

Paving the way in uncrossable CTO

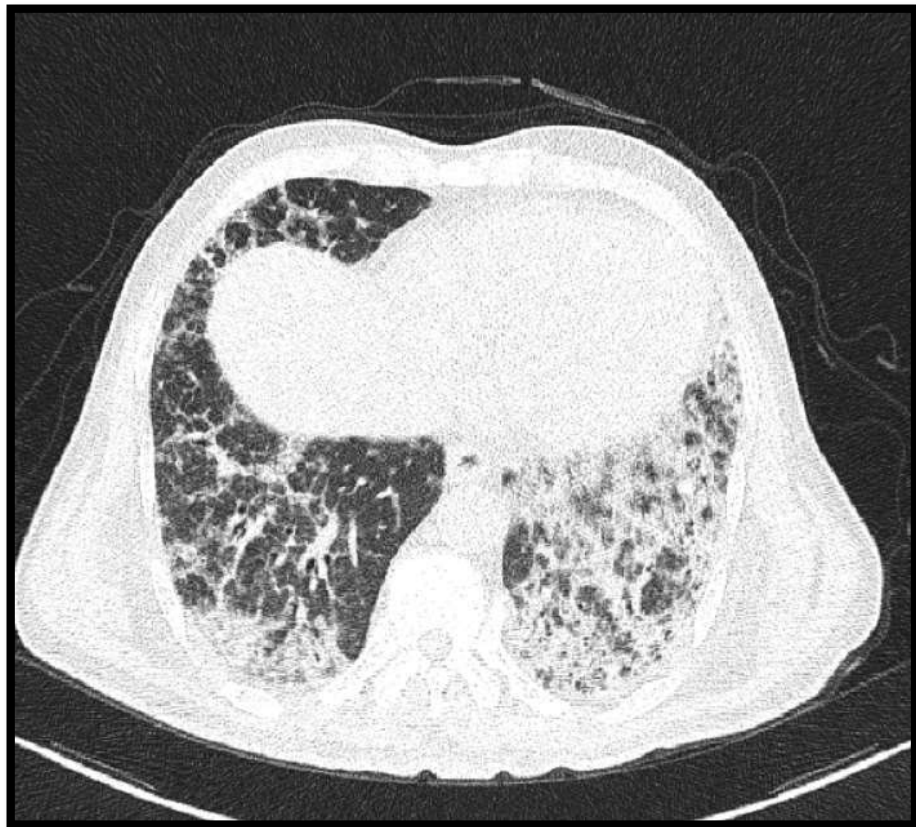
Michael Gergis, MD, FSCAI

Aswan Heart Centre, Magdi Yacoub Foundation

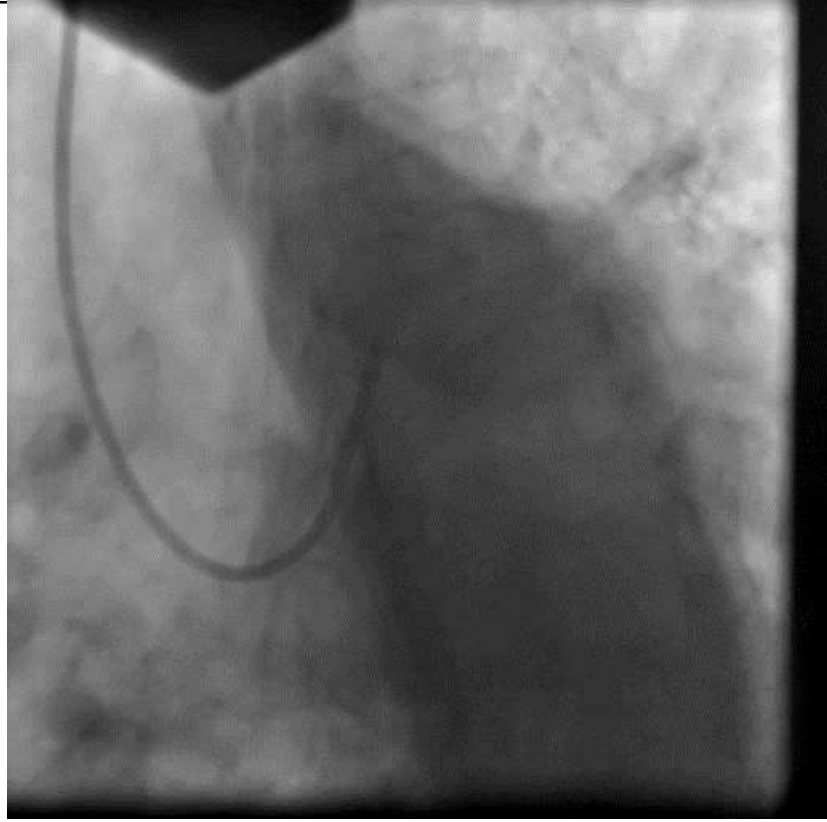
Aswan, Egypt

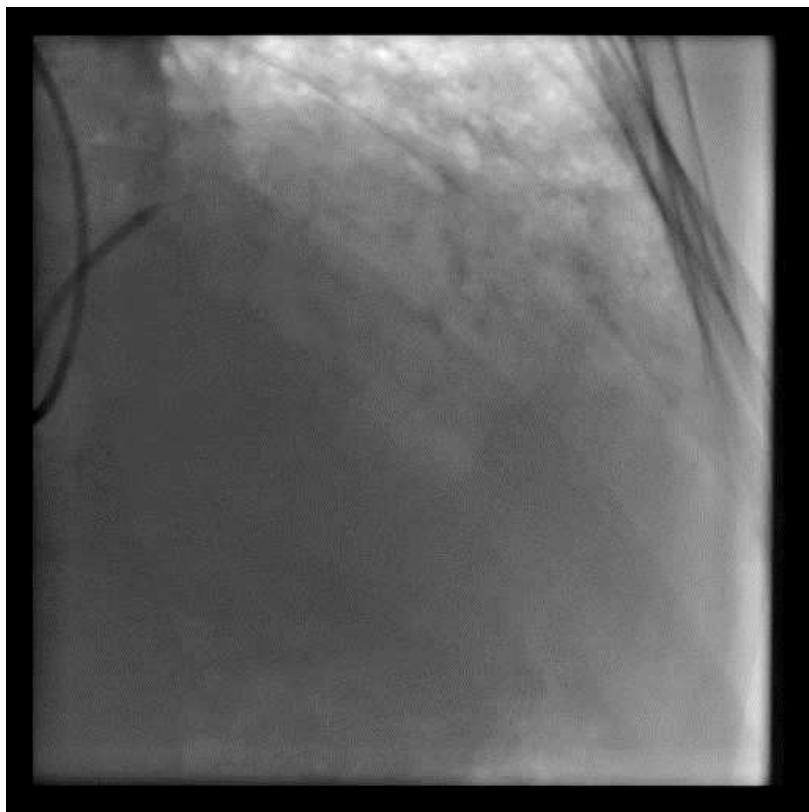
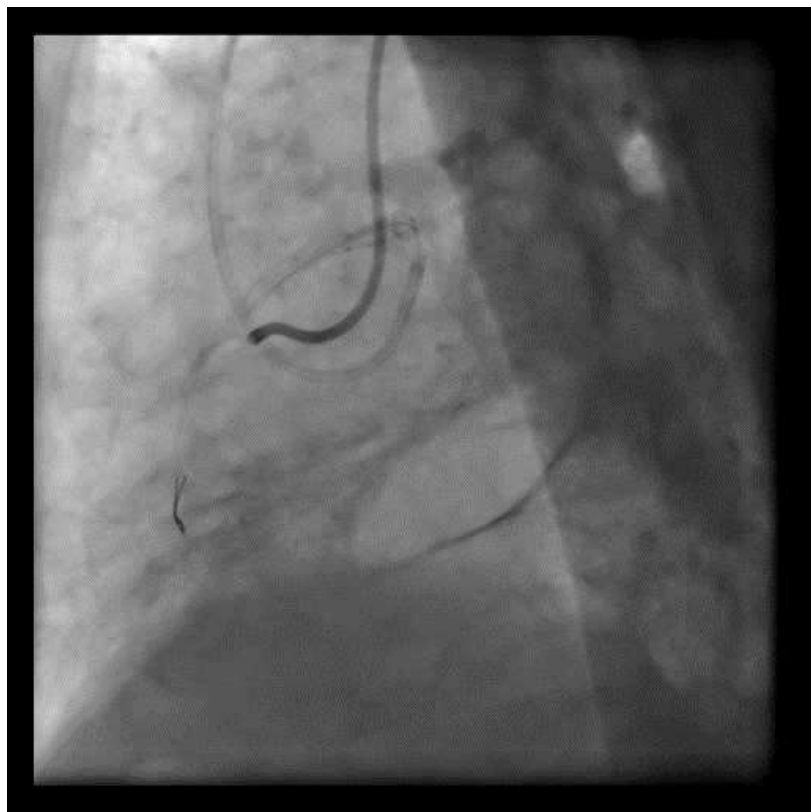
Case Presentation

- 69-Year-old, gentleman, HTN, angina, CCS class III.
- CA showed MVD for CABG
- **HRCT** chest shows extensive IPF (post COVID), Pulmonary function showed moderate to severe restrictive pattern.
- Turned down by surgical team due to restrictive hypoventilation



Coronary angiography

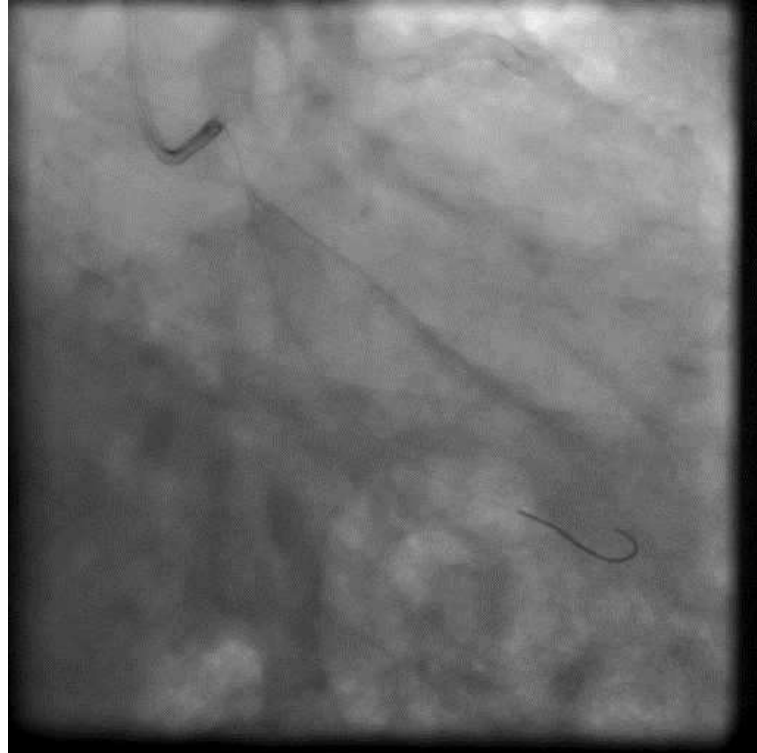




- Planned for PCI to left system
- PCI to RCA CTO same session if contrast volume/radiation dose permits.
- Planned for AWE, if failure is encountered will stop till better collaterals develop after

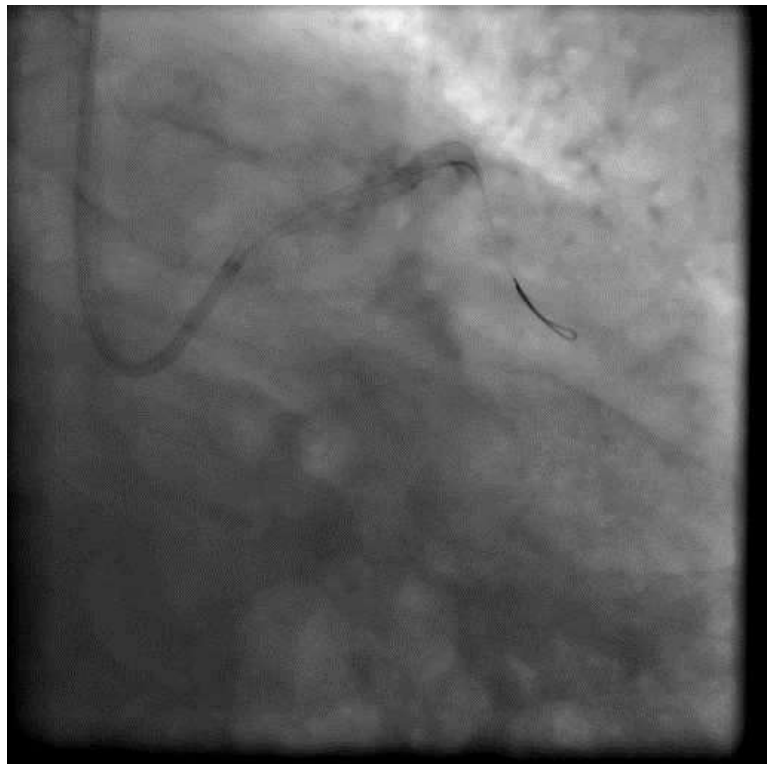
PCI to LAD

POBA to LCX



- Compliant (2.0x 20mm) & NC (2.5x 20mm)
- DCB (2.75x 30mm) at 8 atm for 2 mins.

PCI to LAD

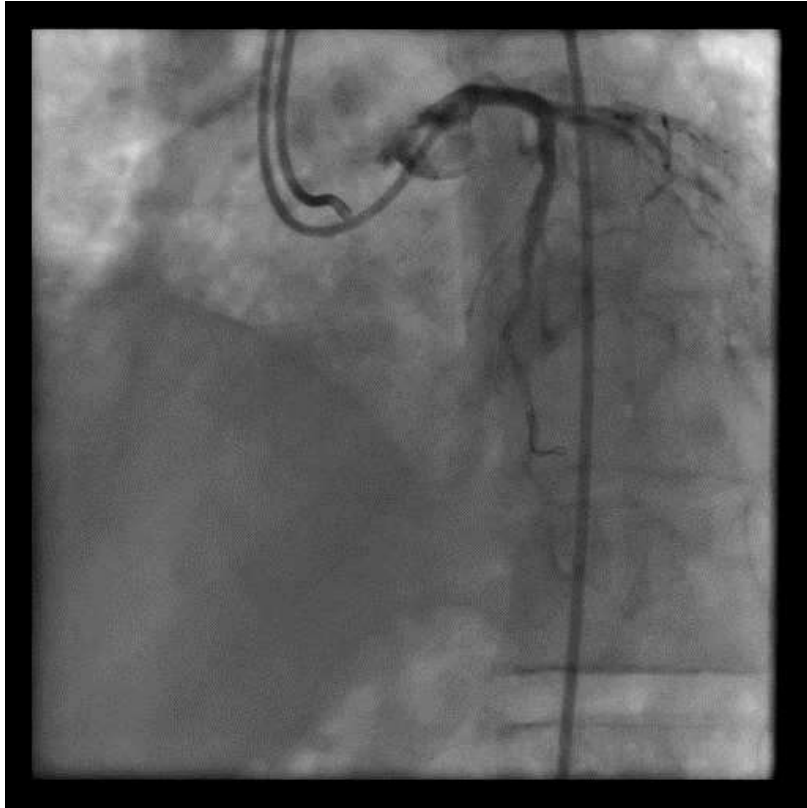


- DES (3.5x 38mm) distally and (4.0x 28mm) proximally
- Optimized NC (4x20)

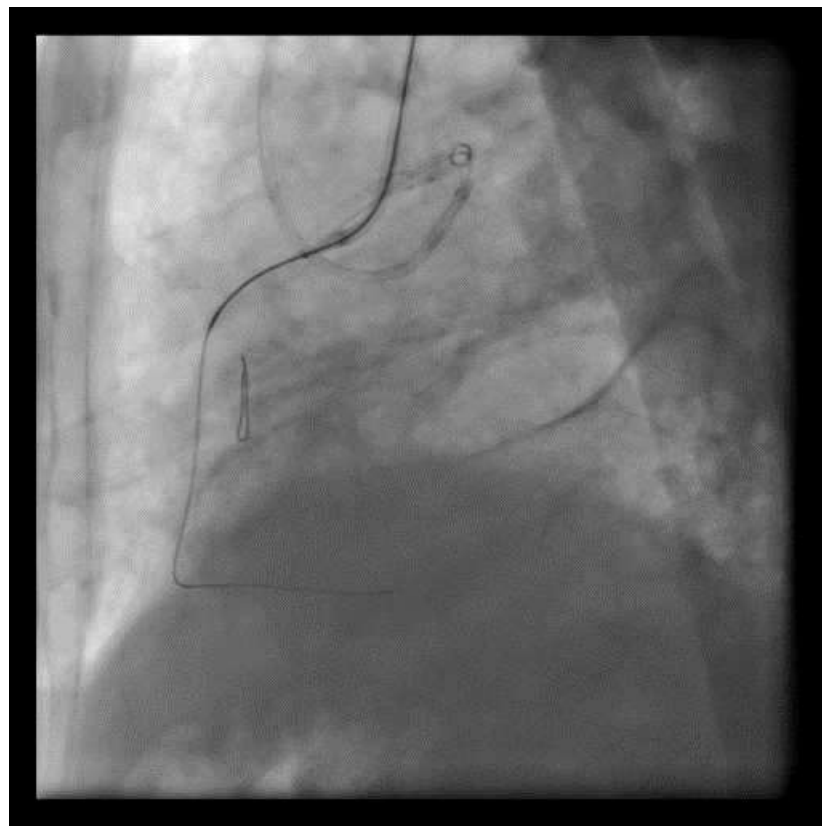
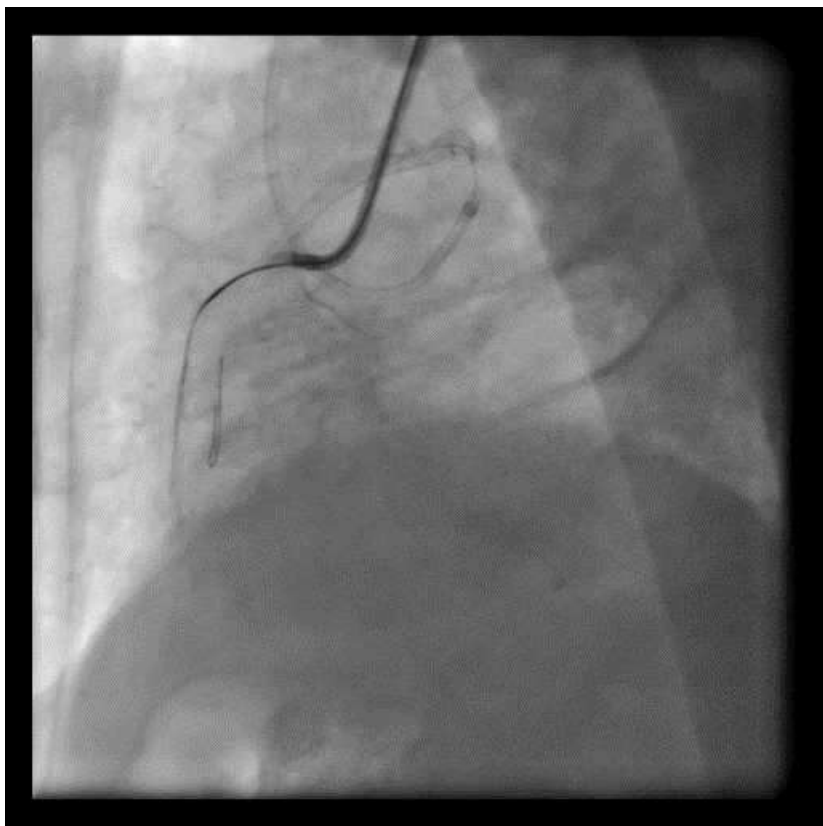
PCI to CTO RCA

- AL 1 & AL 0.75 failed to engage RCA, non-selective wiring >> lost of antegrade system “many times”.
- Replaced by JR 4

PCI to CTO RCA



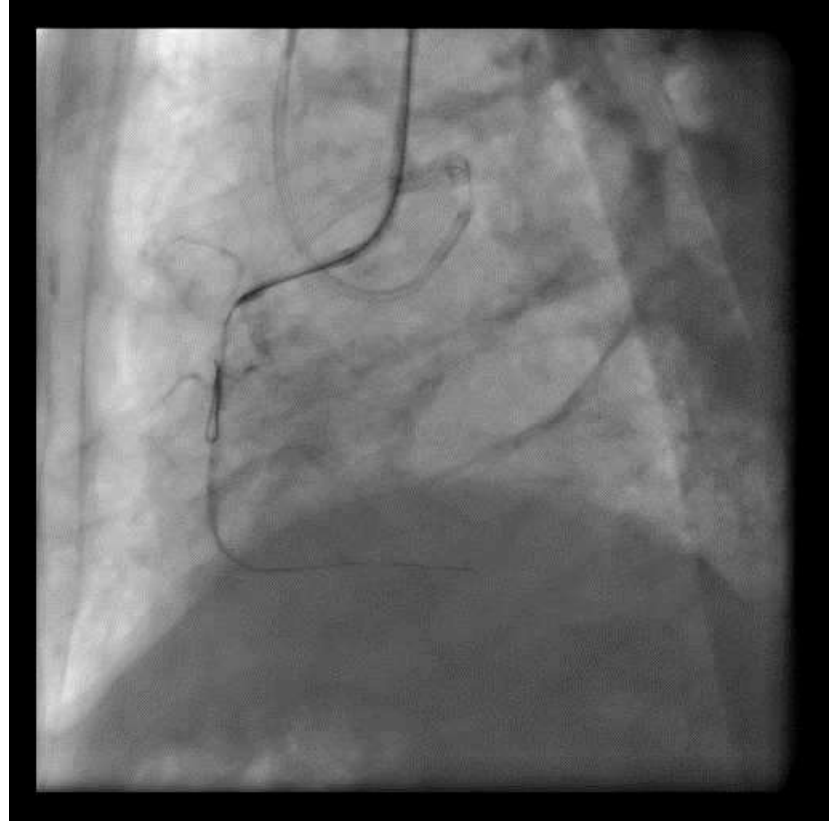
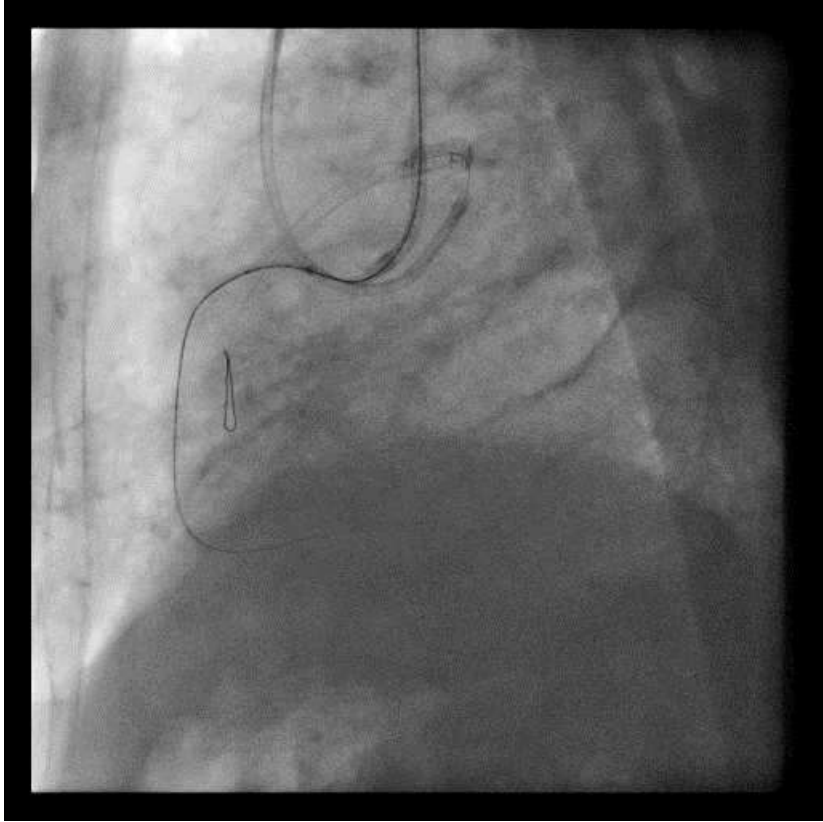
-  • AWE, Caraval 135 cm MC - Fiedler XT-R >> failed



- Gaia II successfully crossed , MC failed to cross the lesion

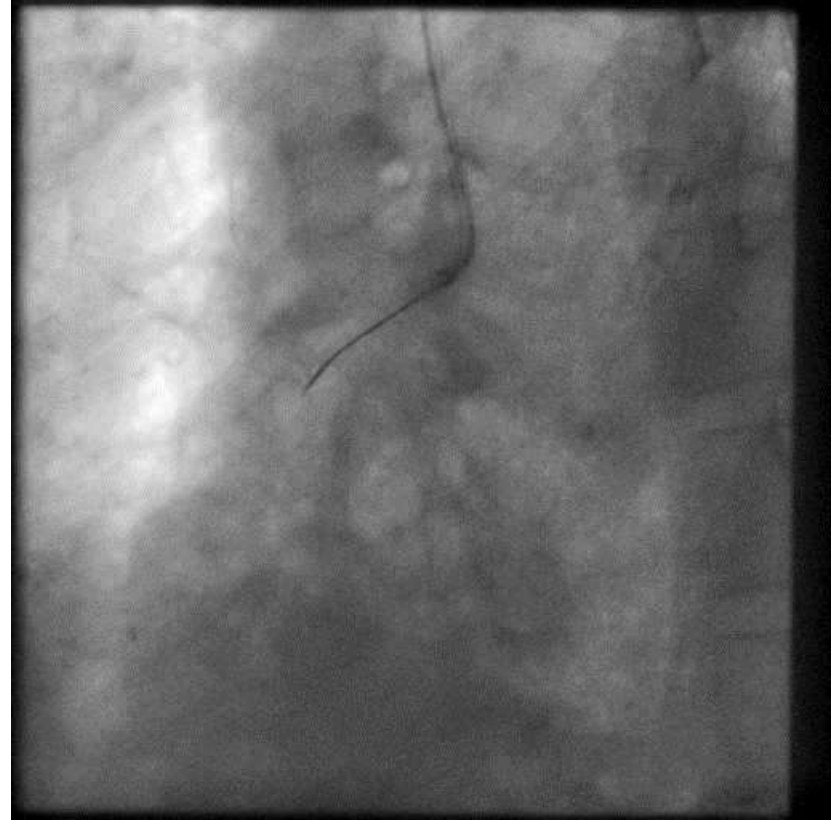
Clinical Challenge

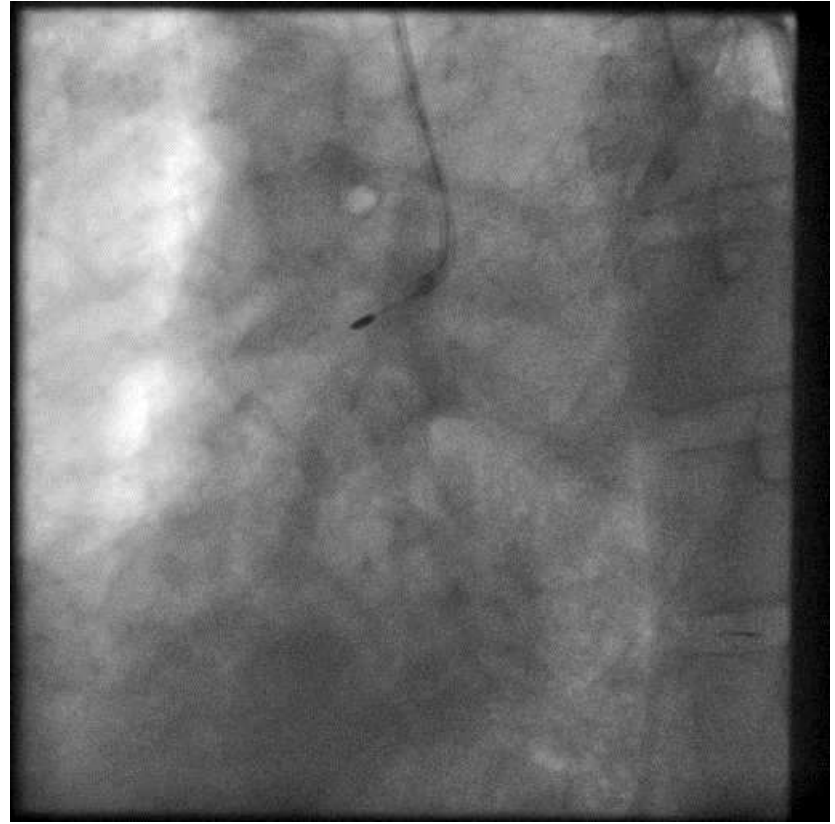
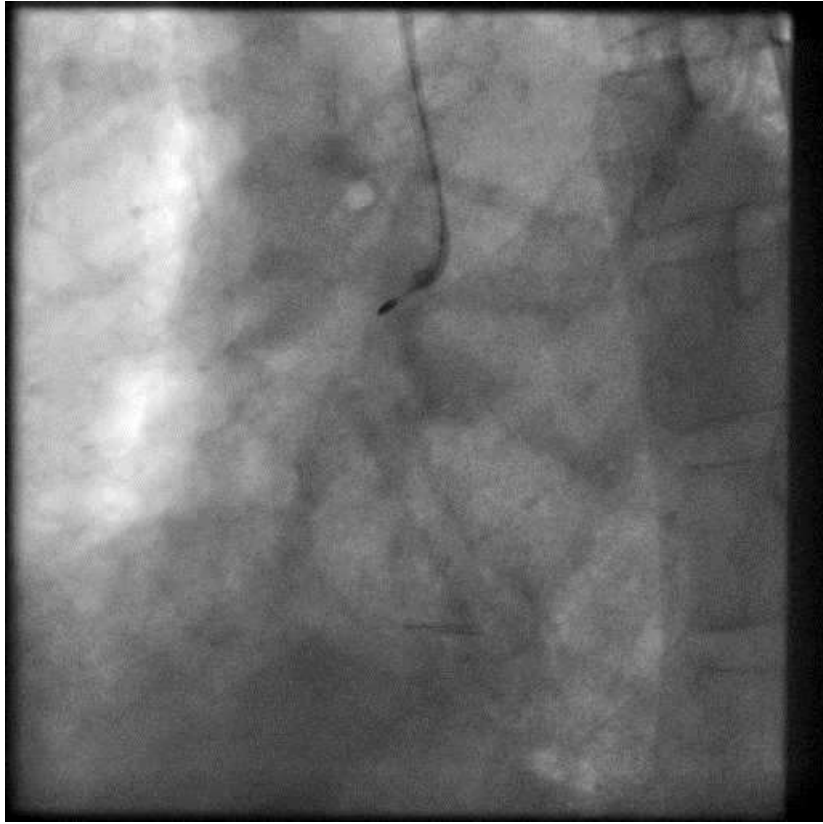
- The setup does not offer good backup support.
- MC failed to cross.
- Balloon 1x15 did not cross
- Guide extension did not change the equation



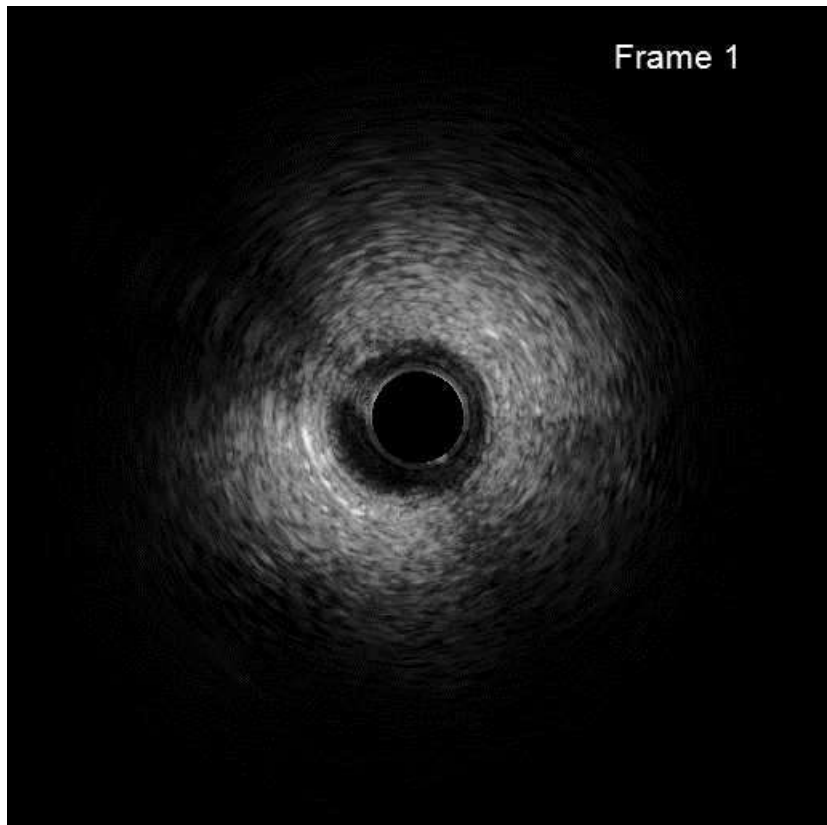
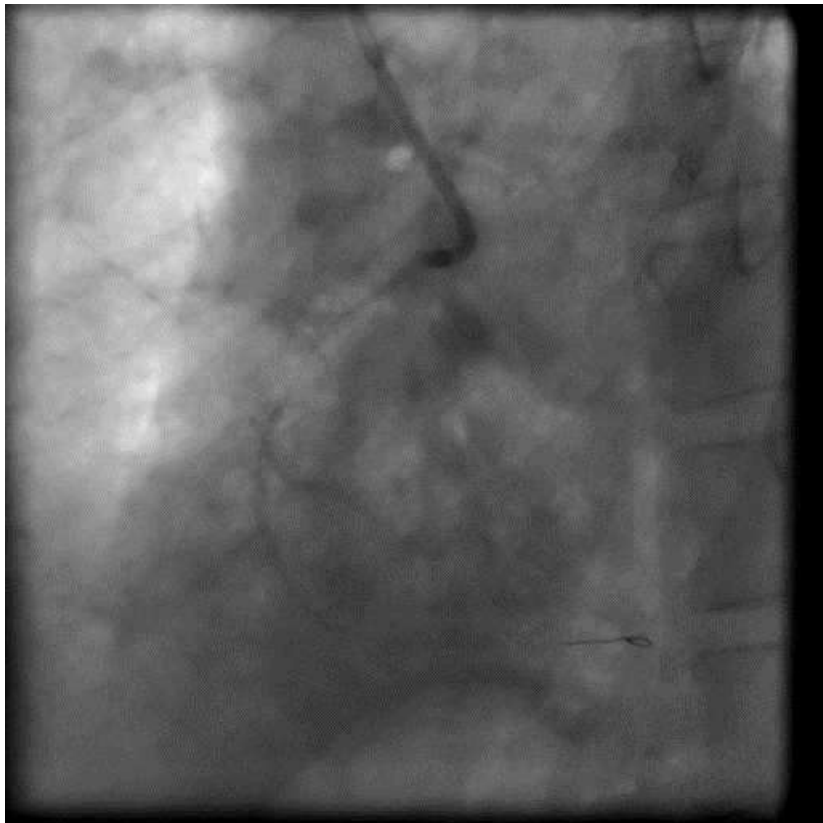
Resolution of the Challenge

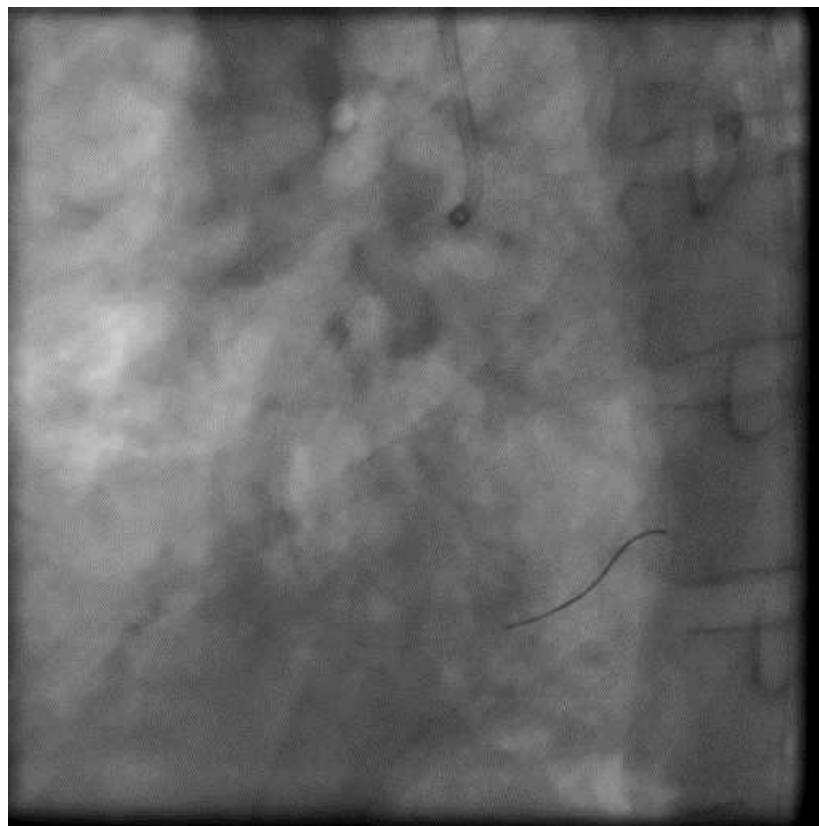
- Rotablation is needed
- MC is not down
- Wiring challenge





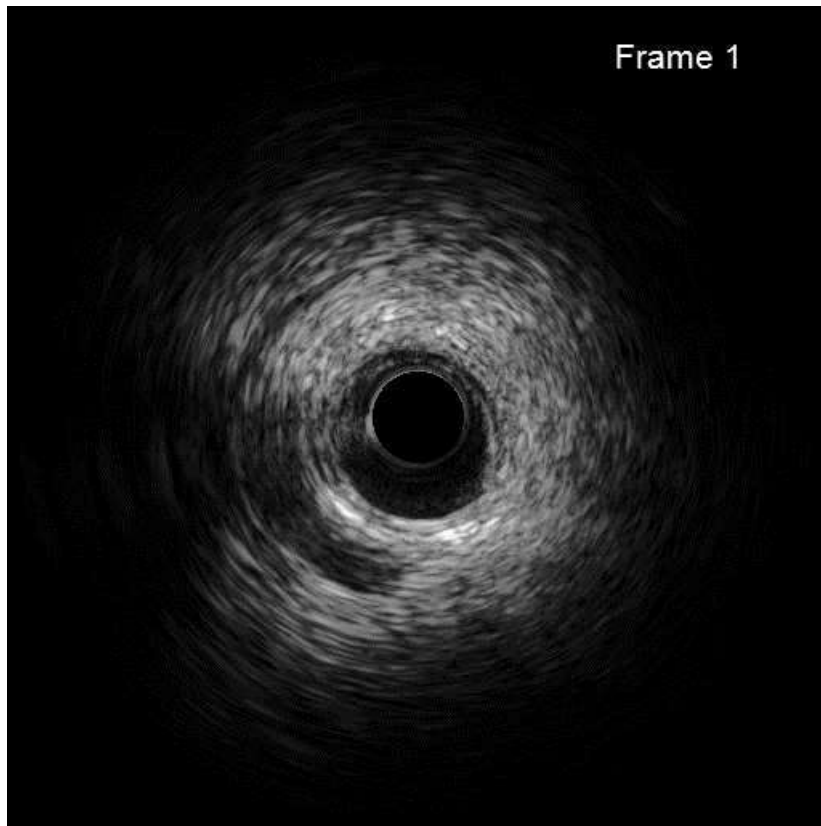
- RPM 175 >> 185 >> crossed



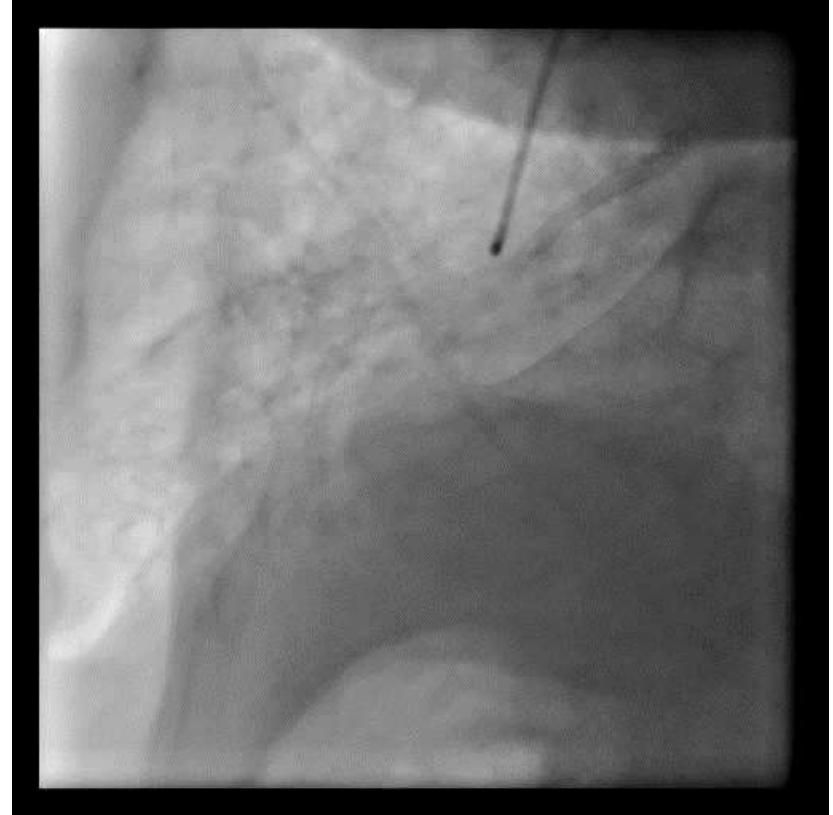


DES (3.0x 34mm) & (3.5x 28mm) optimized by NC 3.5 @ 24 ATM.

Frame 1

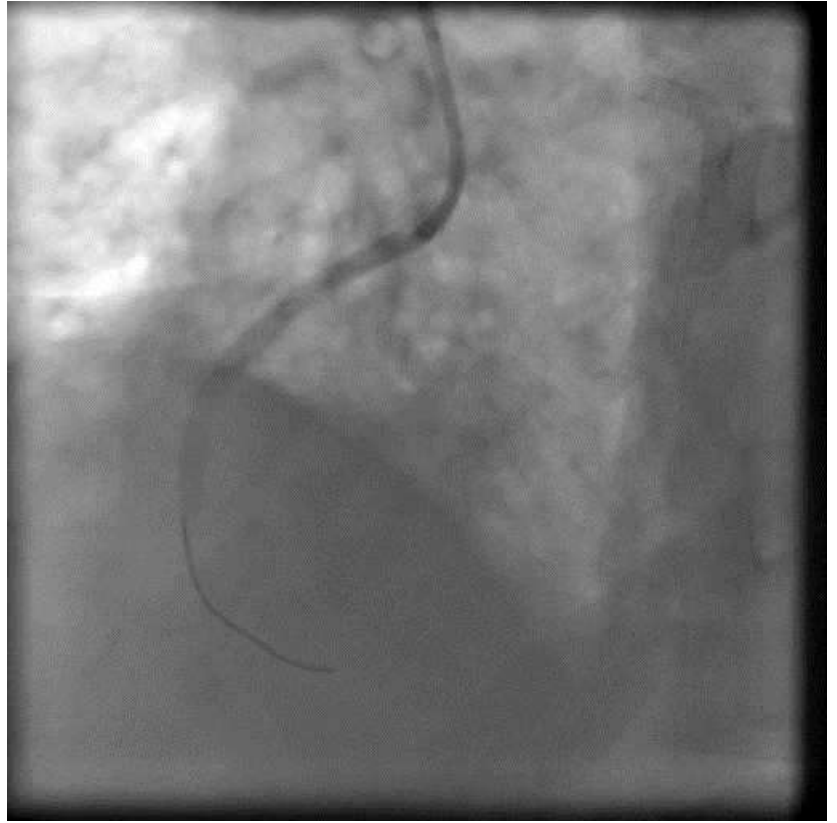
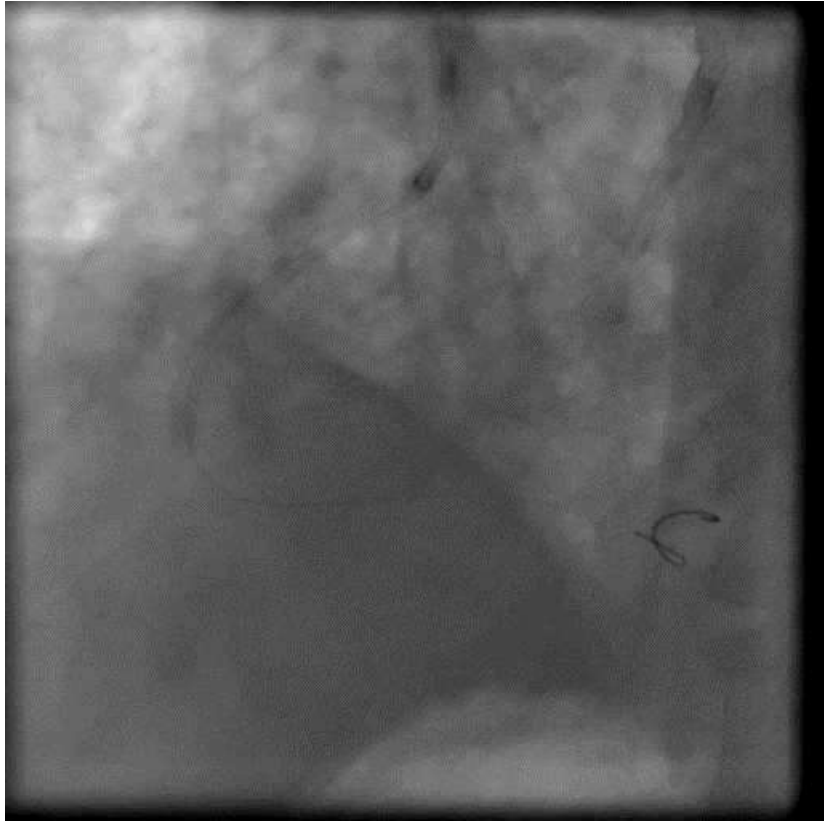


- **1 Hour later** >> V. Fib >> CPR 1 cycle DC>> ROSC
- Back to Cath lab.

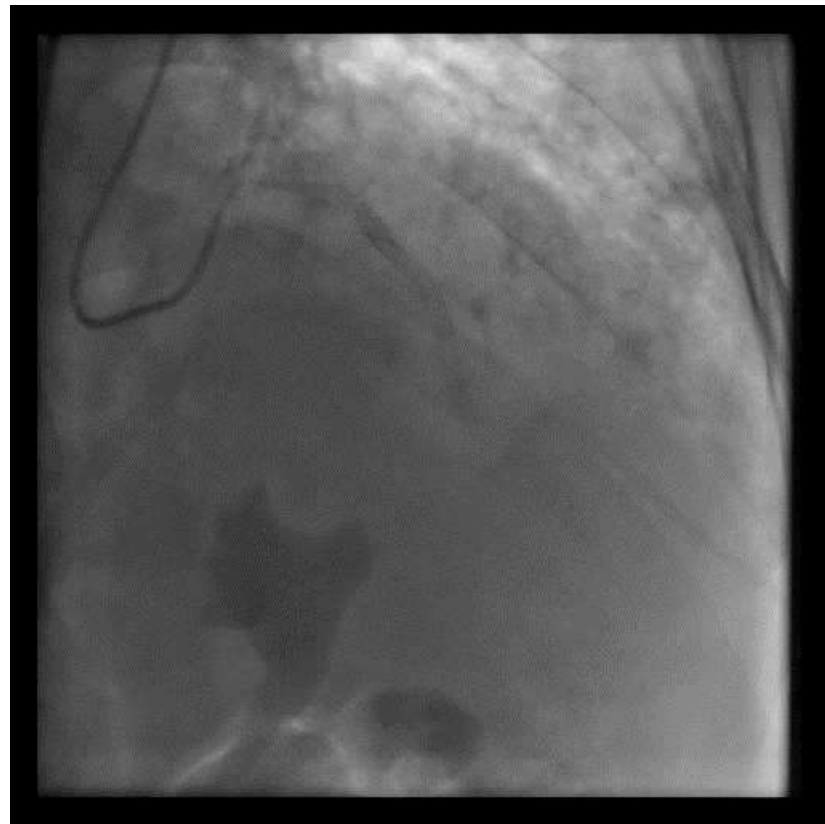
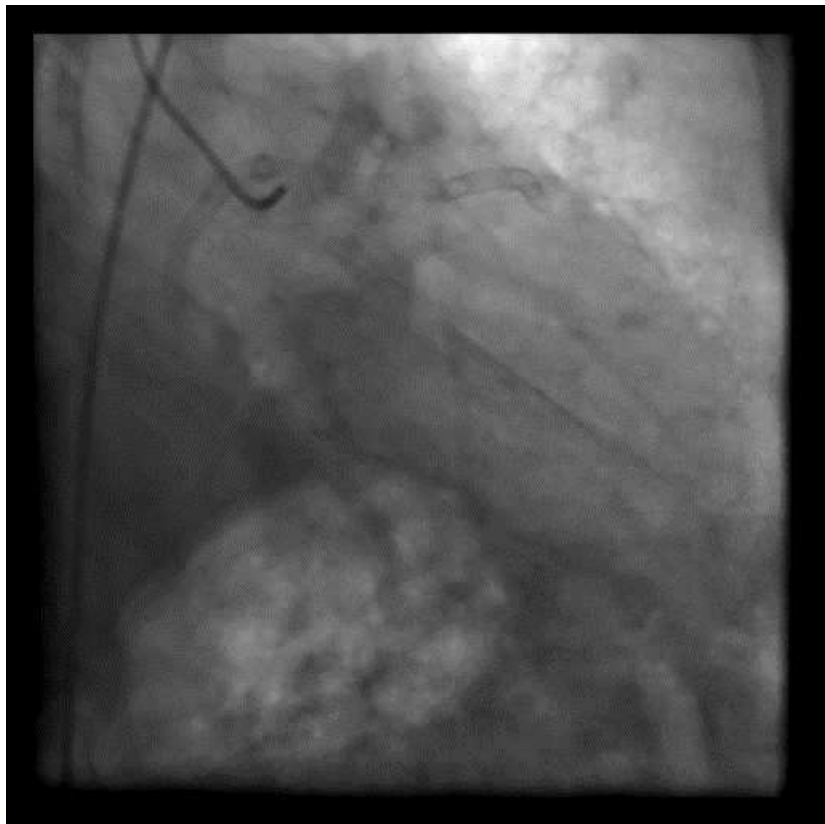


- PTCA NC (3.75x15mm)
- TIMI grade III
- Tirofiban IC





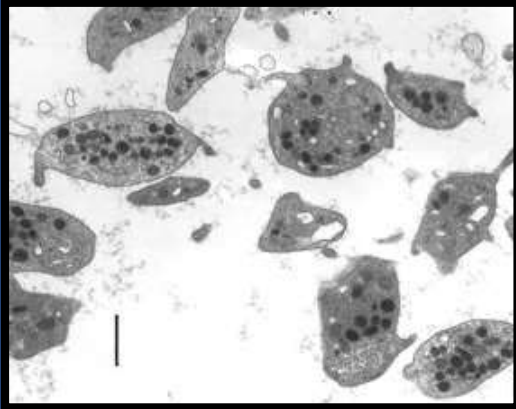
Check left system



- What went wrong??
- Is it Clopidogrel resistance?
- Revise IVUS >> well expanded stent

LITERATURE REVIEW

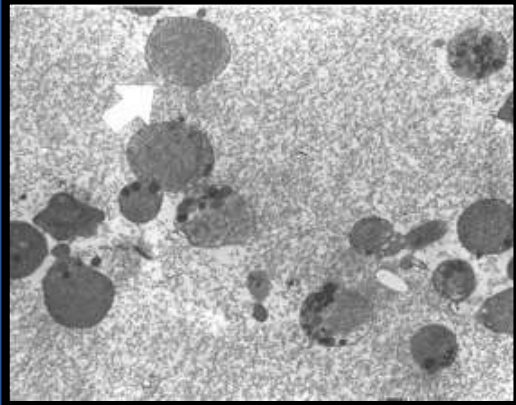
Activation of Platelets by Rotablation Is Speed-Dependent



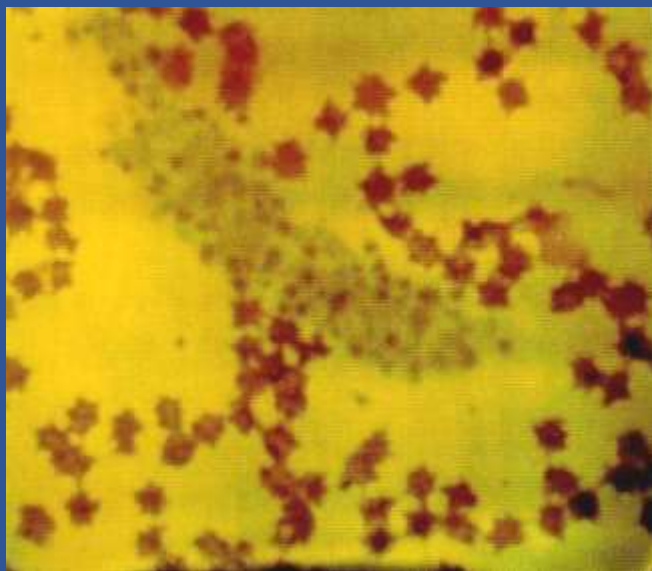
Transmission electron micrography:

Platelet-rich plasma through chamber with rota burr held stationary (0 rpm) and stirred in an aggregometer for 5 min: Intact platelet membrane, intracellular granules, and clear background.

- Platelet-rich plasma was subjected to rotablation at 180,000 rpm and stirred in an aggregometer for 5 min: Ruptured platelet membranes, depletion of intracellular organelles (“ghost platelets”), and cloudy background.



Activation of Platelets by Rotablation Is Speed-Dependent



Porcine blood exposed to a rotating burr resulted in: **Platelet aggregation and red blood cell crenation.**

Rotational speed (rpm)	Platelet aggregates (>20 μm) / ml blood
-------------------------------	--

180,000	7,434 \pm 2,193
----------------	-------------------------------------

140,000	2,269 \pm 627
----------------	-----------------------------------

Control	633 \pm 258
----------------	---------------------------------

p<0.0001 for all groups

Slower rotational speed results in a significantly lower number of platelet aggregates.

Back to our patient

- IC Tirofiban followed by infusion for 24 hours.
- Shifted DAPT strategy to (Tica + ASA)
- Discharged home after 48 hours
- Asymptomatic for the following 2 months.

Key Learnings for the Operator and Team

- Calcified lesions are specific entity with inherent challenges
- RA is game changer in uncrossable lesions
- High speed RA is associated with Platelets activation and may invite thrombotic events or no reflow
- Should GP IIb/IIIa be considered in long lesions RA or when high speed is need ??

Thank You