Coronary Physiology Assessment in a Patient With Triple Vessel Disease and Chronic Total Occlusion

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Disclosure

- Speaker’s name: Koon Wee Koay

  ❑ I do not have any potential conflict of interest

Clinical History

- 70 years old lady
- Comorbid
  - Hypertension
  - Diabetes mellitus
  - End-stage renal disease on regular haemodialysis
- Presented with frequent episode of chest pain during haemodialysis and intradialytic hypotension for 1 month

Physical Examination

- Vital sign
  - BP 170/70 mmHg
  - PR 97 bpm
  - SpO2 97% under room air

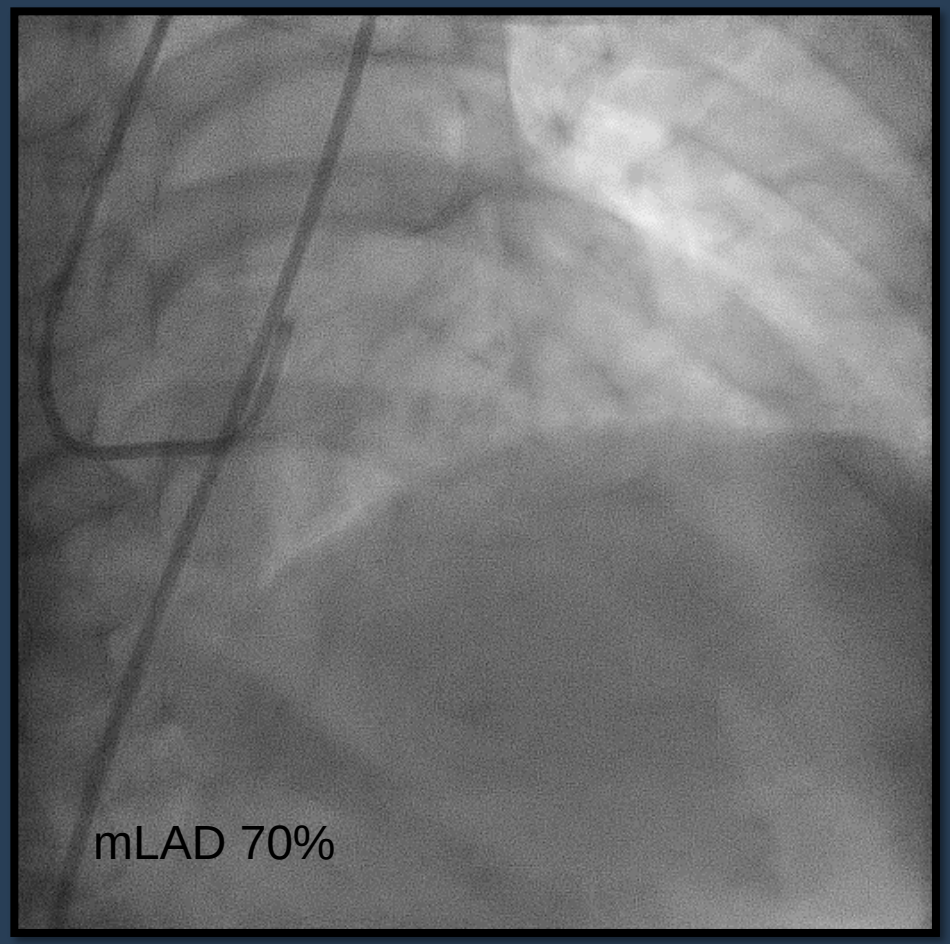
- Physical examination was normal

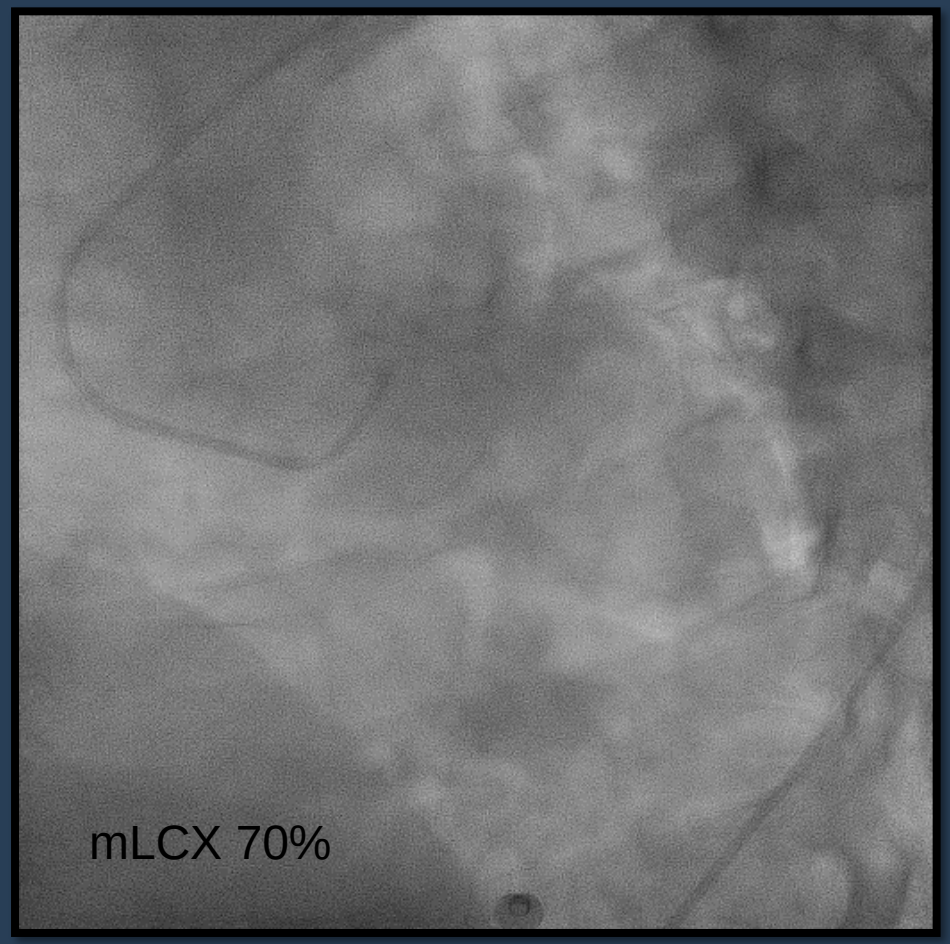
- ECG: SR, Q wave at lead III

- Echocardiogram
  - LVEF 55%
  - LA dilated
  - Hypokinesia at inferolateral, inferoseptal and inferior wall
  - Mild AR, MR, TR
  - No LV clot / vegetation / intracardiac shunt / pericardial effusion

Coronary Angiogram

LEFT CORONARIES





Coronary Angiogram

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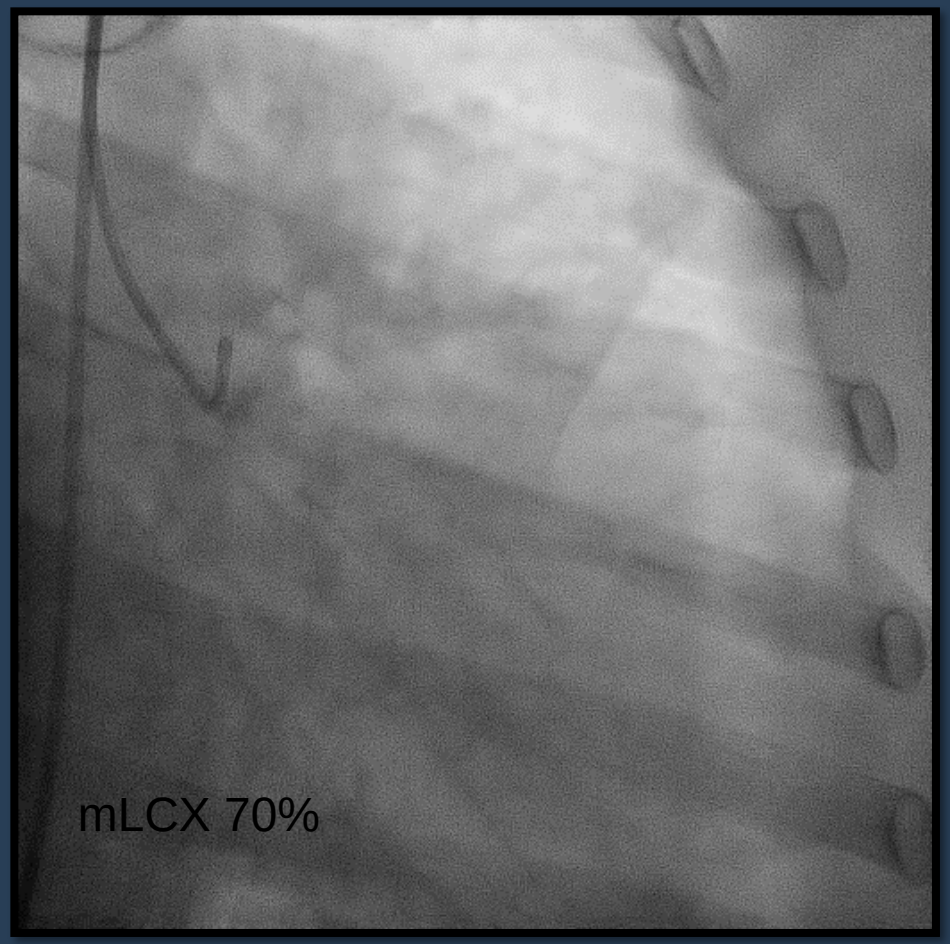
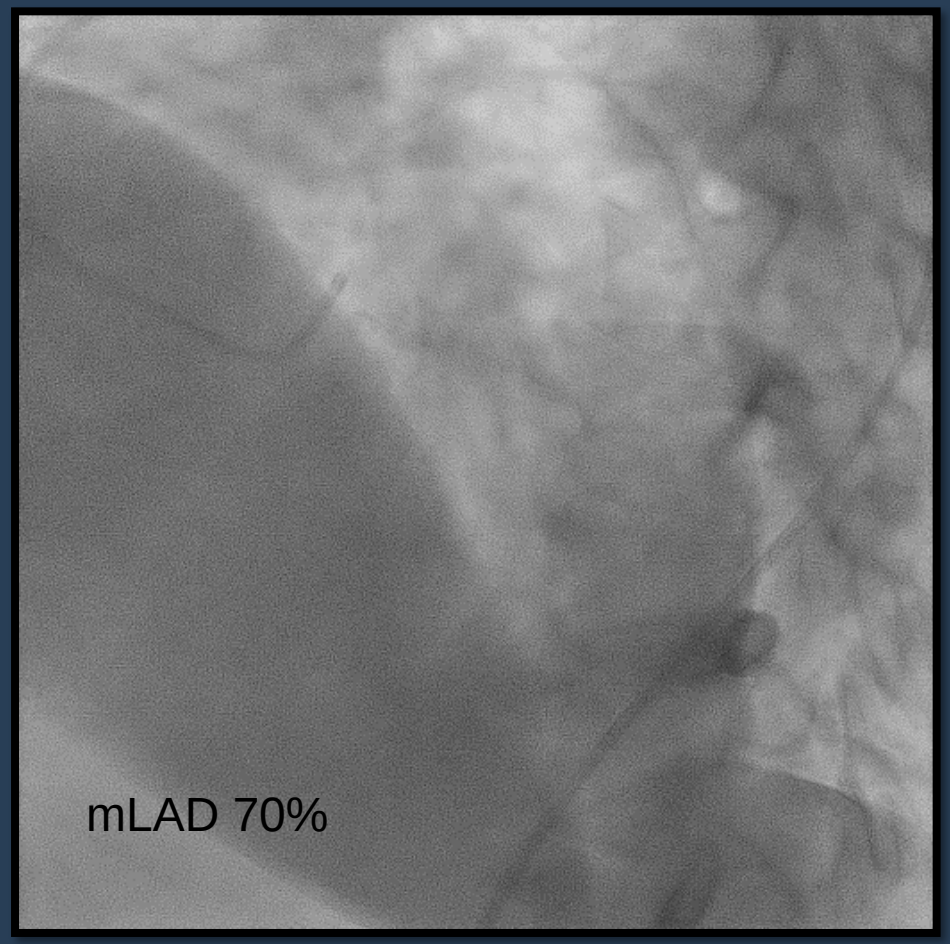
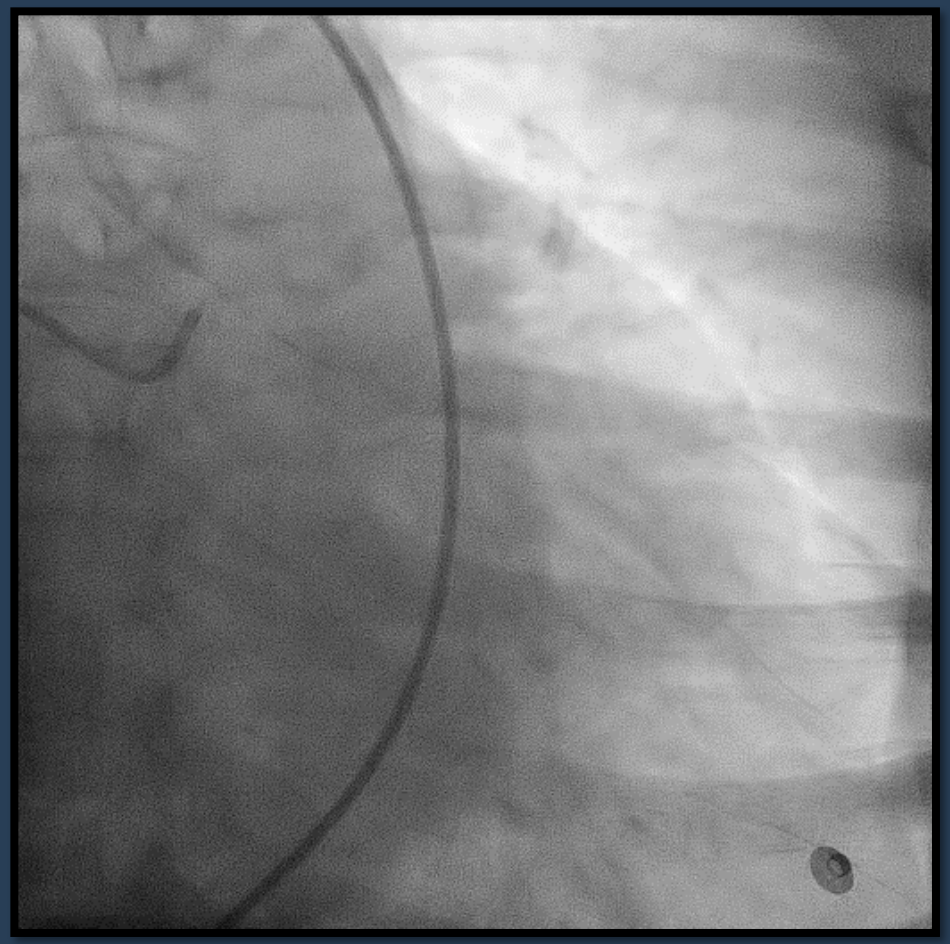




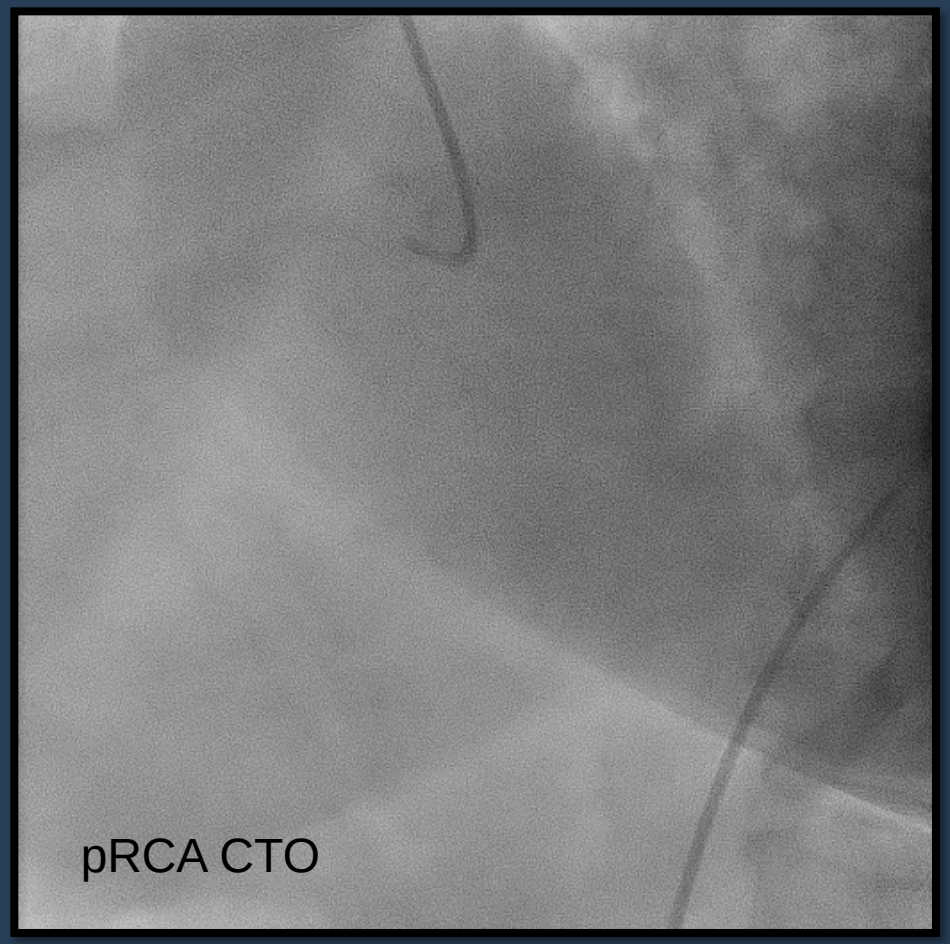
Coronary Angiogram

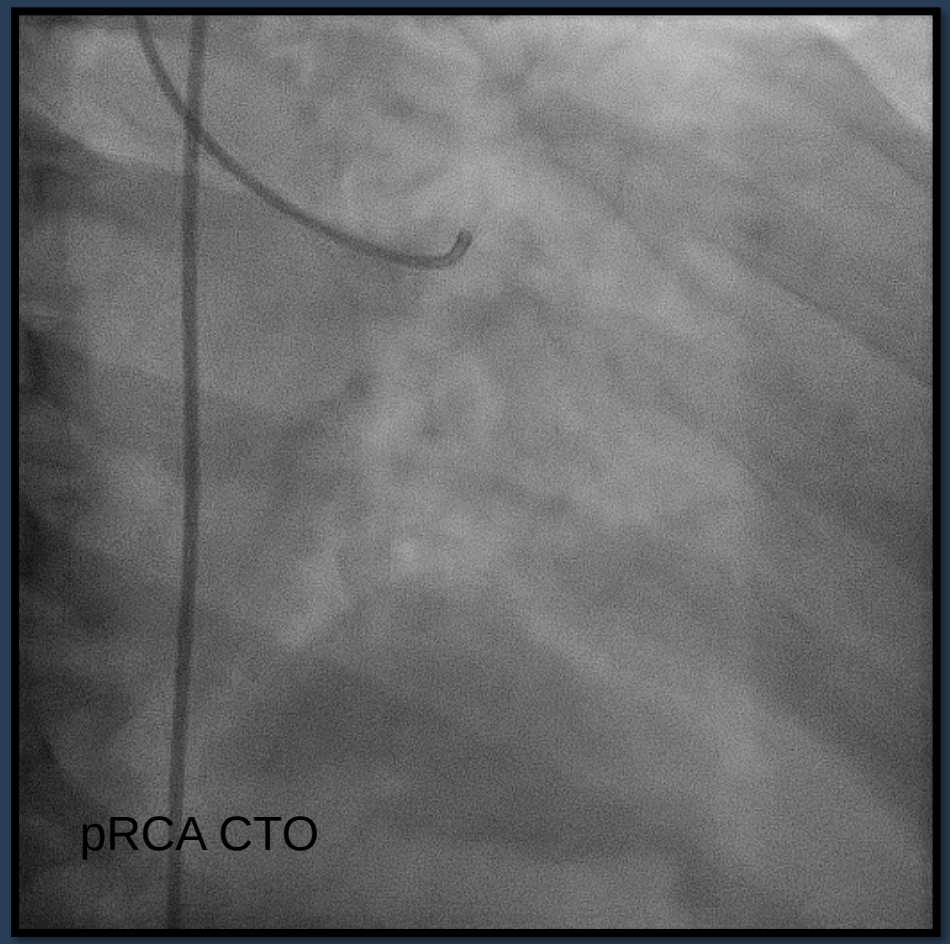


- Coronary angiogram findings:
  - Left main- smooth
  - LAD- mLAD 70%
  - LCX- mid segment 70%
  - Retrograde flow to RCA

Coronary Angiogram

RIGHT CORONARY ARTERY





Summary of This Patient

- 70 years old lady
- Comorbid: hypertension, diabetes mellitus and end-stage renal failure on regular haemodialysis
- Angina and intradialytic hypotension
- Coronary angiogram: triple vessel disease with proximal RCA CTO
- LVEF 55%
- Calculated SYNTAX Score I : 18.0
  SYNTAX Score II : 49.7

- Discussed with patient regarding option of CABG VS multi-vessel PCI
- Patient refused open heart surgery and opted for PCI

Strategy for Percutaneous Coronary Intervention

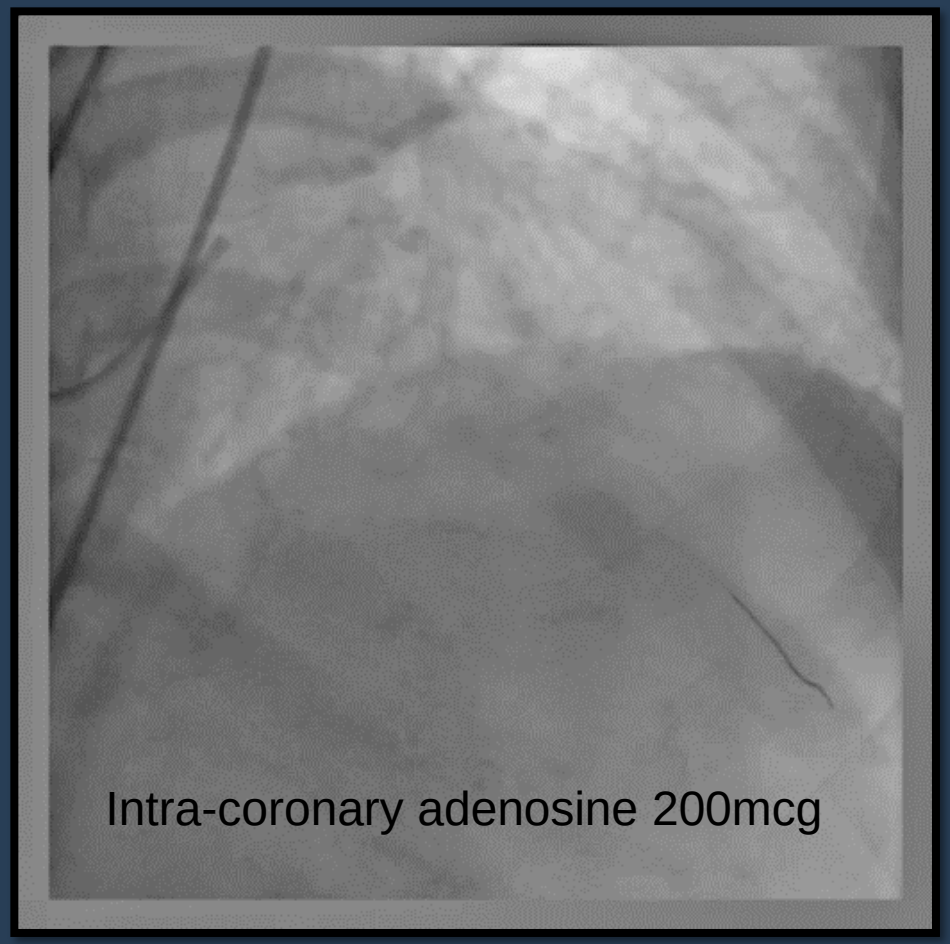
- Fix the RCA CTO first
  - Bilateral femoral access
  - Guiding catheter: 6 Fr AL 1.0 for right coronary artery
    6 Fr XB 3.5 for left coronaries

- Coronary physiology assessment to LAD and LCX prior to PCI

- Reassess physiology assessment to LAD and LCX after PCI to RCA

Fractional Flow Reserve

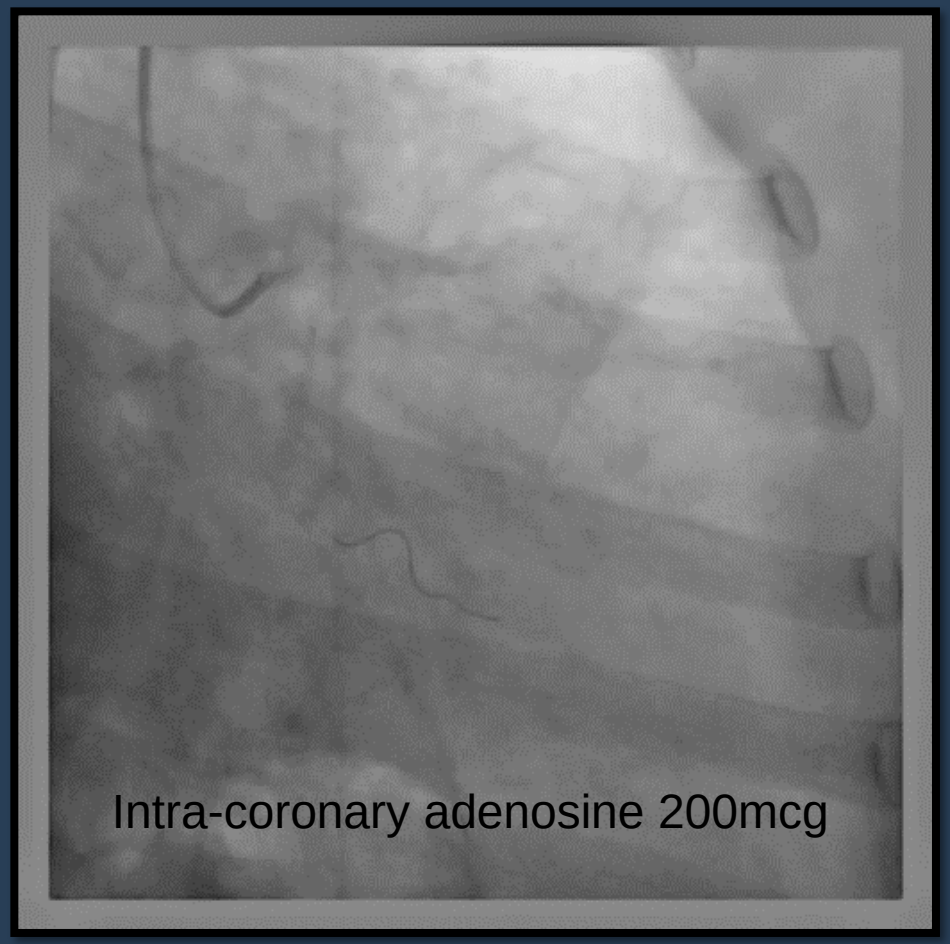
LEFT ANTERIOR DESCENDING ARTERY



FFR LAD 0.76 (positive for ischaemia)

Fractional Flow Reserve

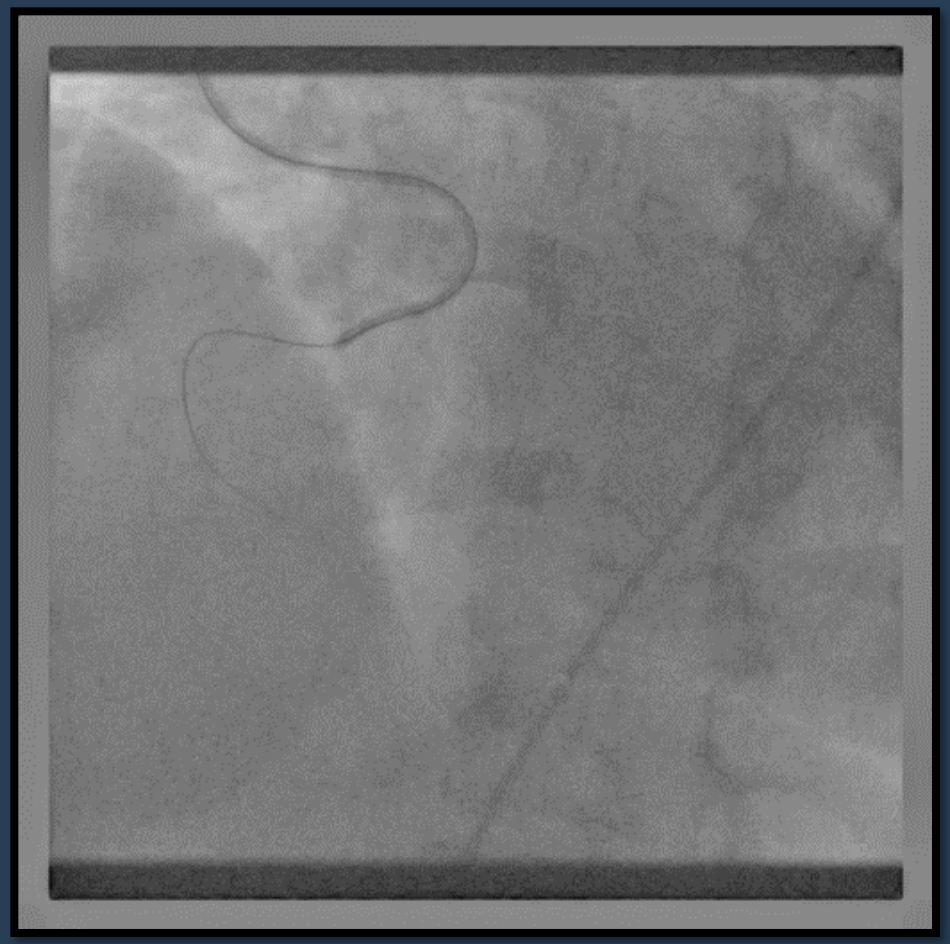
LEFT CIRCUMFLEX ARTERY



FFR LCX 0.90 (negative for ischaemia)

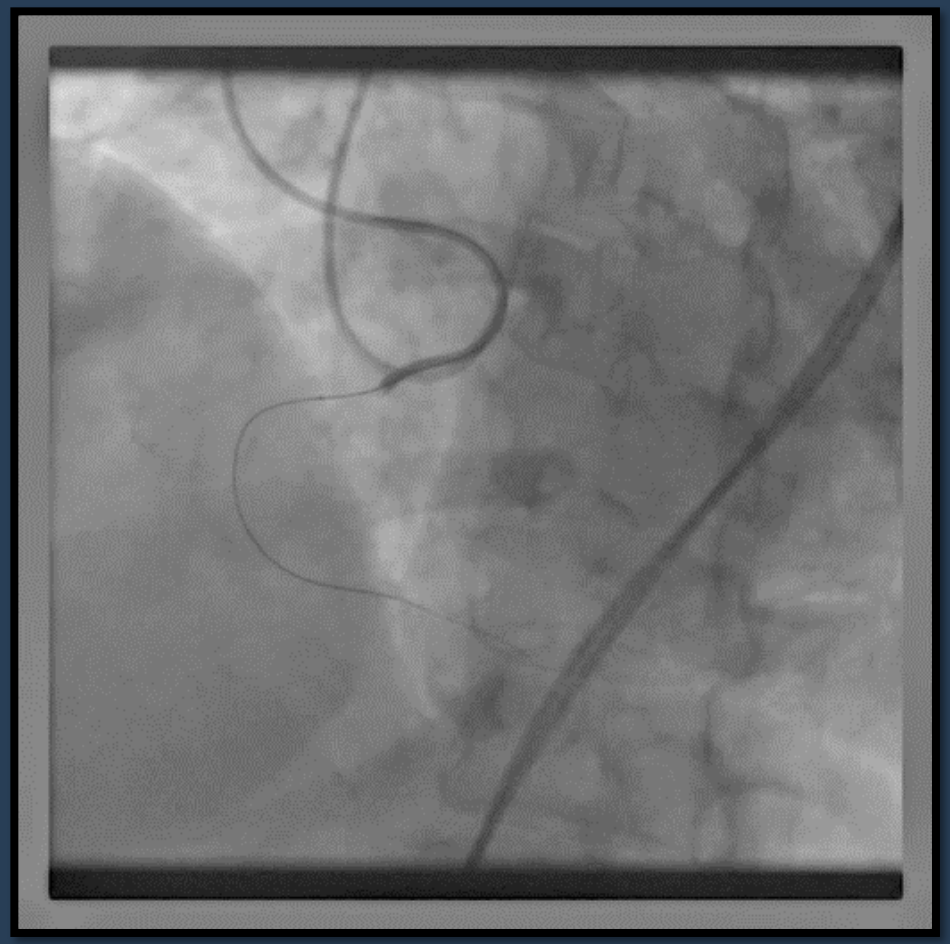
Percutaneous Coronary Intervention

RIGHT CORONARY ARTERY



- 6 Fr AL1.0
- Antegrade wire escalation
- Fielder XT guide wire with Finecross microcatheter

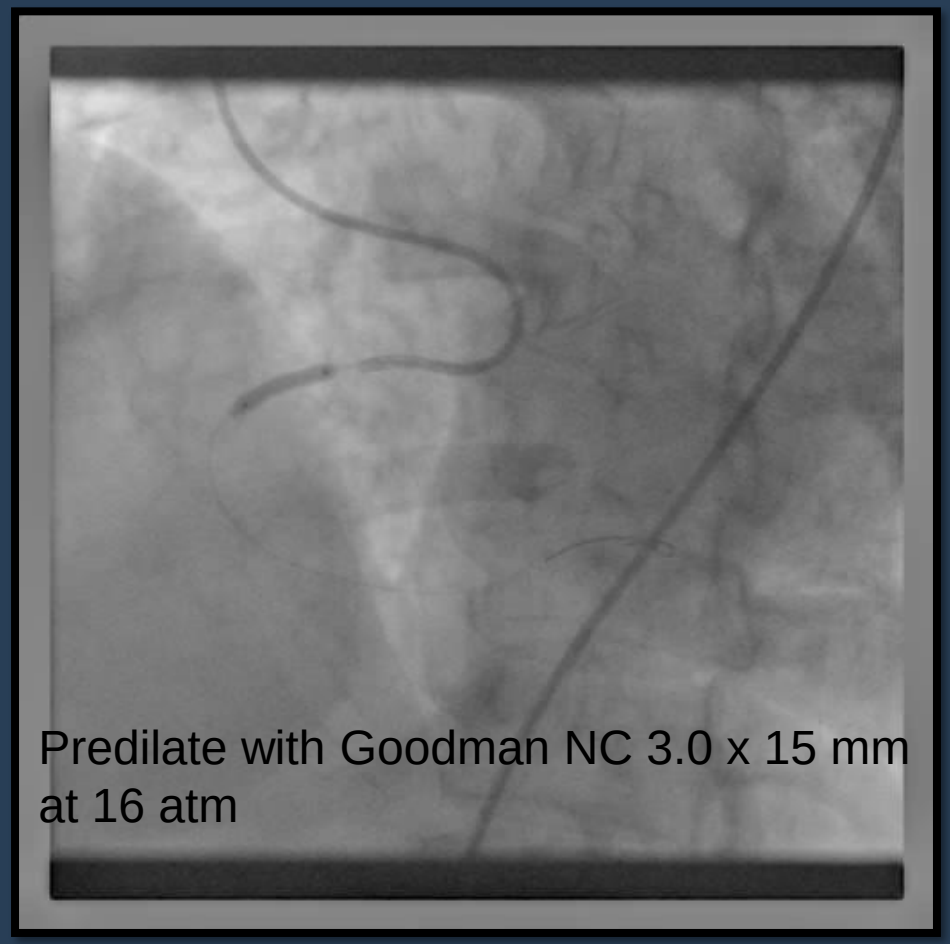
Percutaneous Coronary Intervention



- Contralateral contrast injection to confirm its in true lumen
- Change the Fielder XT guidewire to Runthrough Floppy guidewire

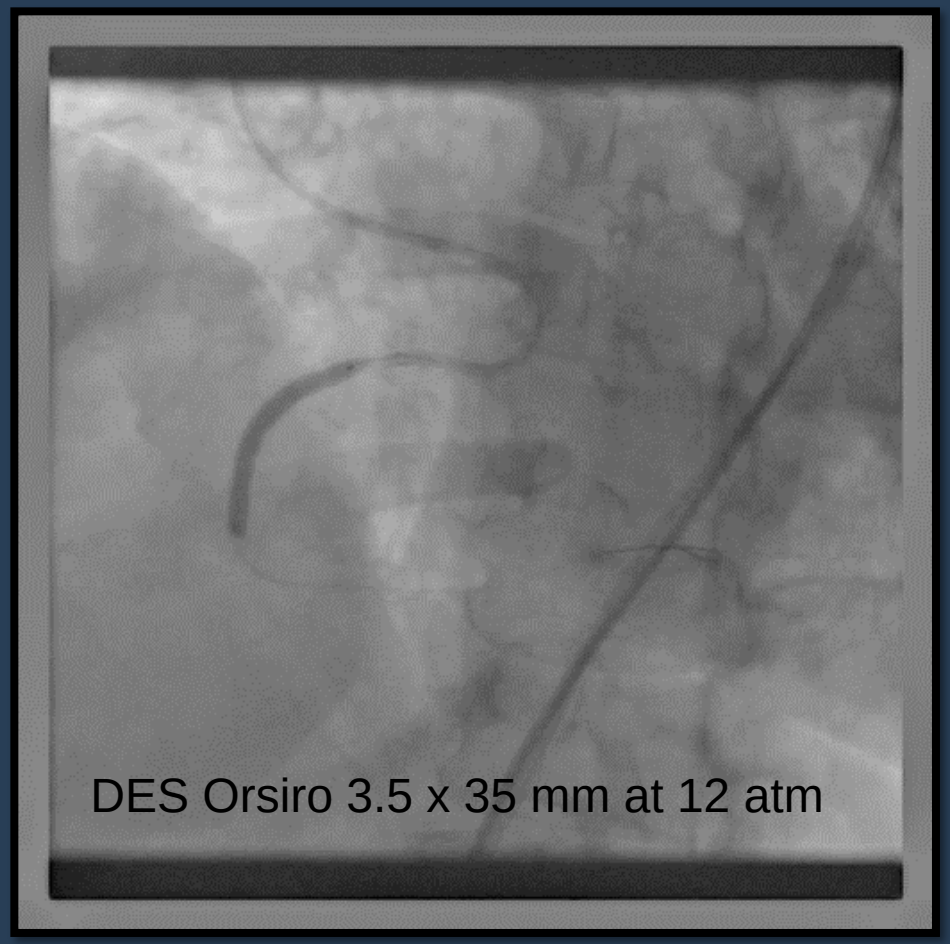
Percutaneous Coronary Intervention

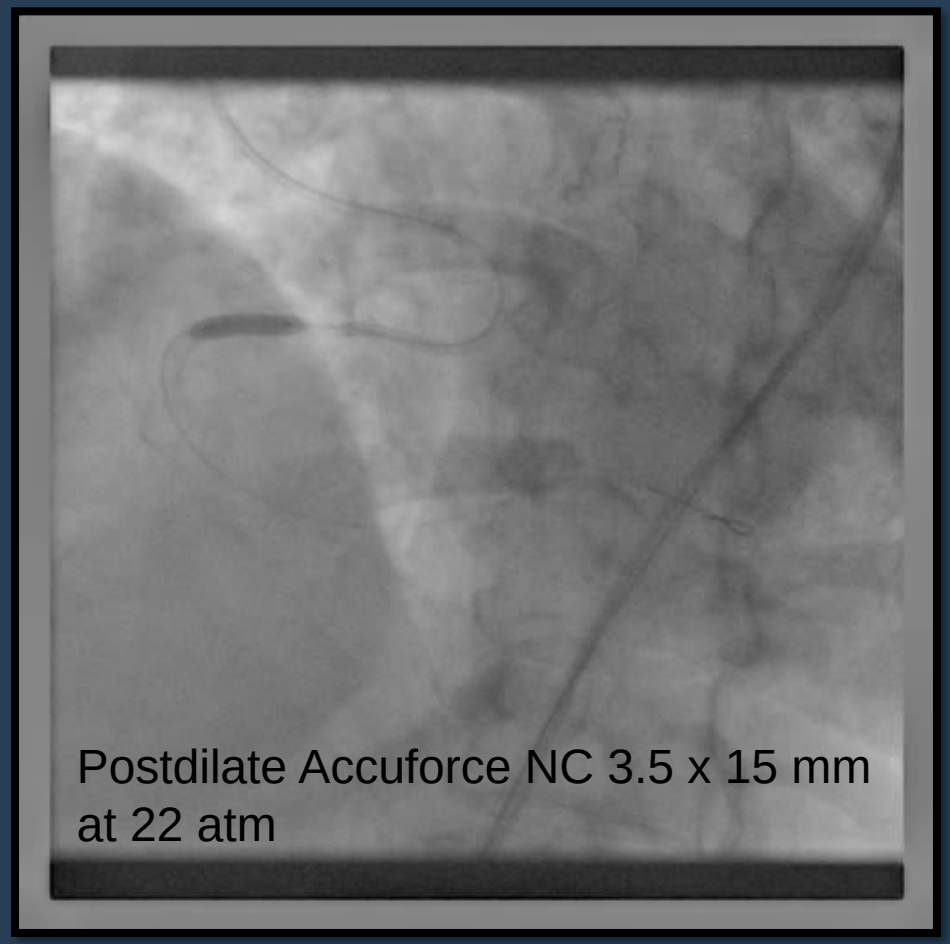
Predilate with Wilma SC 2.0 x 15 mm at 16 atm



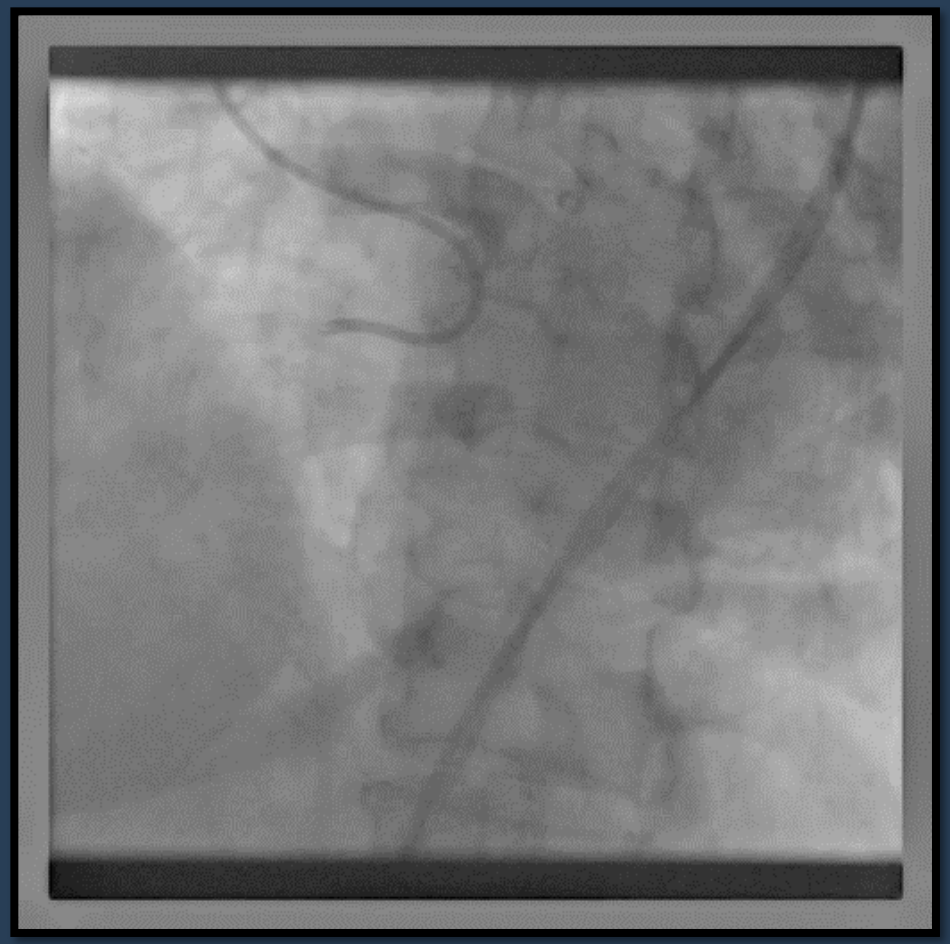
Predilate with Goodman NC 3.0 x 15 mm at 16 atm

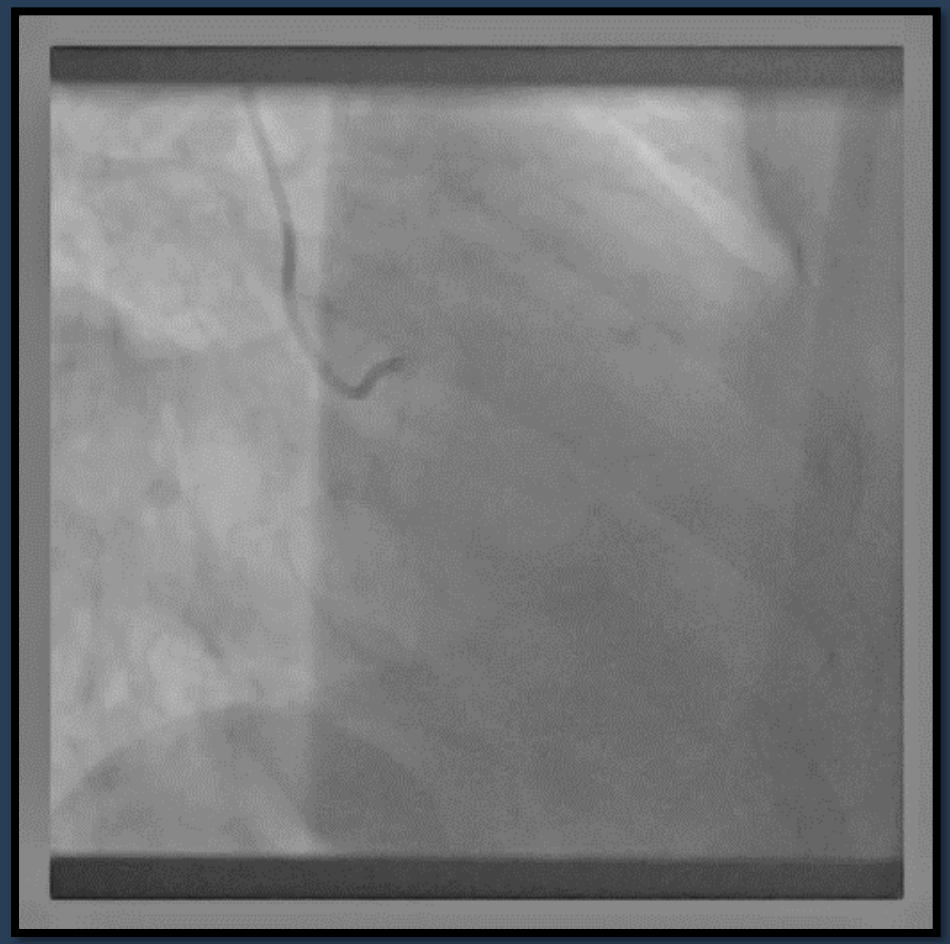
Percutaneous Coronary Intervention





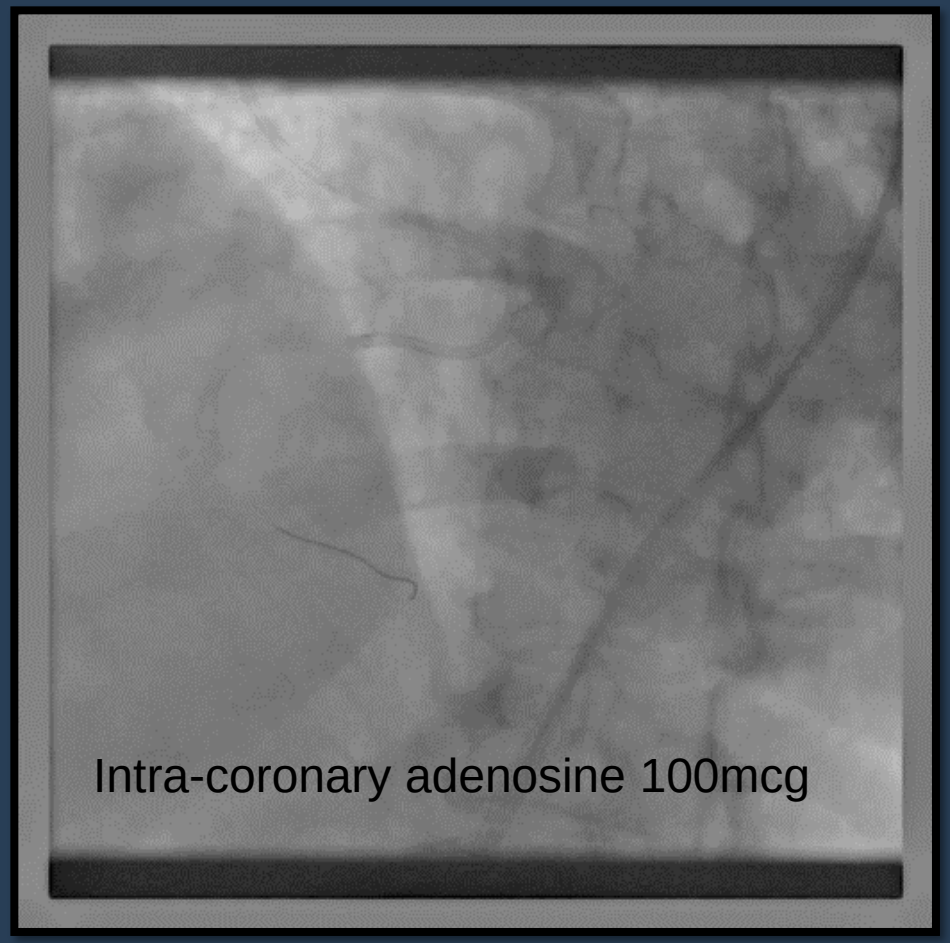
Percutaneous Coronary Intervention





Fractional Flow Reserve

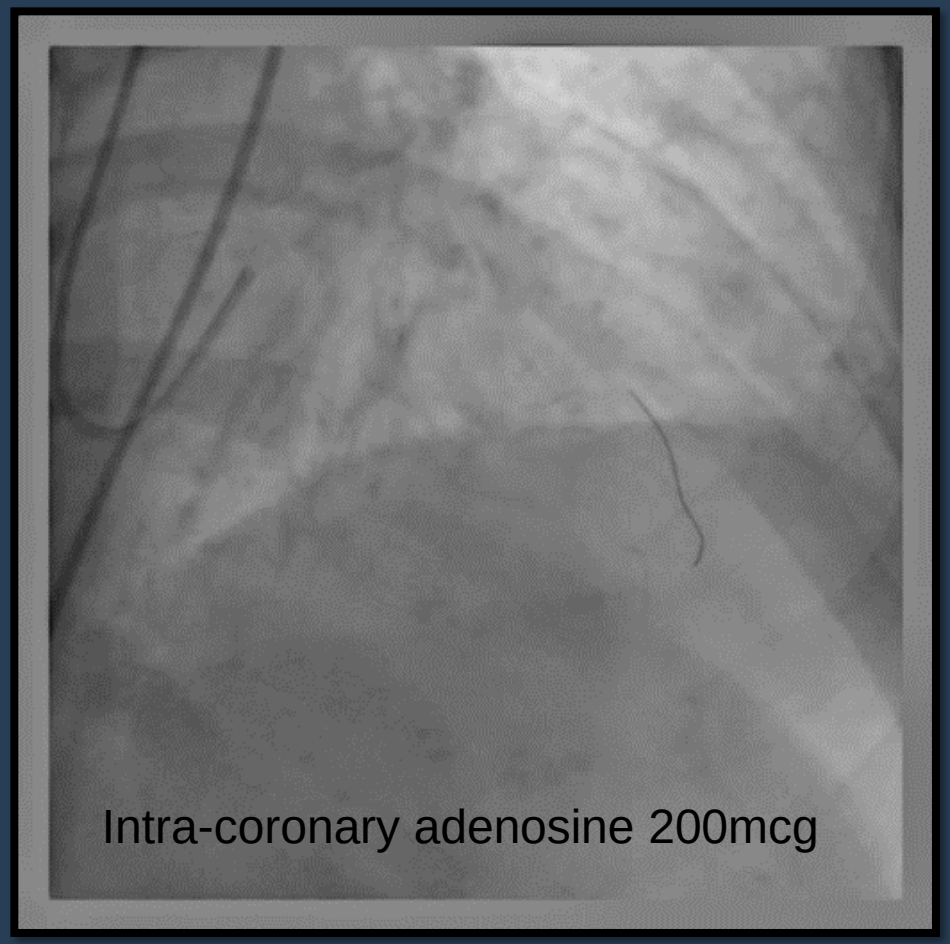
RIGHT CORONARY ARTERY



- Post PCI FFR RCA 0.98
- TIMI 3
- Result acceptable

Fractional Flow Reserve

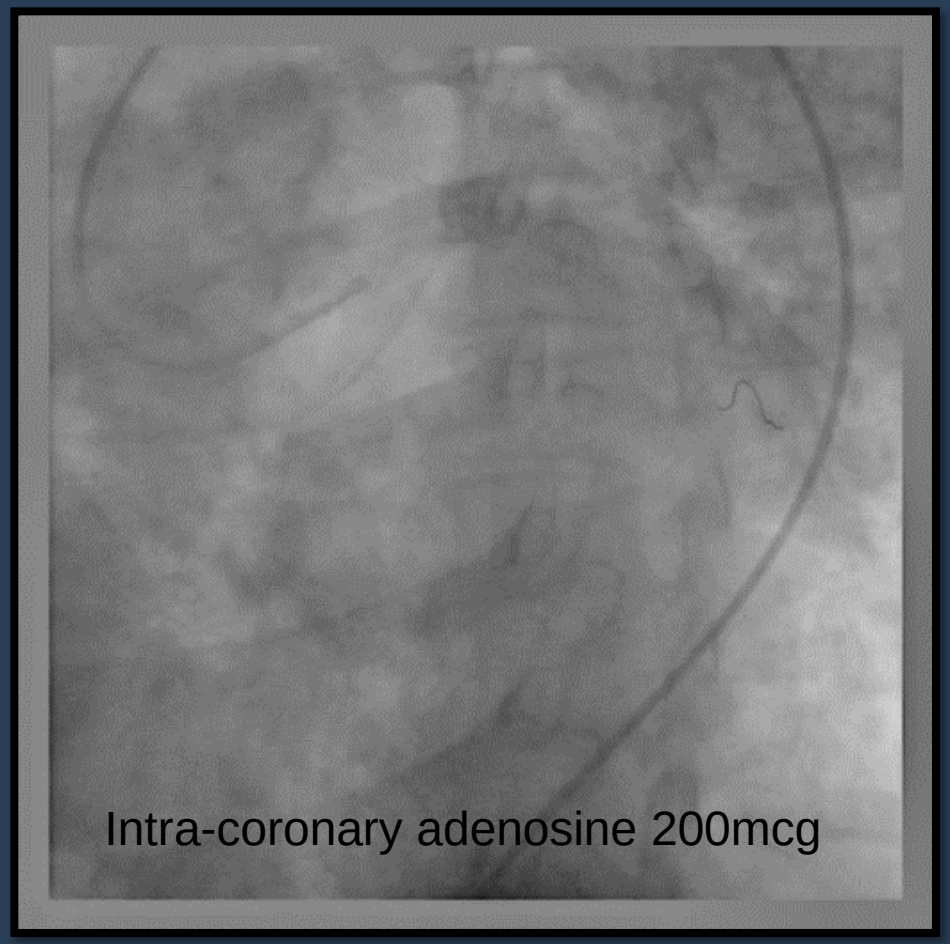
LEFT ANTERIOR DESCENDING ARTERY



FFR LAD 0.85

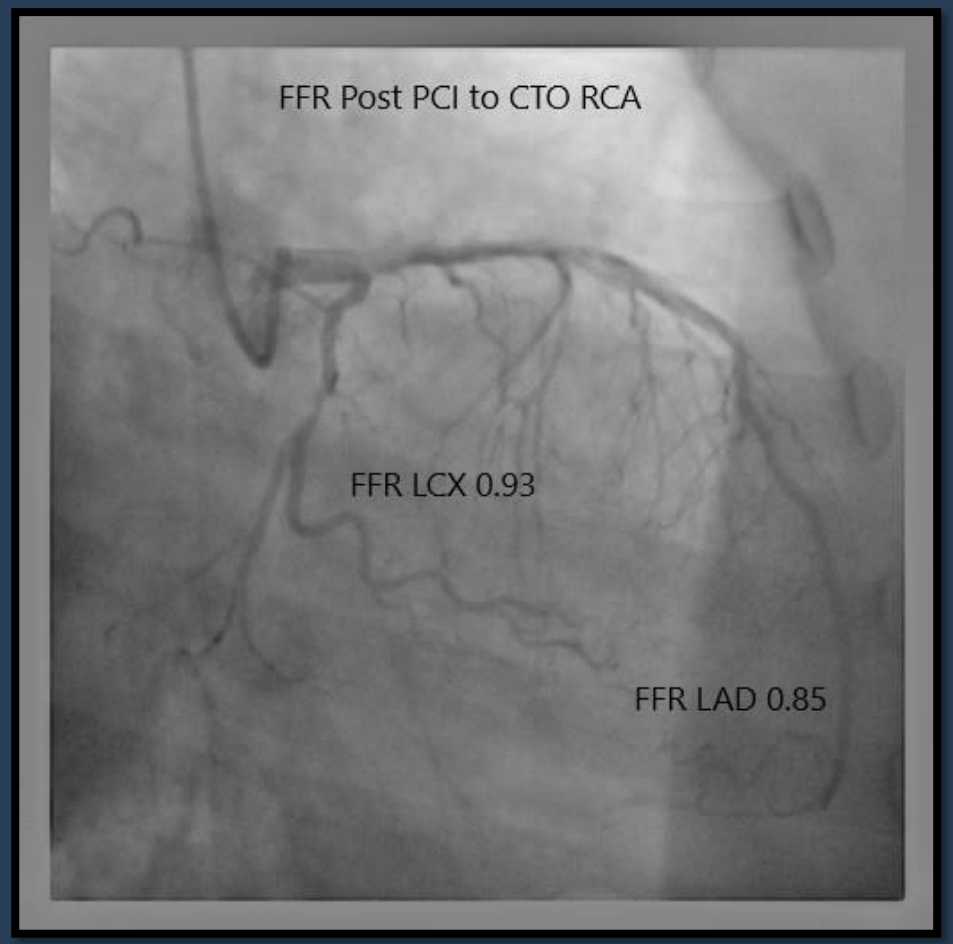
Fractional Flow Reserve

LEFT CIRCUMFLEX ARTERY



FFR LCX 0.93

Fractional Flow Reserve



FFR	Pre PCI RCA CTO	Post PCI RCA CTO
LAD	0.76	0.85
LCX	0.90	0.93
RCA	-	0.98

- FFR for LAD was negative after revascularization of RCA
- LAD ischaemic burden reduced after PCI to RCA CTO
- Medical therapy to LAD and LCX lesions

- Total procedure time 130 minutes
- Total contrast 200 ml
- Patient stented with one DES at RCA, medical therapy for LAD and LCX
- She was planned for DAPT for 6 months

- Post PCI, she was angina free and no more intradialytic hypotension

Conclusion / Take-home Message

- Coronary physiology assessment with FFR has simplified our procedure for this patient.
- FFR-guided PCI should be considered in patients with multi-vessel disease undergoing PCI.
- The FAME trial has showed improved better patient outcomes with FFR-guided PCI, compared with angiography-guided PCI.