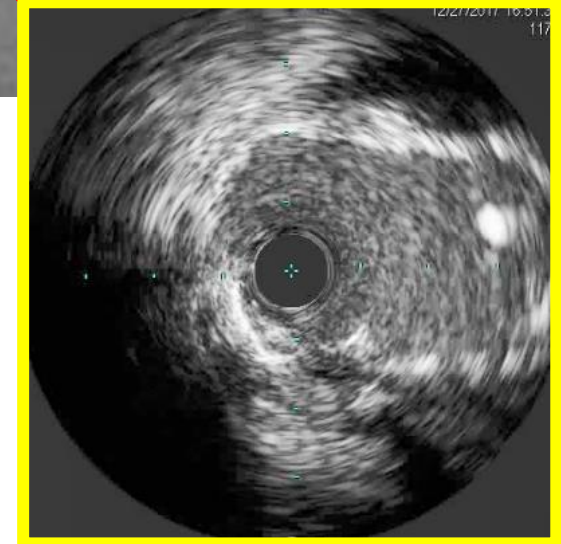
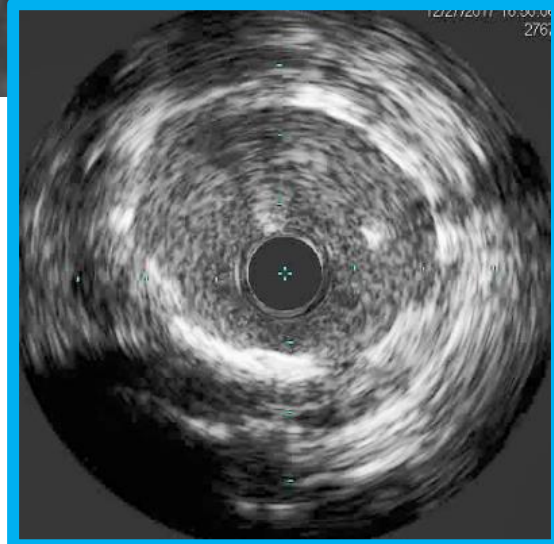
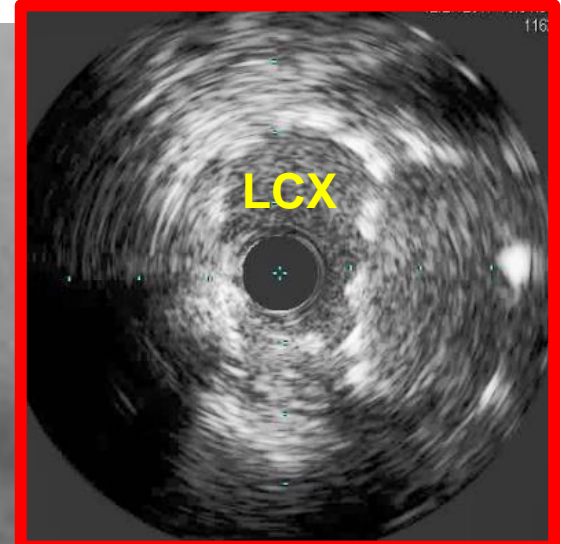
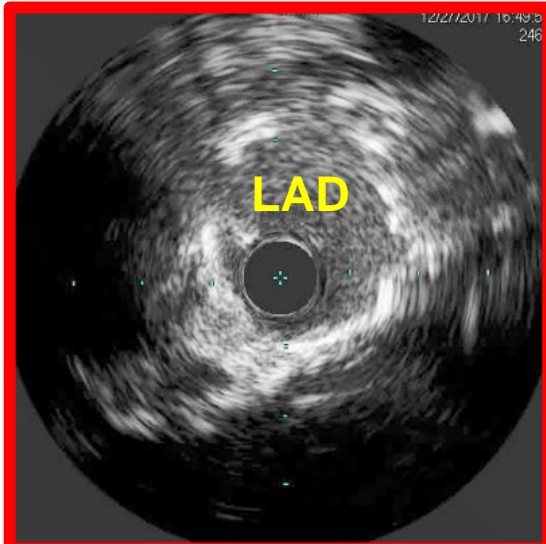


Orsiro 3.0/15

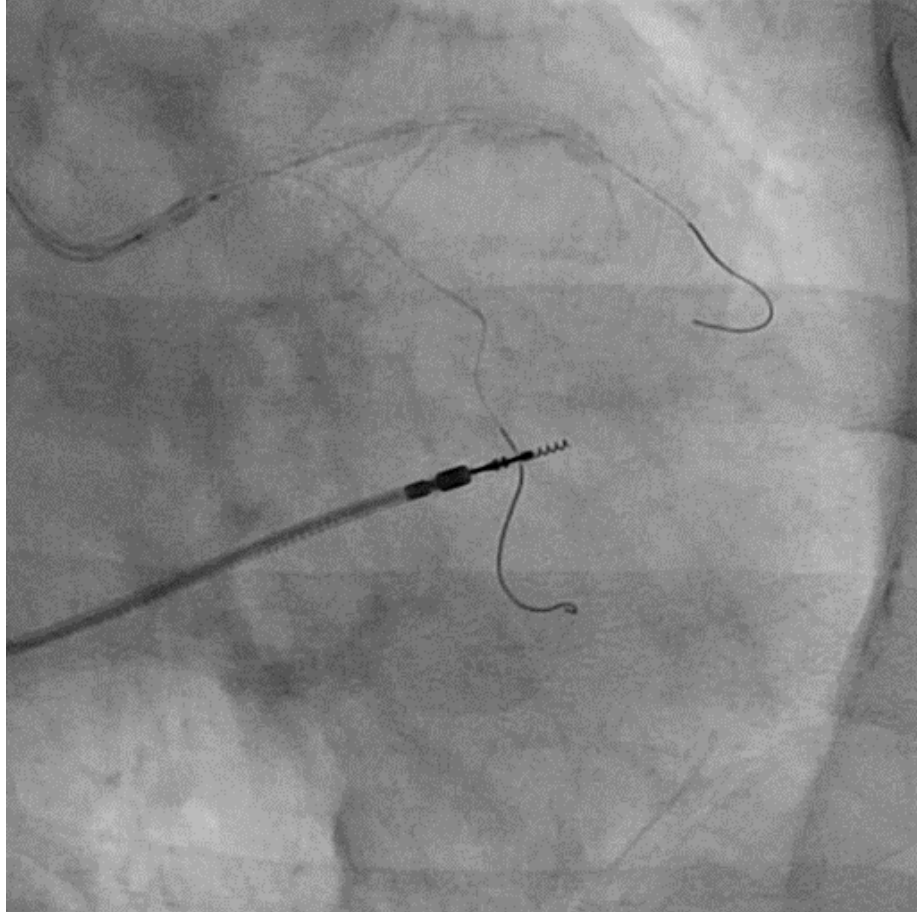


Kissing : Fine 2.5/15 & Stent balloon 3.0/15

IVUS finding (Bifurcation)



Final angiography



Case 3. mLAD calcified CTO

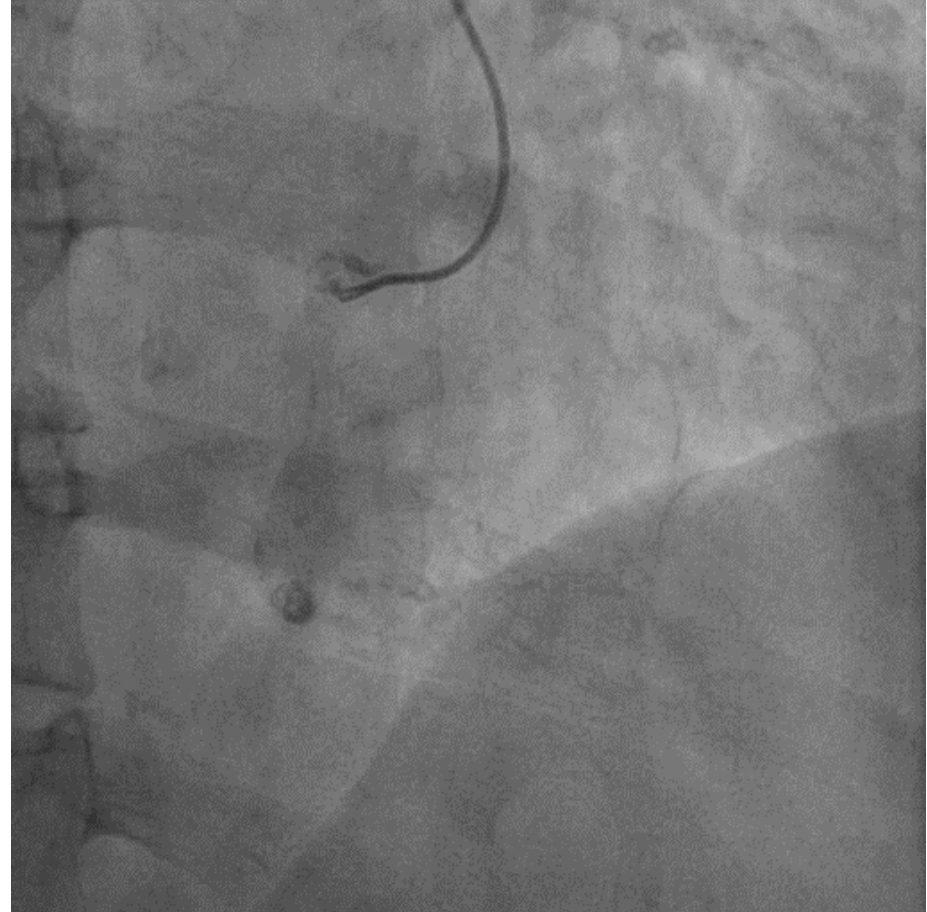
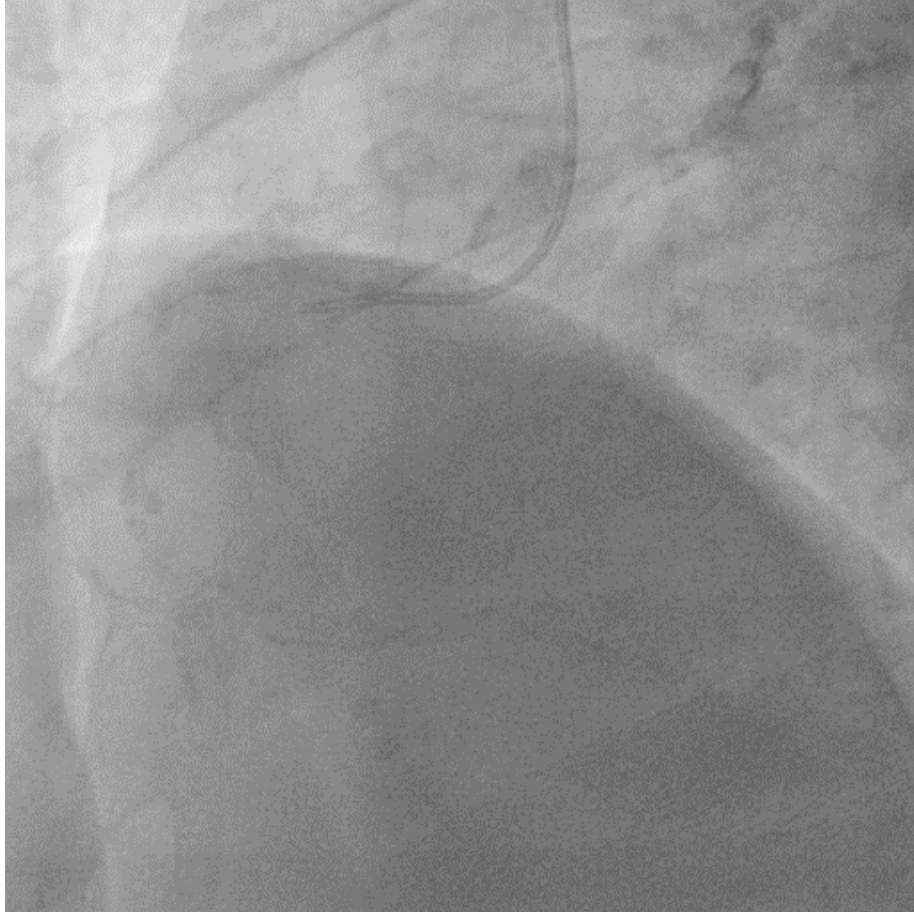
→ Rotablation atherectomy

- 64 year-old male
- CC: chest pain during walking (aggravated during 1 week)
- CT from referred hospital: Multiple coronary calcification
- Risk factors: Hypertension, DM, Old CVA, Dyslipidemia
- Current smoker: 20 pack x years
- Alcohol: Daily Soju 1 bottle
- Echo: LVEF 67%, No regional wall motion abnormality

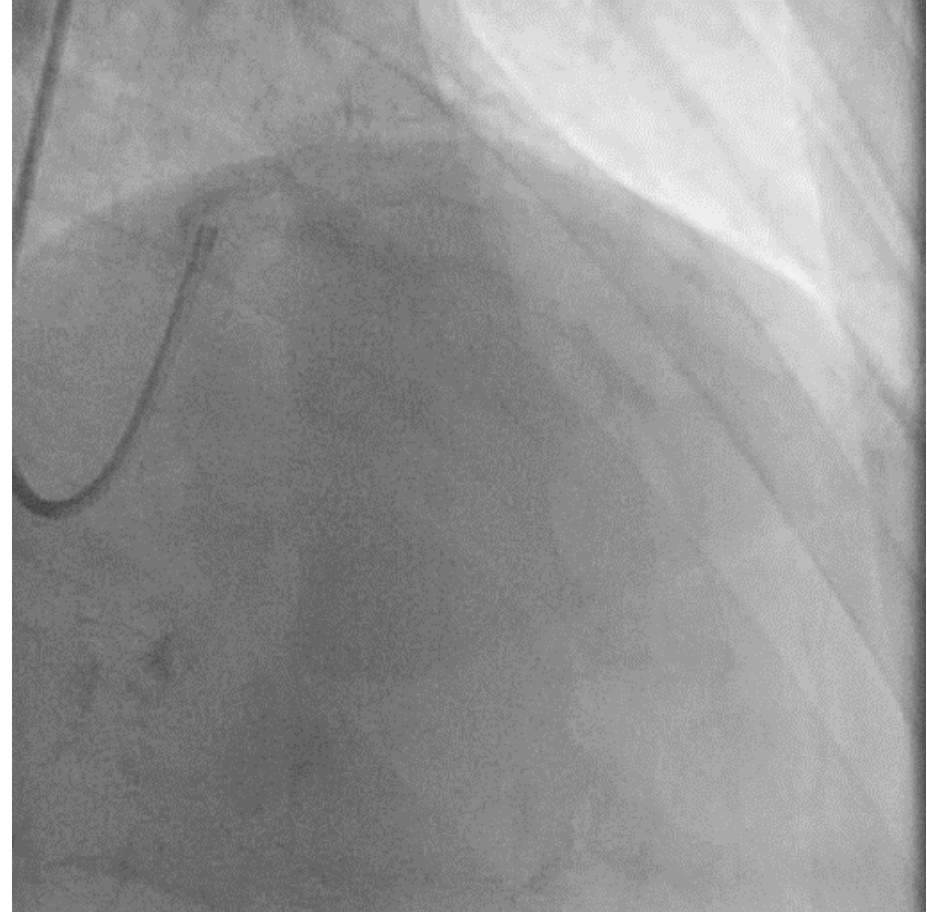
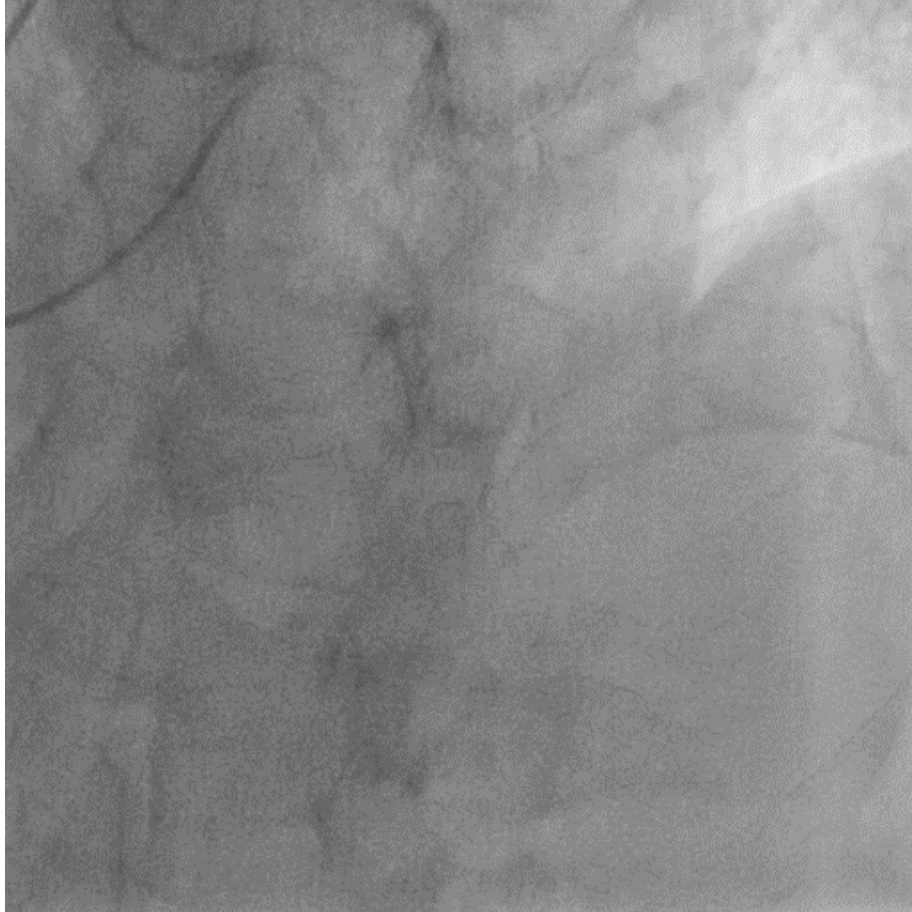
DRA angiography



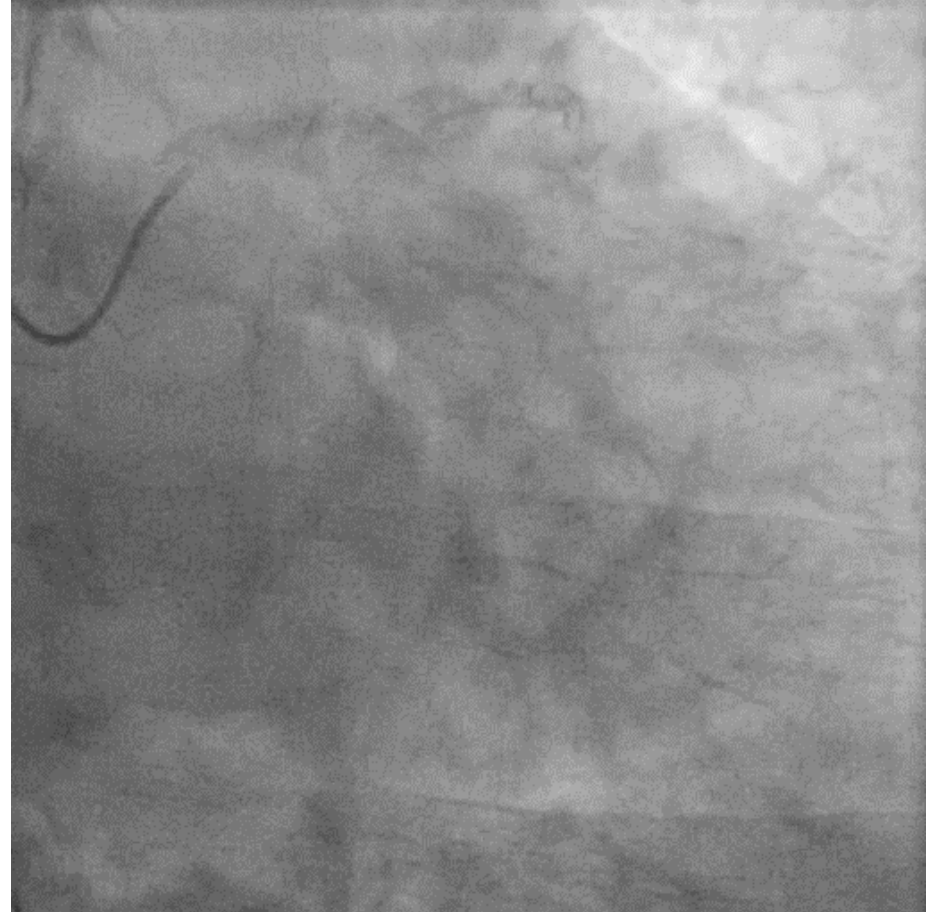
RCA



LAD



Lt main & LCX

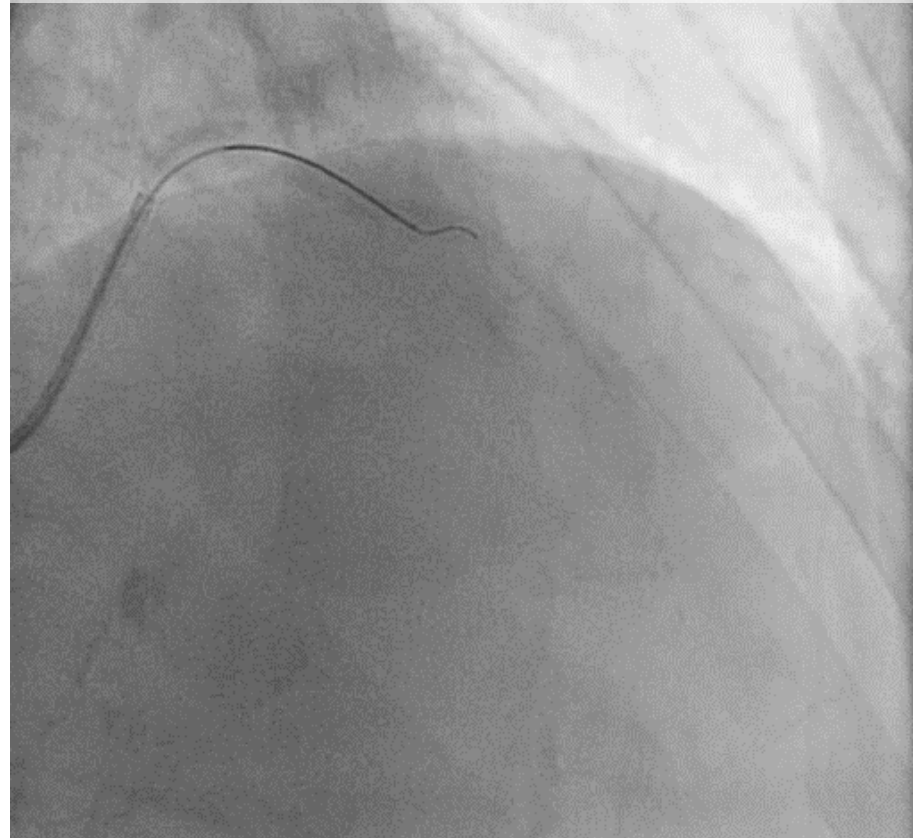


Problem

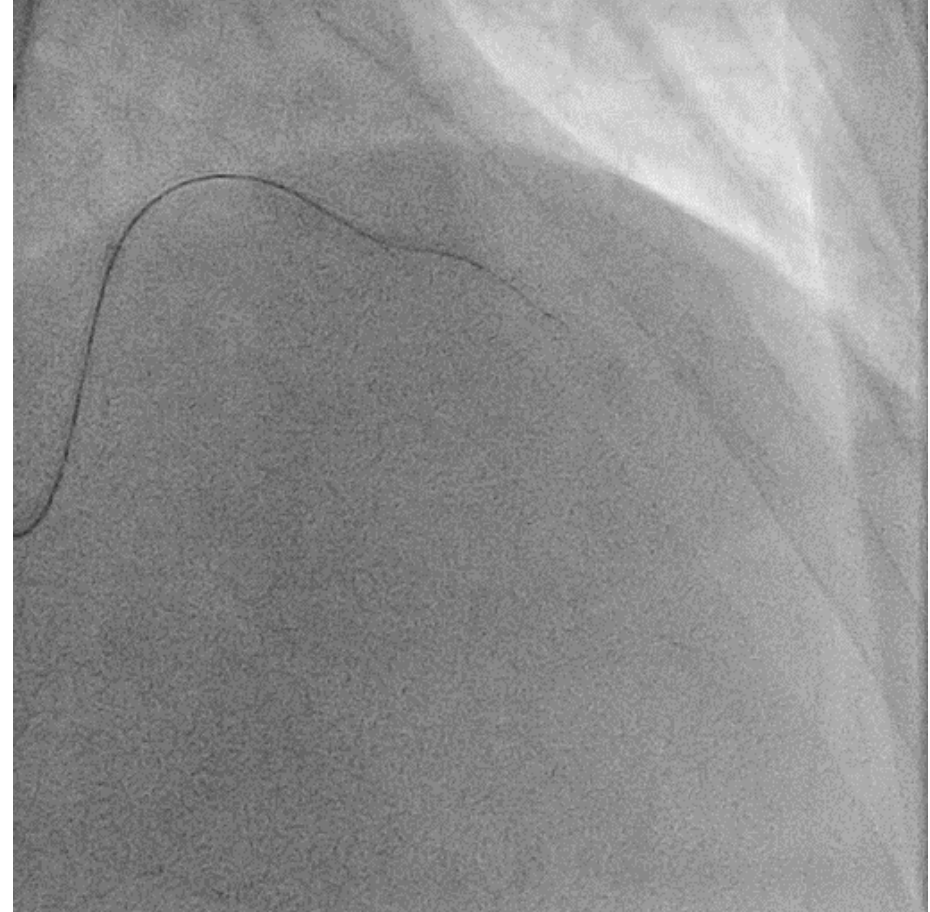
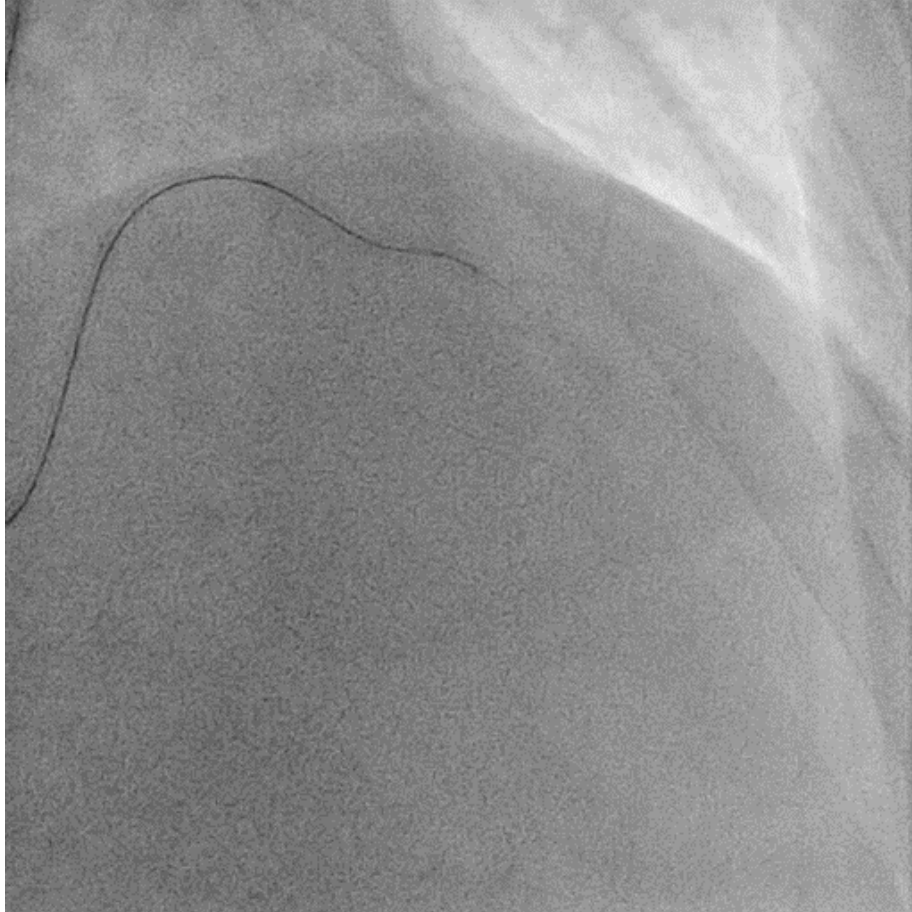
1. Culprit segment for symptom: LAD ostium
2. Huddle: mLAD CTO
3. Consider CTO strategy
 - a. mLAD lesion morphology: heavily calcified
 - b. mLAD CTO proximal: microchannel (maybe)
 - c. Retrograde option: Big ramus, Septal branch (distal CTO cap)

Guiding catheter (6Fr XB 3.5)

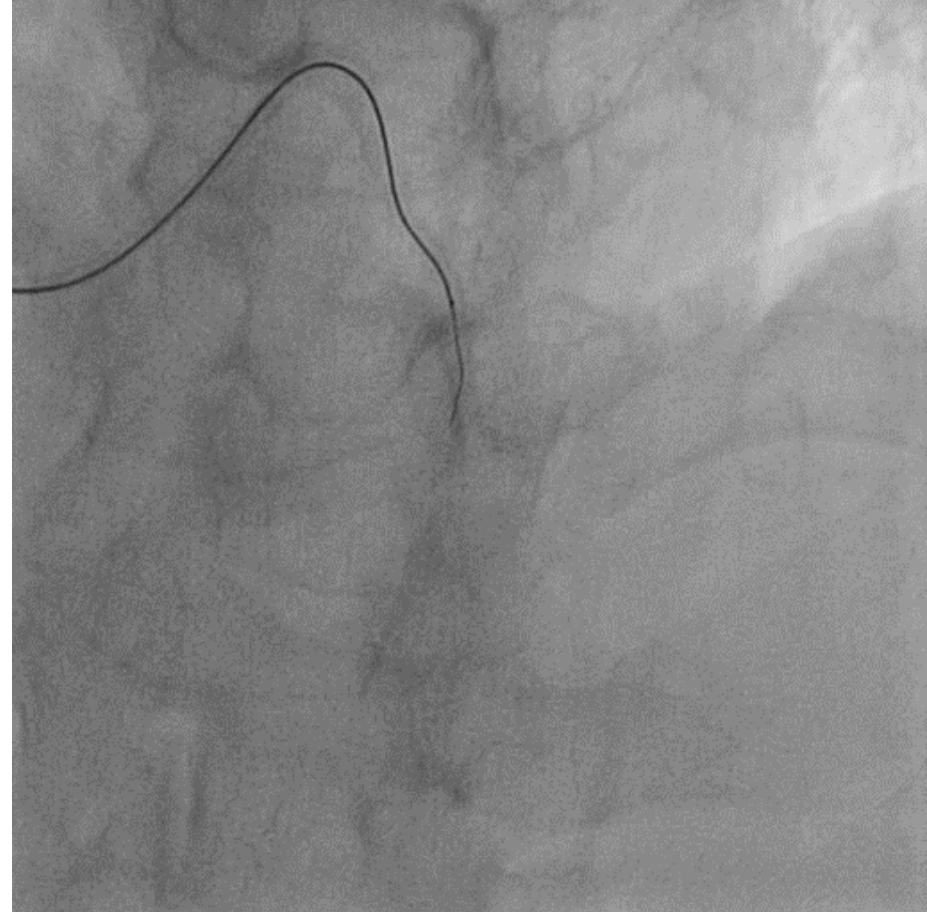
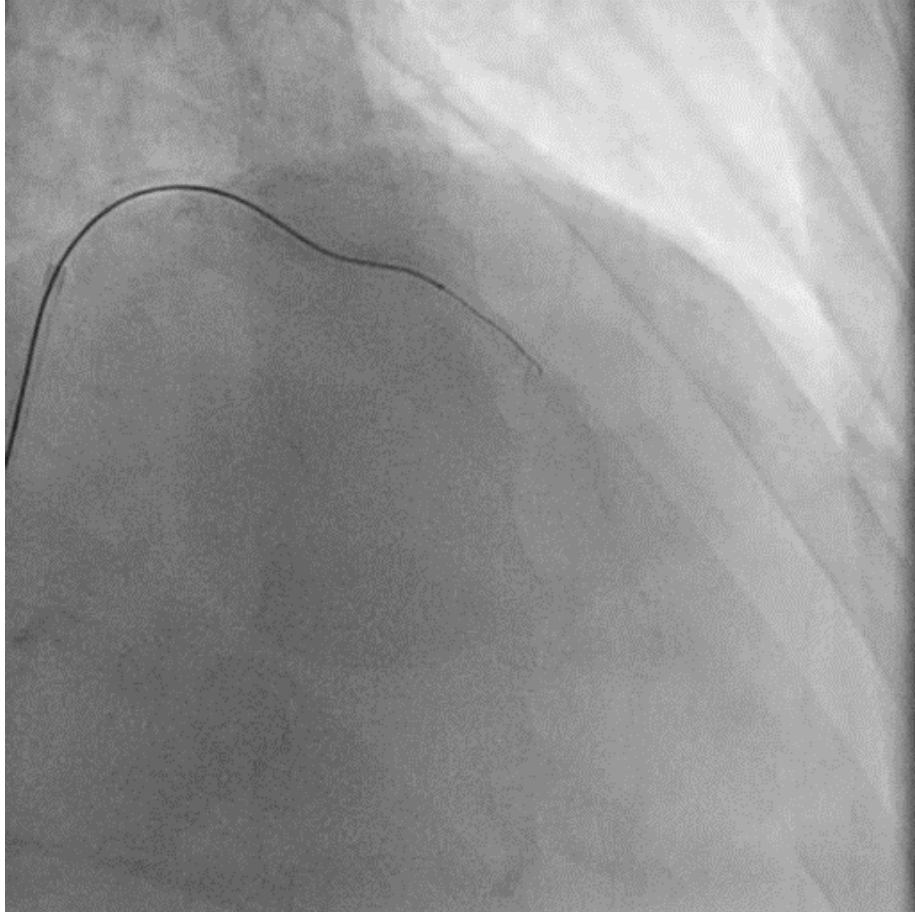
Sion blue + Carnelian microcatheter



Change to soft wire: Fielder XT-A



Wire escalation (GAIA first) for targeting distal CTO cap



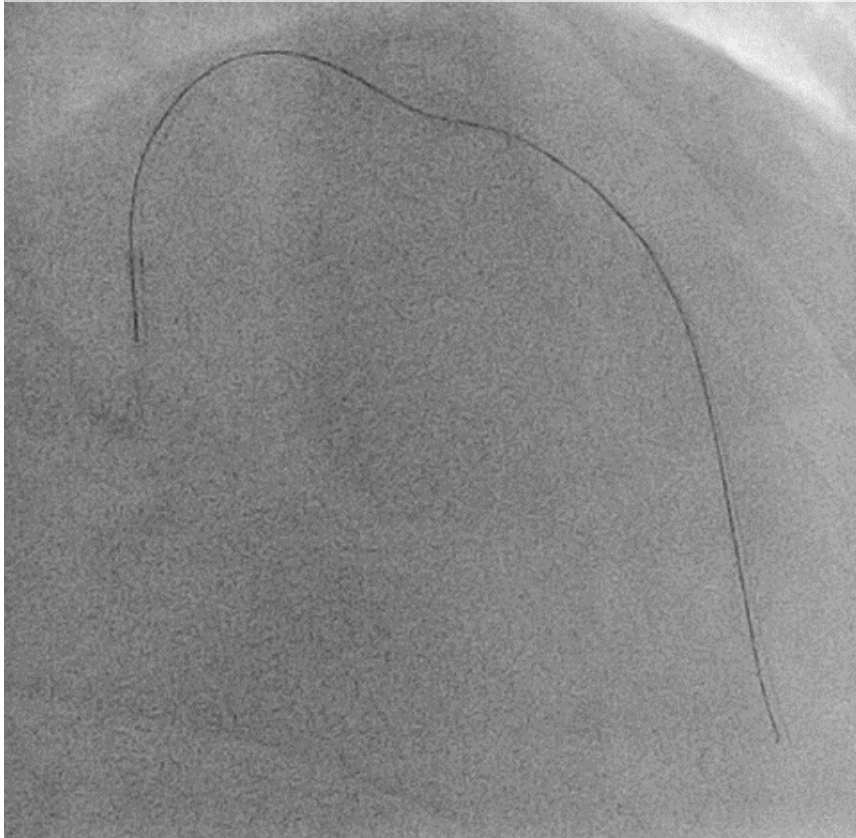
Puncture distal CTO cap with GAIA first

(impossible microcatheter advancement)

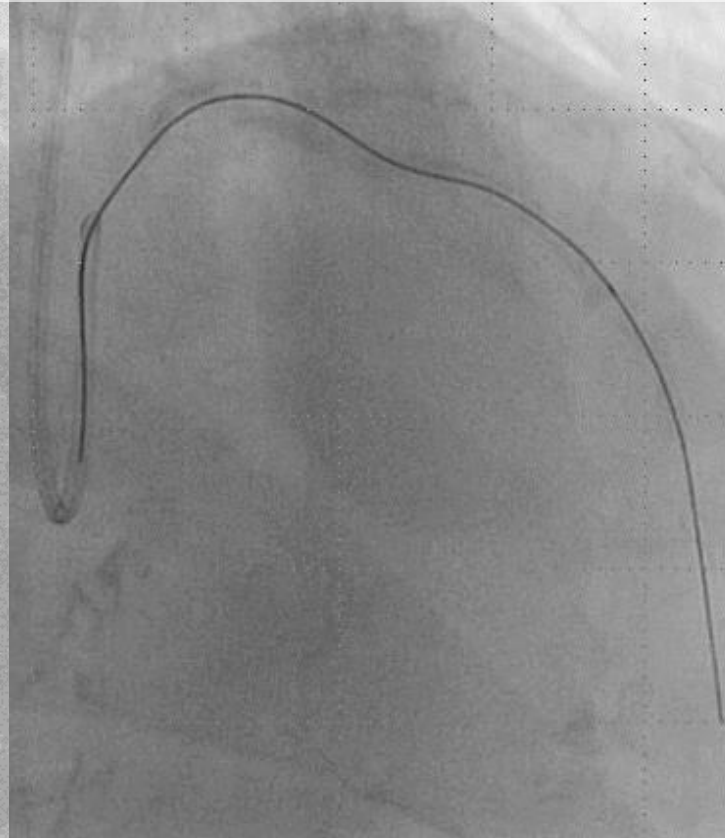


Microcatheter passing

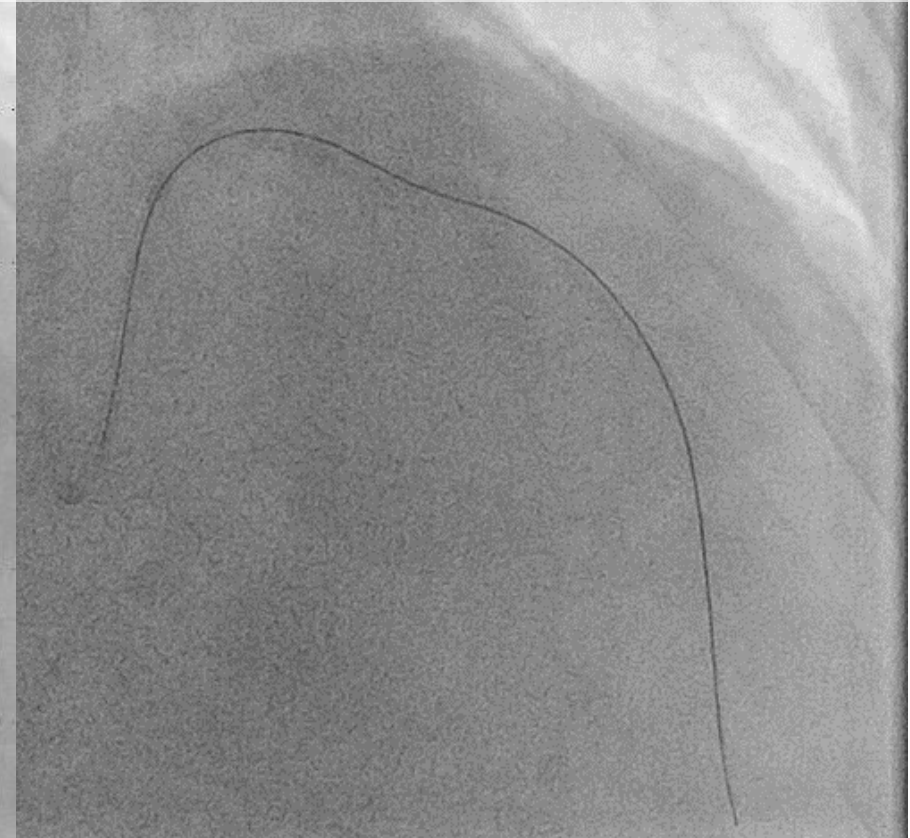
Microcatheter couldn't pass



Balloon 1.0/10mm

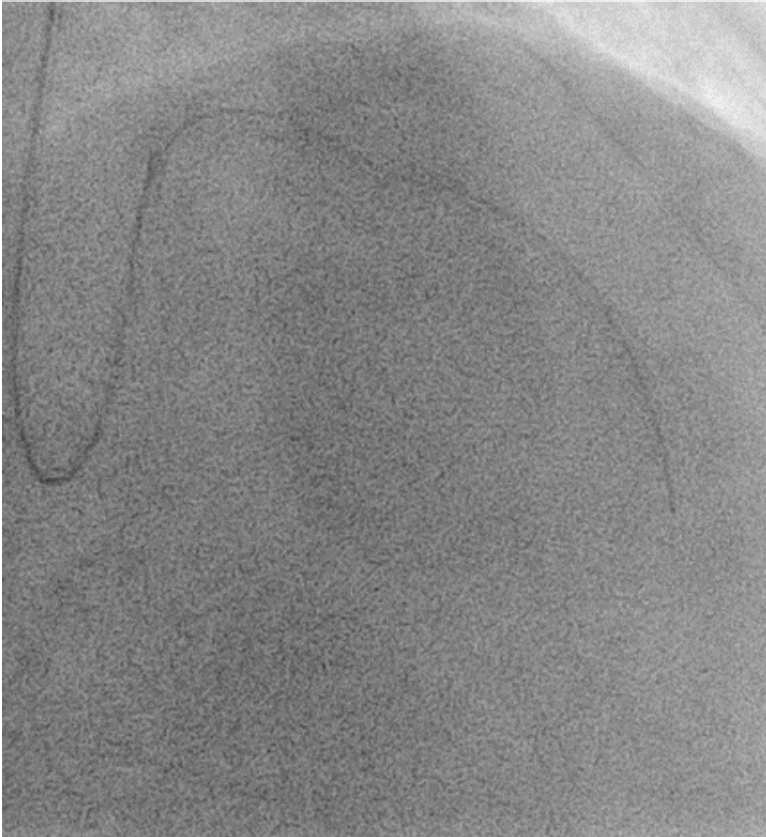


Microcatheter passed

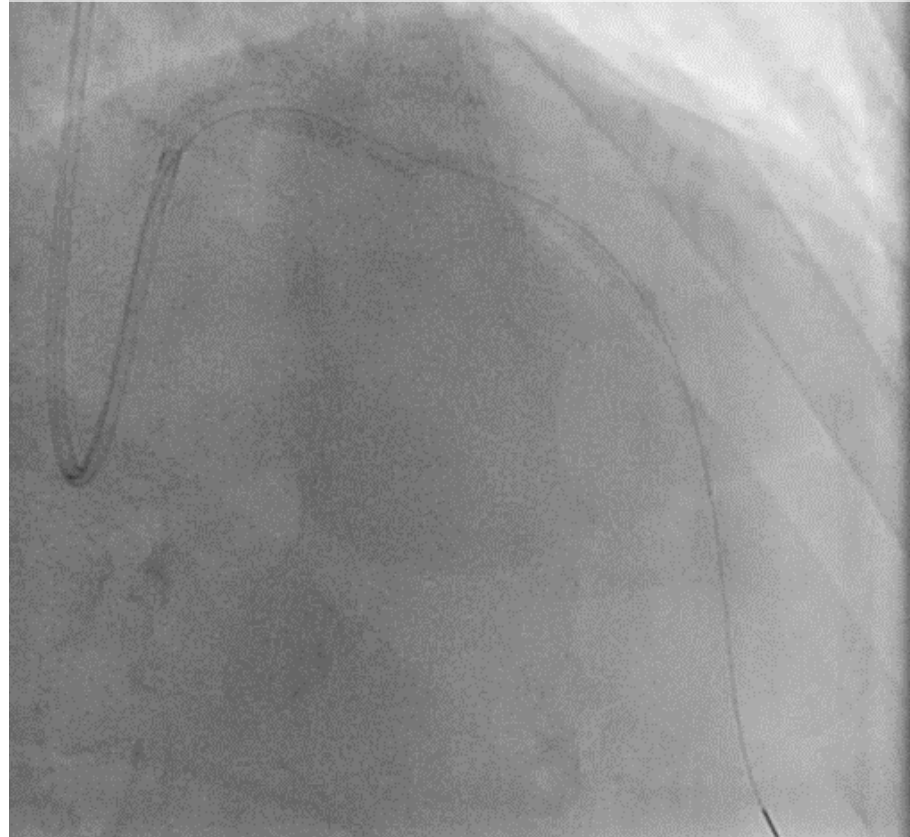


Balloon passing failure

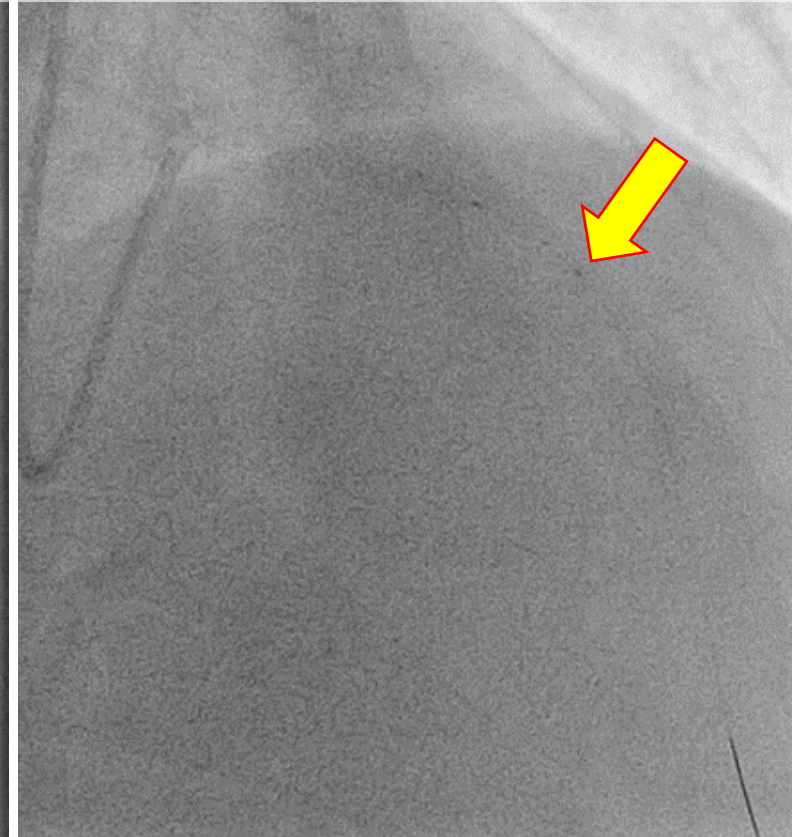
GW exchange (Sion blue)



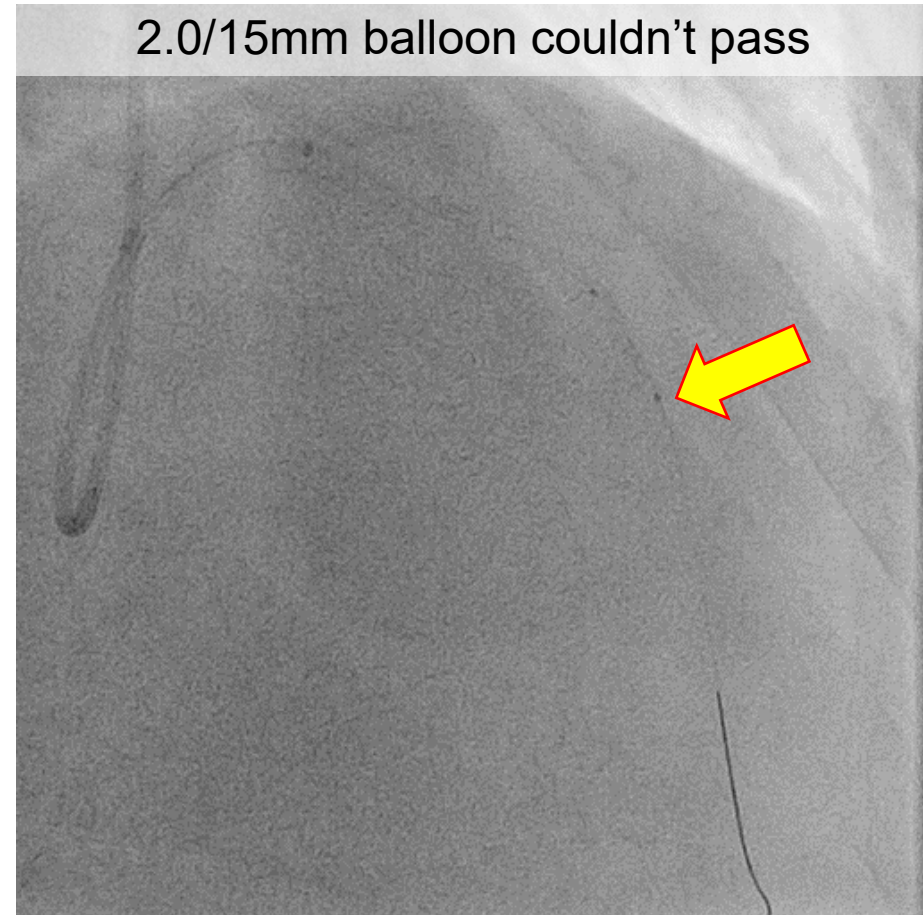
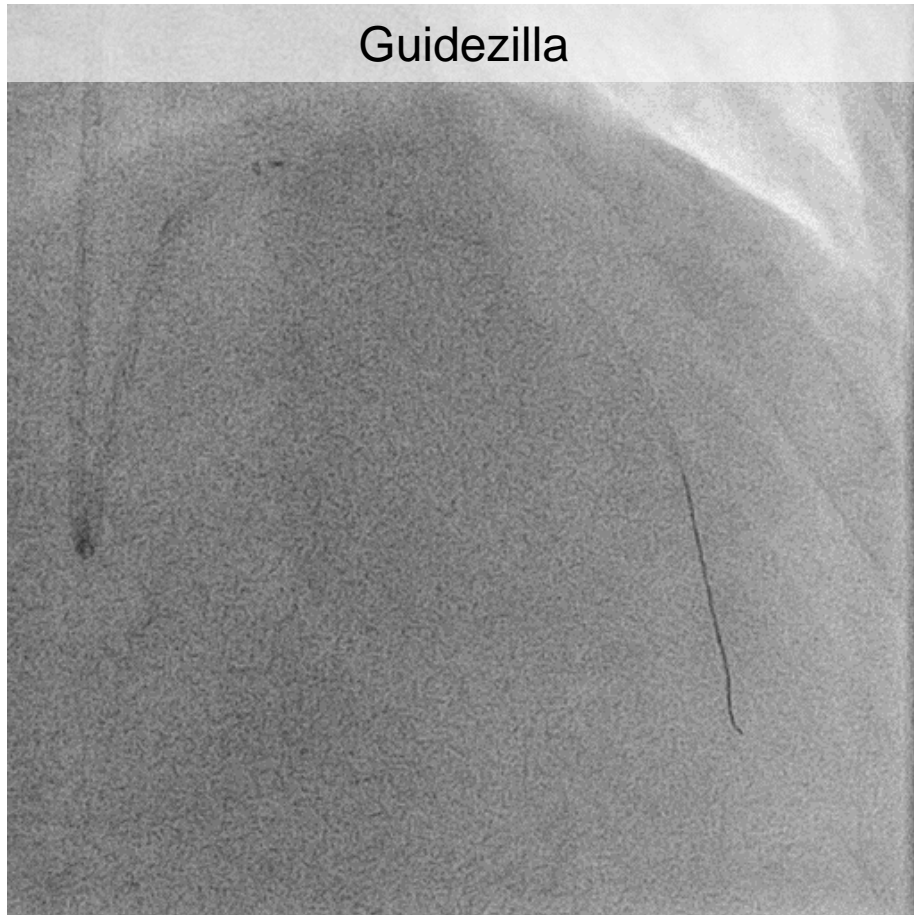
Check LAD



2.0/15 mm balloon couldn't pass

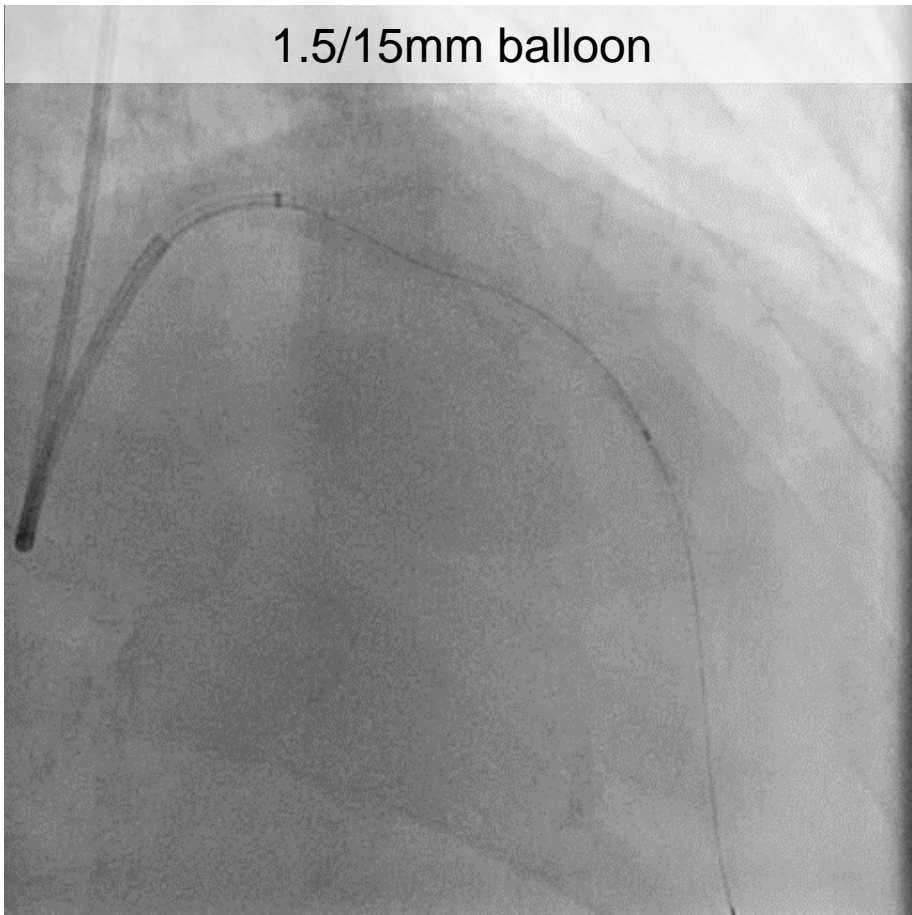


Guiding extension guiding catheter

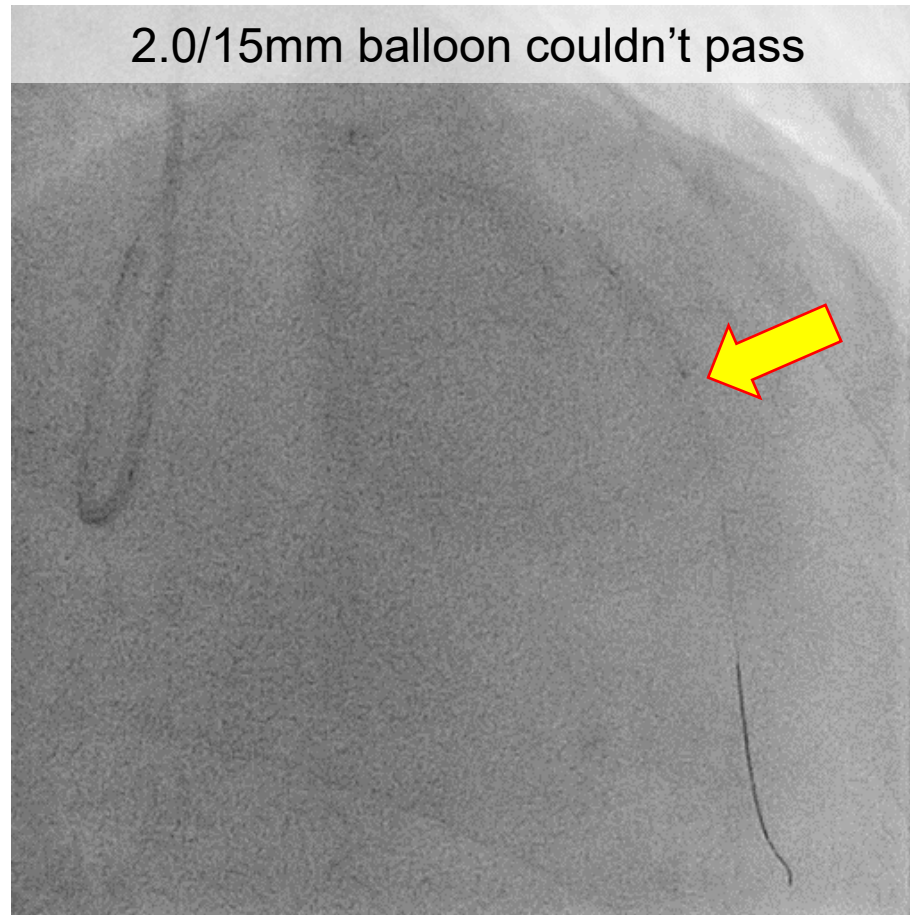


Try smaller balloon again

1.5/15mm balloon



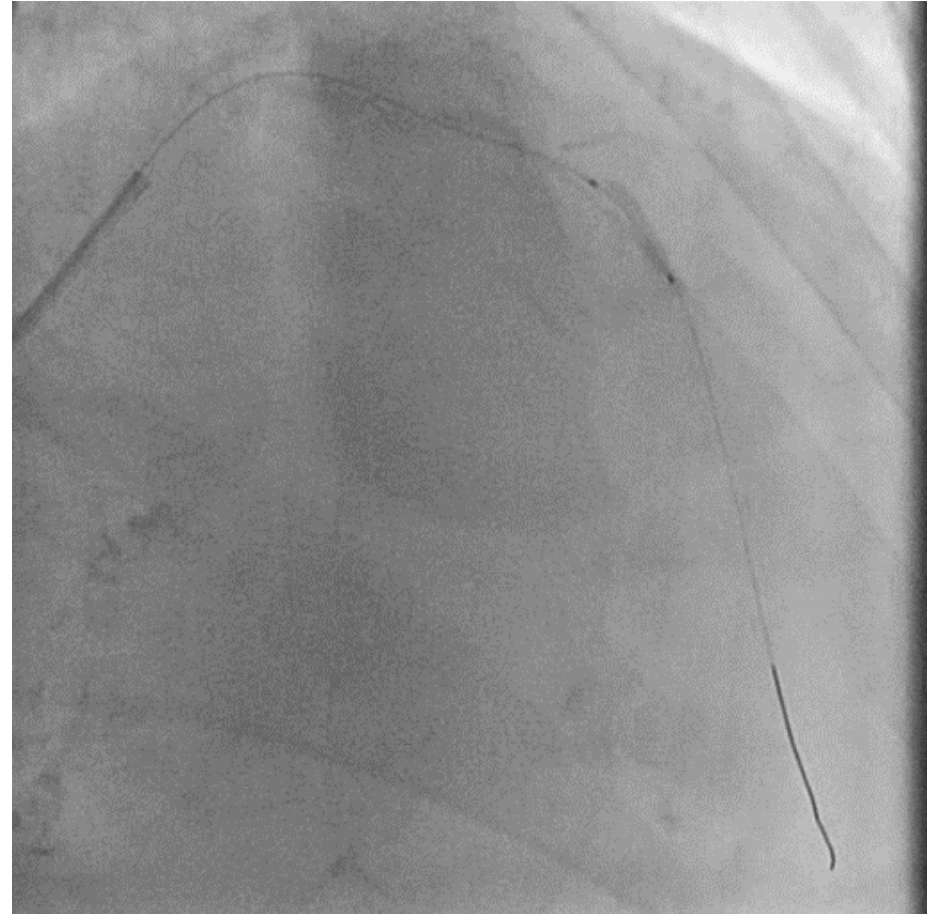
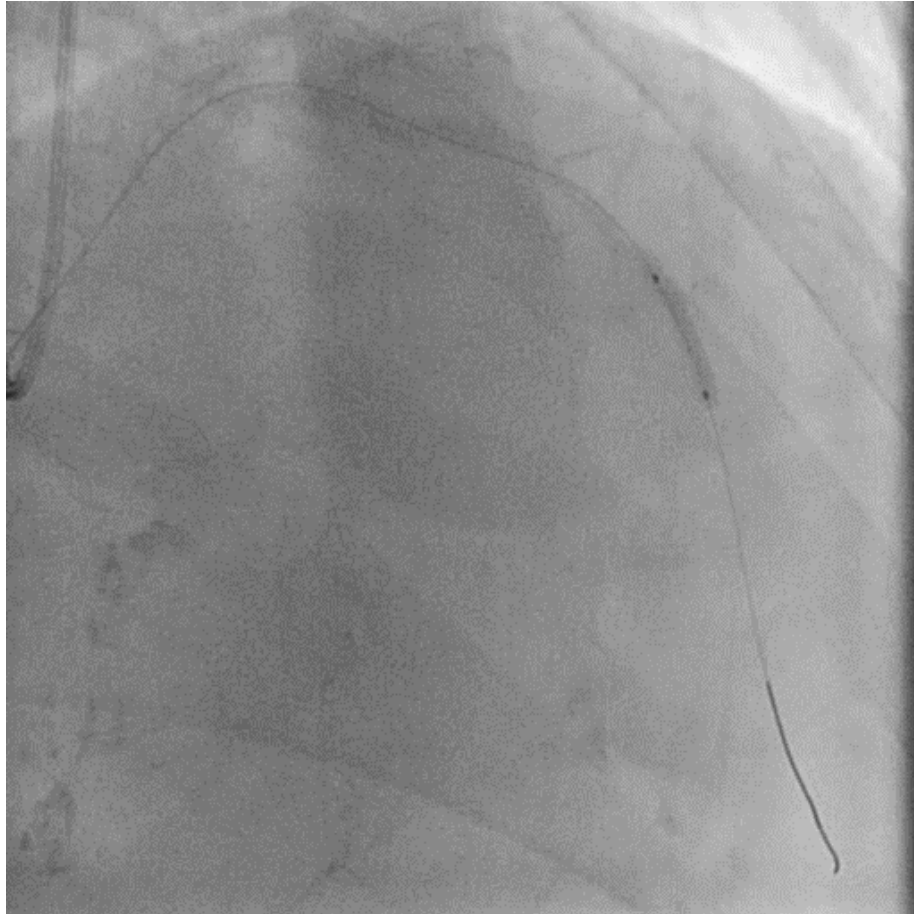
2.0/15mm balloon couldn't pass



Plaque modification (Rotablator 1.25mm)

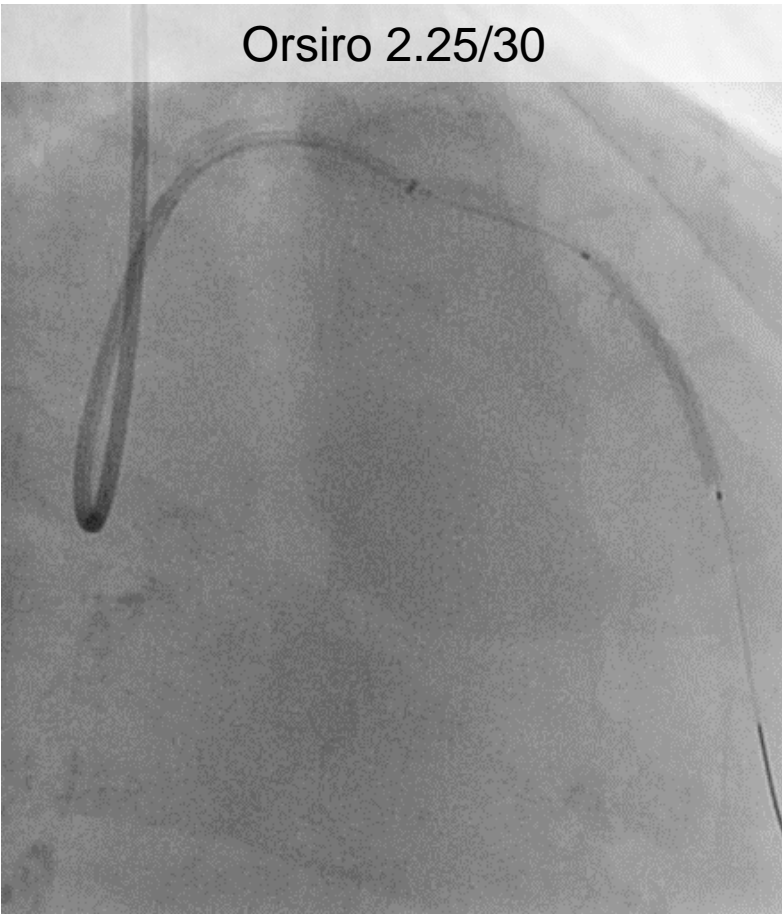


Balloon predilatation 2.0/15mm

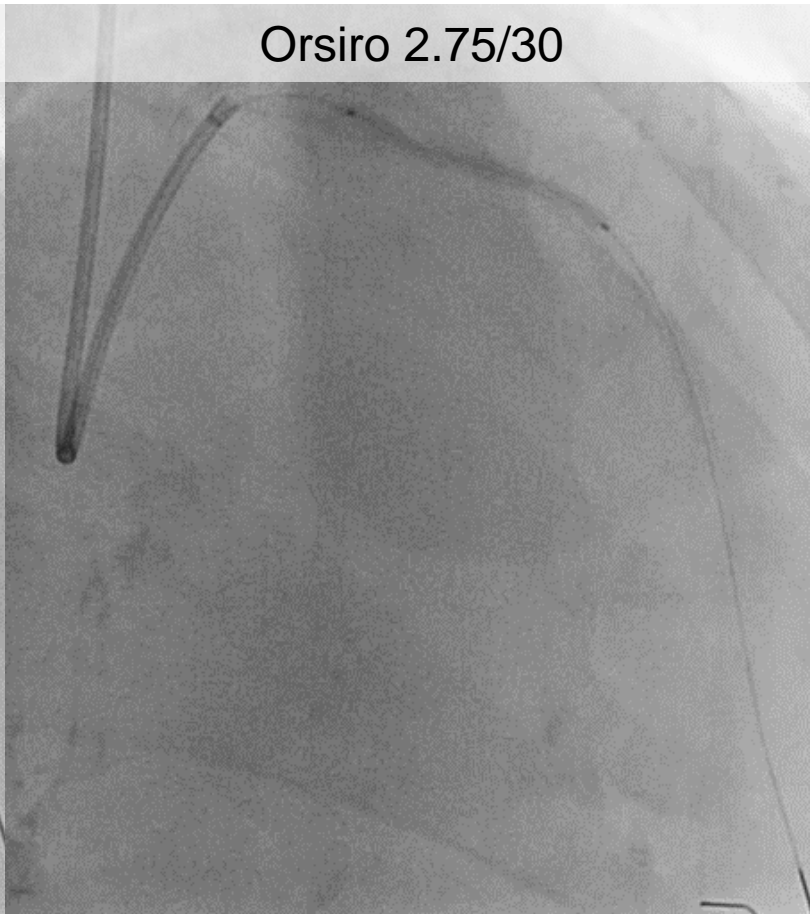


Deployment of 3 DESs

Orsiro 2.25/30



Orsiro 2.75/30



Orsiro 3.5/18

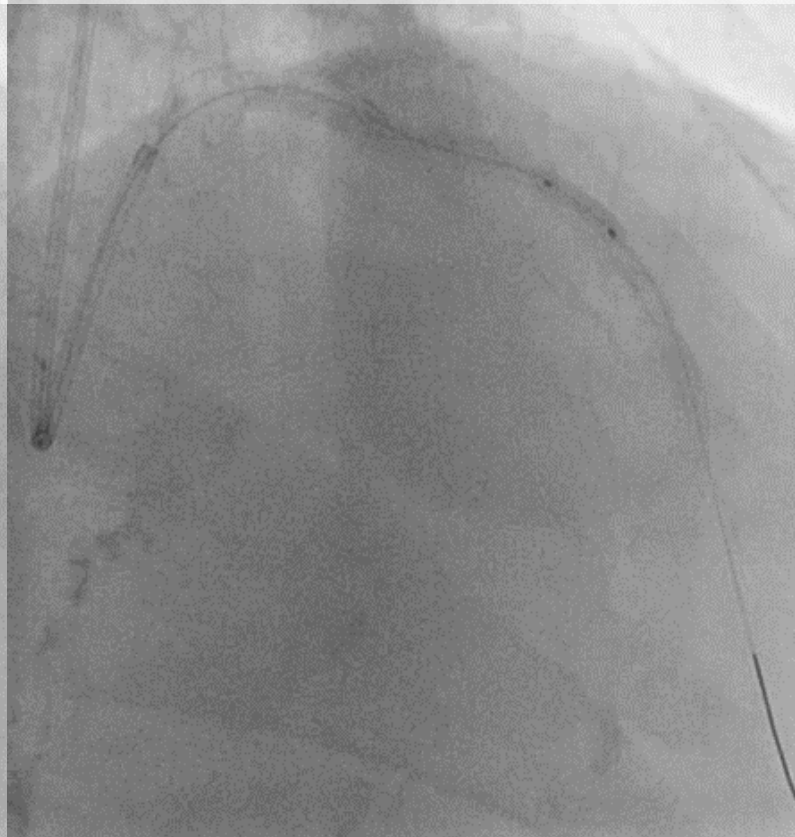


Adjuvant NC balloon

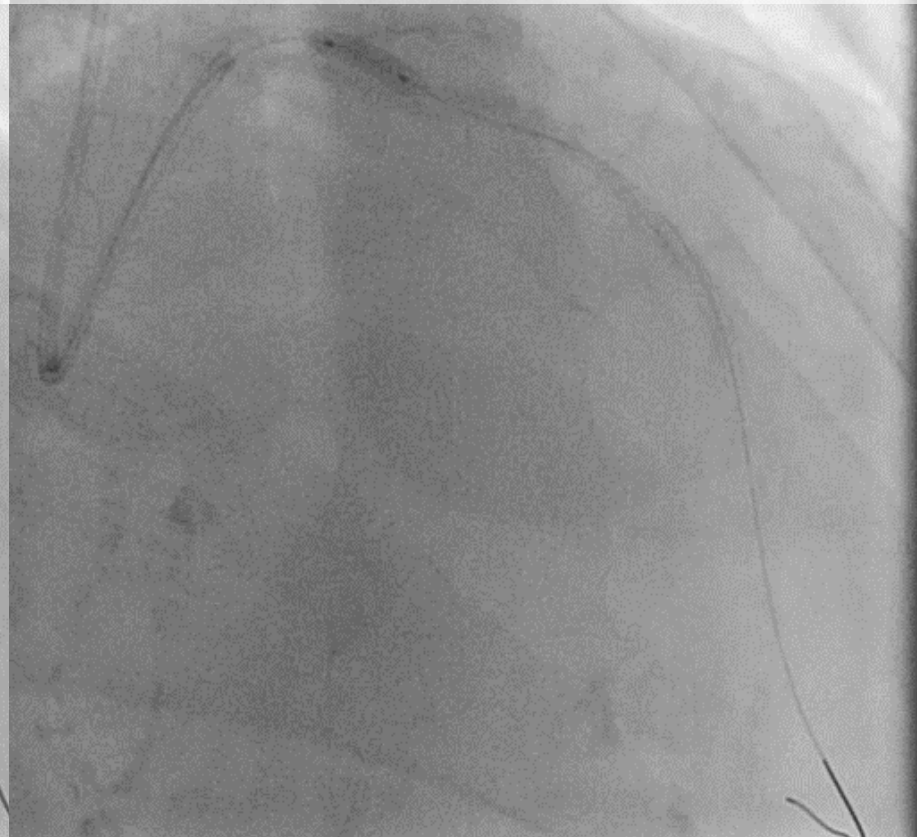
NC balloon 2.5/10 mm



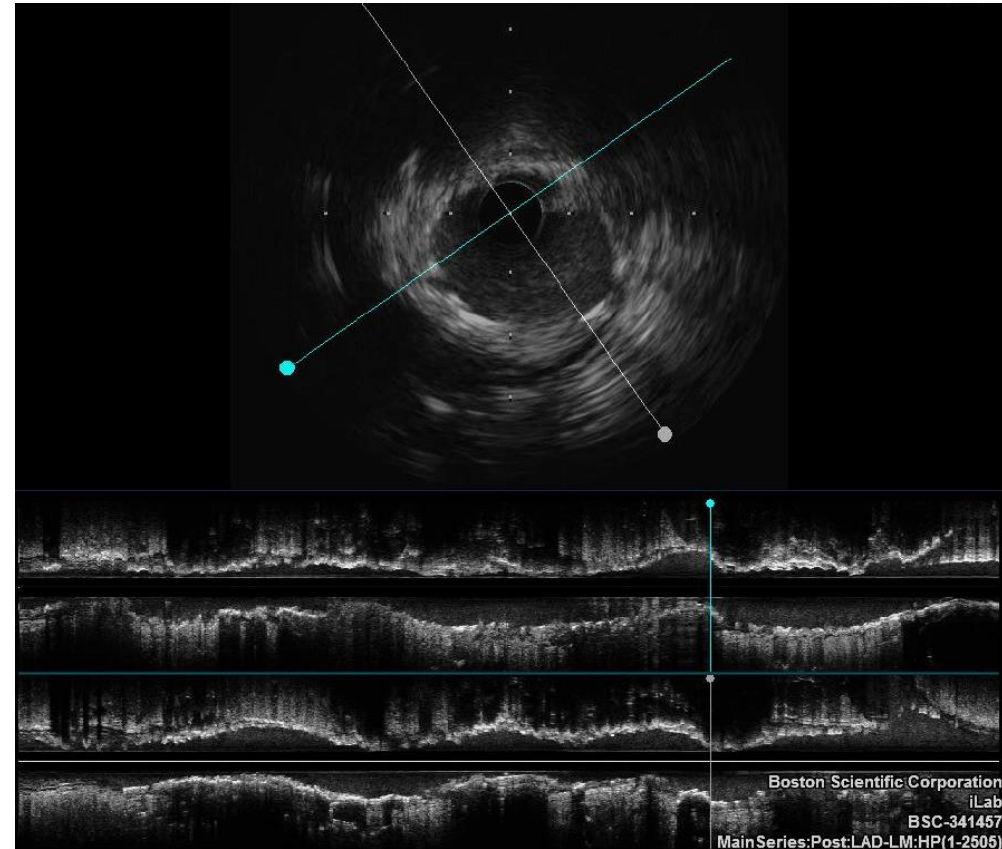
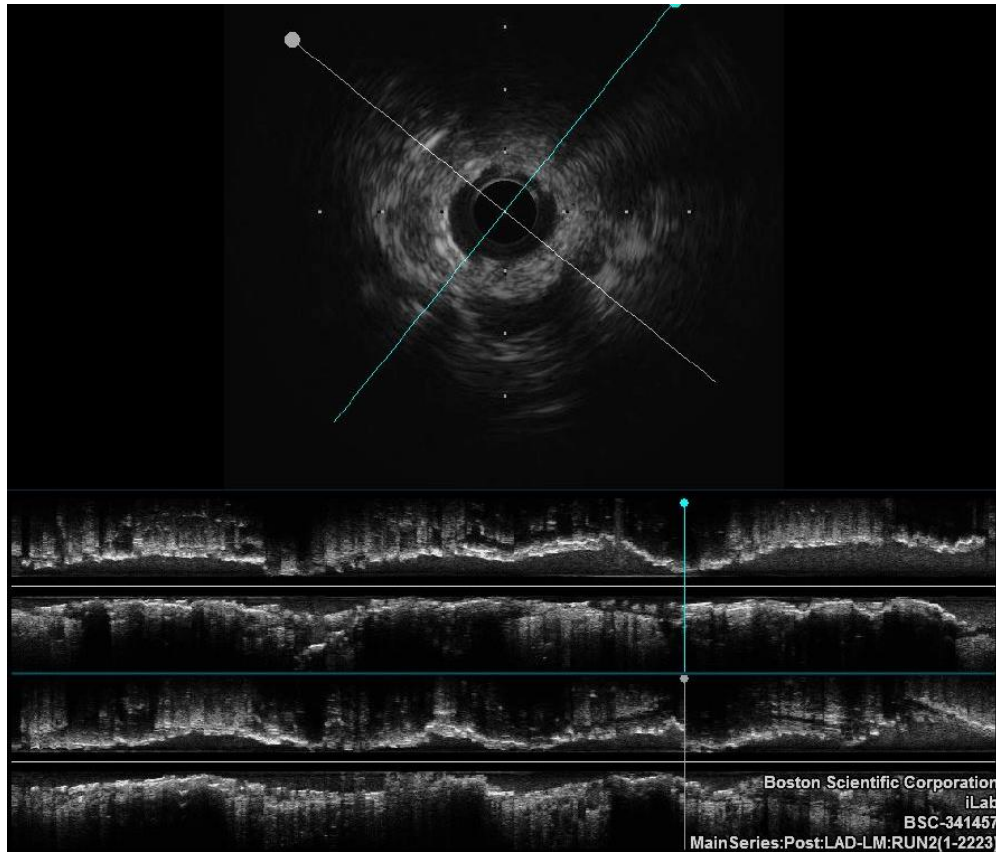
NC balloon 2.5/10 mm



NC balloon 3.0/15 mm



IVUS evaluation (underexpansion)

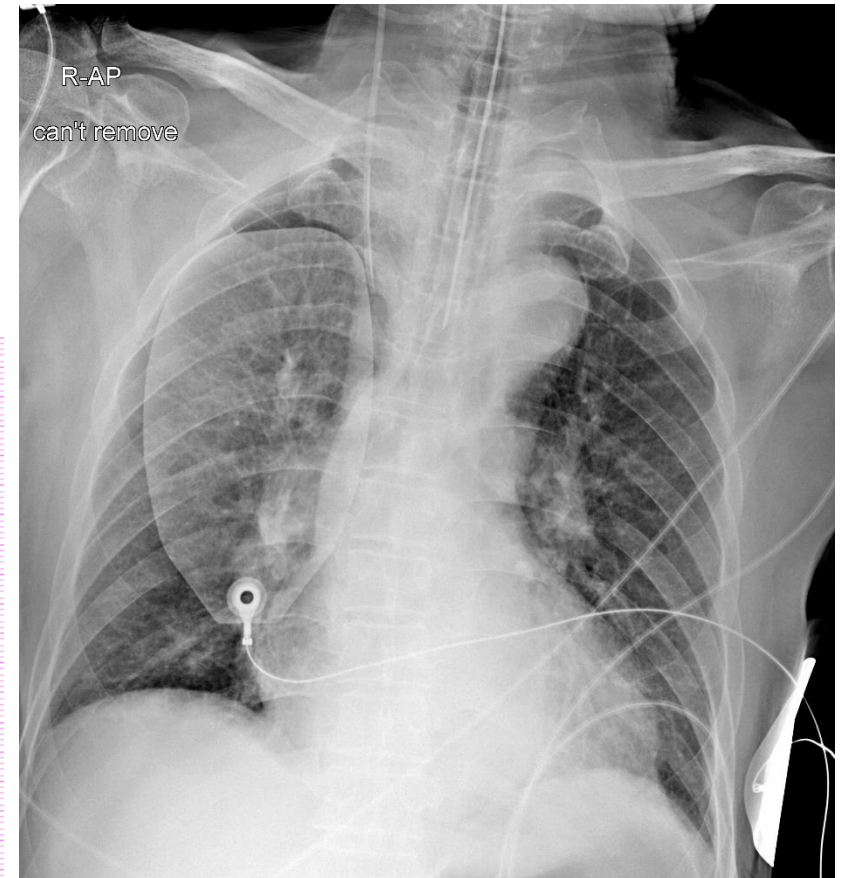
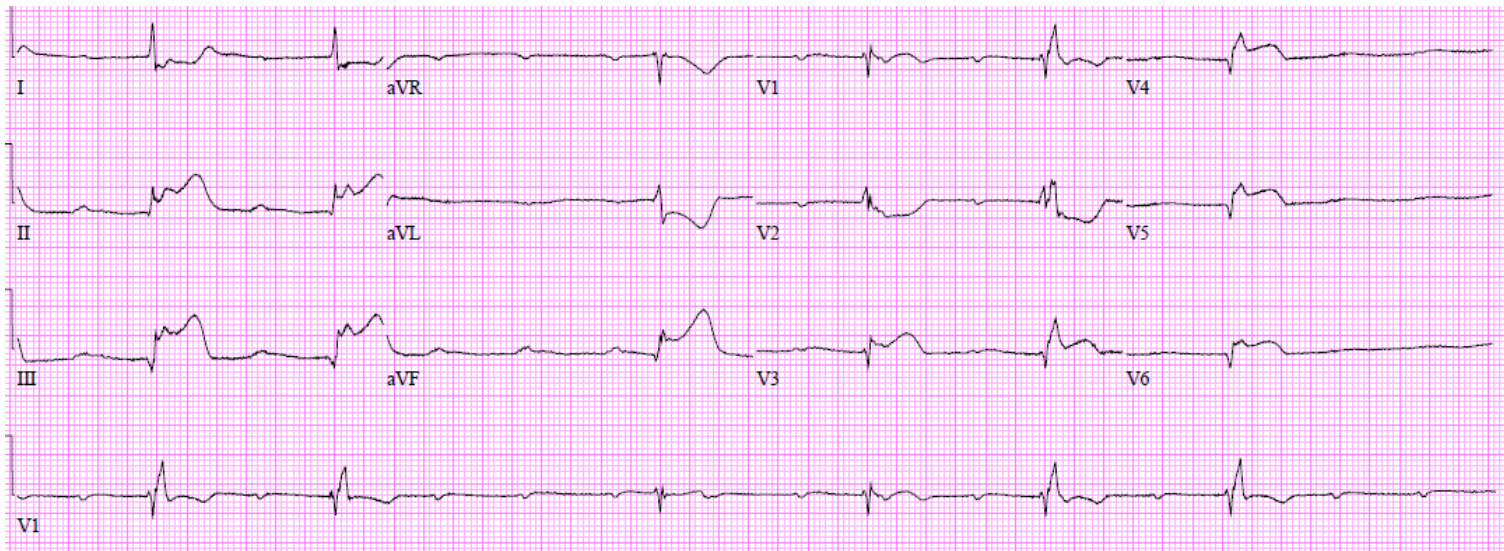


Final angiography

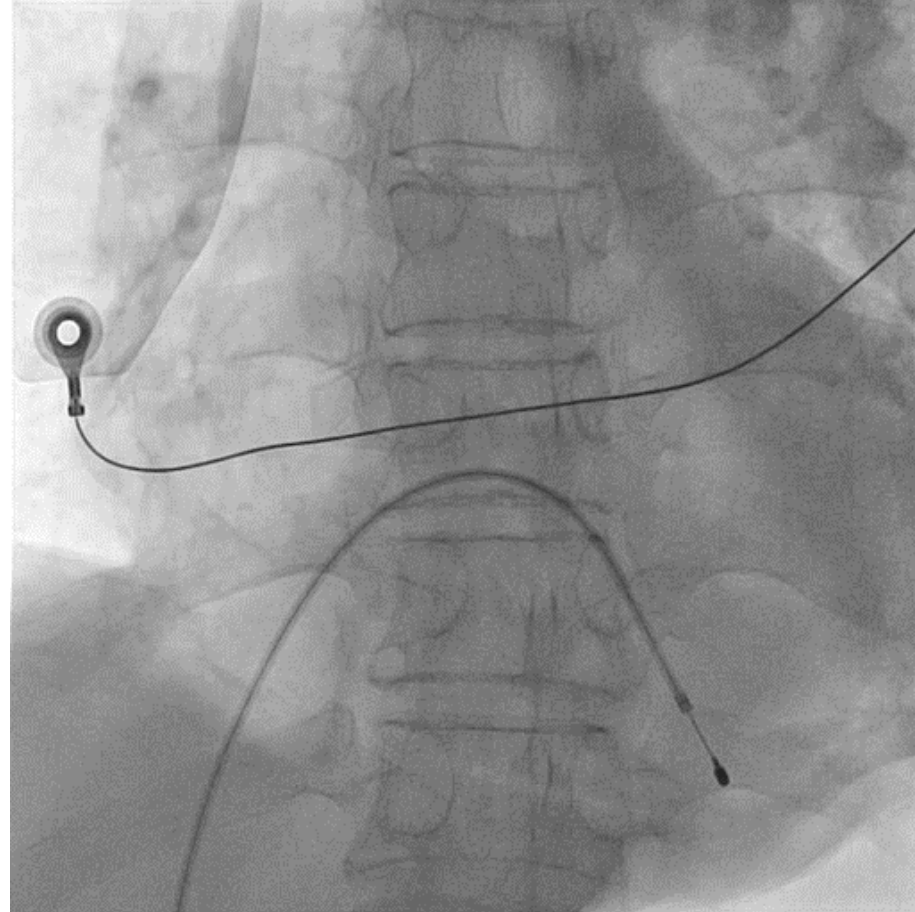


Case 4. RCA STEMI

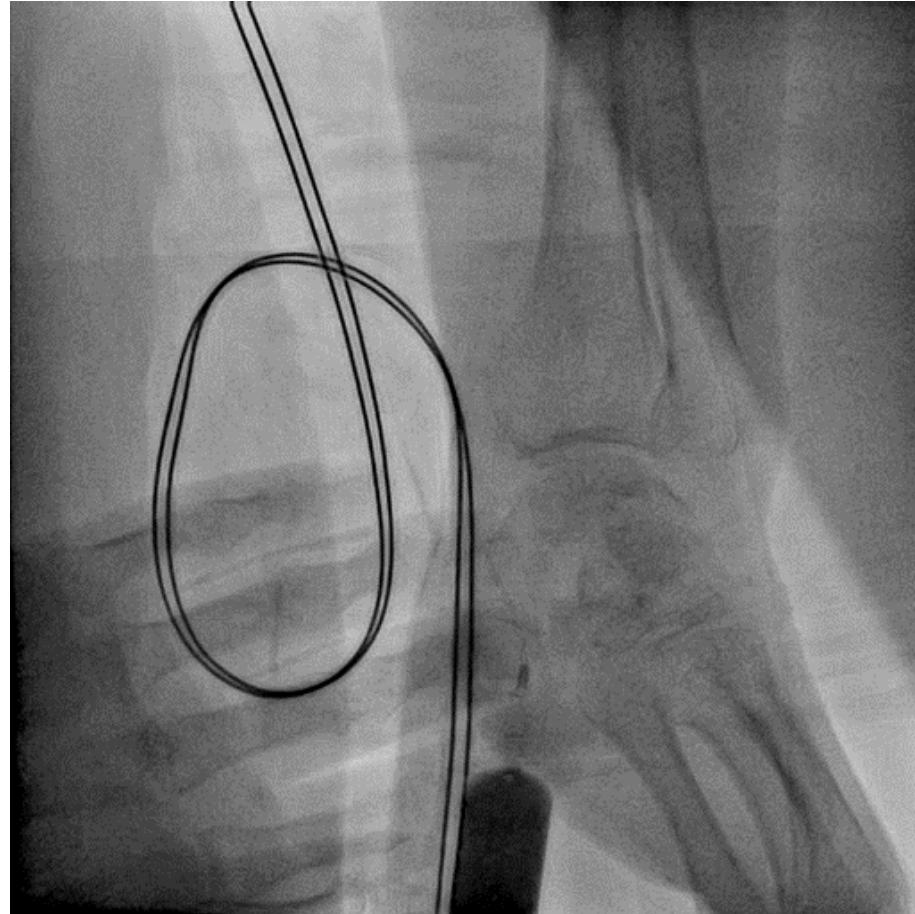
- 80 year-old male
- Killip 4, Complete heart block
- Trans-cutaneous patch apply
- C-line, Endotracheal intubation, IV dopamine



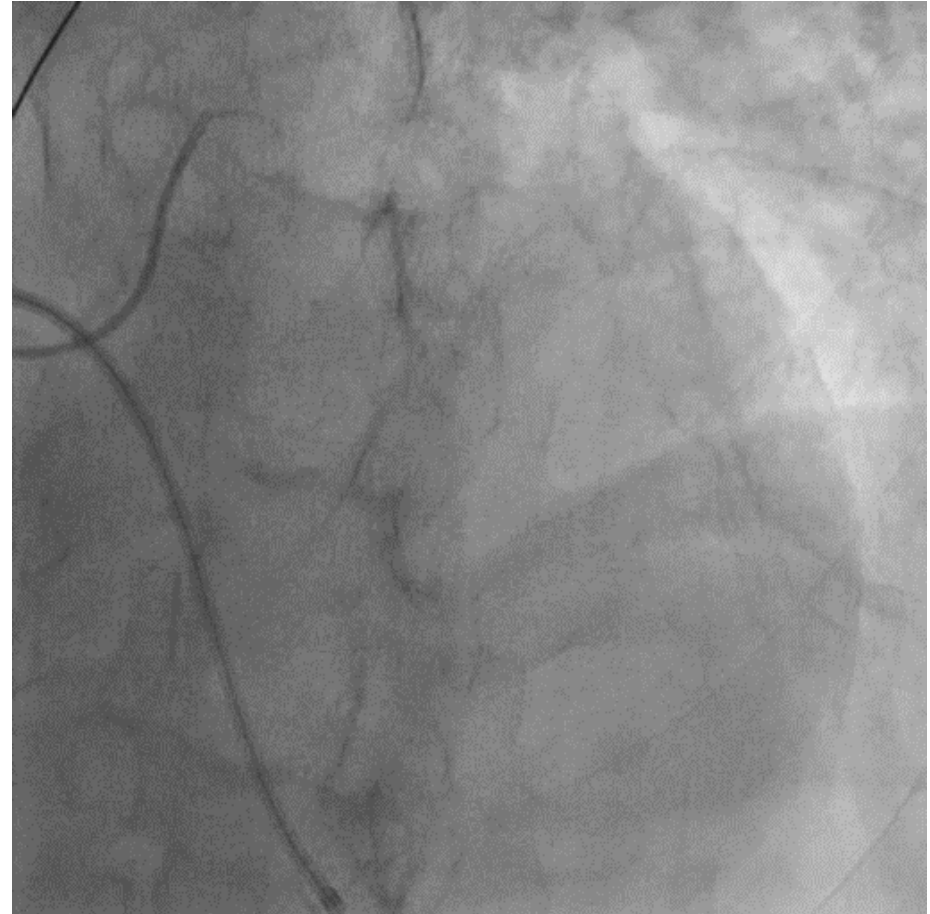
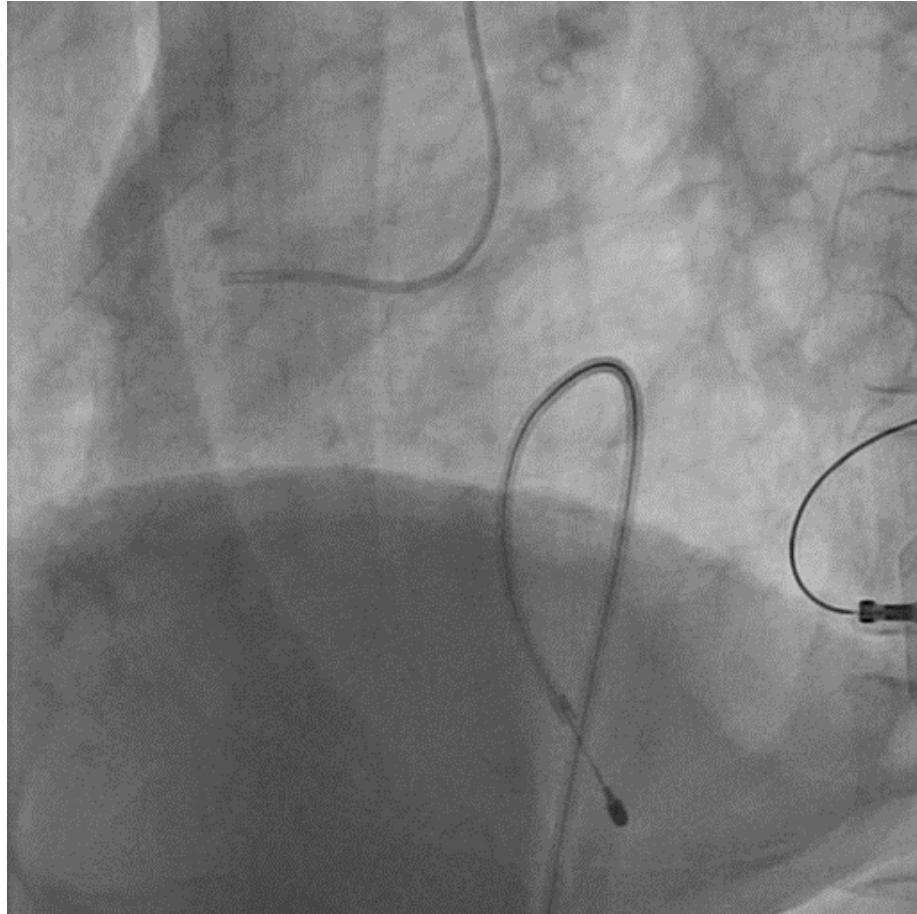
Temporary pacemaker insertion (Right femoral vein)



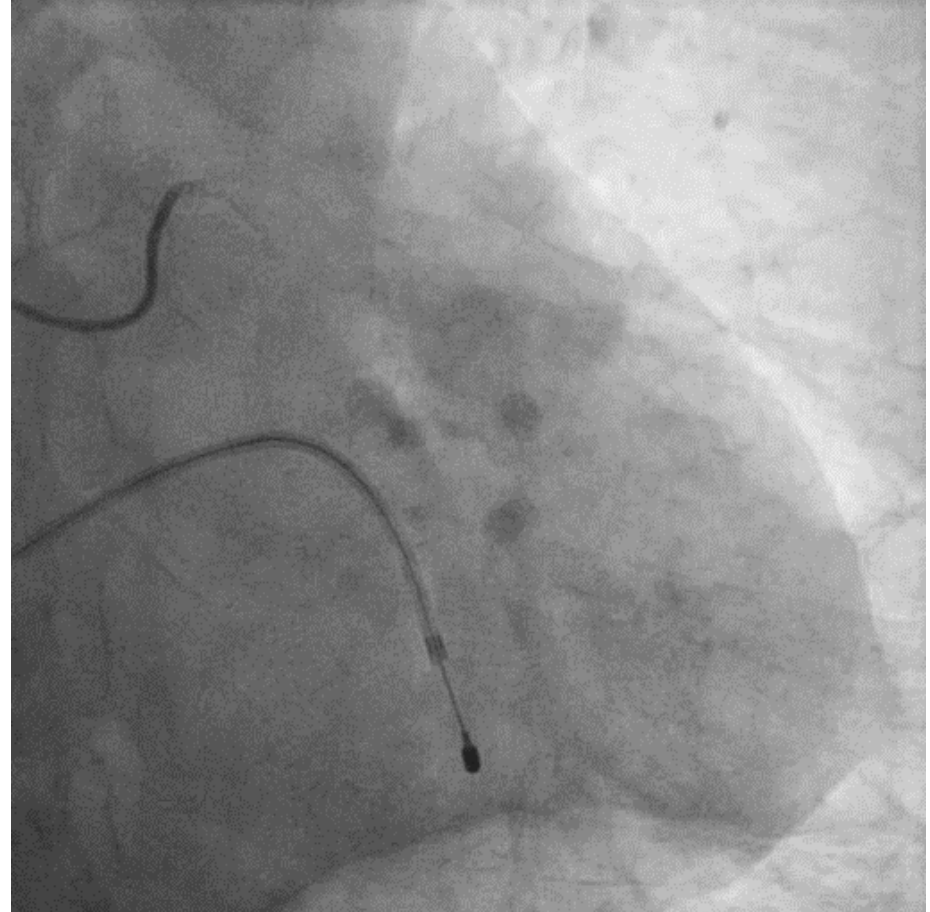
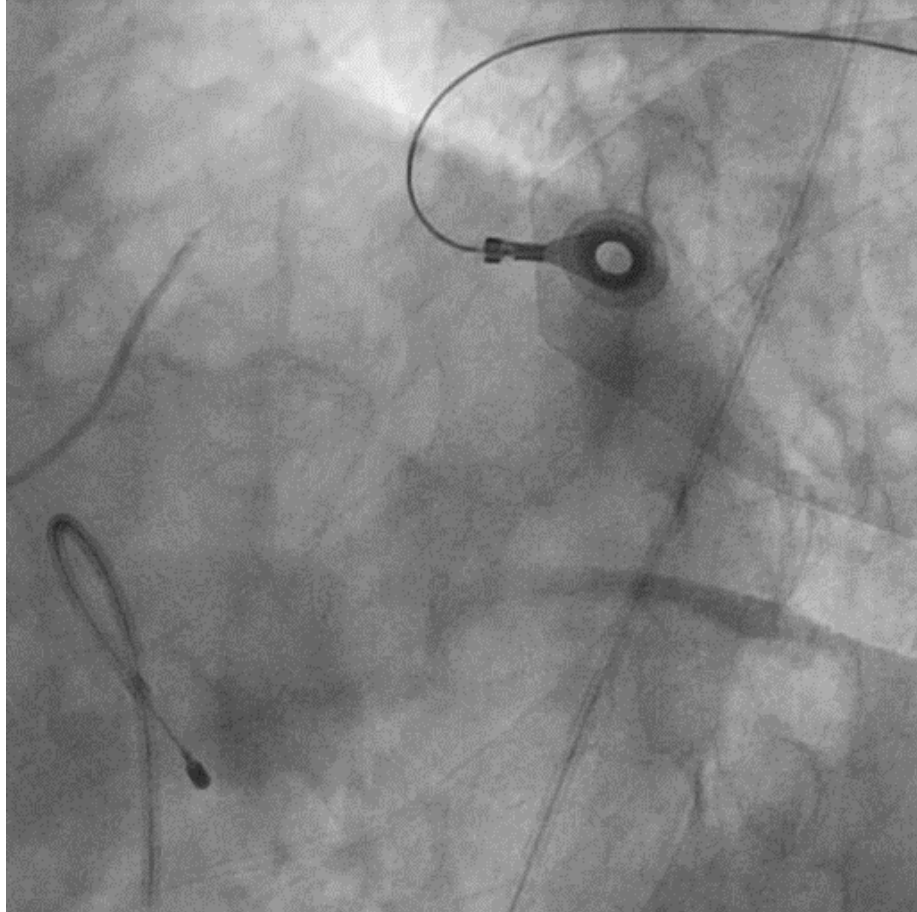
Left distal radial artery puncture



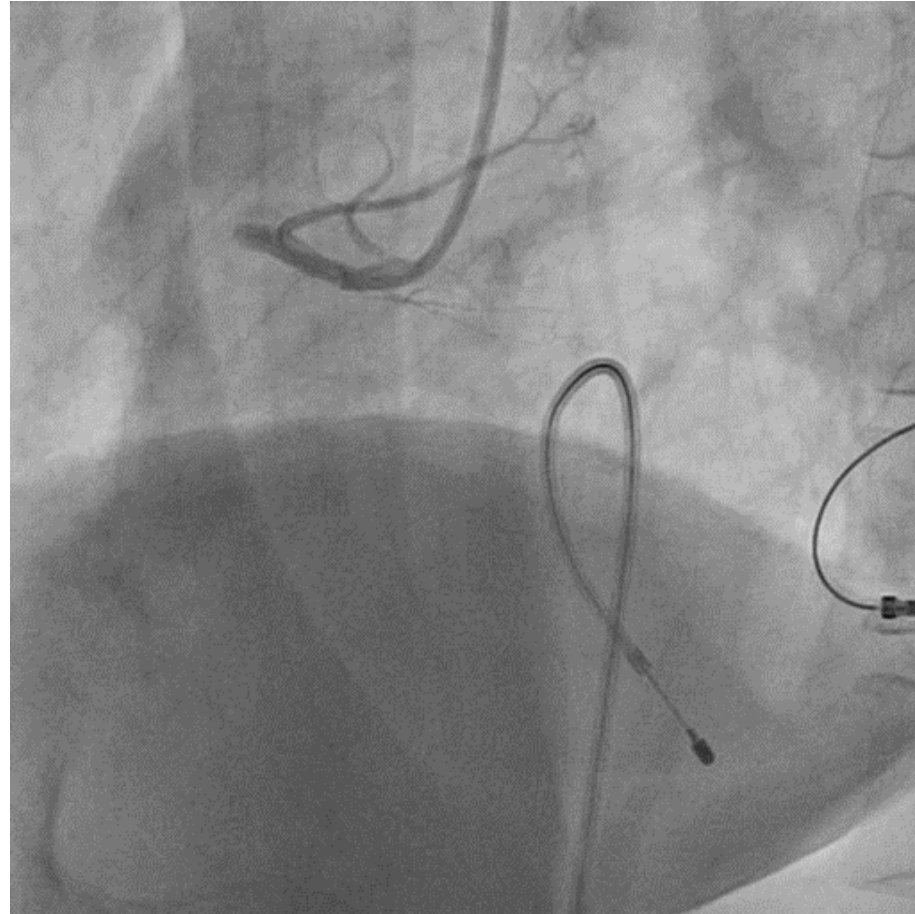
Double CTO? → Which is the culprit?



Ambiguous LAD stump

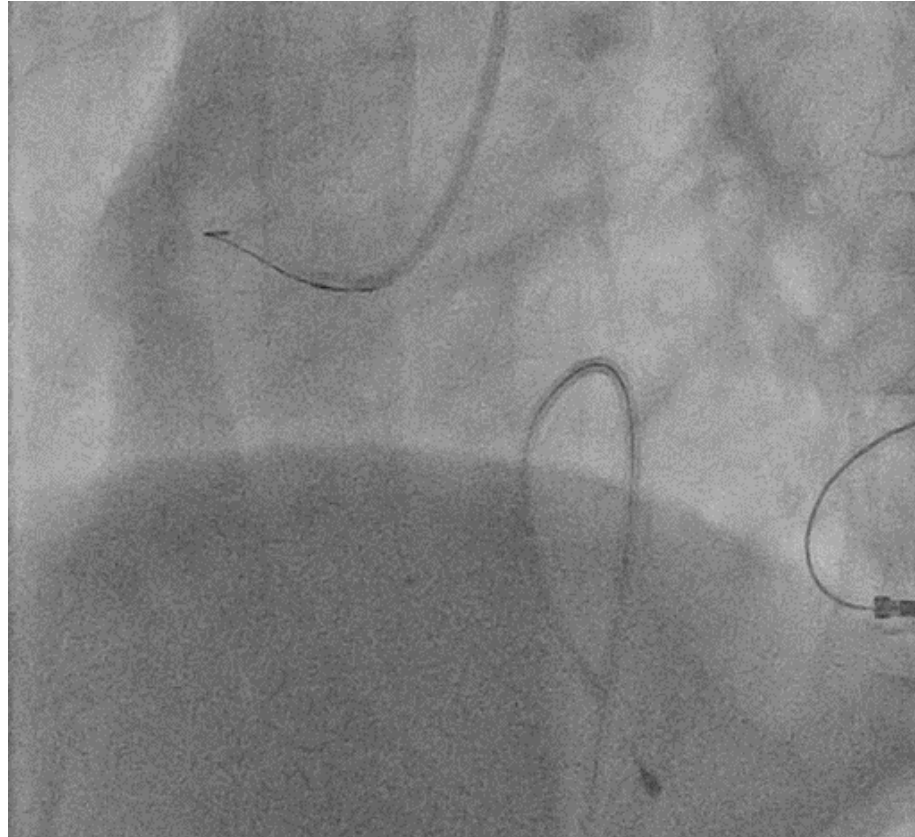


RCA: tapered stump (6Fr JR 4.0)

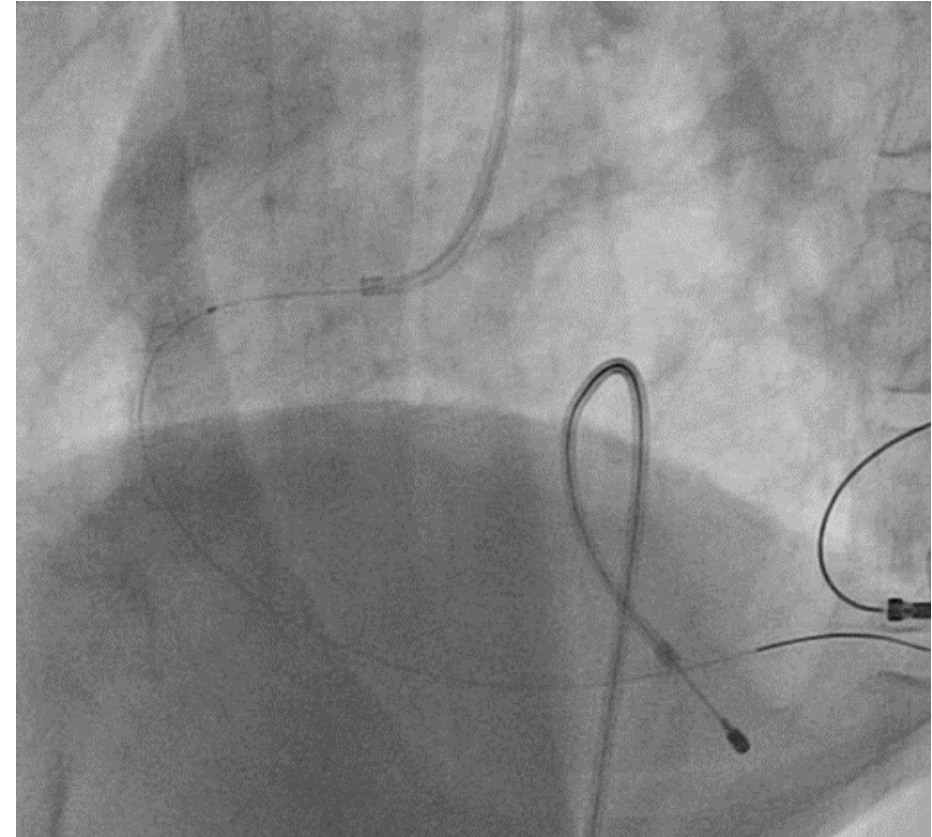


Checking proximal cap

(Drilling with soft guide-wire: Sion blue)

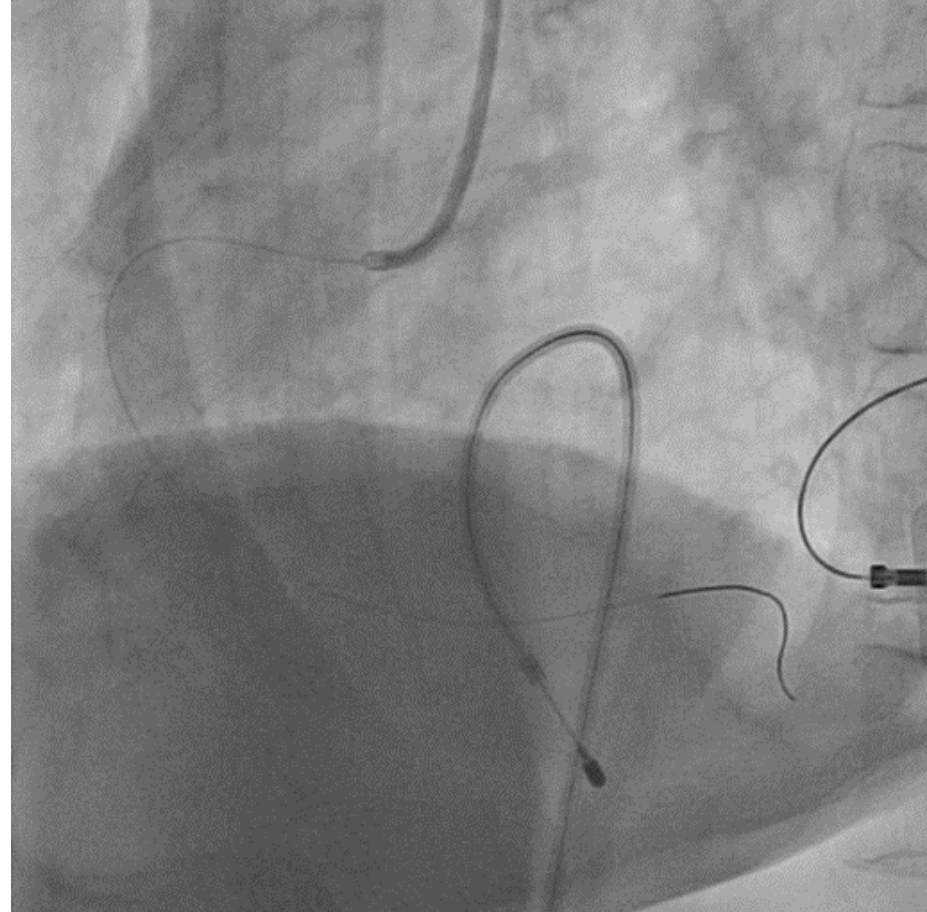
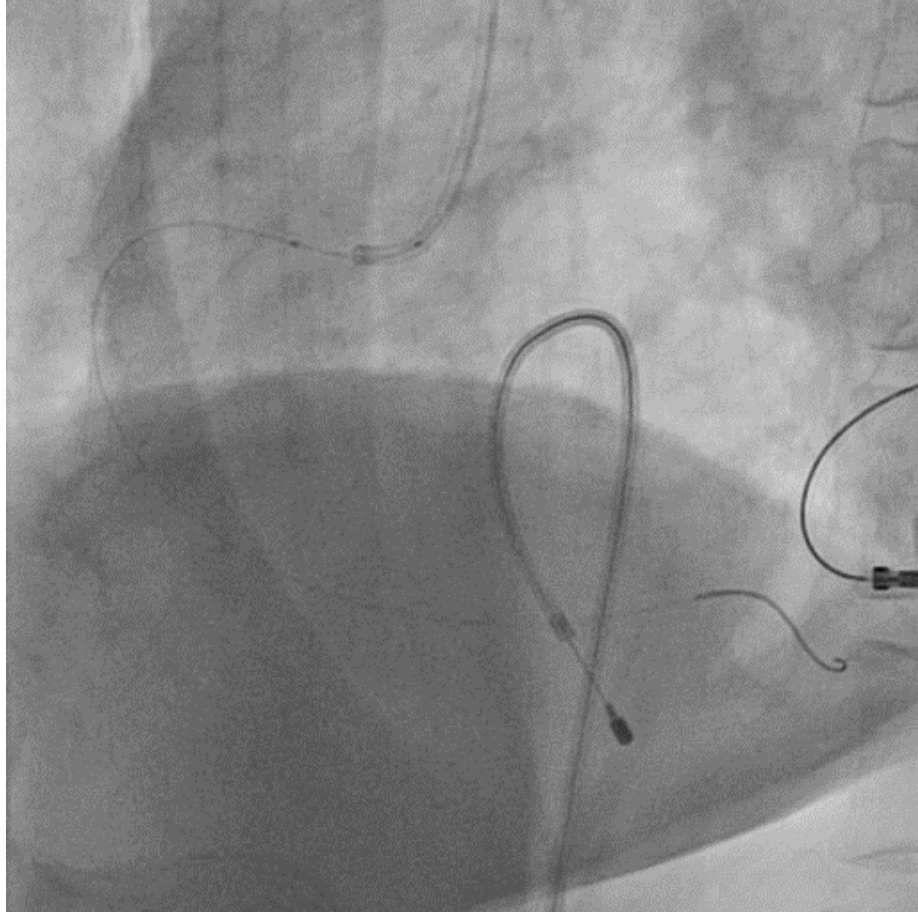


Guidewire: Sion blue

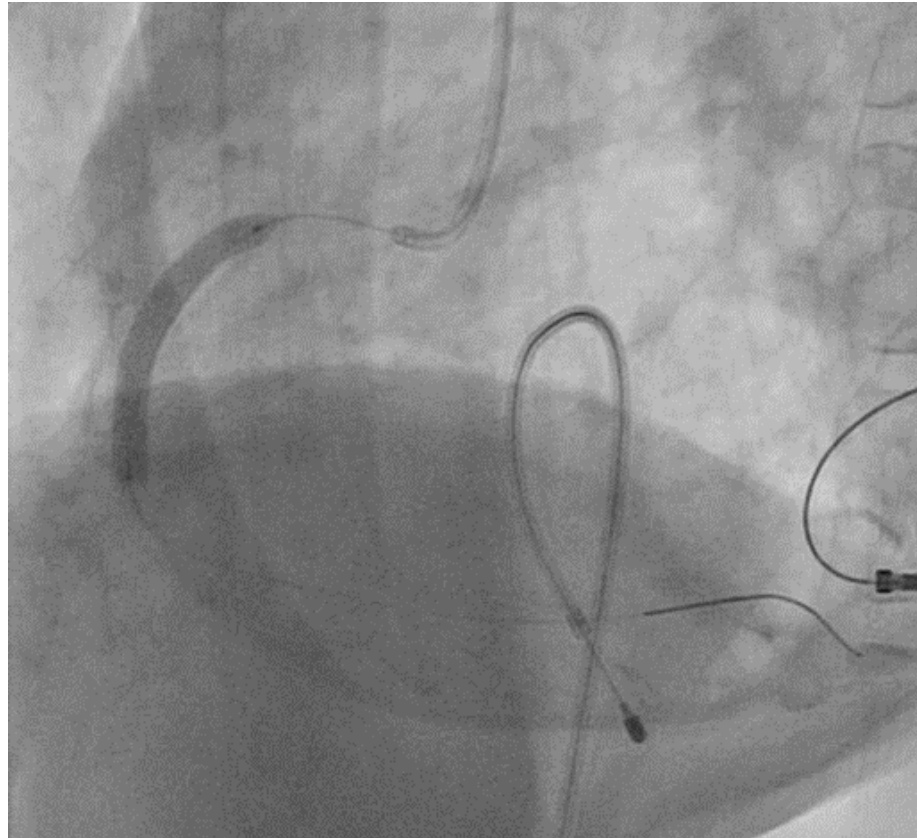


Aspiration thrombectomy

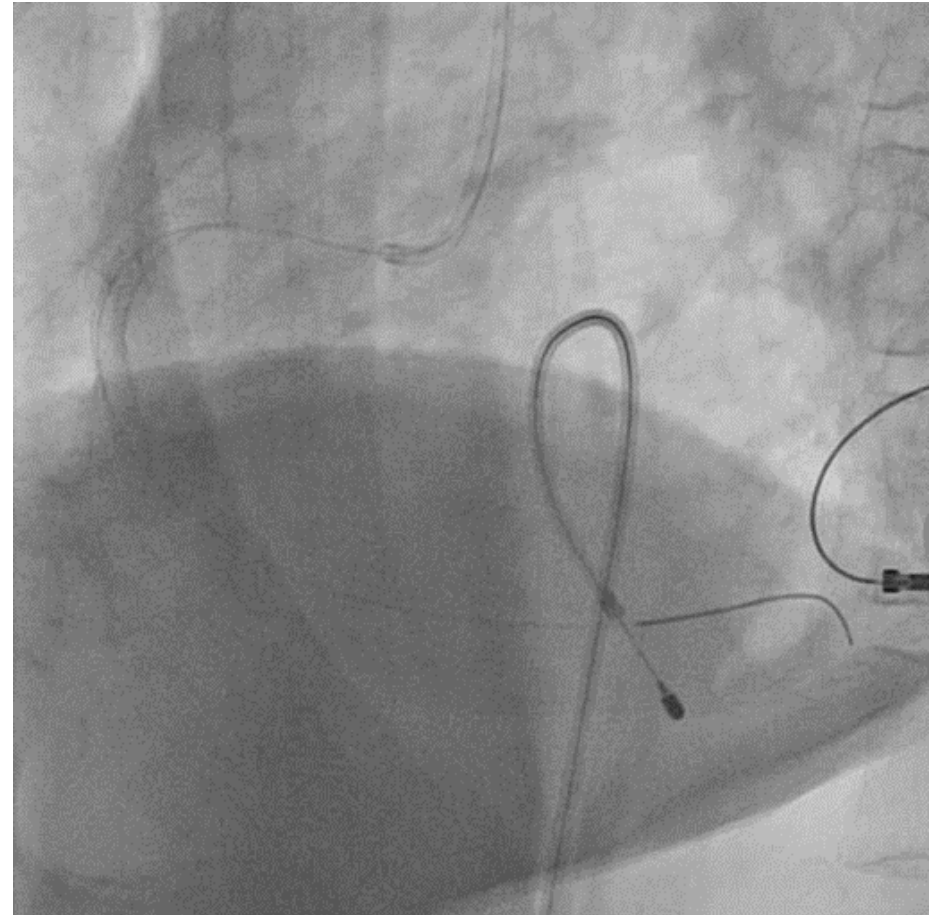
Wait after reperfusion



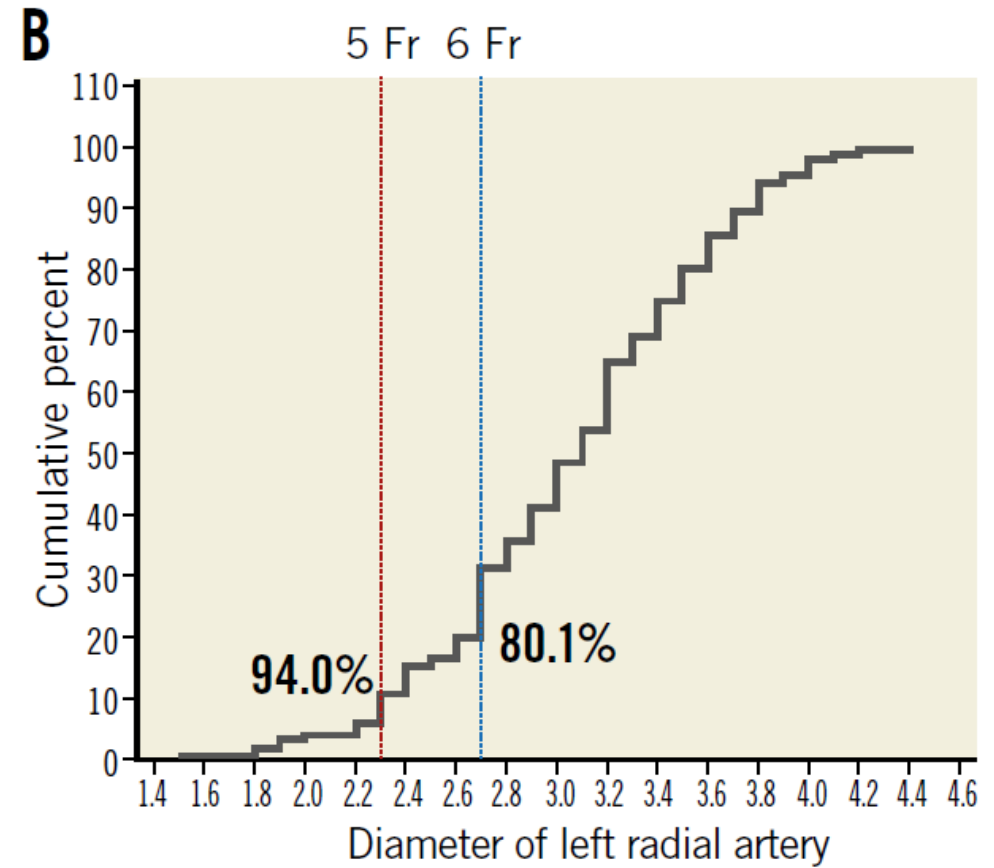
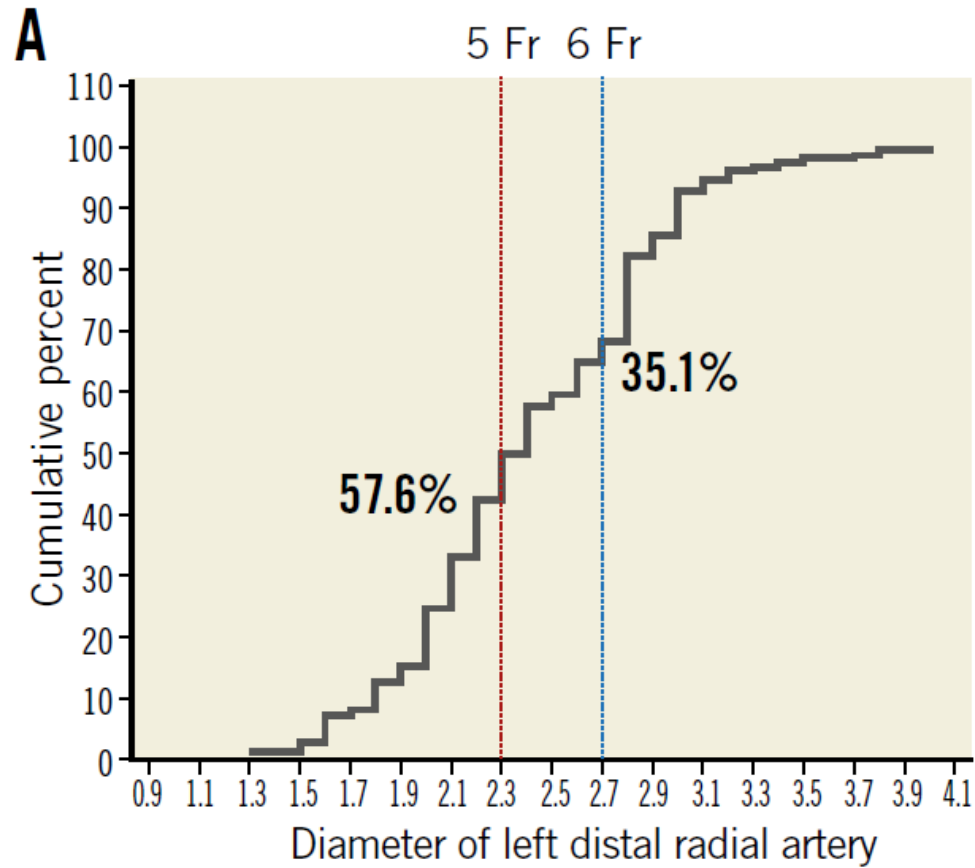
RCA PCI



Resolute Onyx 4.0/38 mm



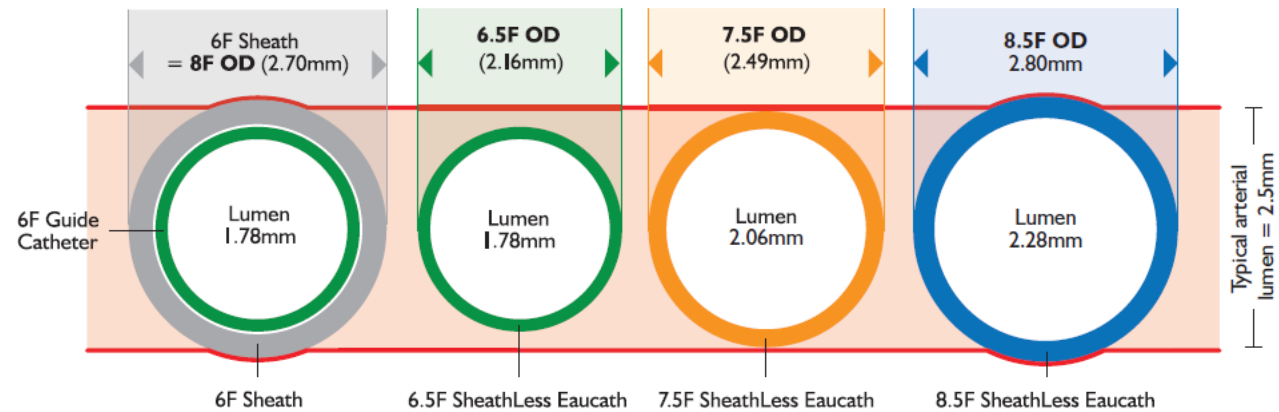
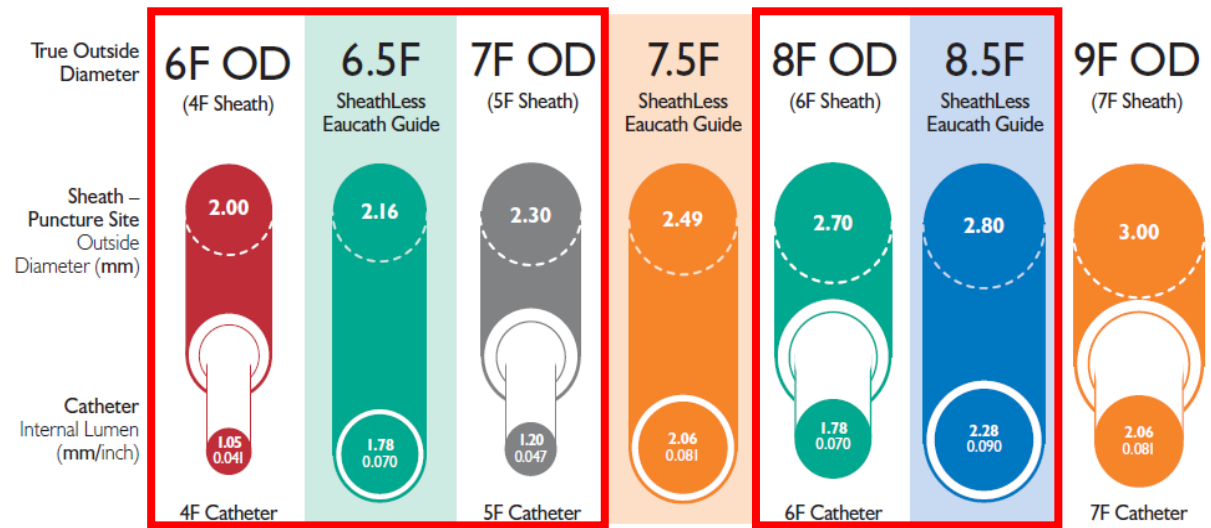
Size does matter



Be familiar with Sheathless GC

| | 6Fr Guiding System | 6.5Fr SheathLess | 7.5Fr SheathLess |
|--------------------------------------|---|---|-----------------------------------|
| O.D. (mm) | 2.50~2.70 | 2.16 | 2.49 |
| I.D. (mm /inch) | 1.78 | 1.78 | 2.06 |
| Deep Seating | Not applicable shaft stiffness | Applicable | Not applicable shaft stiffness |
| Kissing Balloon Technique | Applicable (Balloon catheter smaller than 2.6Fr) | Applicable (Balloon catheter smaller than 2.6Fr) | Applicable |
| Cutting Balloon | ~3.50mm | ~3.50mm | ~4.00mm |
| Rotablator | ~1.75mm | ~1.75mm | ~2.00mm |

Sheathless guiding catheter



| | | | Guiding catheter | | | | | | | |
|-------------------------|----------------|------|------------------|------|------|------|------|------|------|------|
| | | | 5Fr | 6Fr | | | 7Fr | | 8Fr | |
| Device combination / ID | | | 058" | 070" | 071" | 072" | 078" | 081" | 088" | 090" |
| Finecross | 014 wire | 048" | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Corsair | 014 wire | 050" | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Crusade | 014 wire | 056" | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Finecross | Finecross | 068" | X | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Corsair | Finecross | 070" | X | X | ○ | ○ | ○ | ○ | ○ | ○ |
| Corsair | Corsair | 072" | X | X | X | X | ○ | ○ | ○ | ○ |
| Finecross | Balloon | 068" | X | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Corsair | Balloon | 070" | X | X | ○ | ○ | ○ | ○ | ○ | ○ |
| Crusade | Balloon | 076" | X | X | X | X | ○ | ○ | ○ | ○ |
| 5Fr IVUS | 014 wire | | X | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 6Fr IVUS | 014 wire | | X | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 5Fr IVUS | Finecross | | X | X | X | X | ○ | ○ | ○ | ○ |
| 6Fr IVUS | Finecross | | X | X | X | X | X | ○ | ○ | ○ |
| Crusade | Finecross | | X | X | X | X | ○ | ○ | ○ | ○ |
| 5Fr IVUS | Corsair | | X | X | X | X | ○ | ○ | ○ | ○ |
| 6Fr IVUS | Corsair | | X | X | X | X | X | X | ○ | ○ |
| Crusade | Corsair | | X | X | X | X | X | ○ | ○ | ○ |

Potential benefit of distal radial approach

(Hypoplastic ulnar artery)



Summary

1. **Distal radial approach for complex PCI** could be **feasible and safe**, if performed **experienced operator**.
2. After learning curve, you can have **one more route**.
3. There is **no limitation** to use distal radial artery **for complex PCI**, **if you have every answers** for the expected situations.
4. **Slender system** (Sheathless, Glide sheath slender) is good option for small distal radial artery.
5. Finally, DRA will follow the **same way of radial approach**.