

# Rota burr incarceration

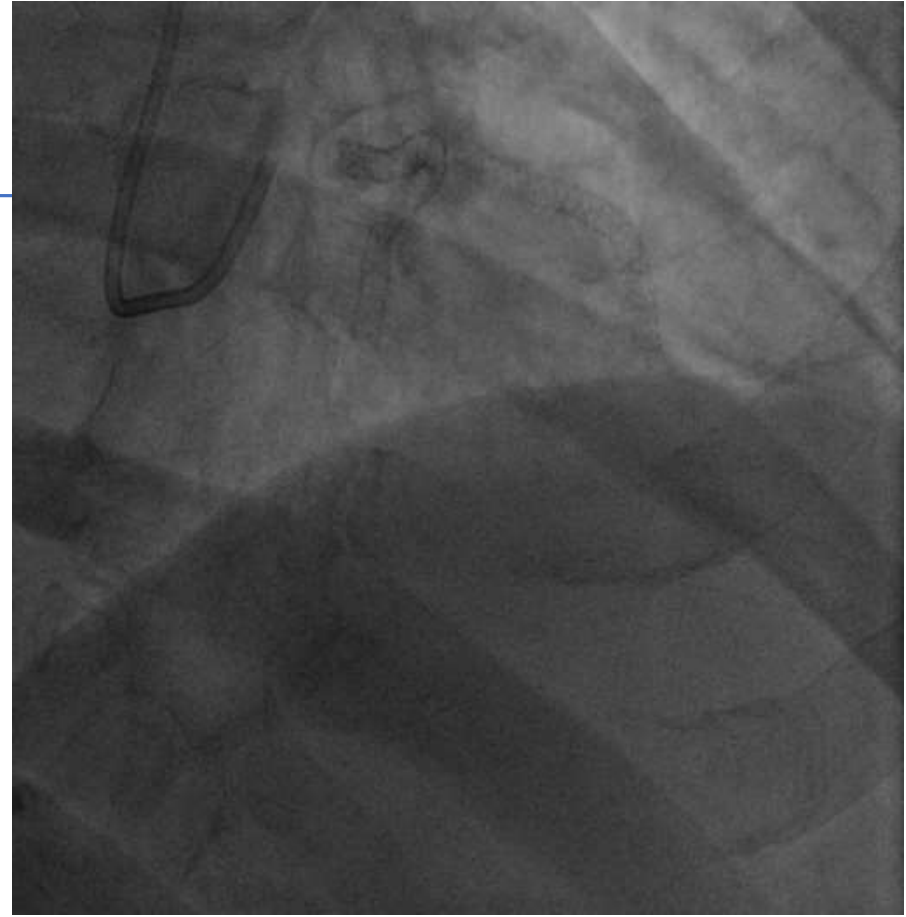
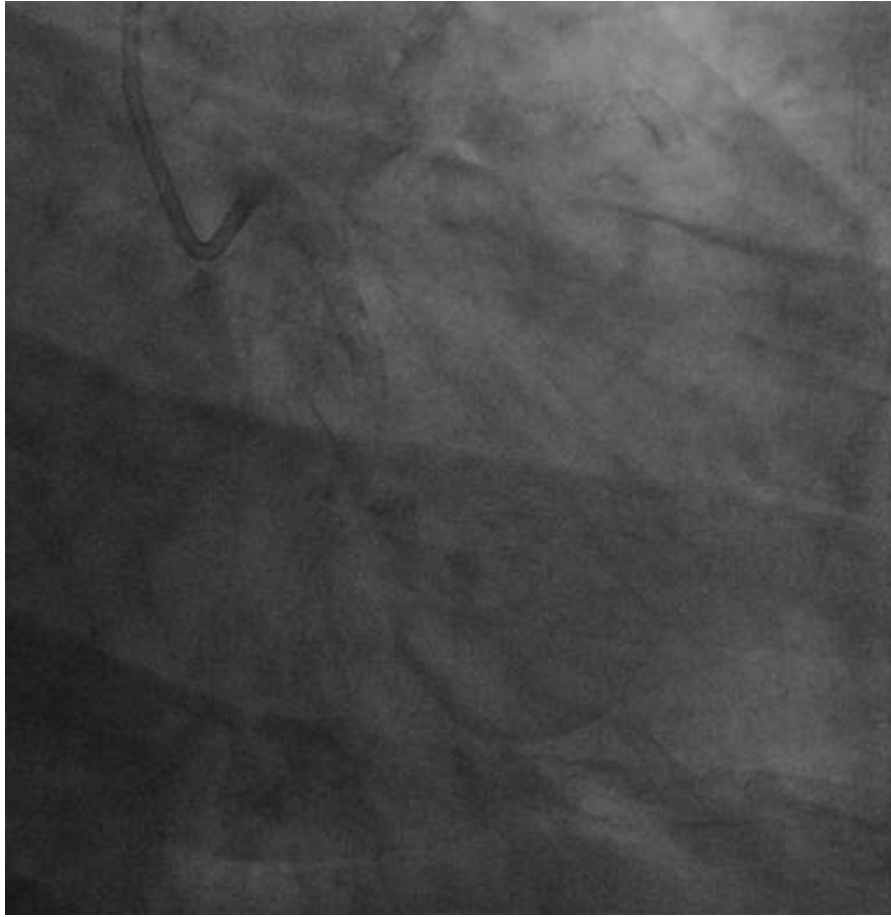
Swapnil Mate M.D. & Wu Chiung-Jen, M.D.  
Chang Gung memorial hospital, Kaohsiung  
Taiwan

PCI-Complex 2019

Nov. 28, 2019, Seoul, Korea

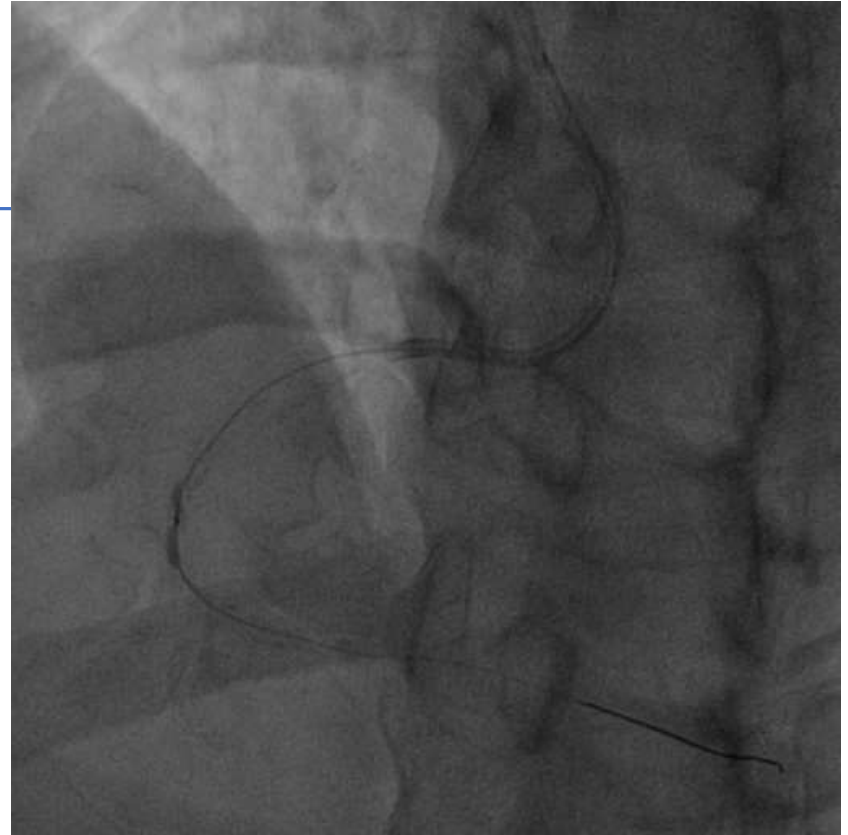
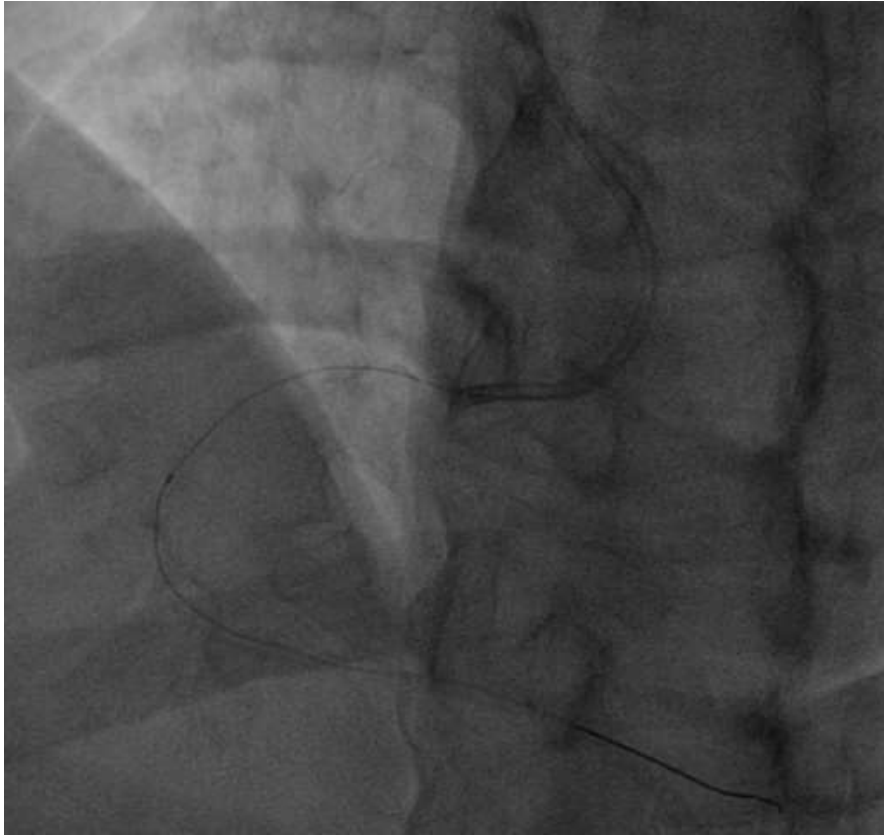
- A 63 yrs, gentleman
- HTN and Type 2 DM
- SCAD , +ve TET
- 2 weeks before he underwent PCI with DES to p-m LAD and m-d LCX
- Echo : No RWMA , Mod MR , DD grade 2 , **LVEF 65%**
- ECG : Non specific ST-T wave changes
- Target lesion : **fix RCA CTO**

**Access:** Right snuff box artery with 6-7 Terumo Glidesheath  
**Diagnostic catheters :** 6 F JL 3.5 and JR 4.0, DES in LAD & CX  
was OK, stage PCI for RCA CTO



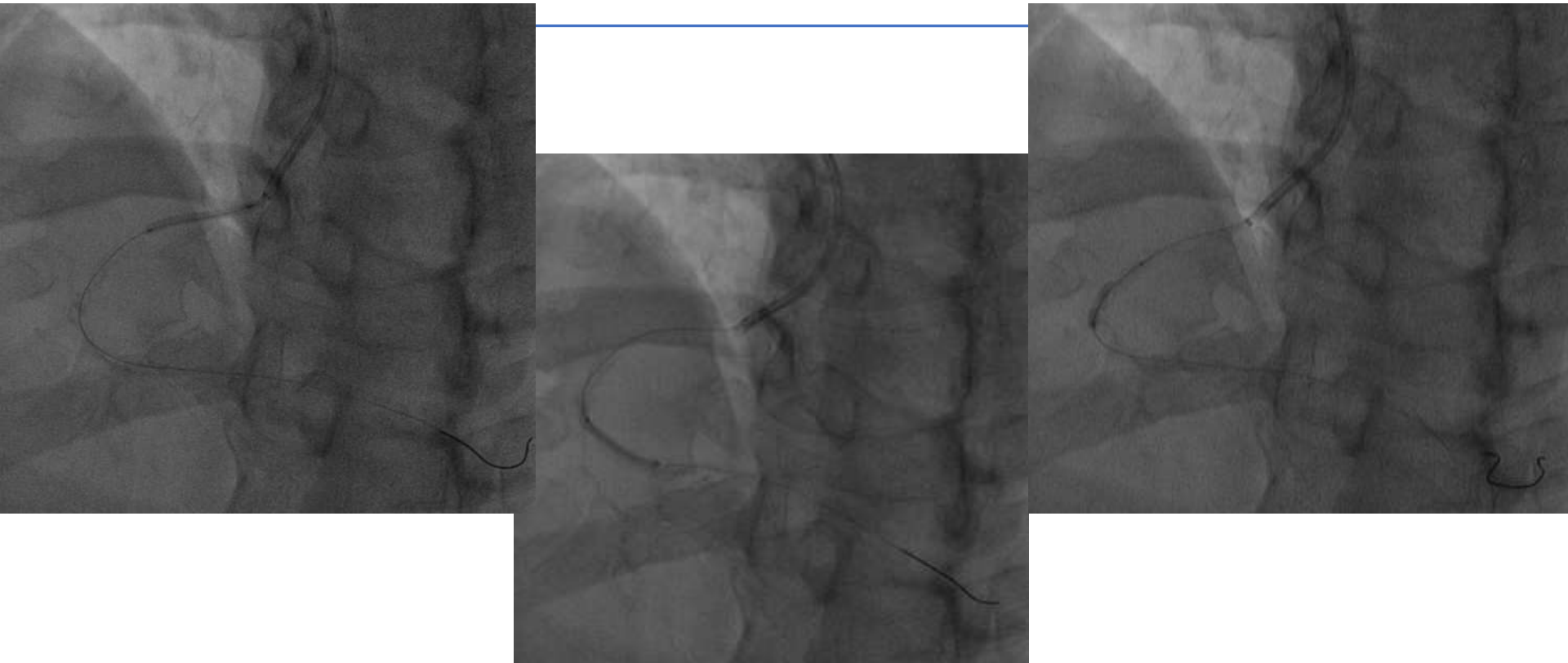


Using 7F SAL1, **Sion blue** GW successfully crossed to distal PDA with support of Finecross MC

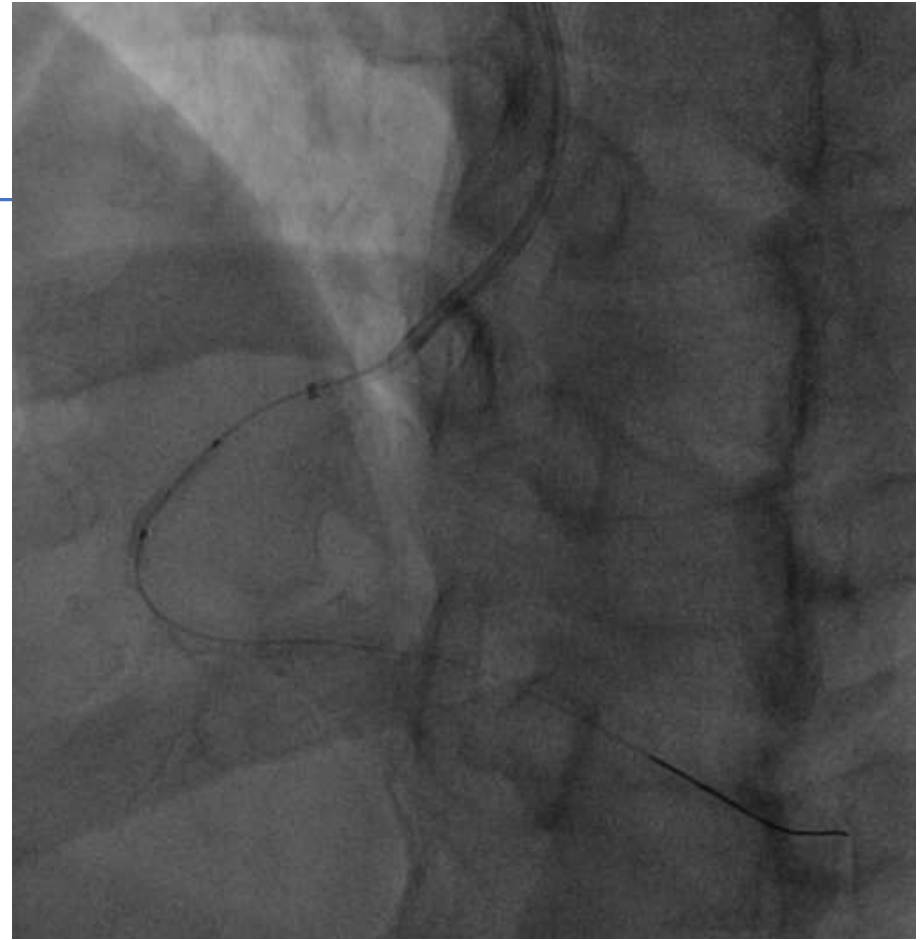
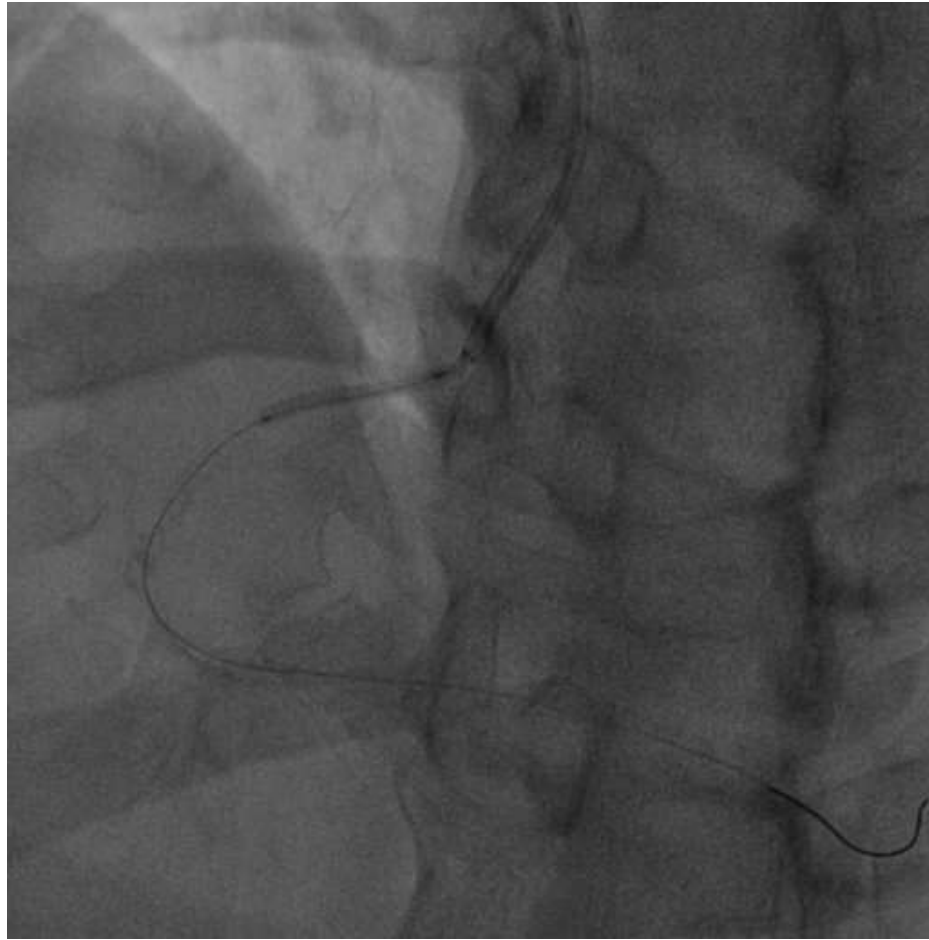


Balloon advancement with guideliner support, But still some **waist** in mid RCA

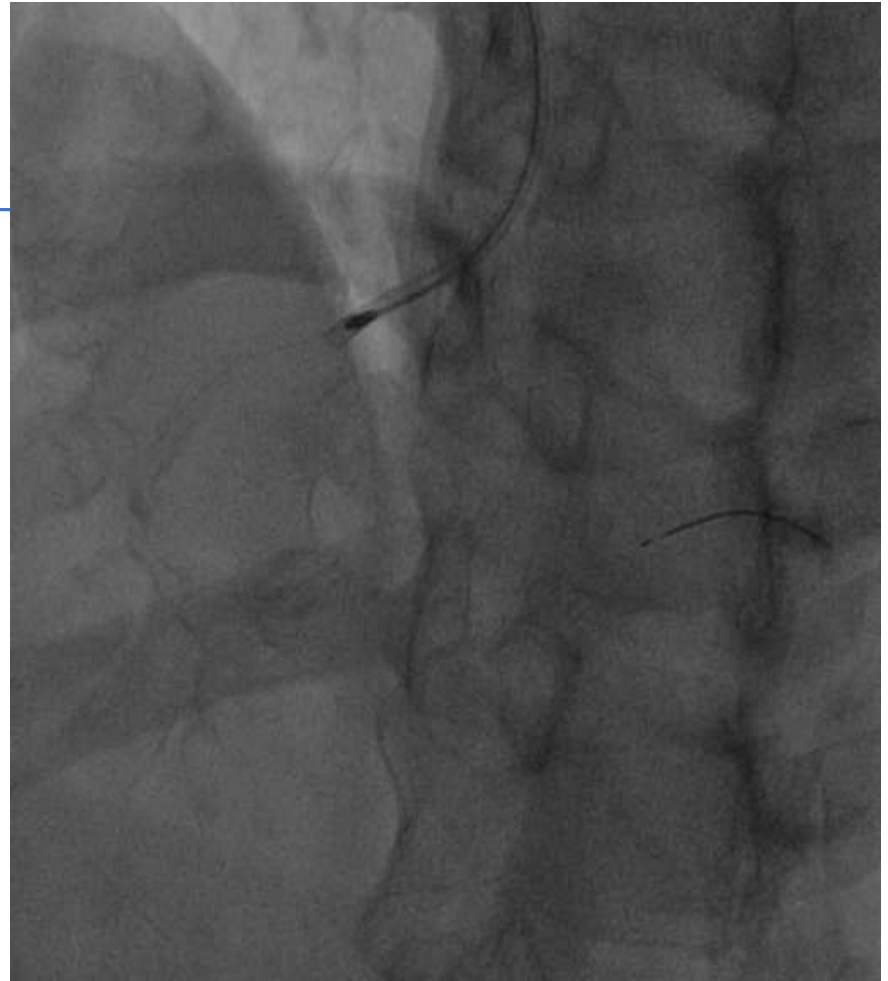
Mini trek 1.5 x 12 mm & 2.0 x 20 mm up to 18 atm



# NC Emerge 2.0x15mm up to 26 atm

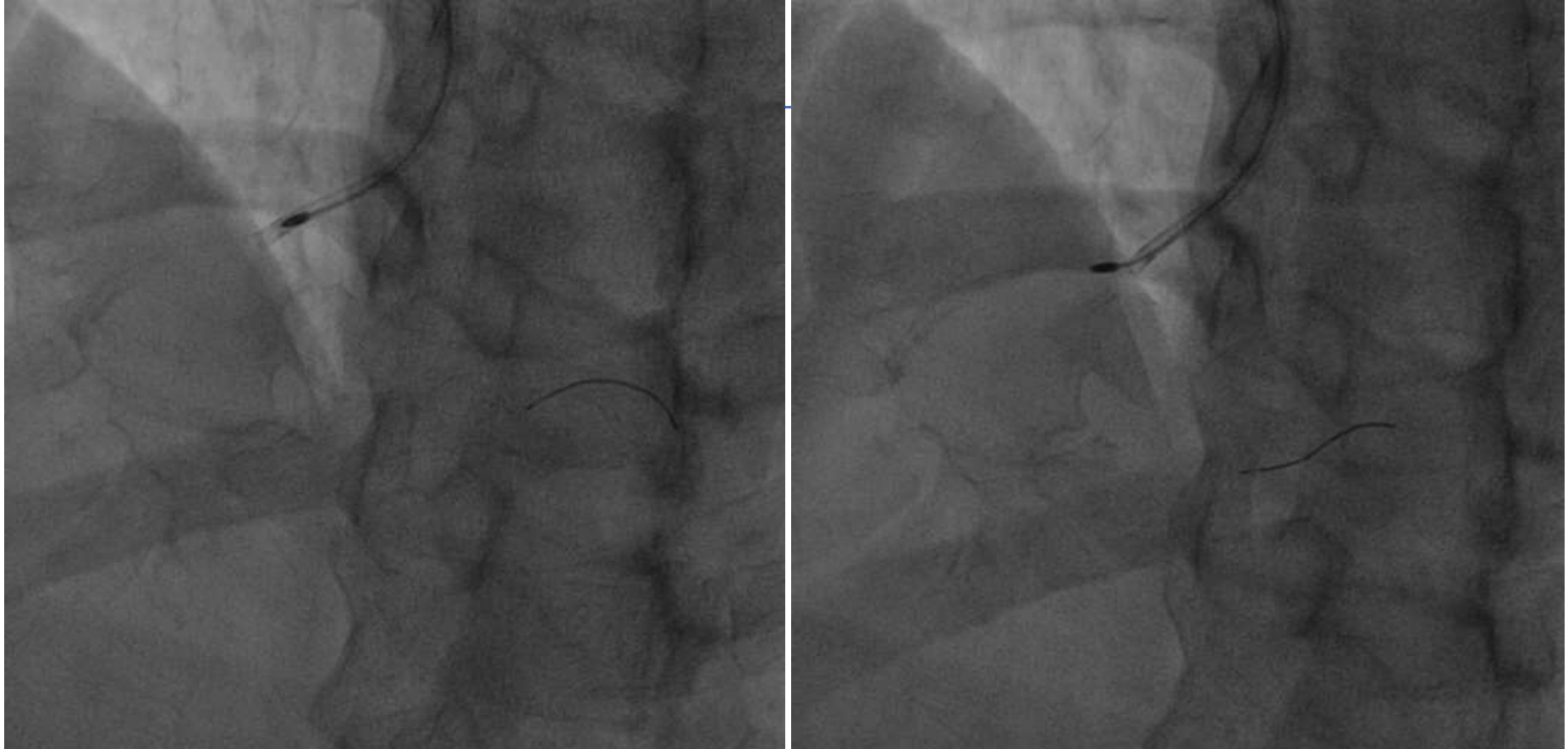


# Rotablation (1.5 mm burr)





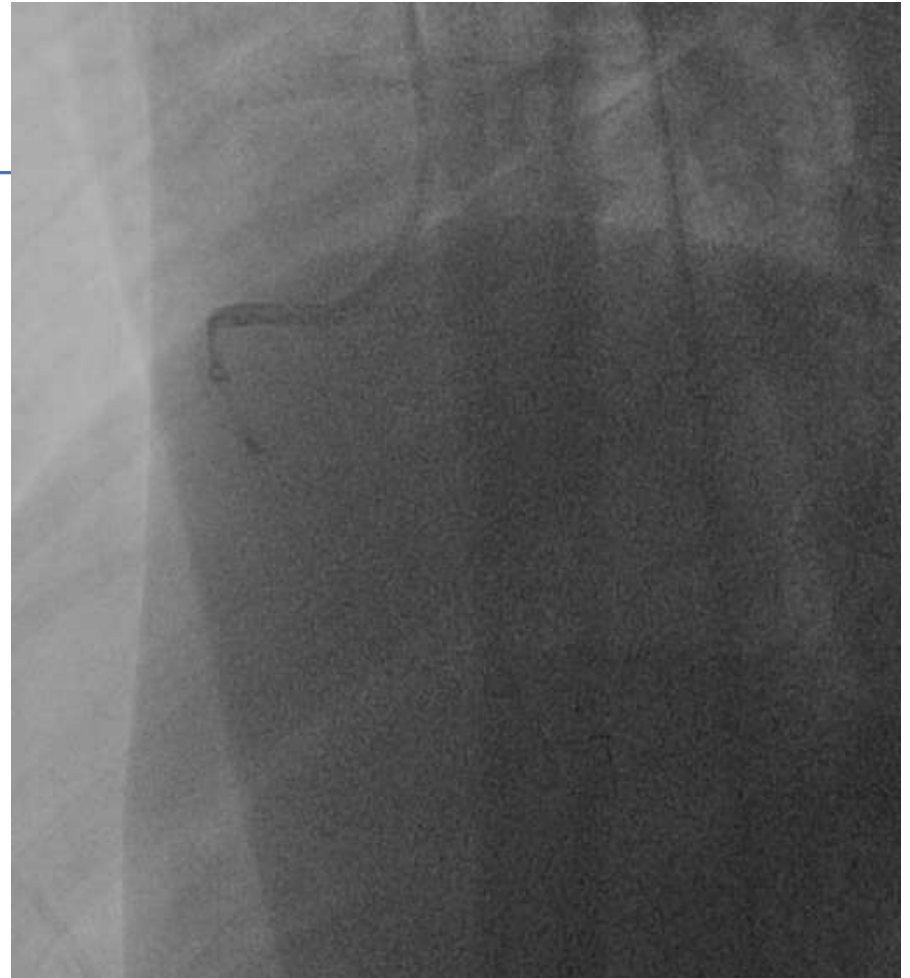
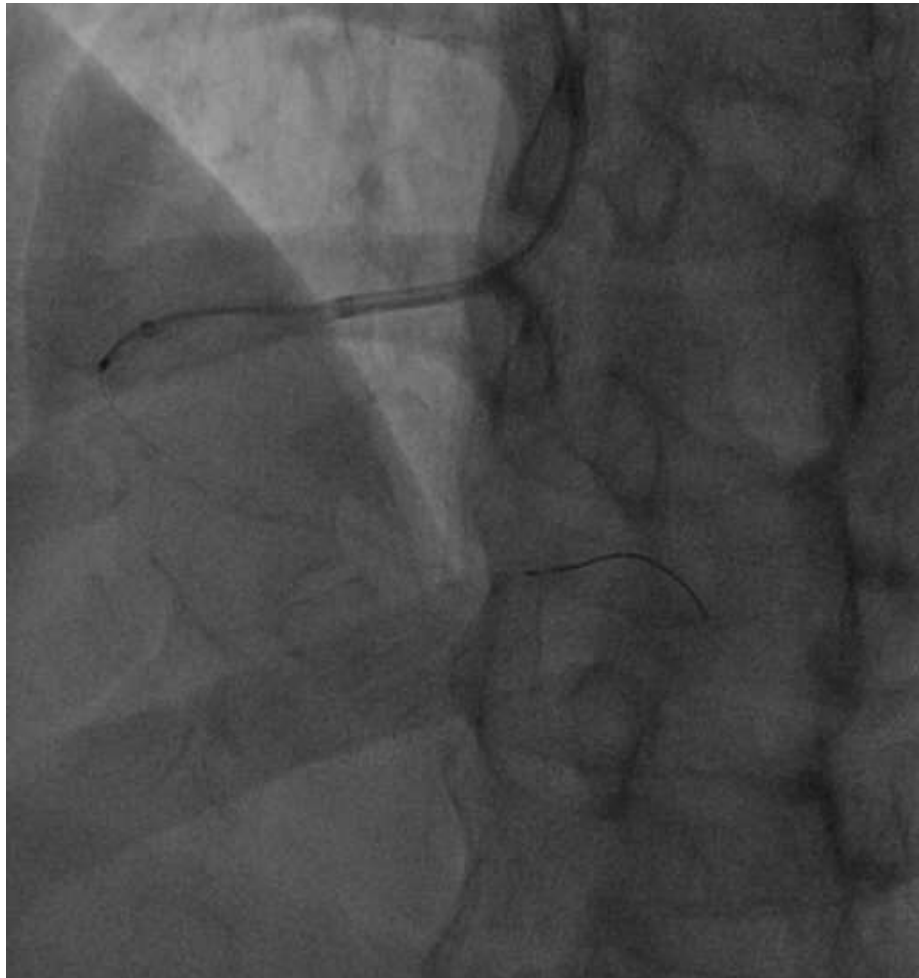
1.5 mm burr at 180.000 rpm for 30 seconds x 3times , but **failed to pass mid RCA. Bradycardia** , transient 2:1 block intermittent with complete **A-V block** which recovered spontaneously after stoppage rotablation >> Atropine 1mg given



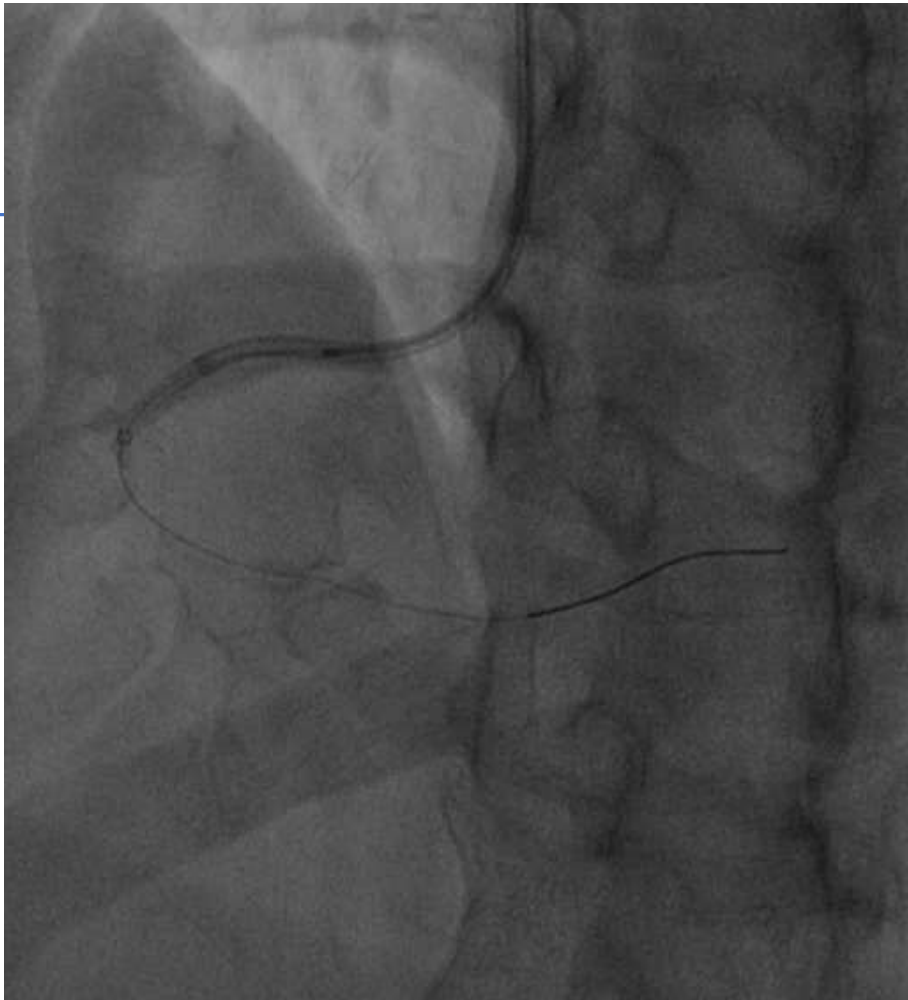
Os-RCA dissection was noted



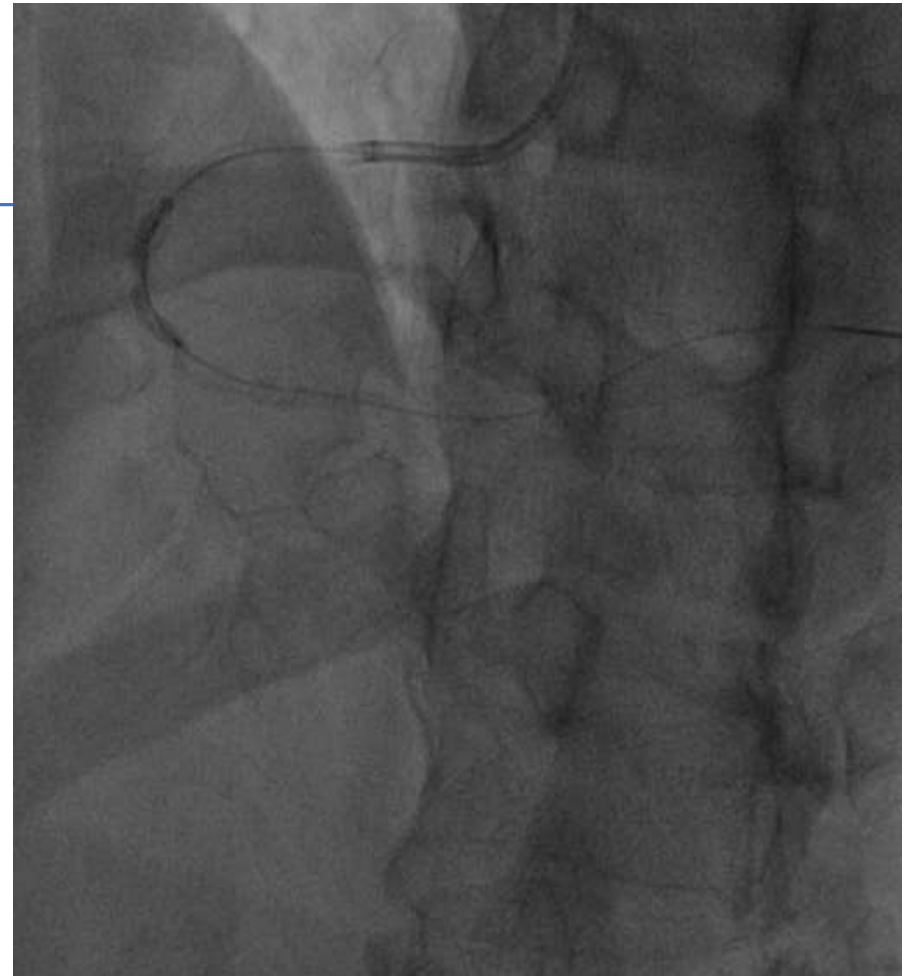
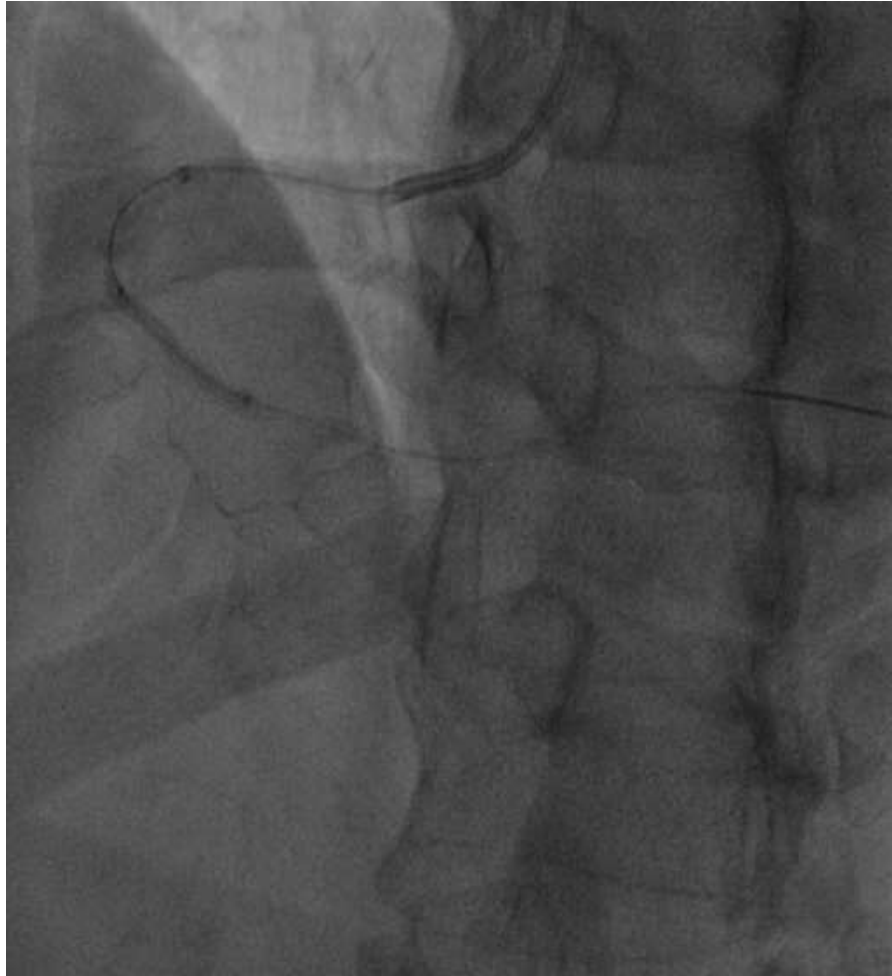
Finecross was used to exchange rota wire to sion. **Corsair MC could not cross mid RCA**



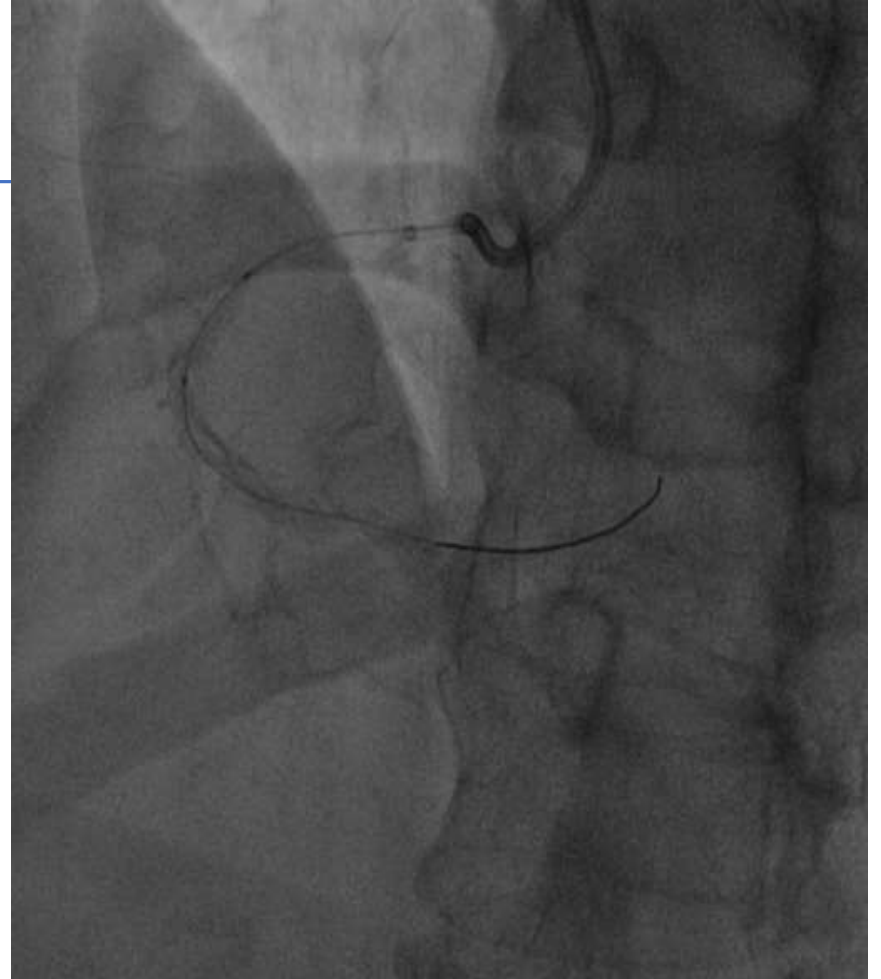
**Turnpike gold stuck in m-RCA** and was removed by advancing Guideliner



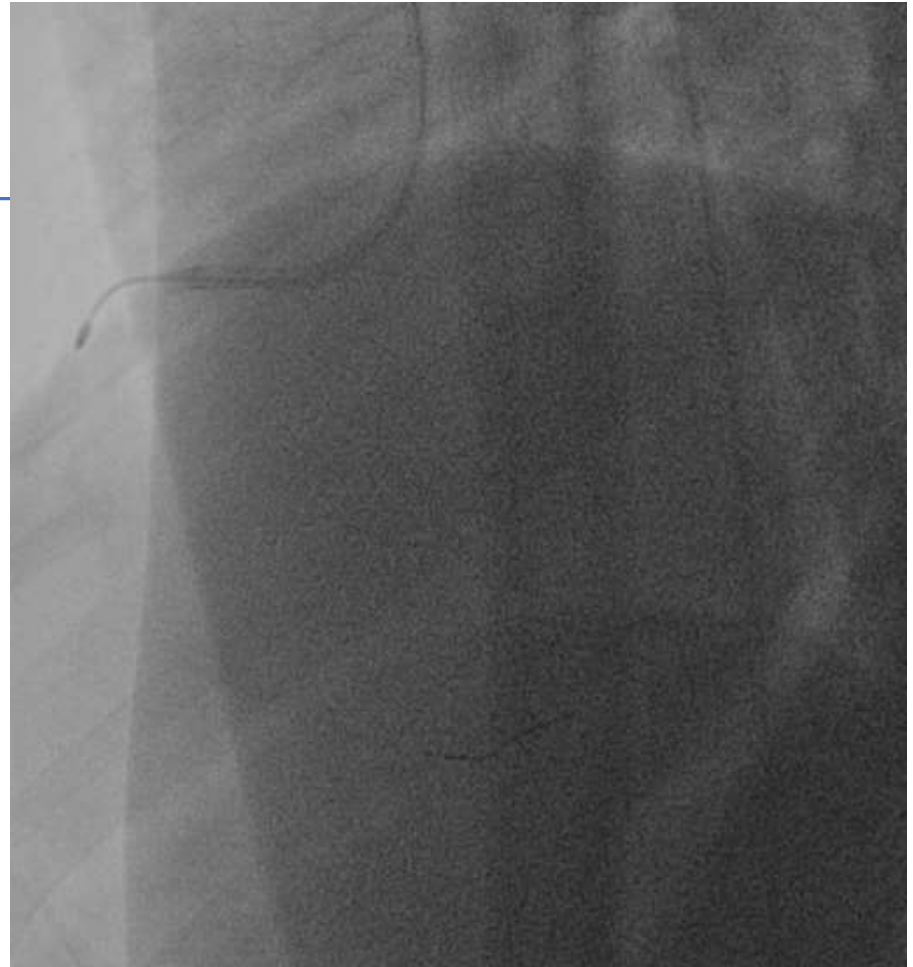
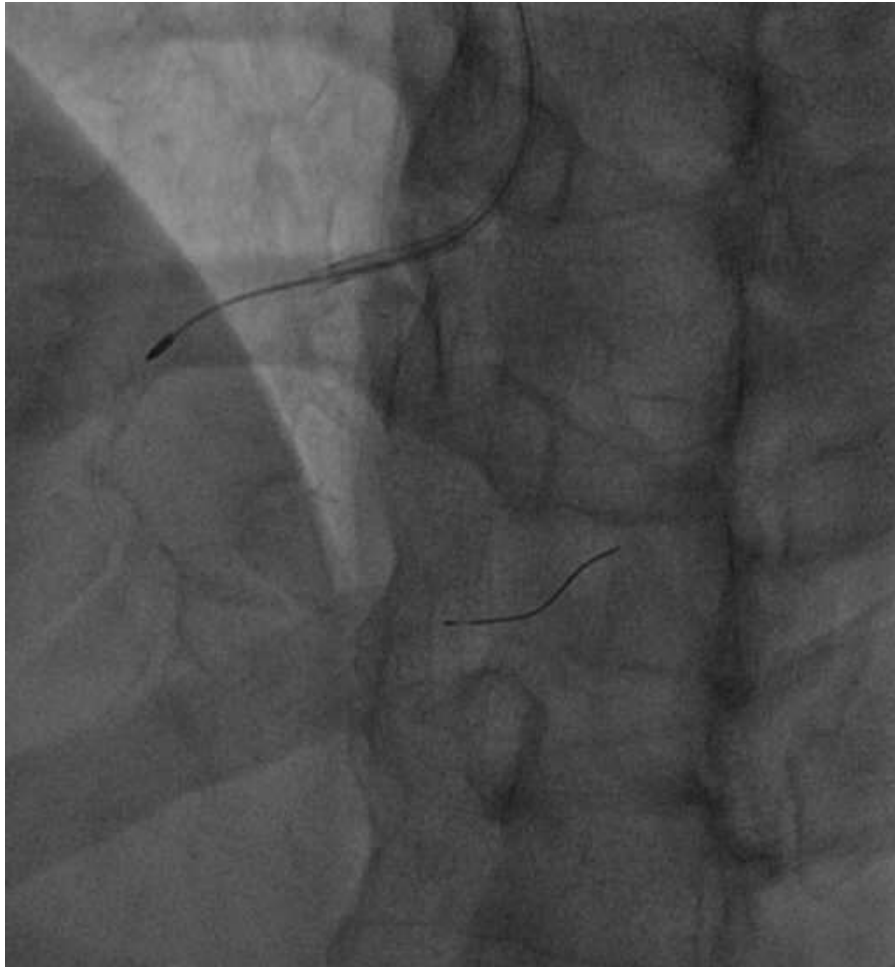
NC Trek 2.5x15 and NC Emerge 2.5x8 mm up to 18 atm  
**failed** to open the lesion at m-RCA



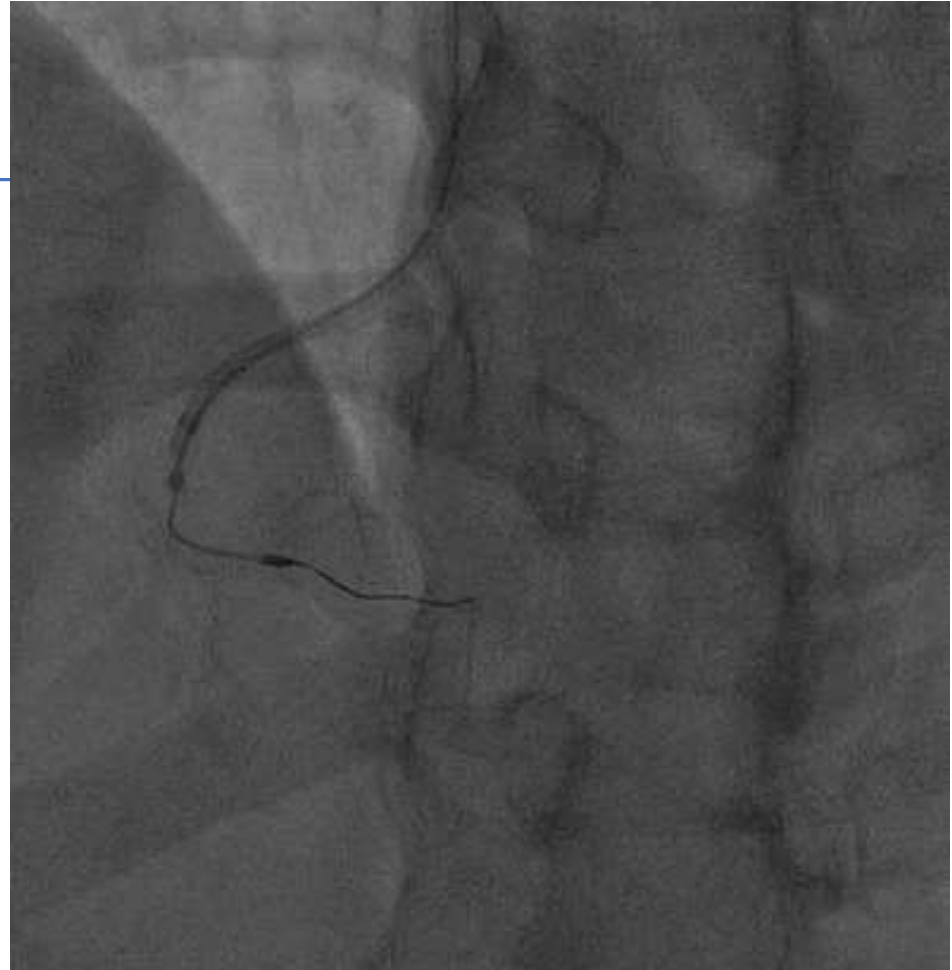
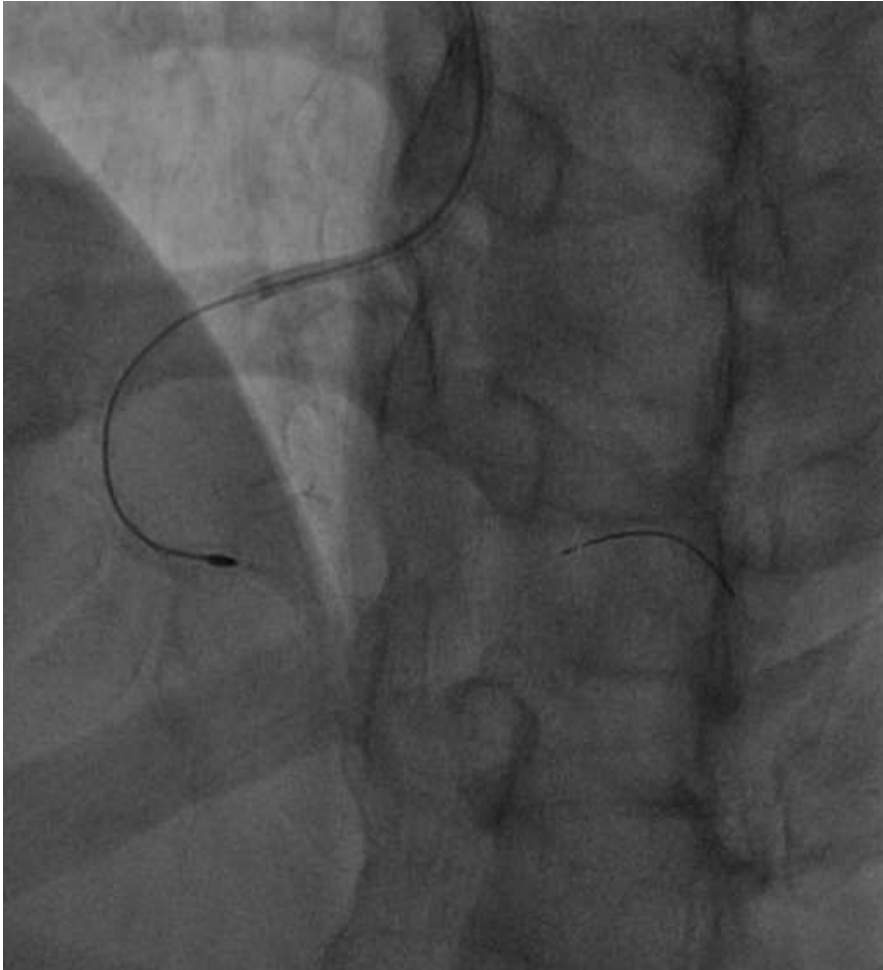
# Grenadoplasty



Sion GW was changed to rota wire (with Finecross), **1.25 mm Rotaburr** was used at 180.000 rpm



but it was **incarcerated** at the distal RCA calcified lesion  
Rota retrieval attempted by **5.5F guideliner** catheter - **Failed**.





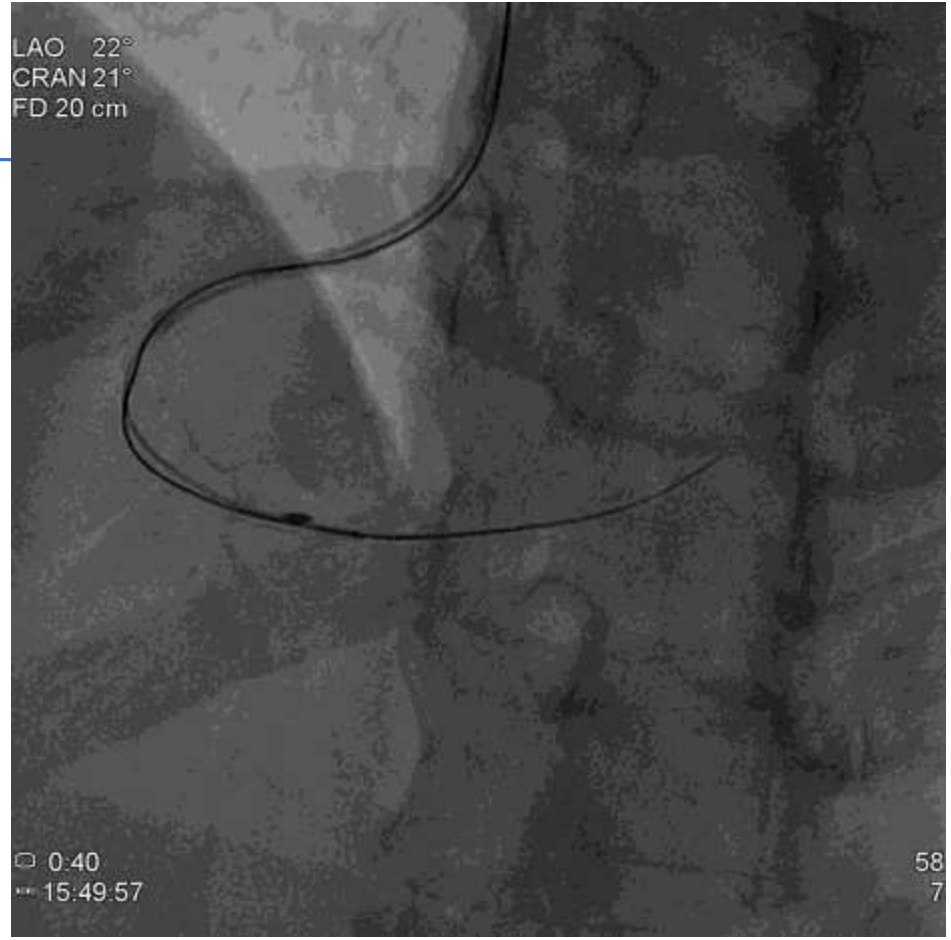
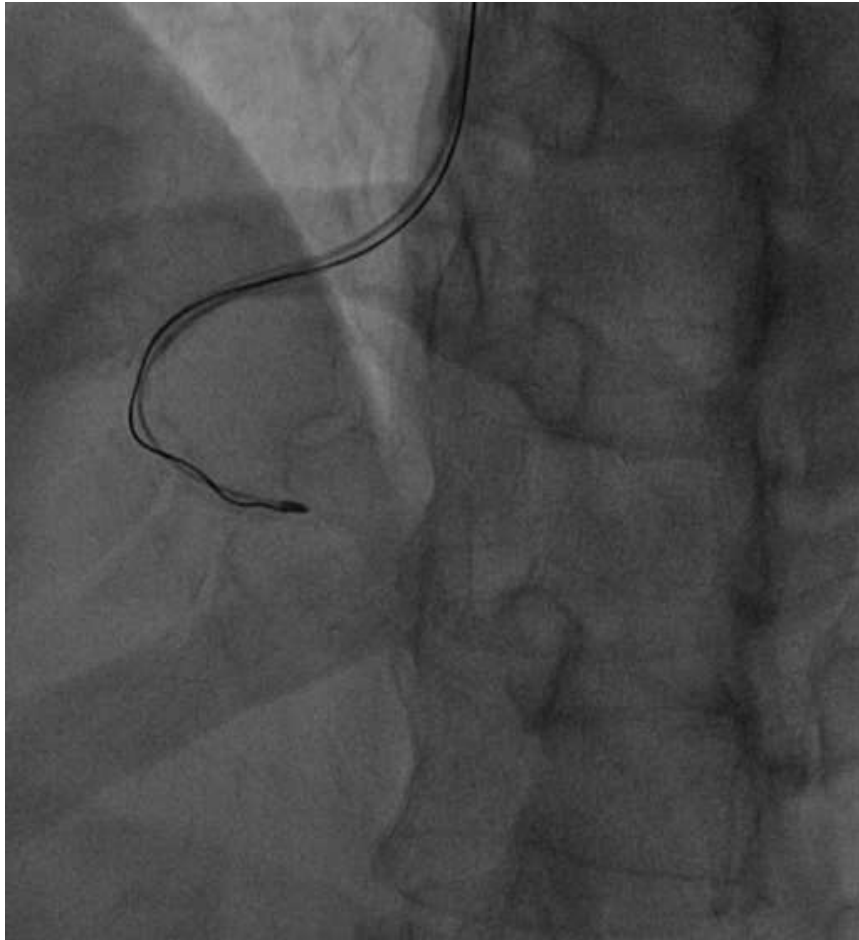




- Rota burr was cut,  
Y-connector removed,  
5F ST-01 \*(Terumo Corp.)  
advanced under non invasive BP  
monitoring - **Failed to retrieve**



**UB3** was tried to cross to distal RCA but failed and **conquest pro** successfully passed subintimal space at trapped burr site



Sapphire 1.0 x5mm then 1.2x6mm at burr site and Mini Trek at m-d RCA



Rota burr was successfully removed with guidewire withdrawn together smoothly using another ST01



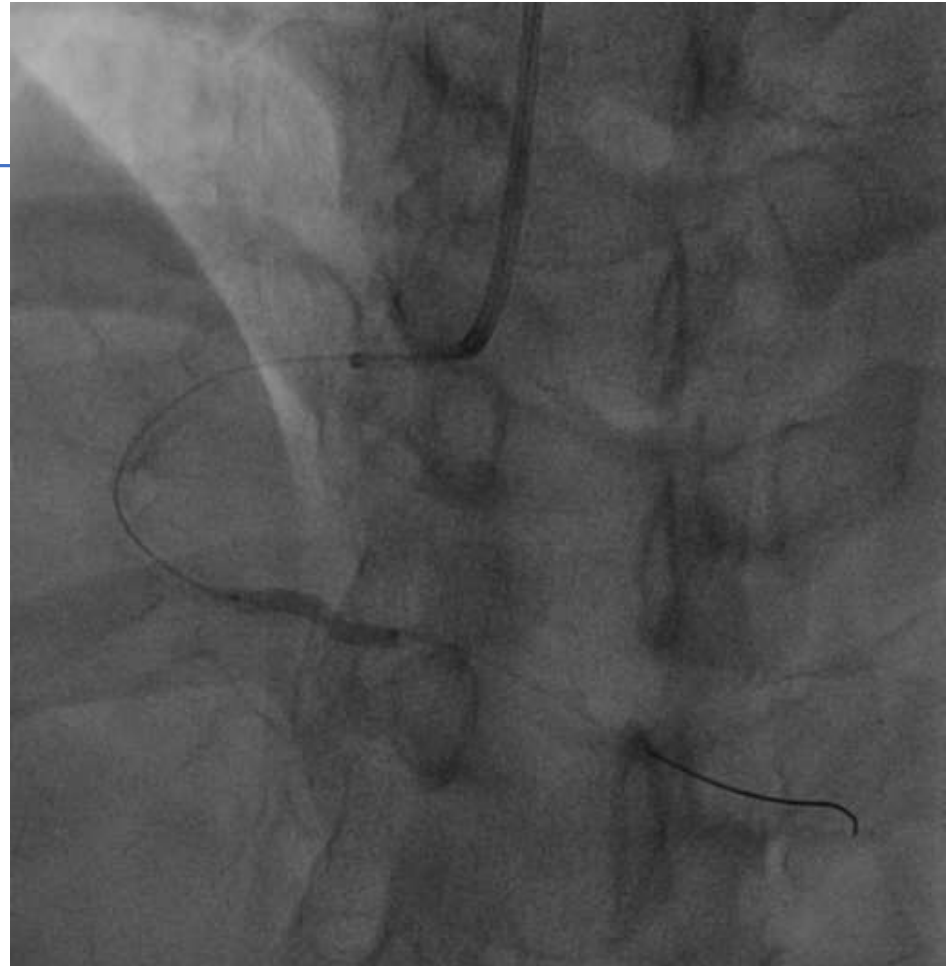
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Catheter was changed to 6F  
JR4  
Spiral ostial dissection was  
noted

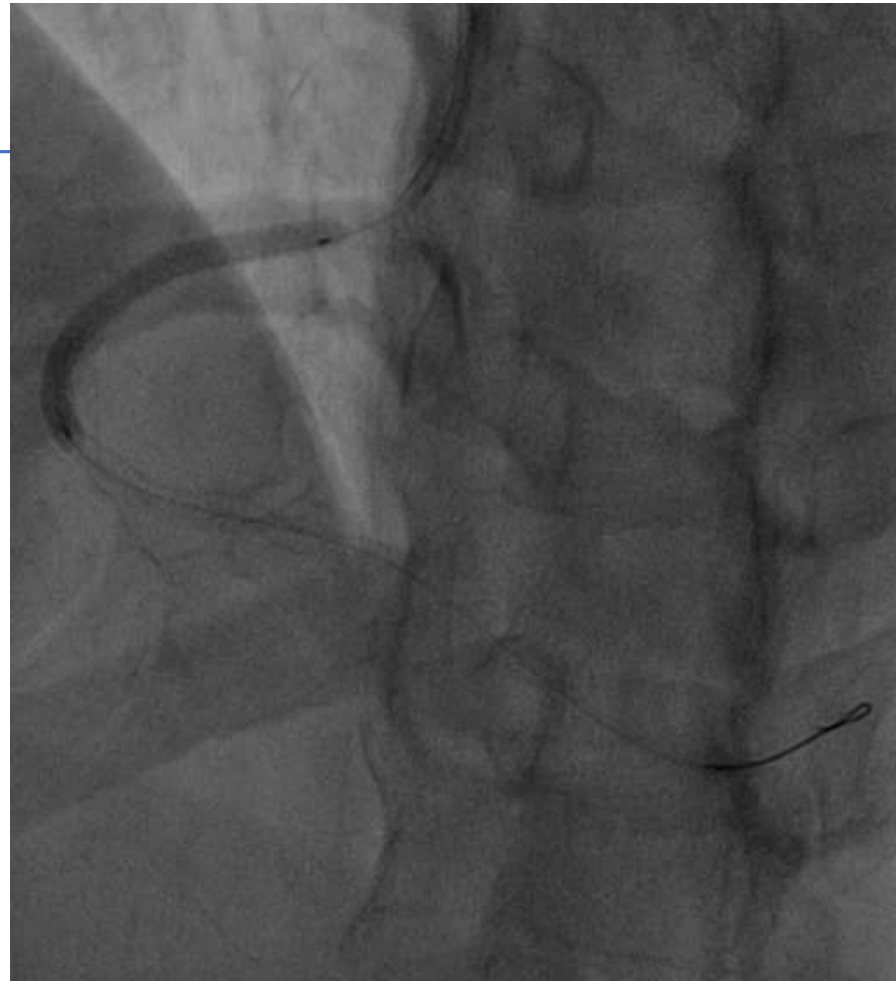
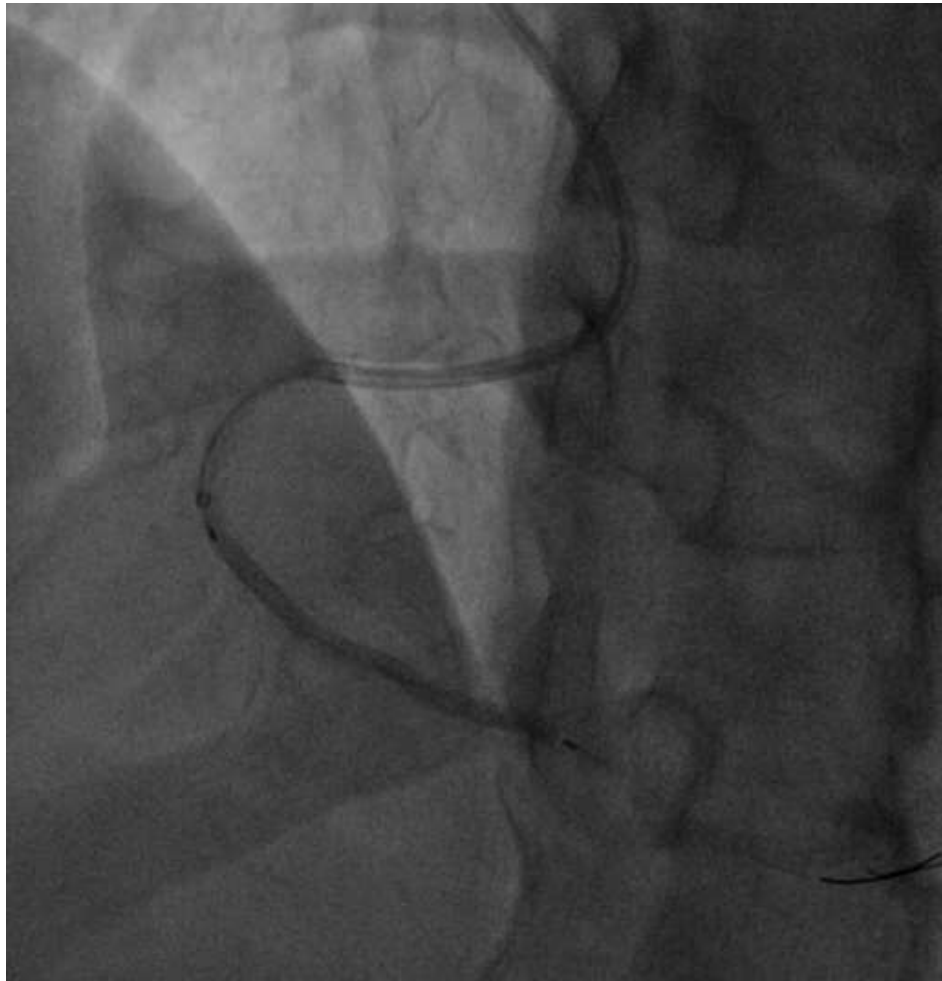


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Runthrough guidewire was advanced to distal PDA pre-dilatation with guideliner support - Accuforce 2.5x15mm up to 20 atm

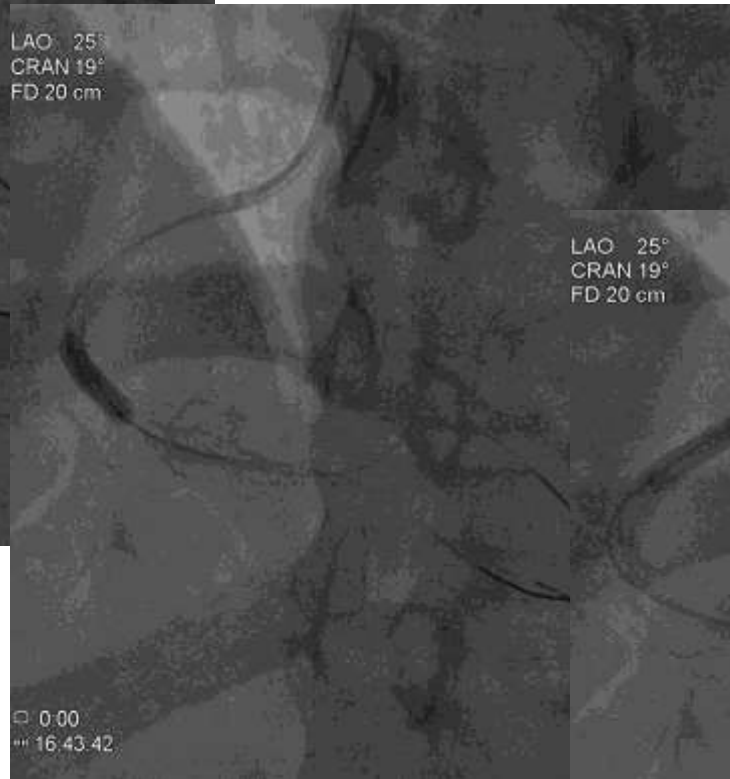


2 long DES 2.5x48 and 3.0x48 mm from distal to ostial RCA up to 16 atm

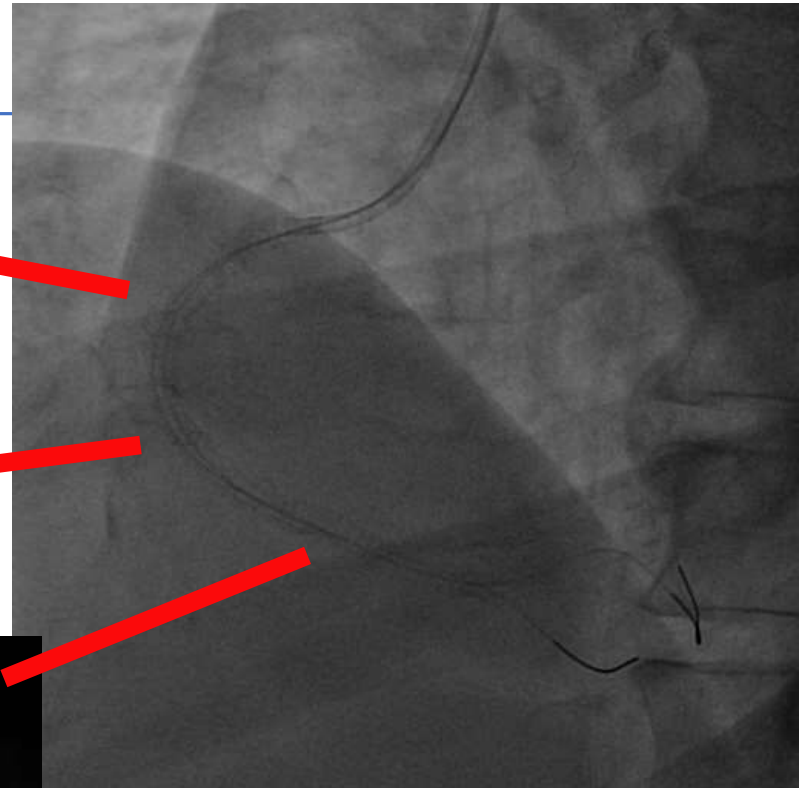
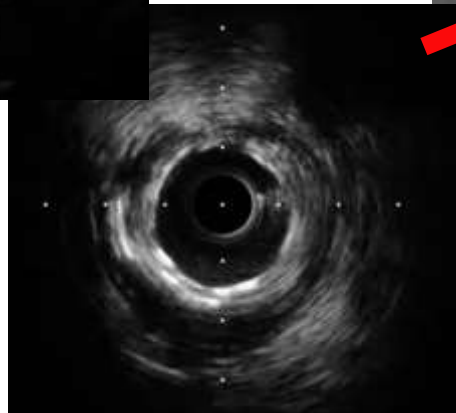
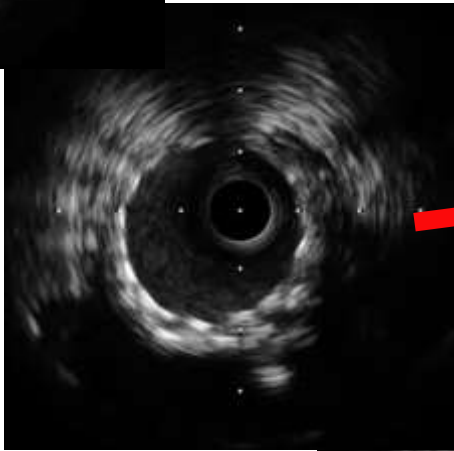
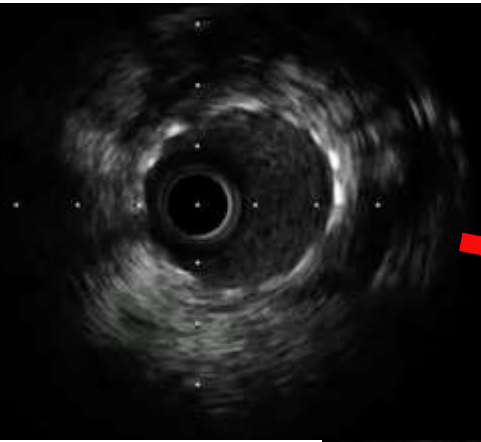




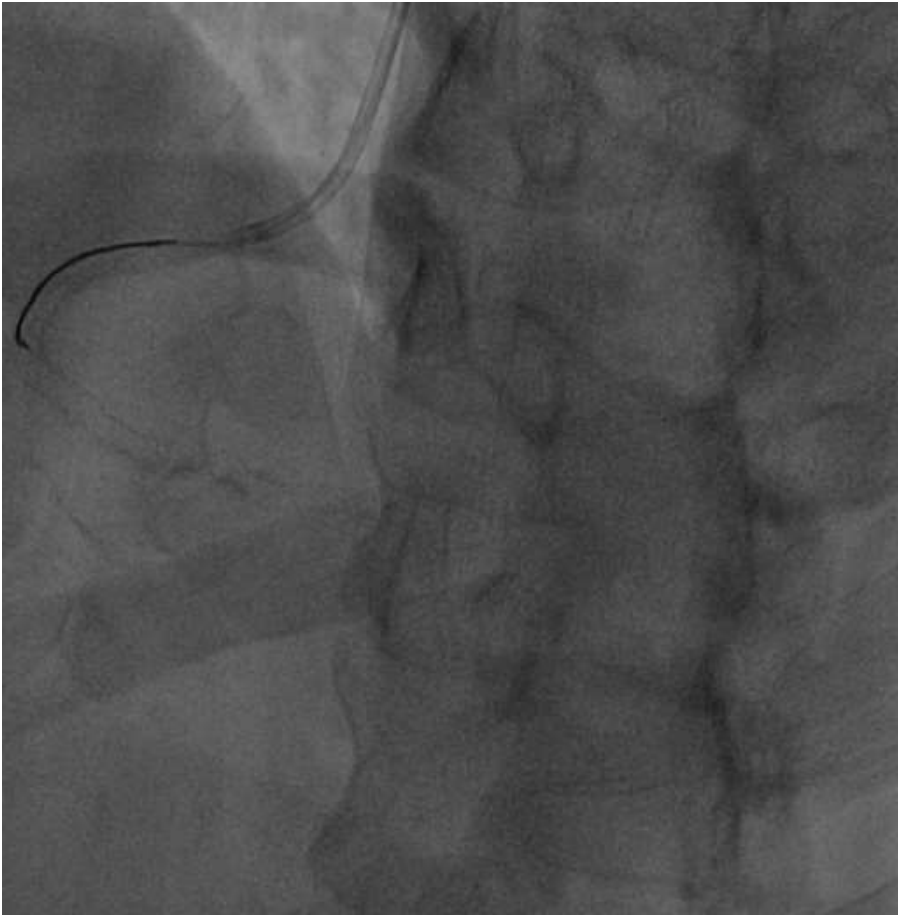
Post-dilatation with Accuforce 3.0 mm for d-RCA , 3.5 mm for m-RCA and 4.0mm for p-RCA



Repeat IVUS; good apposition , no stent edge dissection



Final angiography: procedure time = 224 min, Fluroscopic time = 90 min, contrast volume = 240 ml



# Patient Profile

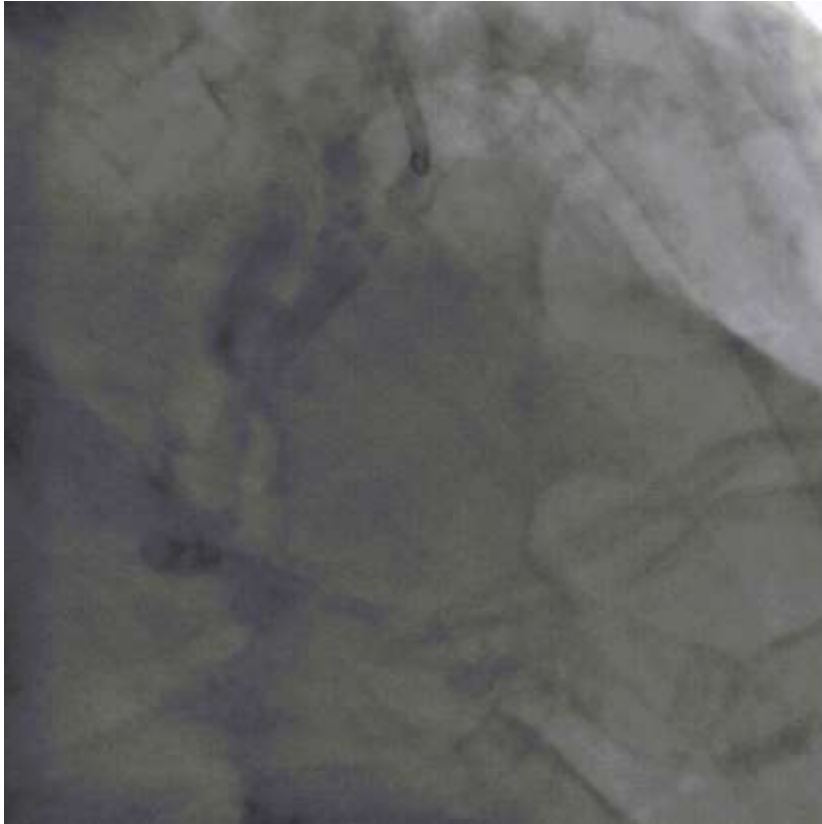
- Age: A 63 years old
- Gender: male
- Risk factor: DM, HTN, **ESRD on P/D**,
- LV EF: 45% , anterolateral wall hypokinesia
  
- Condition:
  - Recent NSTEMI cardiogenic shock, 3VD was Dx at other hospital, turn-down by CVS for CABG, and transferred to our center for considering of PCI
  - **Shifted to transient H/D**
  - **IABP support**
  - Dopamine support

TERUMO 6-7 Glidesheath via L't Snuffbox d-LRA

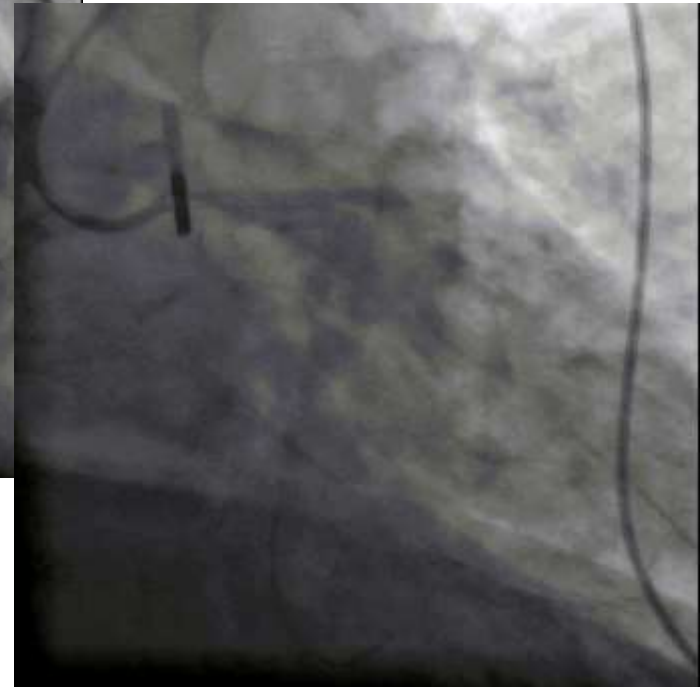
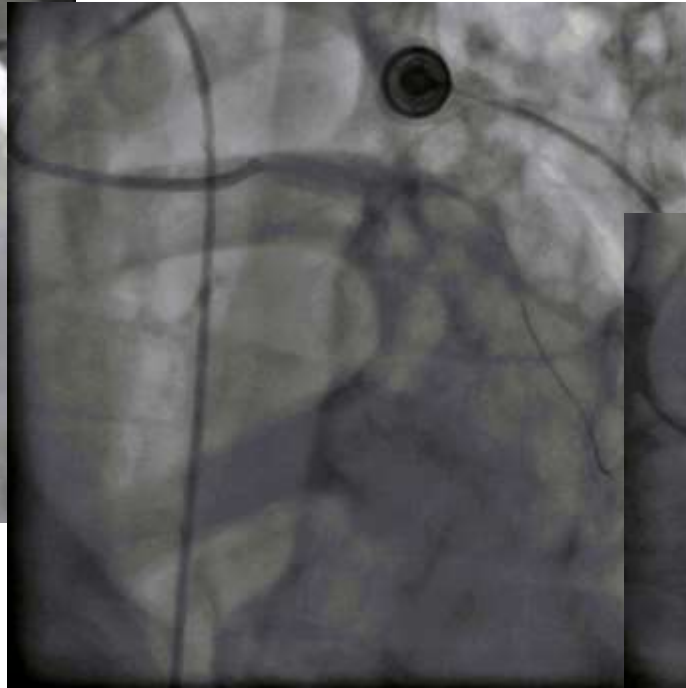
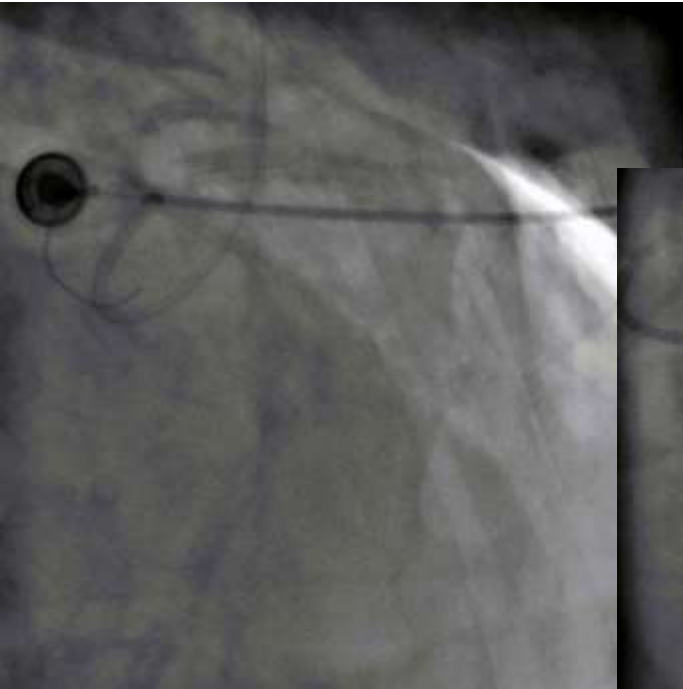


# RCA

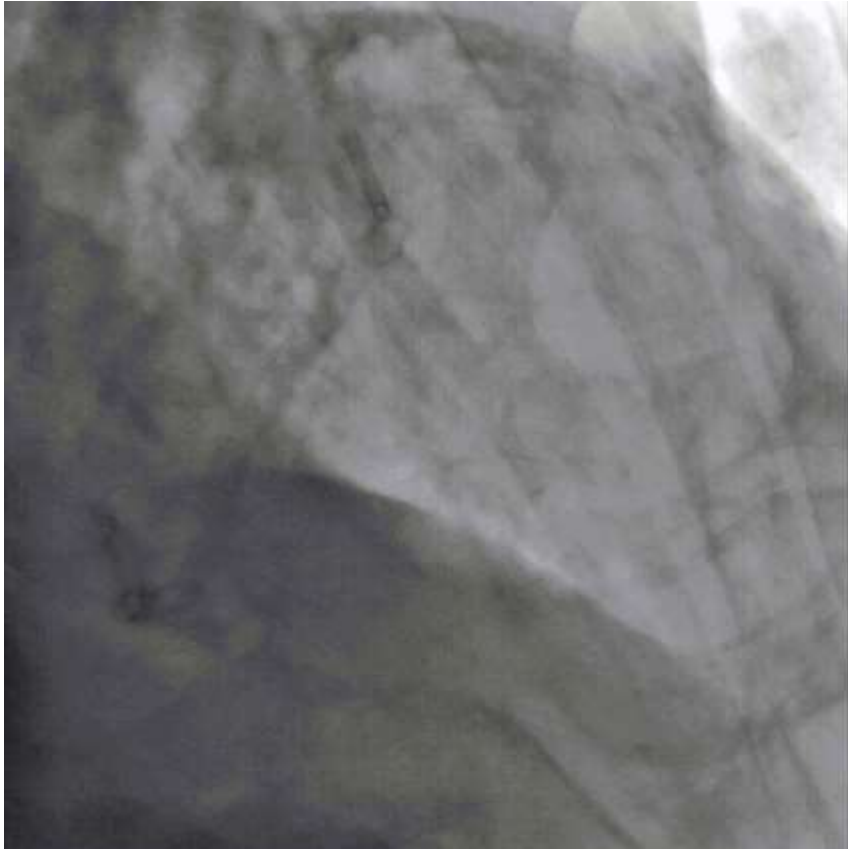
6Fr IL4 guiding catheter for both side coronary arteries



# LCA

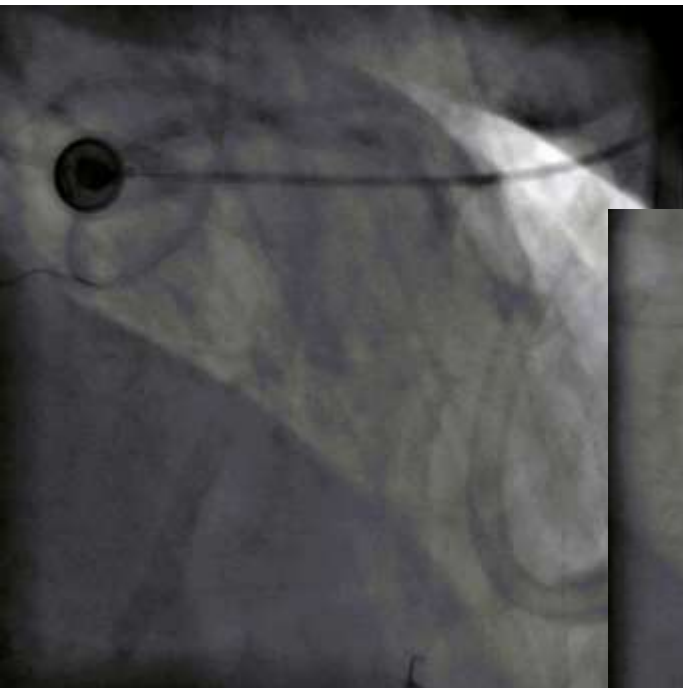


# RCA s/p stenting final angiogram:

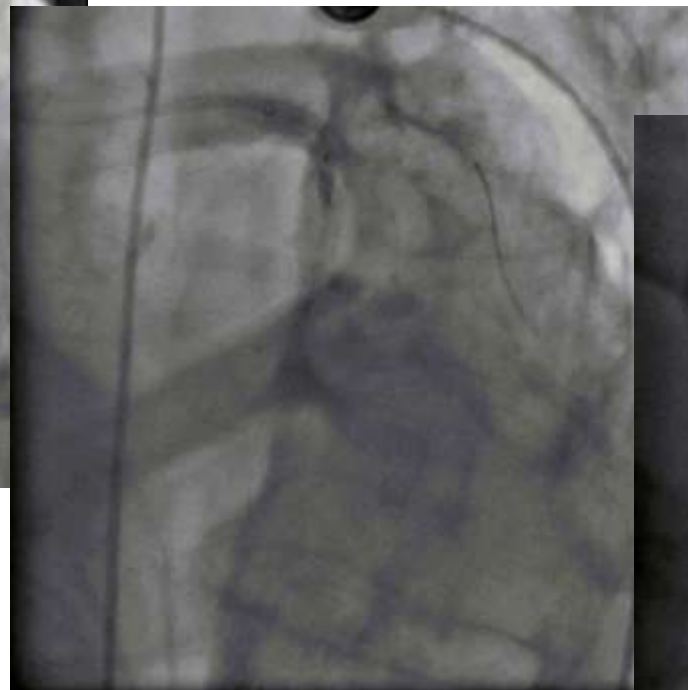


# PCI to LCA (transient hypotension on LAD PCI under IV Dopamine & IABP)

Proximal LAD critical lesion with 2.5x15 mm → “NC-balloon un-dilatable”



Mini-Trek 2.0x20 mm



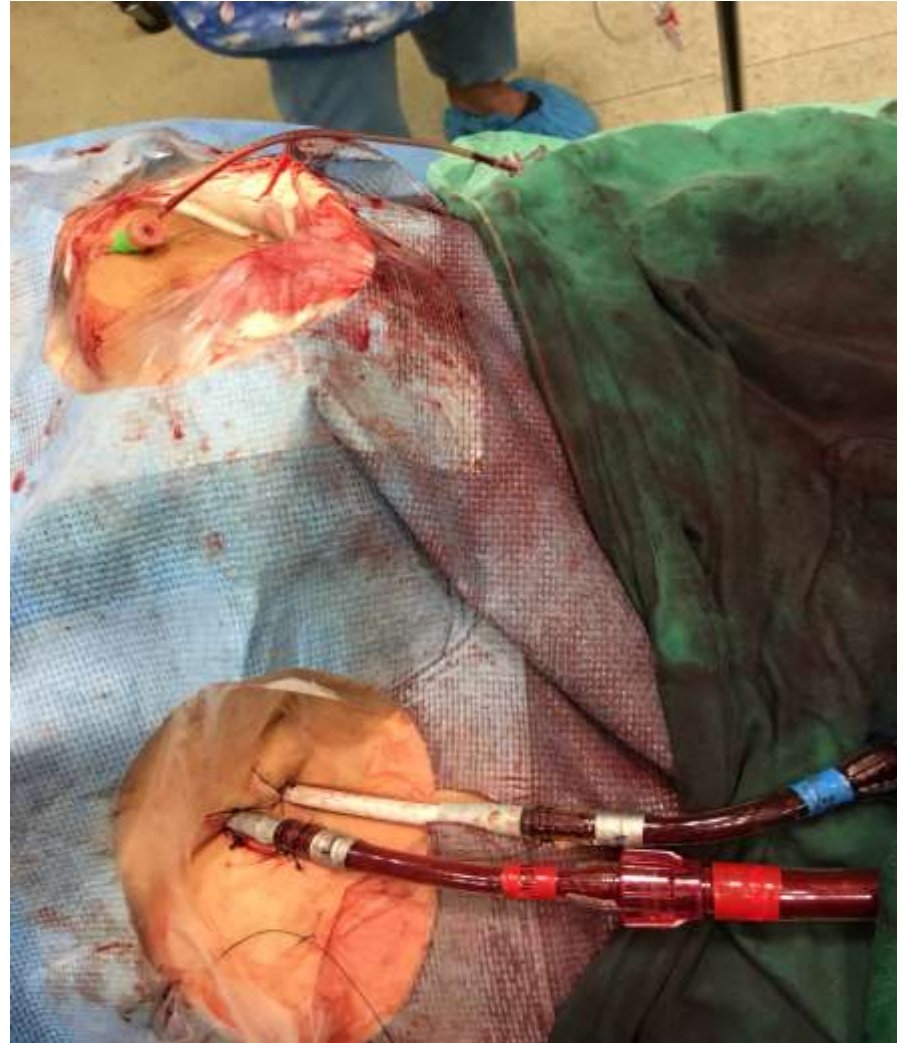
Accuforce 2.5x15mm HPB



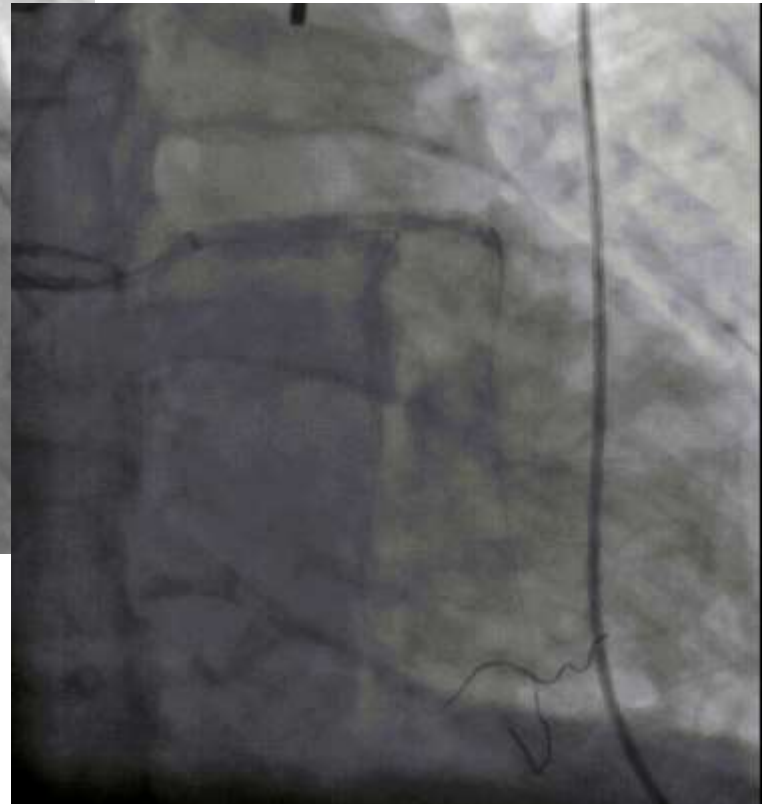
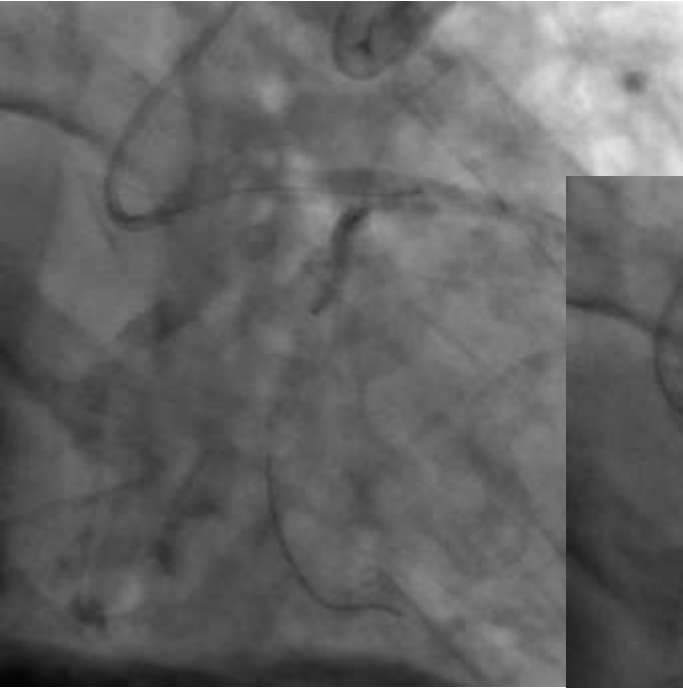


# Start further mechanical support: VA-ECMO

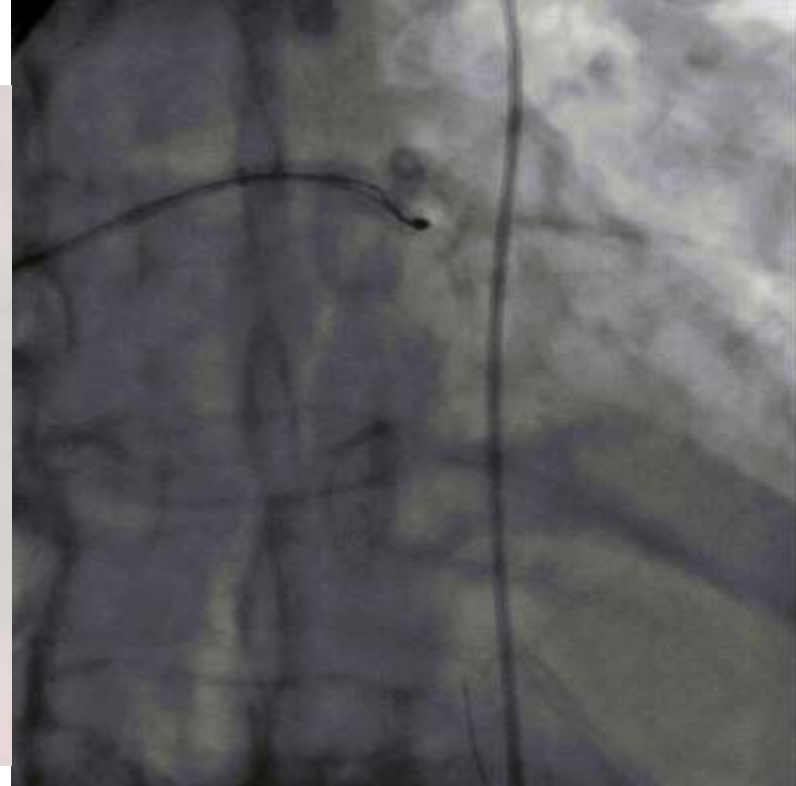
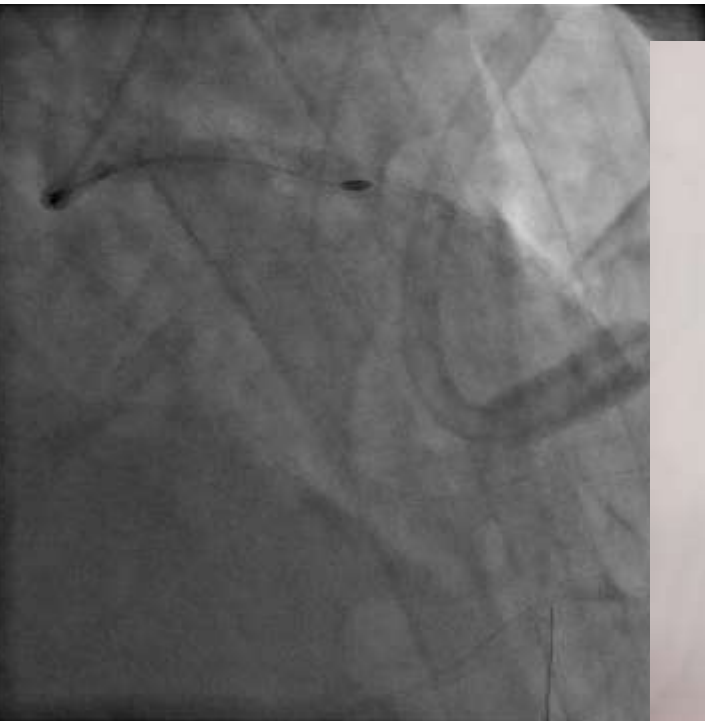
- POBA LCX first
- On VA-ECMO support via RFA/RFV
- Perform Rotablator atherectomy for undilatable LAD-p lesion



# POBA LCX



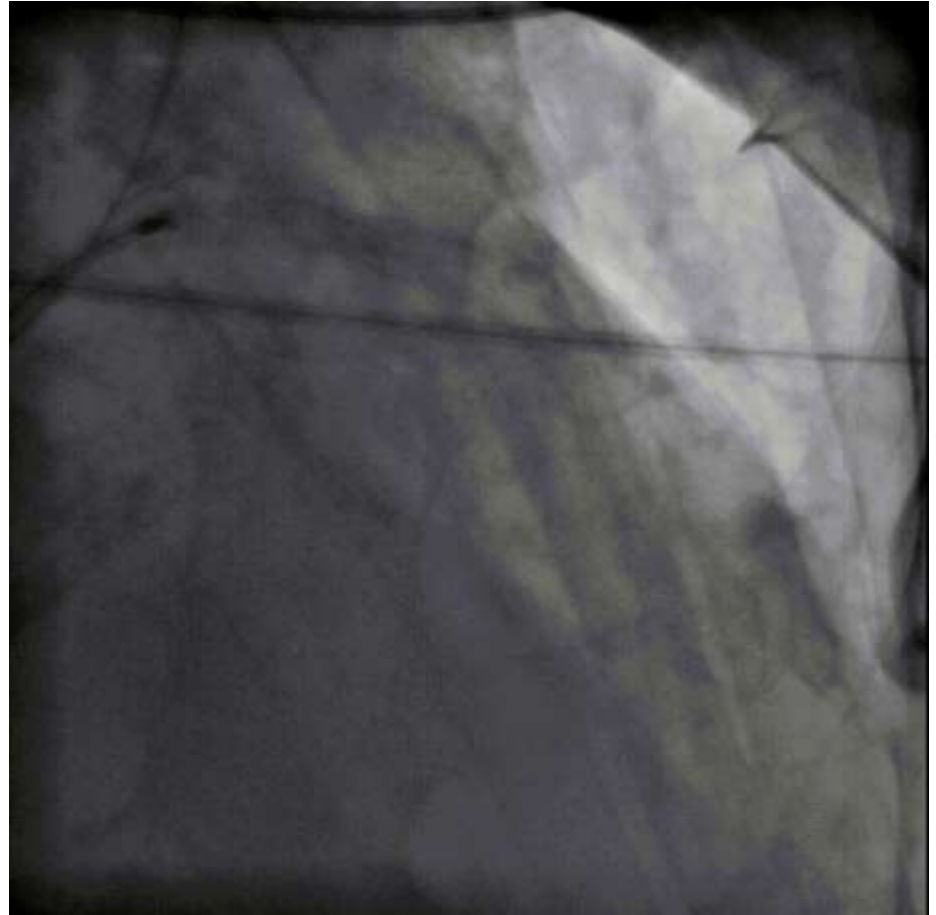
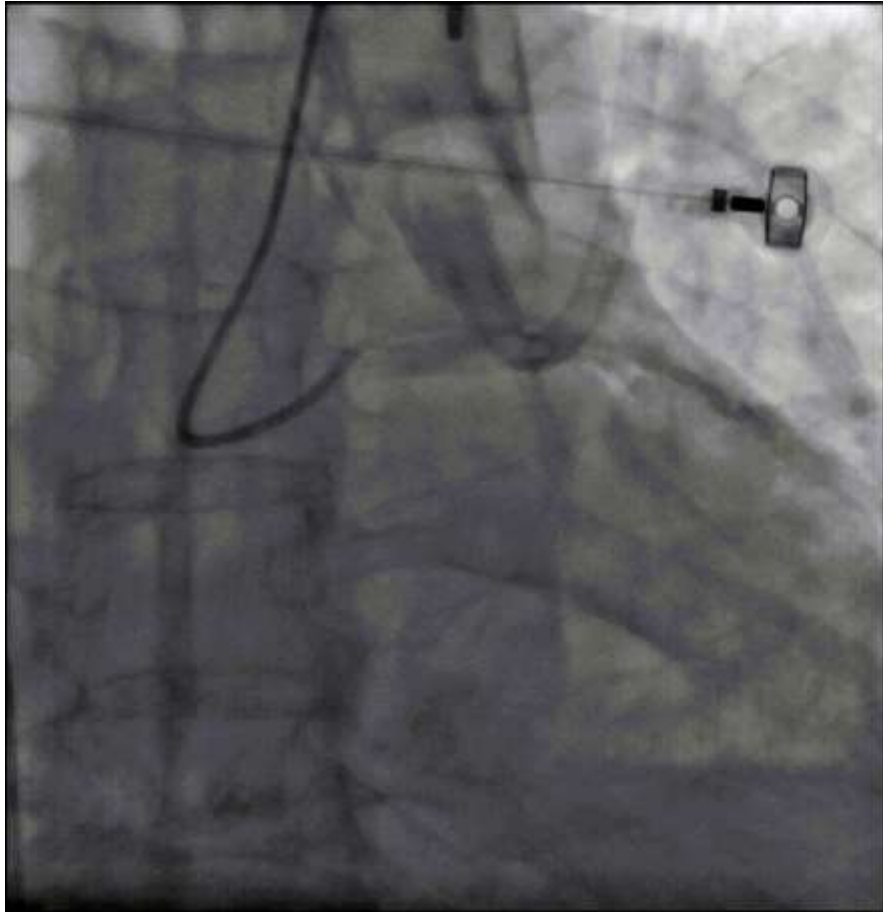
Rotablator burr was entrapped, s/p cut rotar shaft & 5F ST-01 deep intubation failed to remove 1.5 mm burr, VT Attack need DC shock with 200 J, BP = 80/50 mmHg



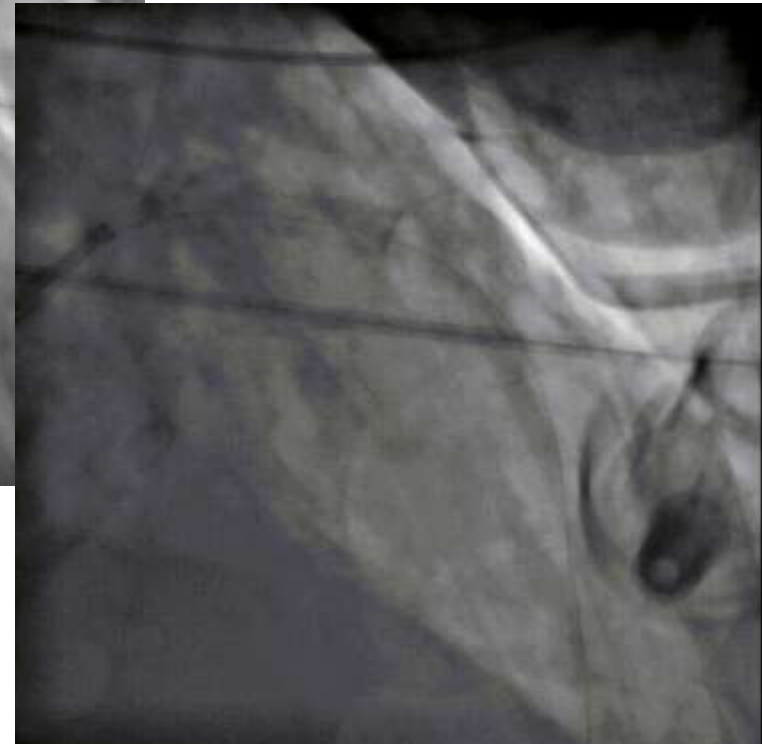
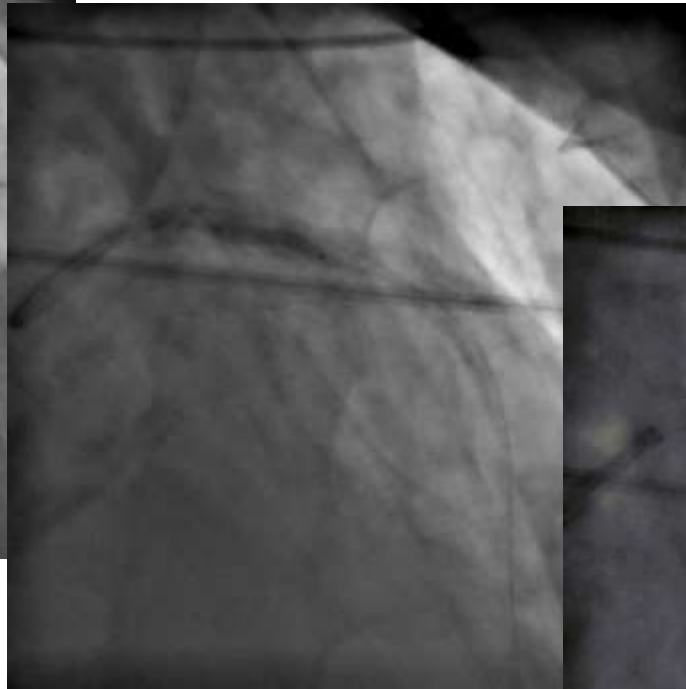
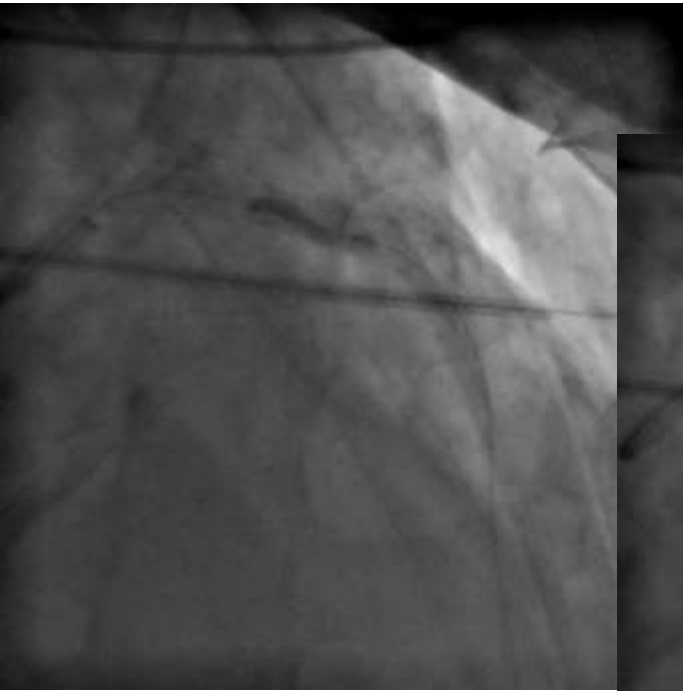
Rotablator burr 1.5 mm was entrapped at 3<sup>rd</sup> pass (Burr speed 180,000 rpm)

UB3, Conquest pro & 8/20 guidewire intentionally punctured peri-burr hard tissue

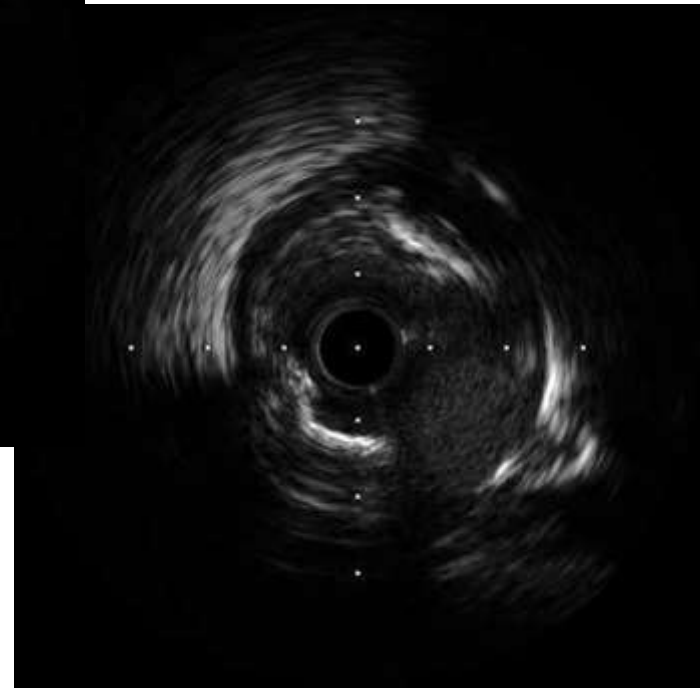
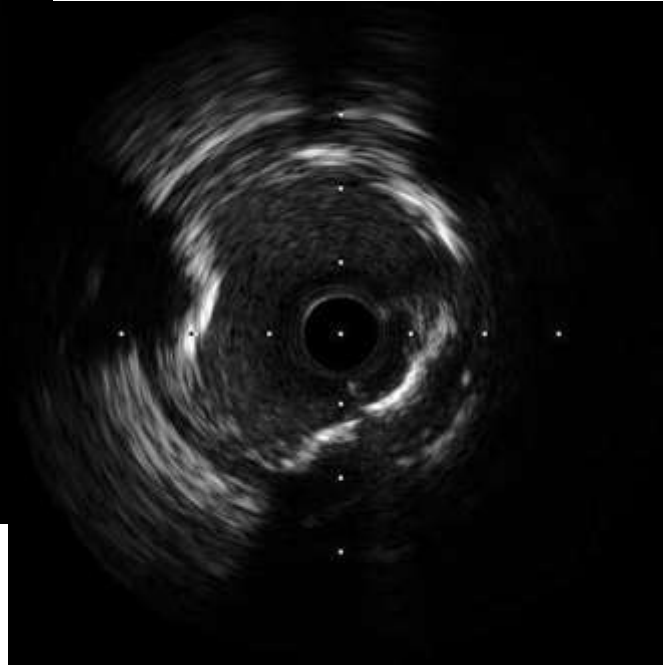
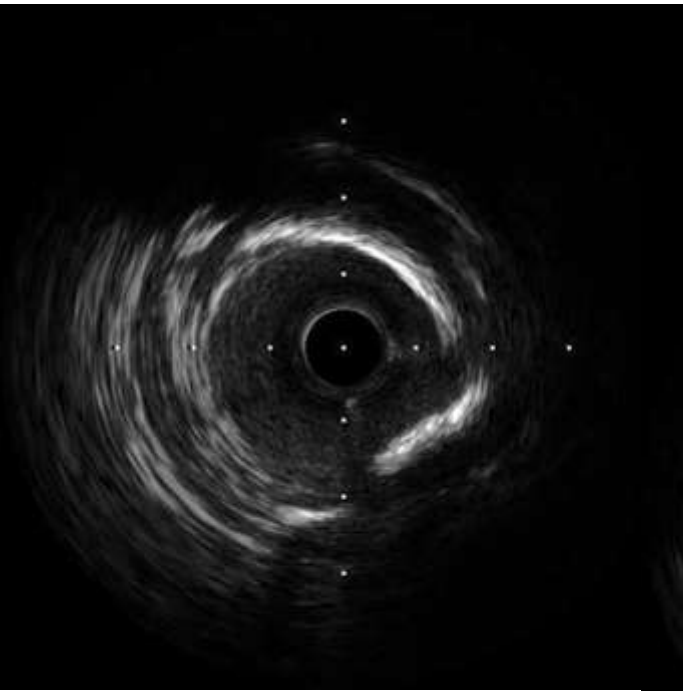
About 20 mins later, rotablator burr was successfully removed by 5F ST-01 catheter, then, we try 1.5 mm rotar again.....



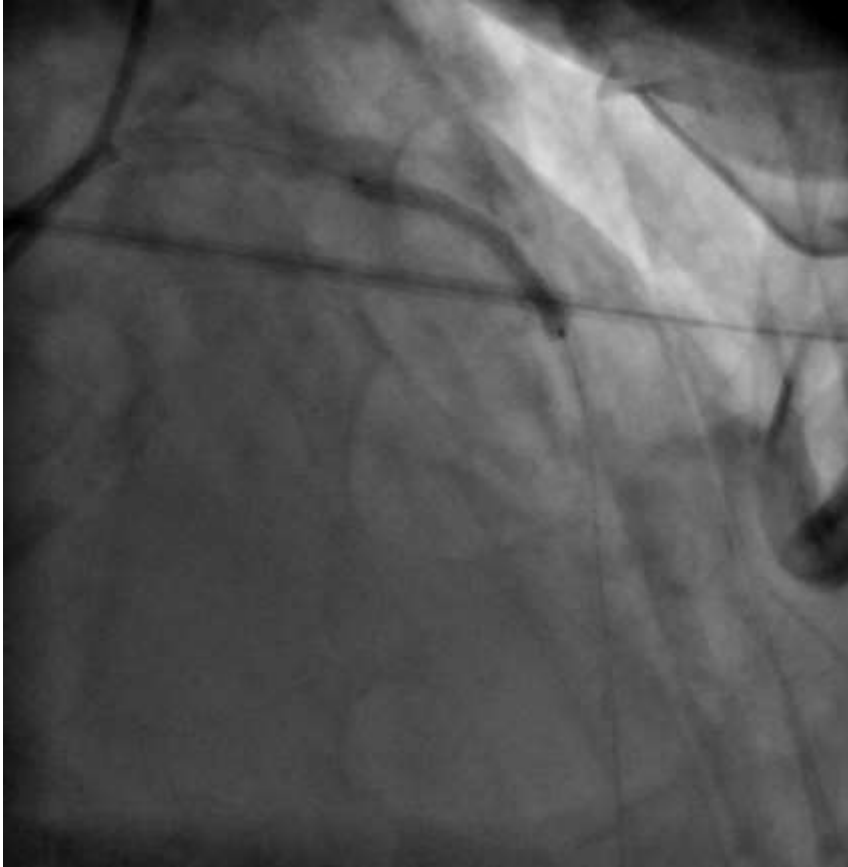
POBA again with NC-balloon 2.5x15 & 3x15 mm became dilatatable



IVUS to ensure cracking of 360 degree of calcium ring



# LAD stenting

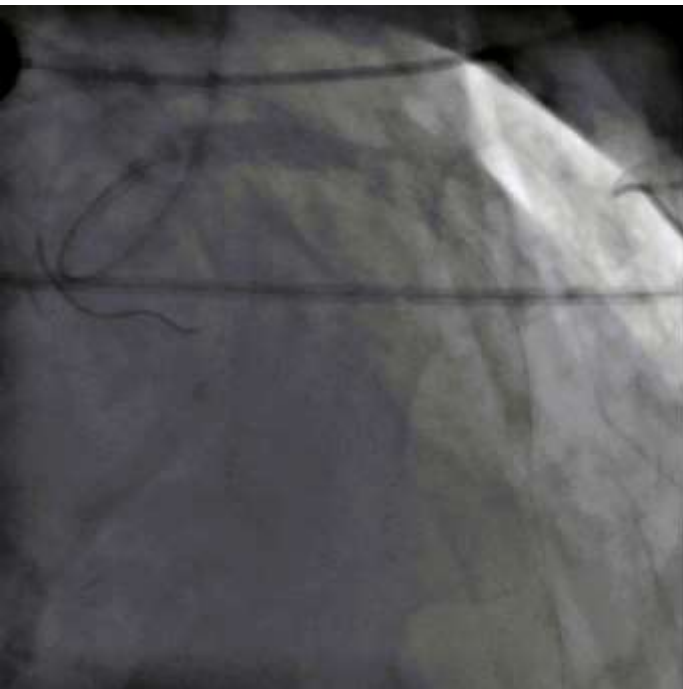


3.0x28 mm DES, followed with  
3.0x15 mm HPB



3.5x38 mm DES LM-LAD, followed  
with 3.5x15 mm HPB 20-28 atm

# Final angiogram:





# Mechanisms of rota burr entrapment (incidence = 0.4%)

*EuroIntervention 2013;9:251-258*

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- A small burr advanced beyond a heavily calcified plaque without sufficient debulking (**Kokeshi phenomenon**) (burr is pushed firmly against at a high rotational speed)
- A large burr pushed without sufficient pecking motion → decreased rotational speed → entrapment.



A photograph showing a person's hands holding a white rectangular sign. The sign has the text "PREVENTION IS BETTER THAN CURE" printed in a bold, red, sans-serif font. The person's arms are visible, and the background is plain white. The entire image is framed by a black border.

**PREVENTION  
IS BETTER  
THAN  
CURE**

# Ablating technique: “Pecking technique”

## Proper : slow/smooth/short

- **Feedback during ablation**
- **Visual:**
  - Smooth advancement under fluoroscopy
  - Contrast injection to discern lesion contours and borders
- **Auditory :**
  - Pitch change relative to resistance encountered by burr
- **Tactile :**
  - Advancer knob resistance
  - Excessive drive shaft vibration : excessive load on burr advanced too rapidly

# Strategies for entrapped burr

- Deep engagement of guiding catheter & simple **manual traction**
- Cutting off disassembled rota system and retrieval with **child in mother** catheter or **guideliner** catheter
- Passing another **guidewire and balloon** inflation to release the trap
- Using **snare** proximal to the burr for forceful local traction
- Combination of methods
- Surgery - most reliable, but always **last option**



Usefulness of Conquest Guidewire for Retrieval of an Entrapped Rotablator Burr

Masayuki Hyogo, MD, Naoto Inoue, MD, FSCAI, Reo Nakamura, MD, Takaomi Tokura, MD, Akiko Matsuo, MD, Keiji Inoue, MD, Tetsuya Tanaka, MD, PhD, and Hiroshi Fujita, MD, PhD

