

# TCTAP 2022

## **Third In-Stent Restenosis in 5 Years - Are We Doing Enough? Role of Intravascular Ultrasound and Lithotripsy in Severely Calcified ISR**

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# Disclosures

- none

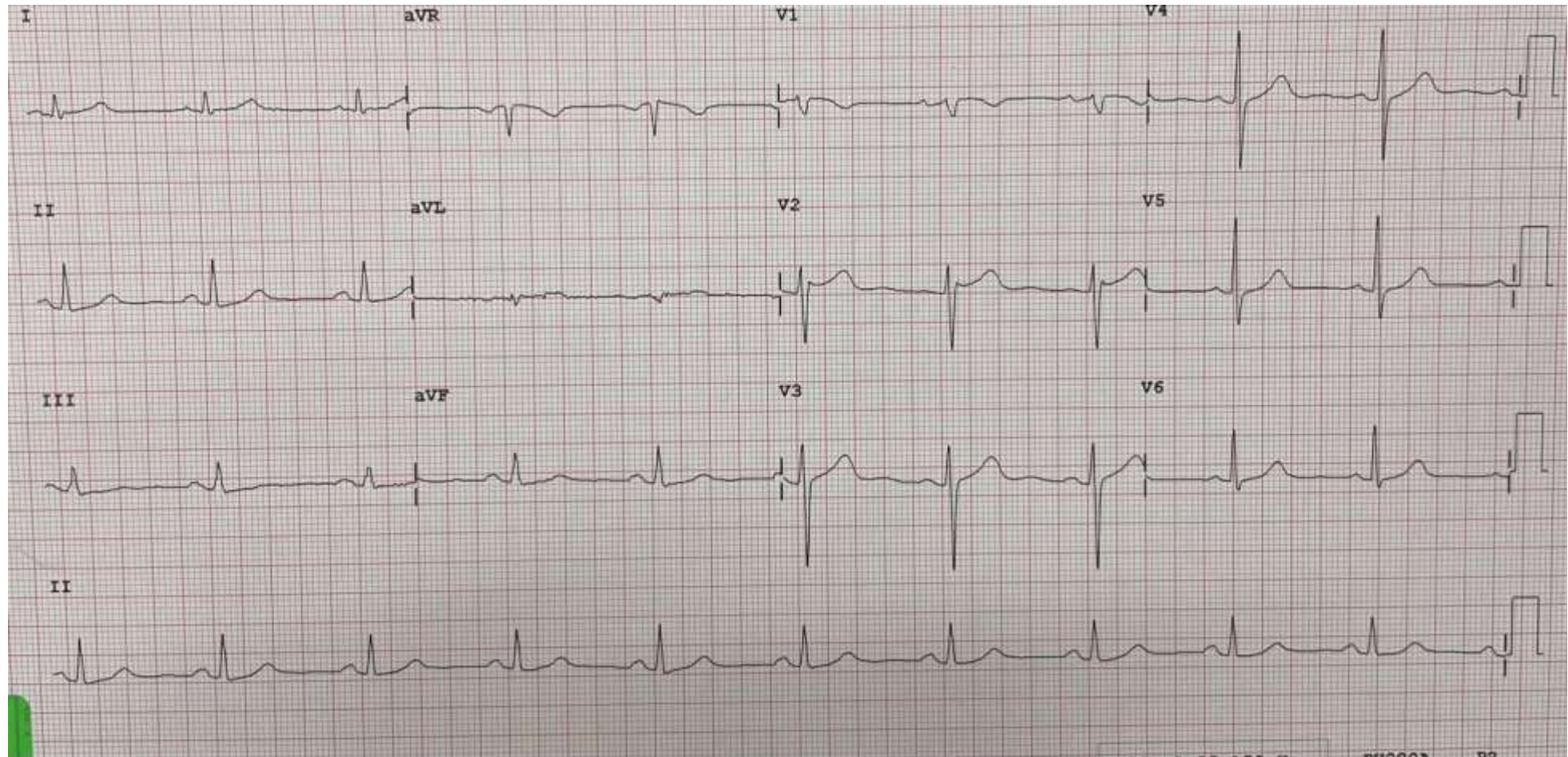
# Mr SS

- 69 year old
  - CAD – PCI LAD/RCA 1998 – inferior MI
    - PCI ISR LAD 2016 – DCB 3.0/30
    - PCI ISR LAD 2019 – DCB 3.0/30
  - Type II Diabetes
  - Hypertension
  - Chronic Kidney disease IIIa

# Mr SS

- Admitted with frequent typical chest pain
- Treated as unstable angina
- ECG – normal sinus rhythm, abnormal R wave progression, no ST – T wave abnormalities
- Troponin T – 12 (negative)
- Cr 112 eGFR 56

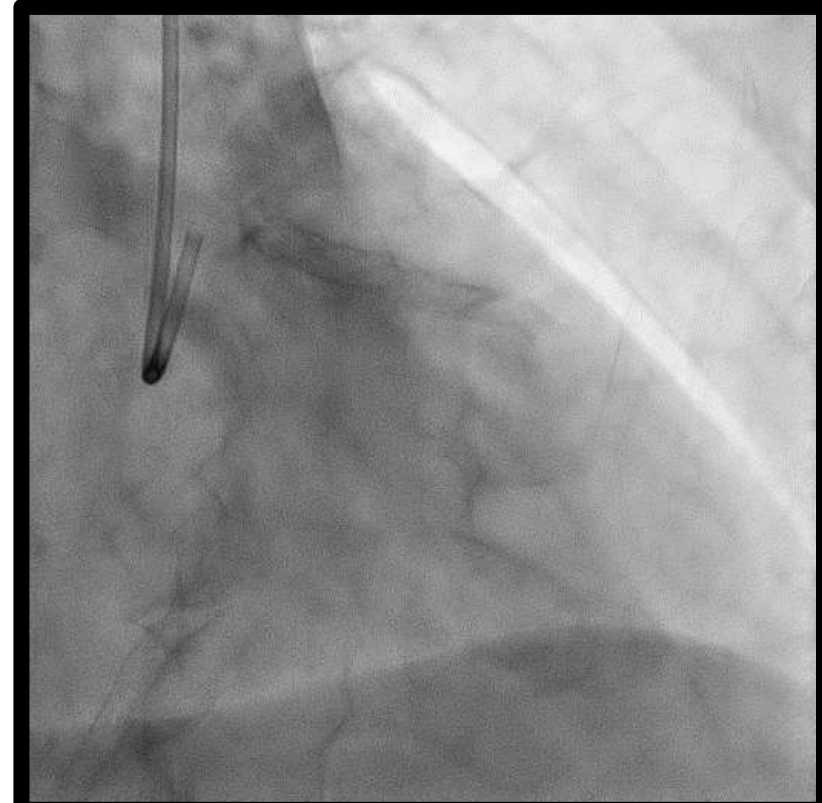
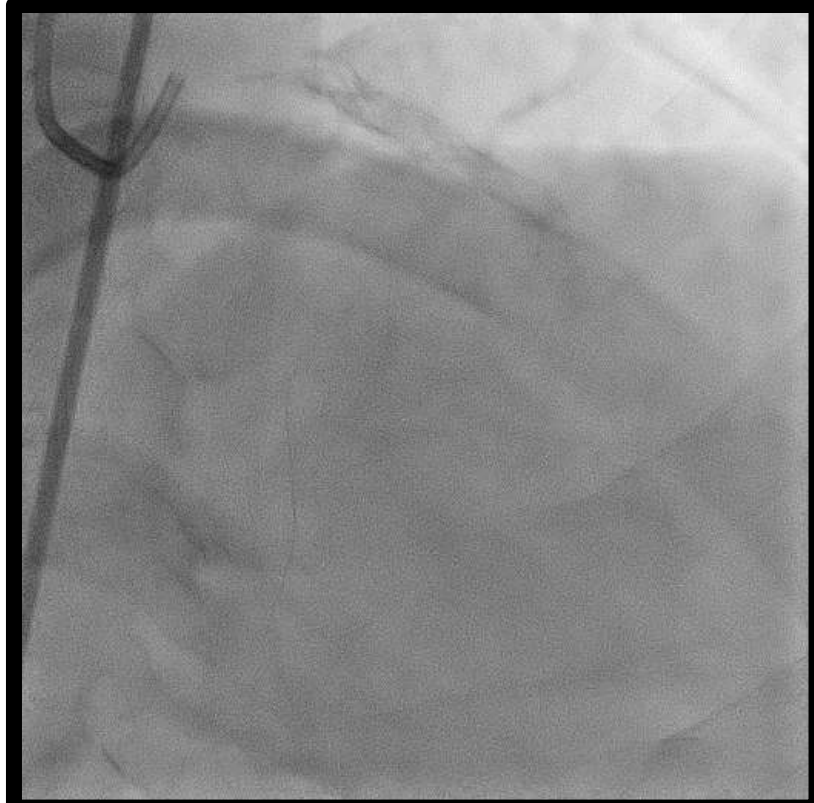
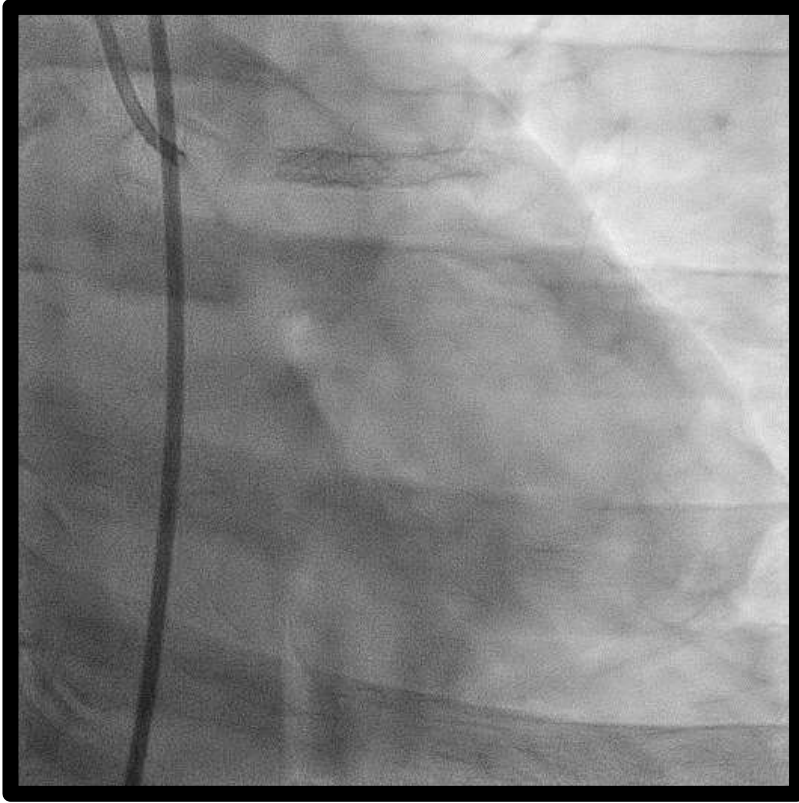
# ECG



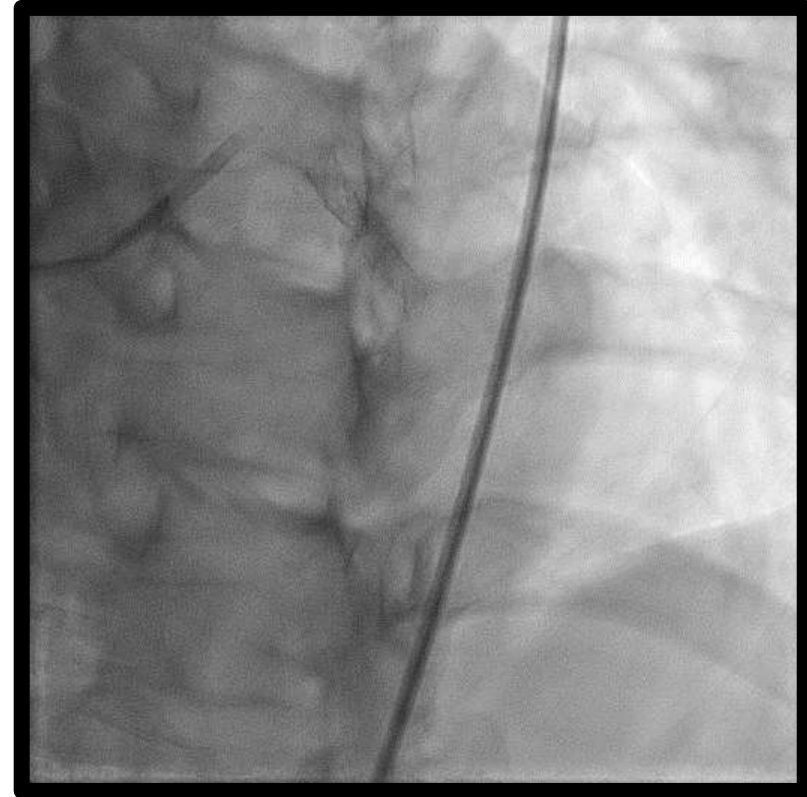
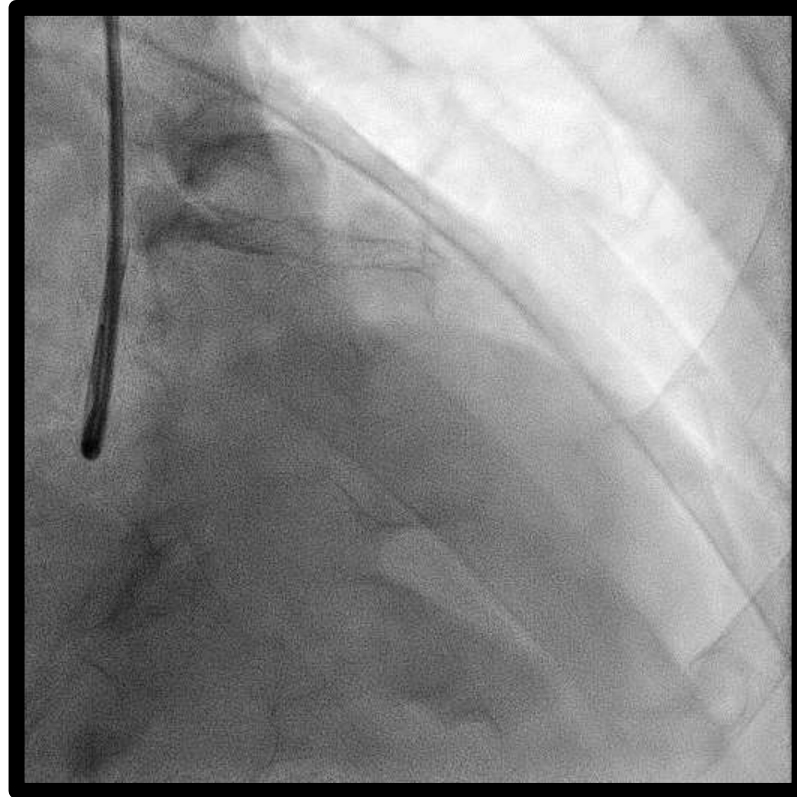
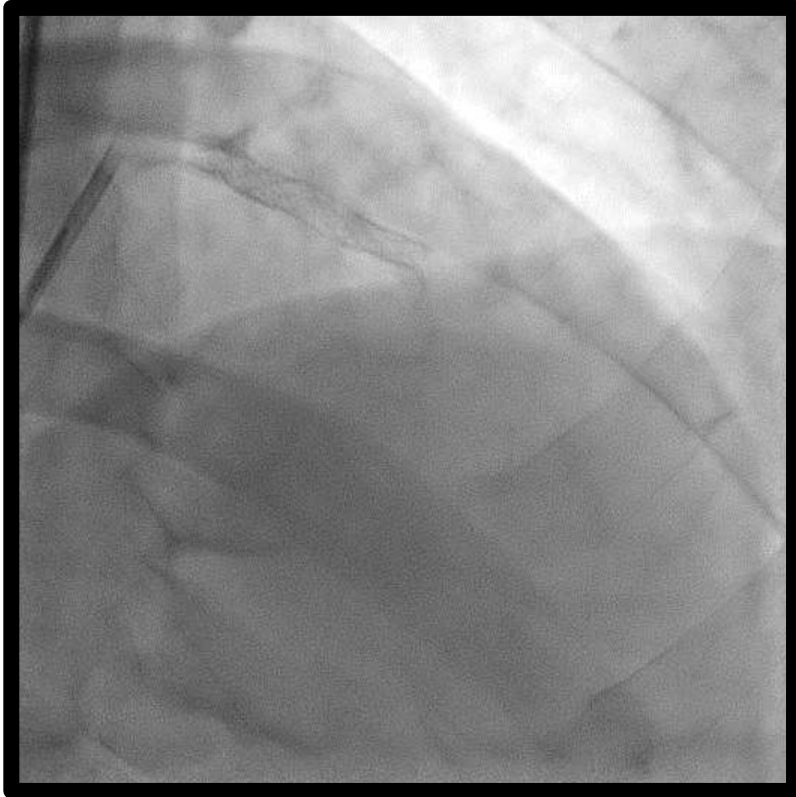
# Transthoracic Echocardiogram

- LVEF 50%, **septal hypokinesia**
- RV function normal
- No significant valvular abnormalities

# 2019 – Coronary Angiogram & PCI ISR LAD

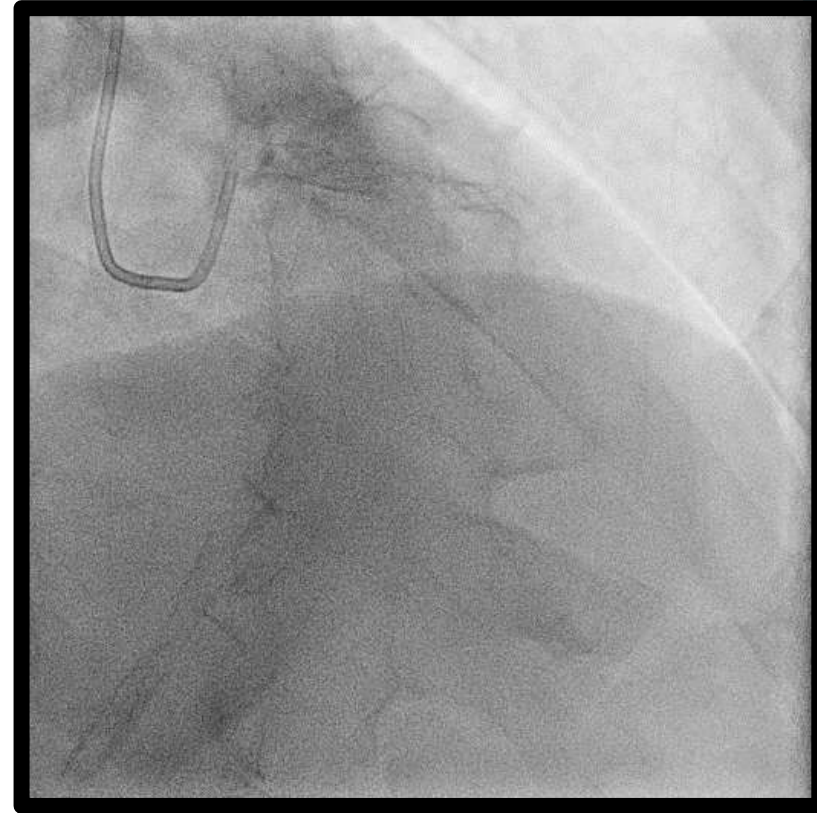
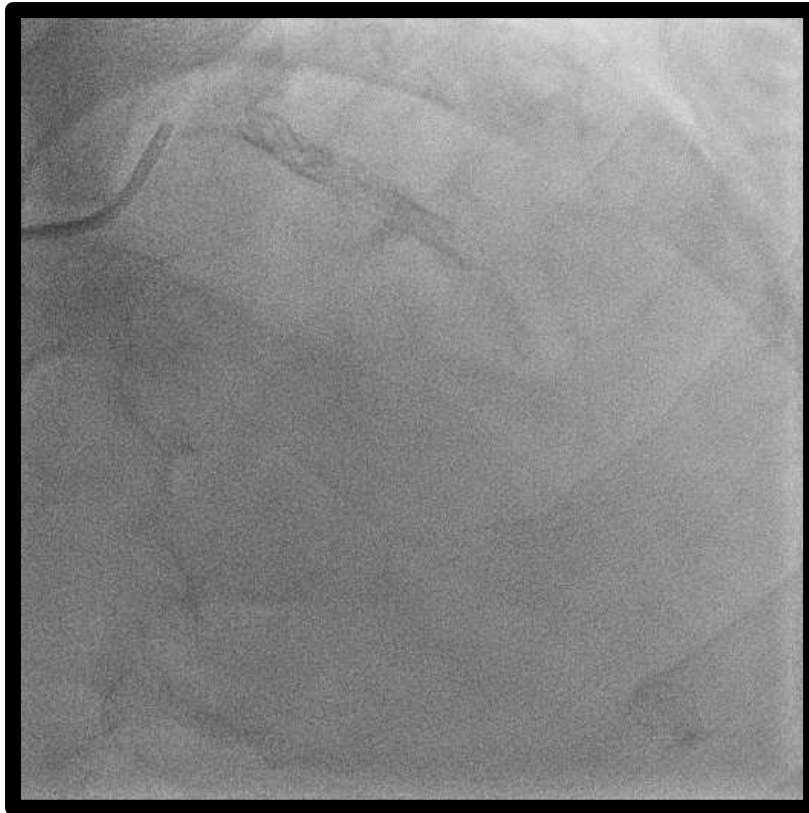
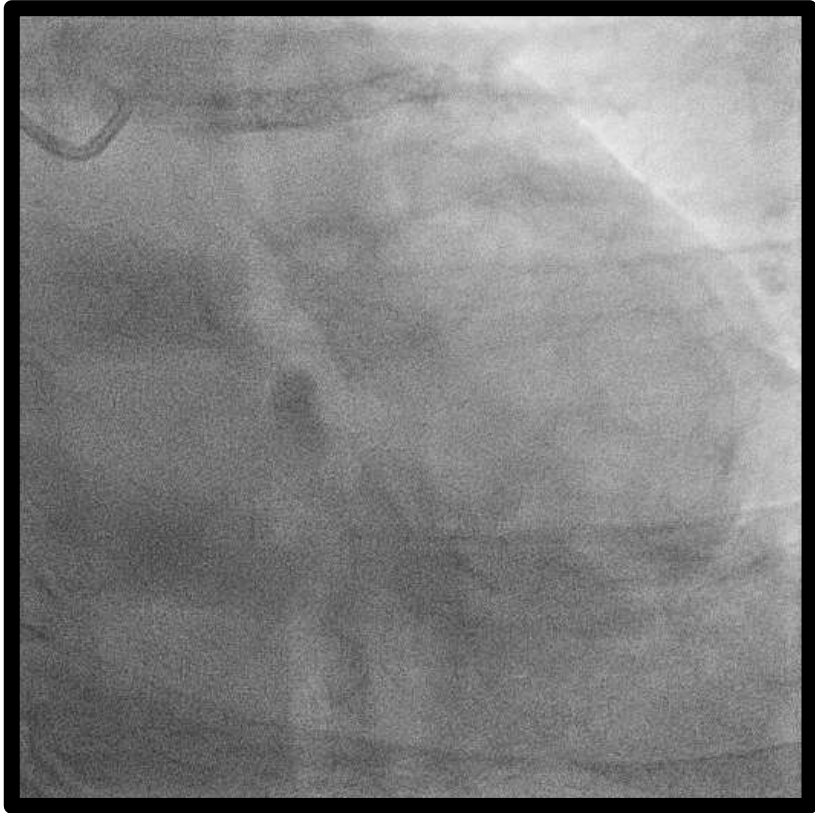


# 2019 – Post DCB – ?suboptimal results with inadequate preparation of calcified ISR

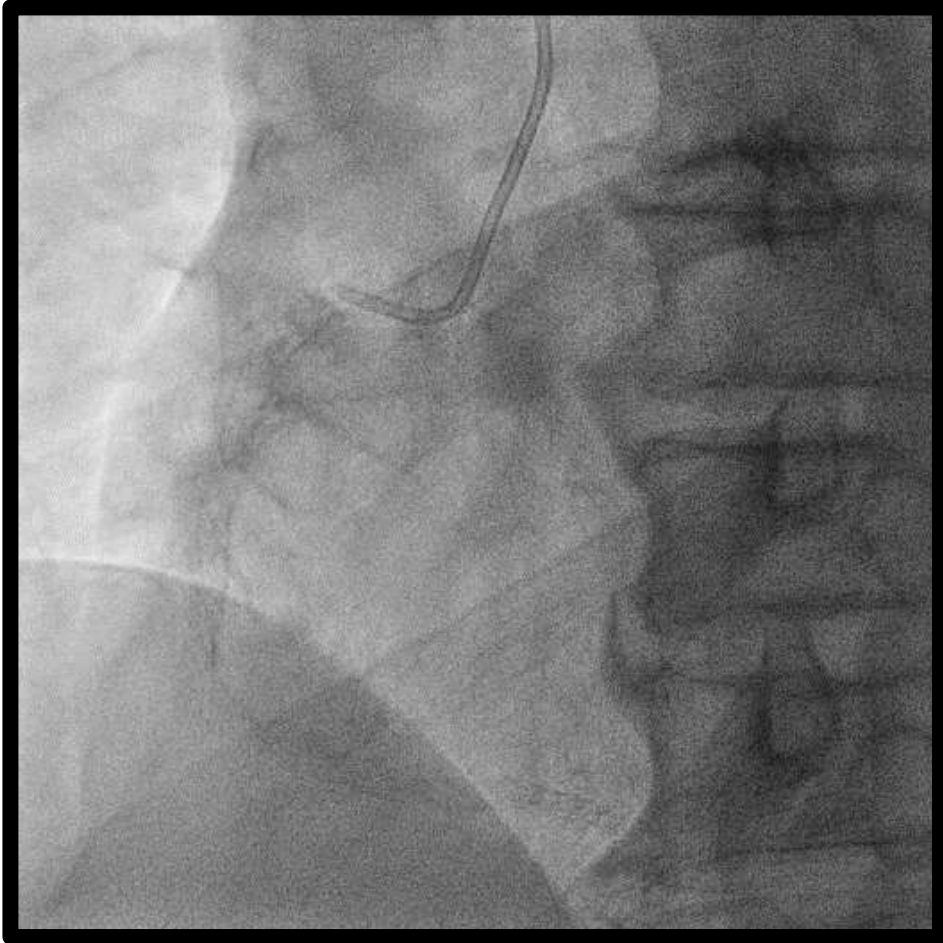




# Coronary Angiogram – current admission



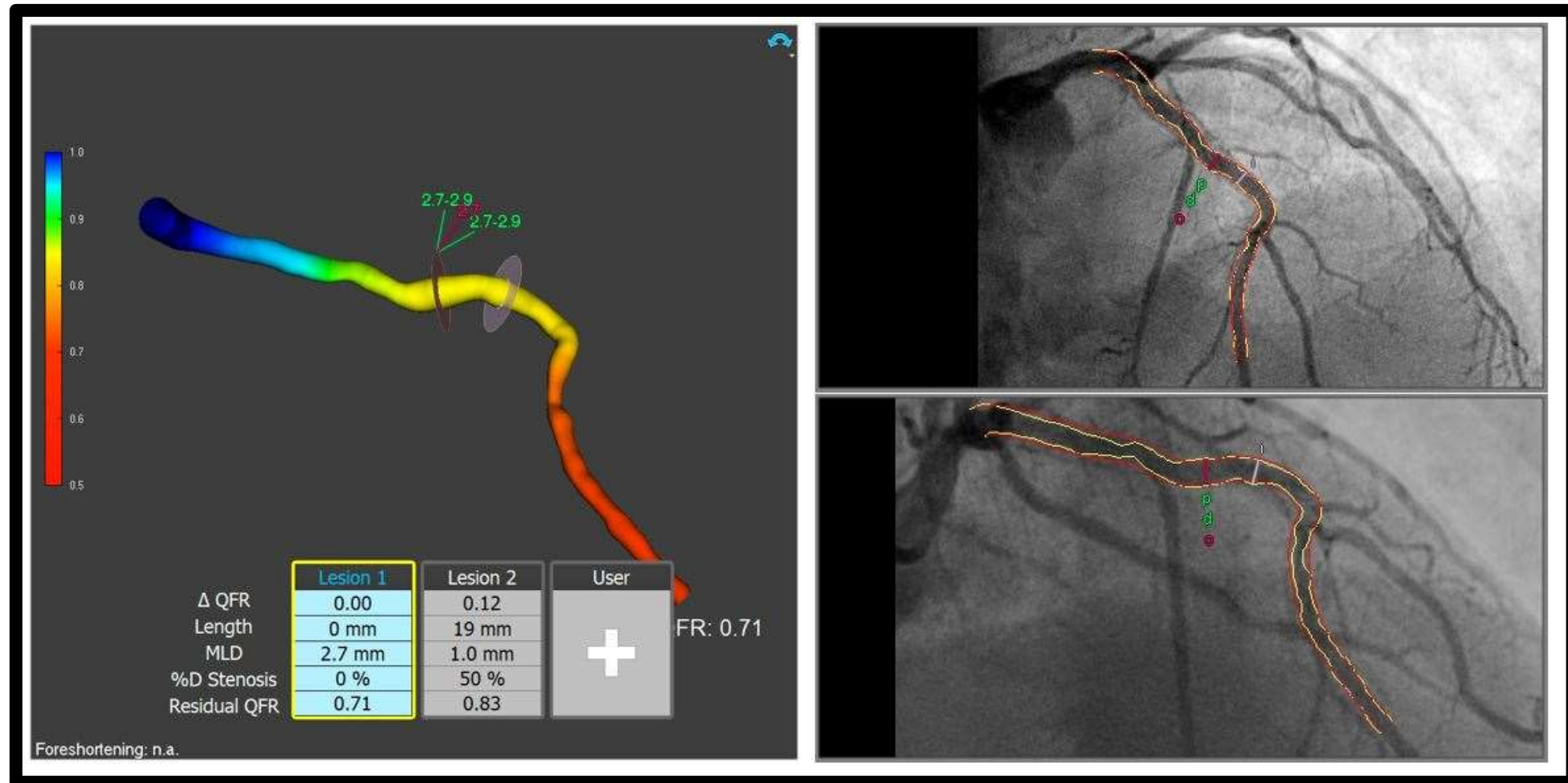
# Coronary Angiogram - current admission



# Thoughts?

- Significance of diffuse borderline lesion (60-70%) proximal LAD ISR
- Third ISR in 5 years and very 'old' stent (Index PCI LAD in 1998)
  - If need angioplasty, to perform with IVUS to investigate and optimise angioplasty results
  - Suspected **heavily calcified ISR** – considered debulking/preparing lesion with IVL, as rotablation/atherectomy 'relatively' contraindicated in ISR cases

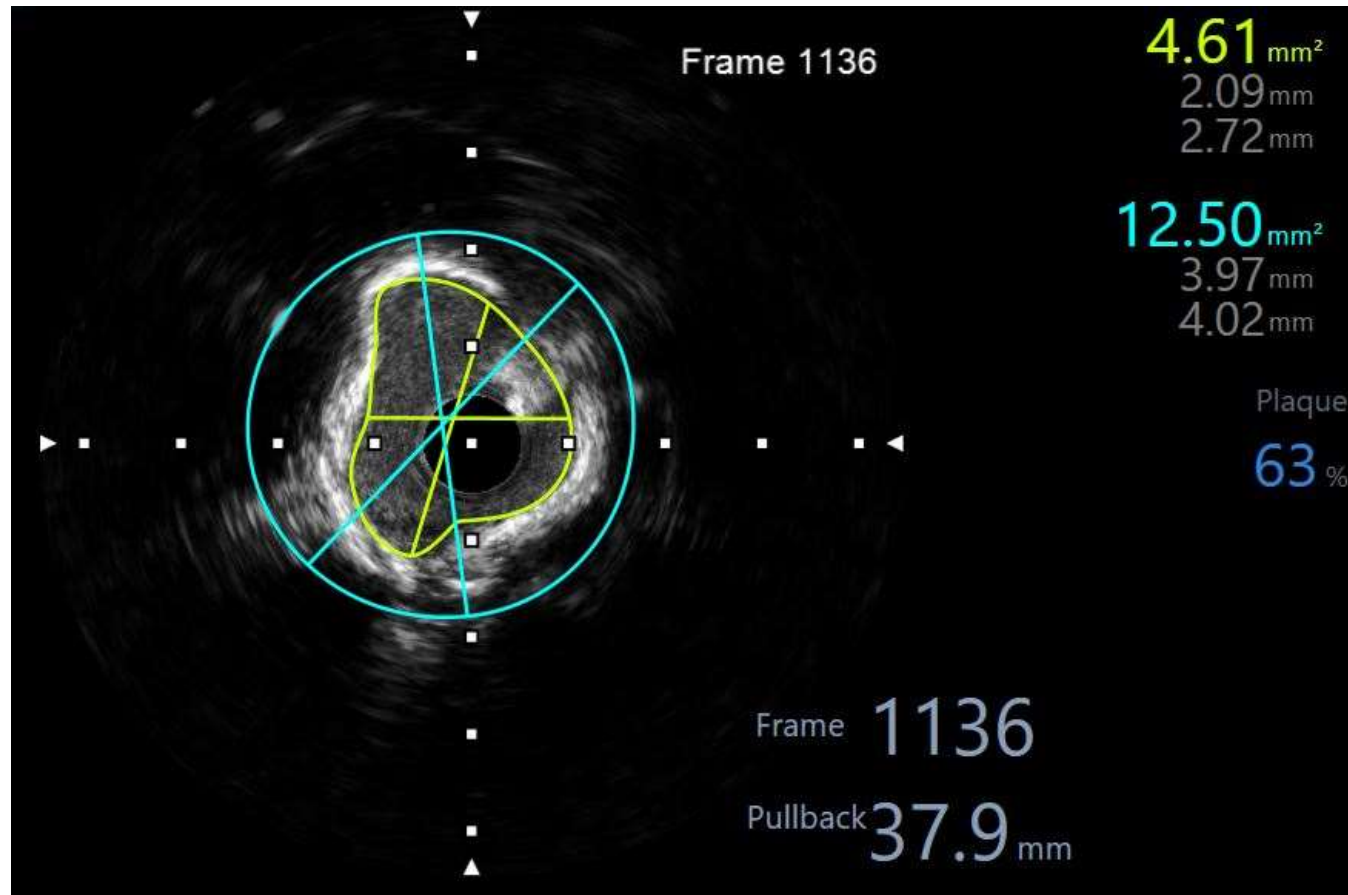
# QFR – pre PCI = 0.71



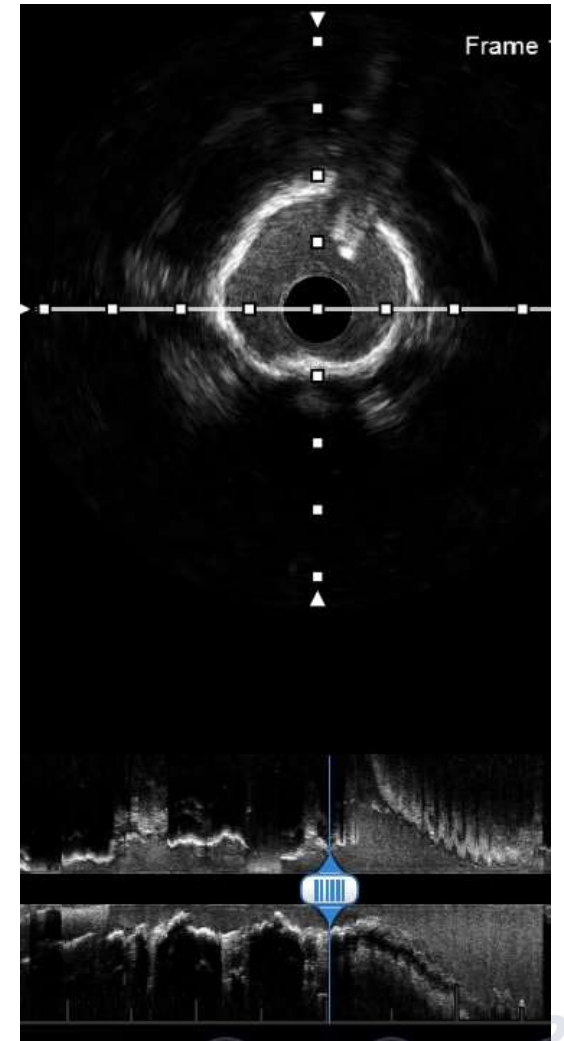
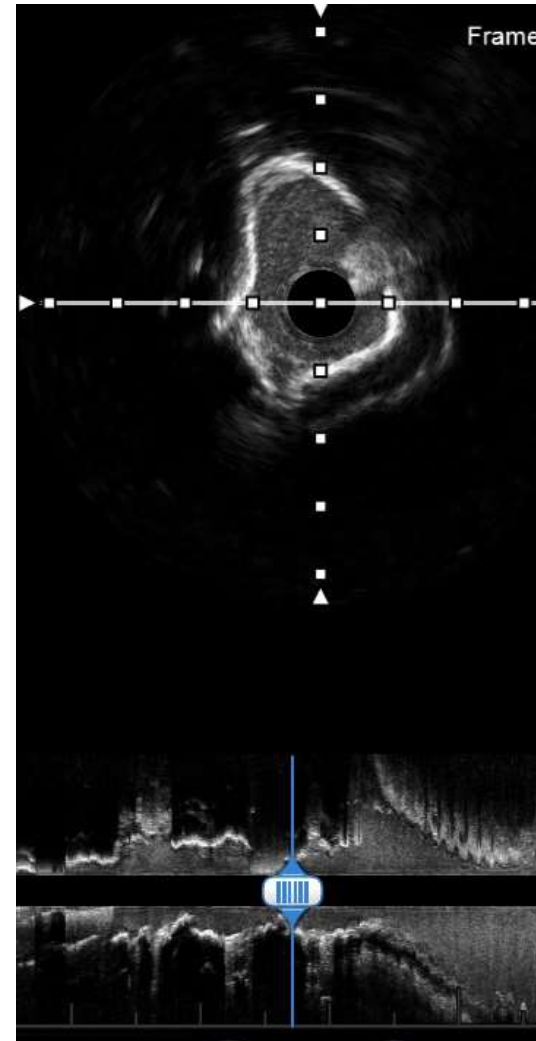
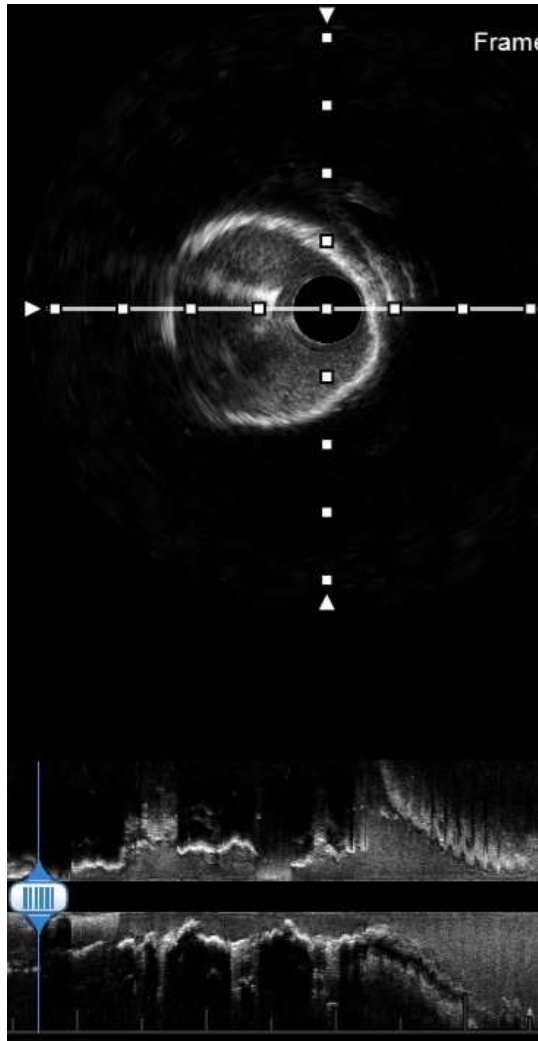
# PCI to LAD with IVUS and IVL

- QFR **0.71 is significant (<0.80)** therefore decided for angioplasty to ISR LAD
- As previous results not fully satisfactory, decided for Intravascular lithotripsy (IVL) if significant calcification on IVUS for better lesion preparation before DCB

# IVUS LAD – pre PCI – MLA 4.61mm<sup>2</sup> with 63% plaque burden (calcified)



# IVUS LAD – pre PCI – multiple areas of circumferential calcification



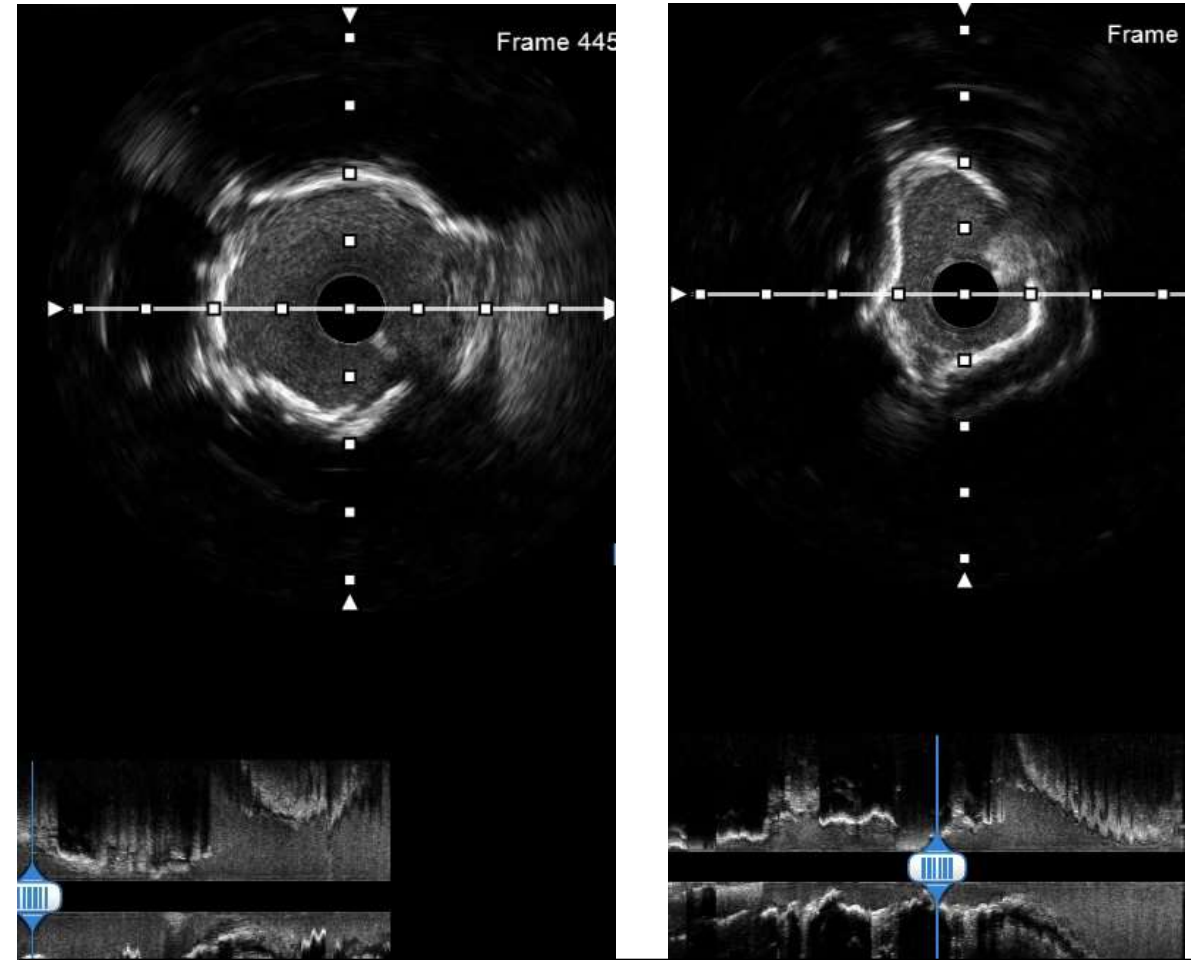
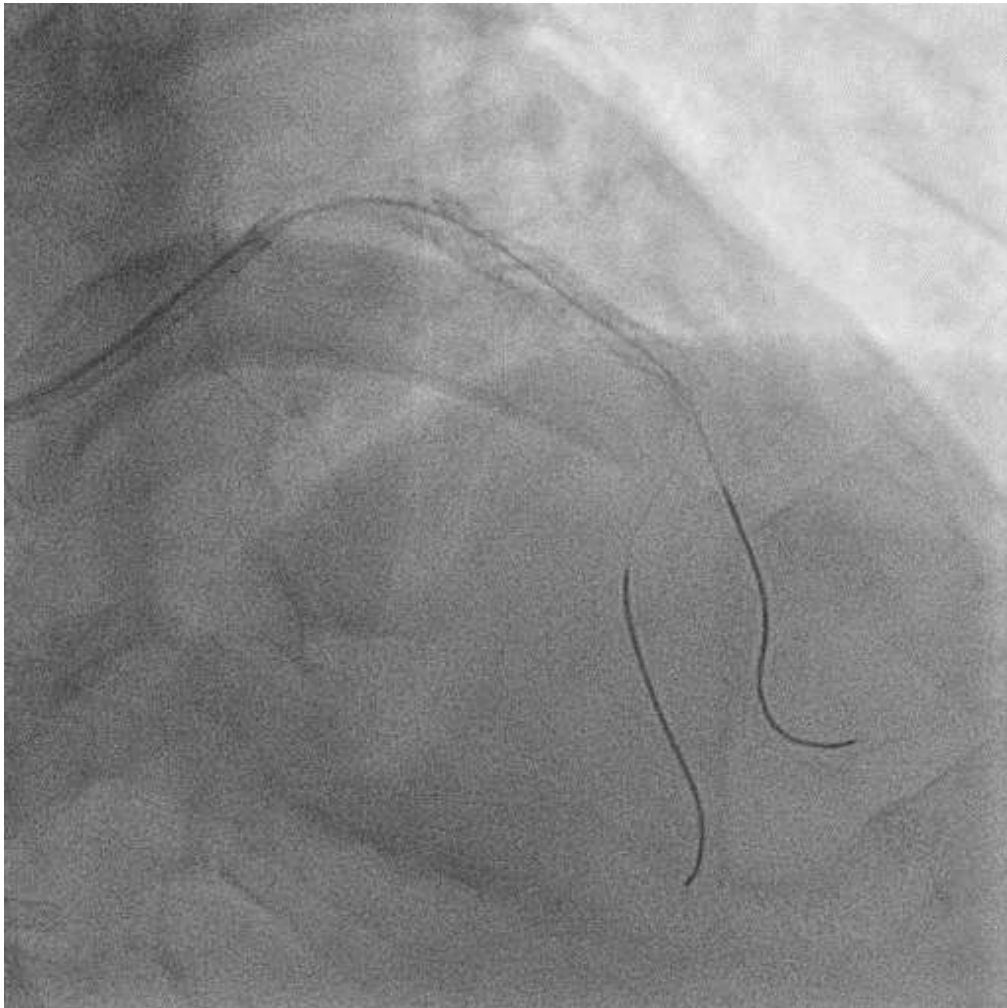
## PCI – IVL (80 pulses from proximal – mid LAD)



IVL done with 80 pulses – more pulses given on the proximal and mid part of LAD stent with heavier calcification

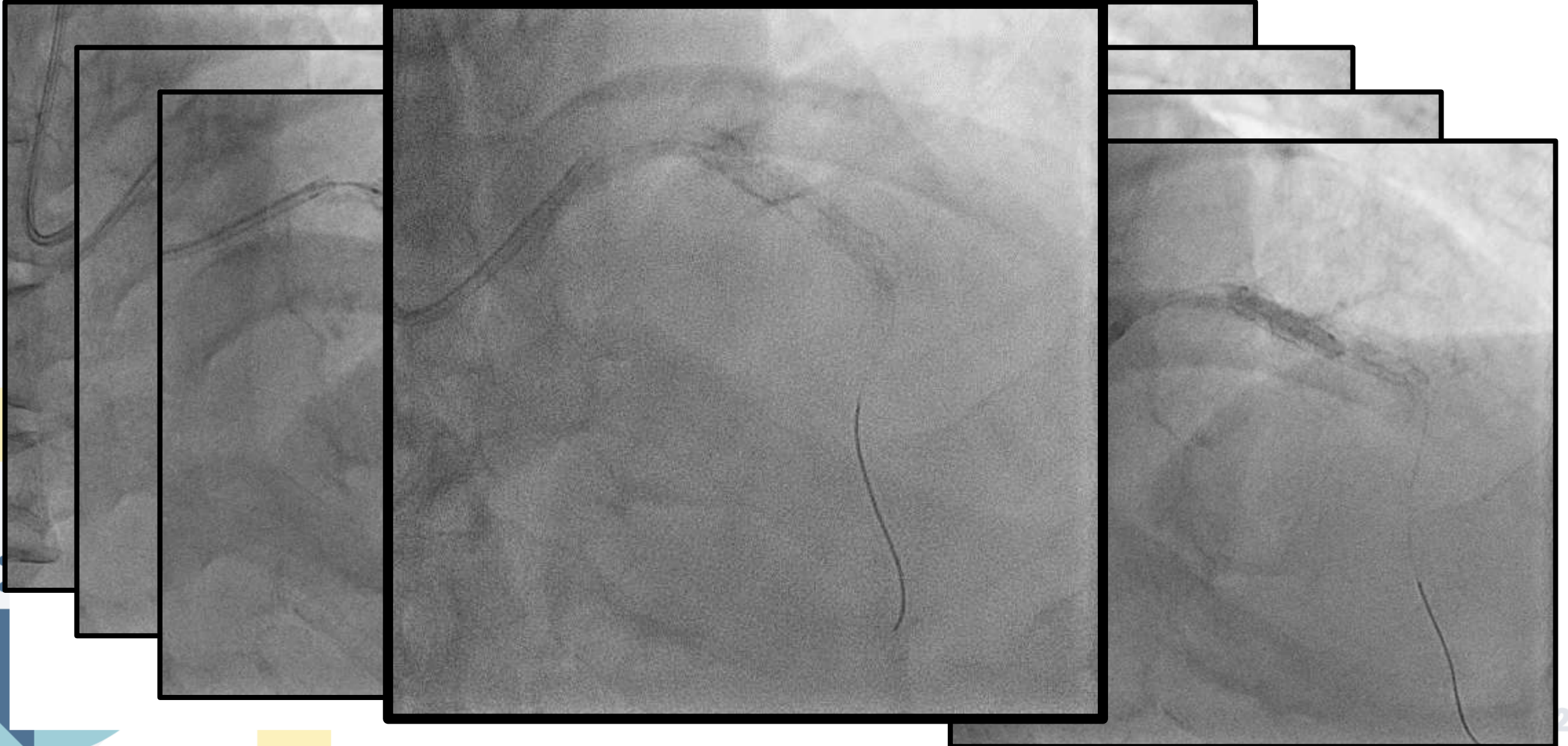


# Post IVL debulking - angio and IVUS images

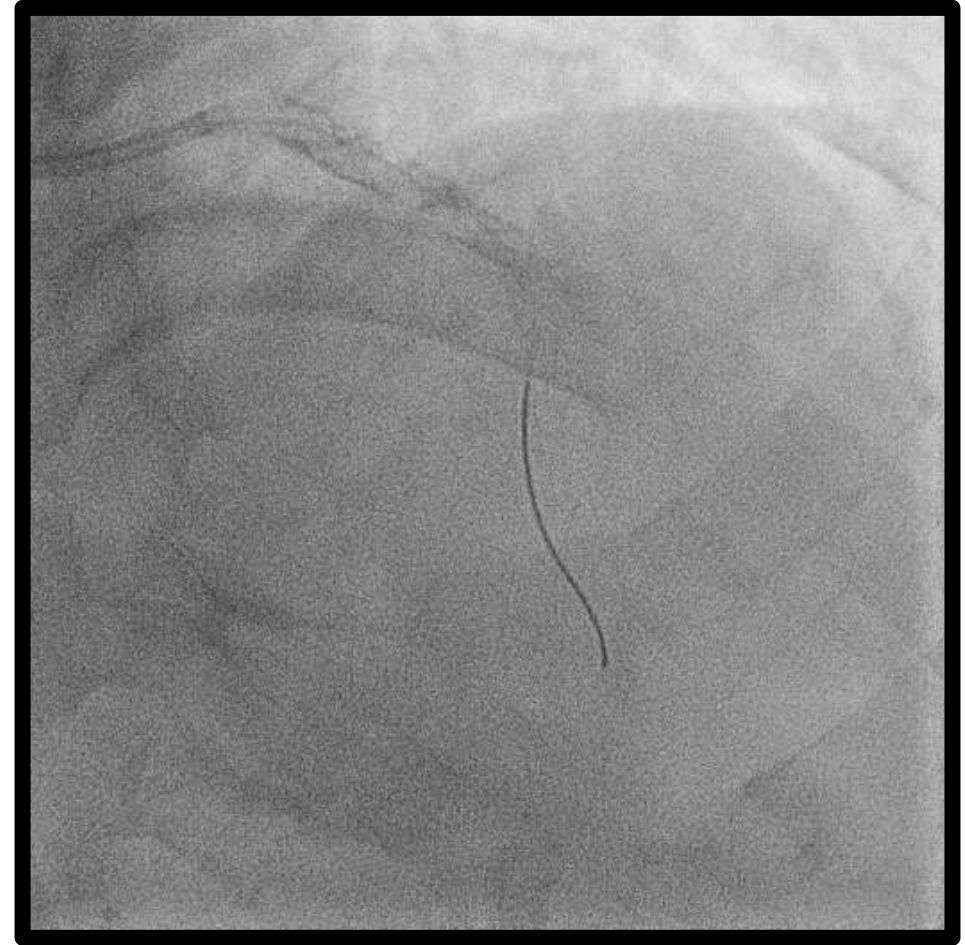
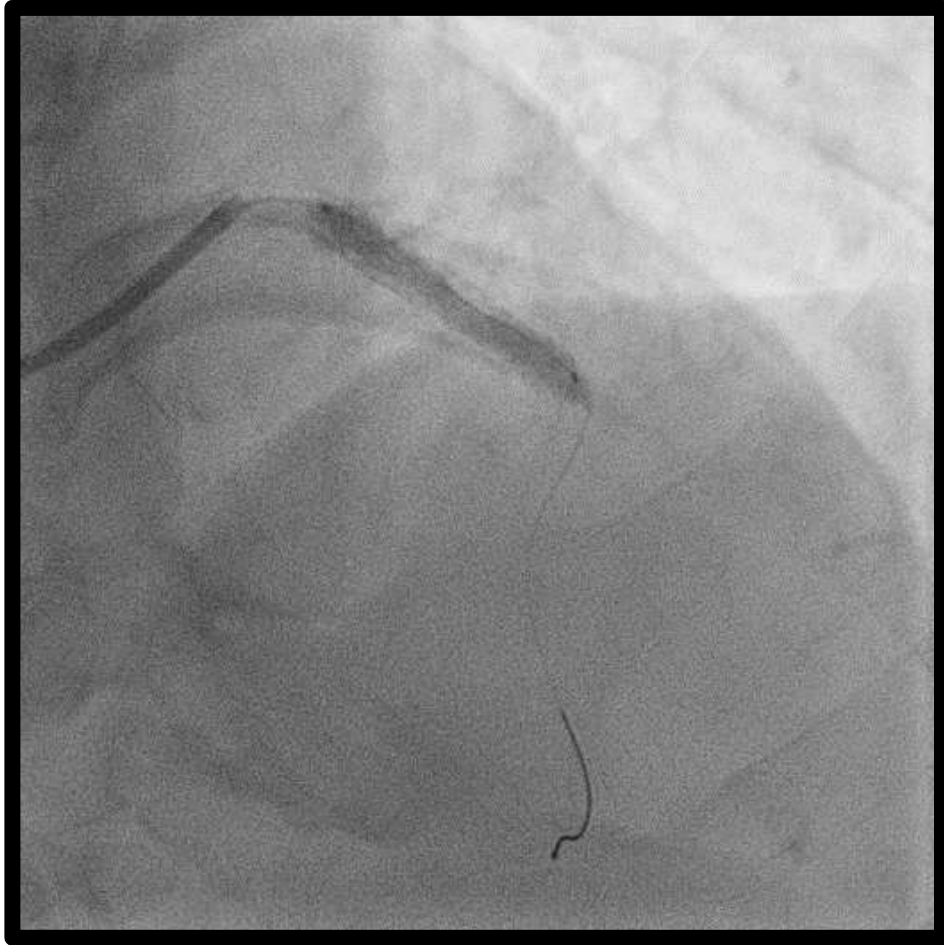


Better luminal gain and multiple cracks seen on IVUS

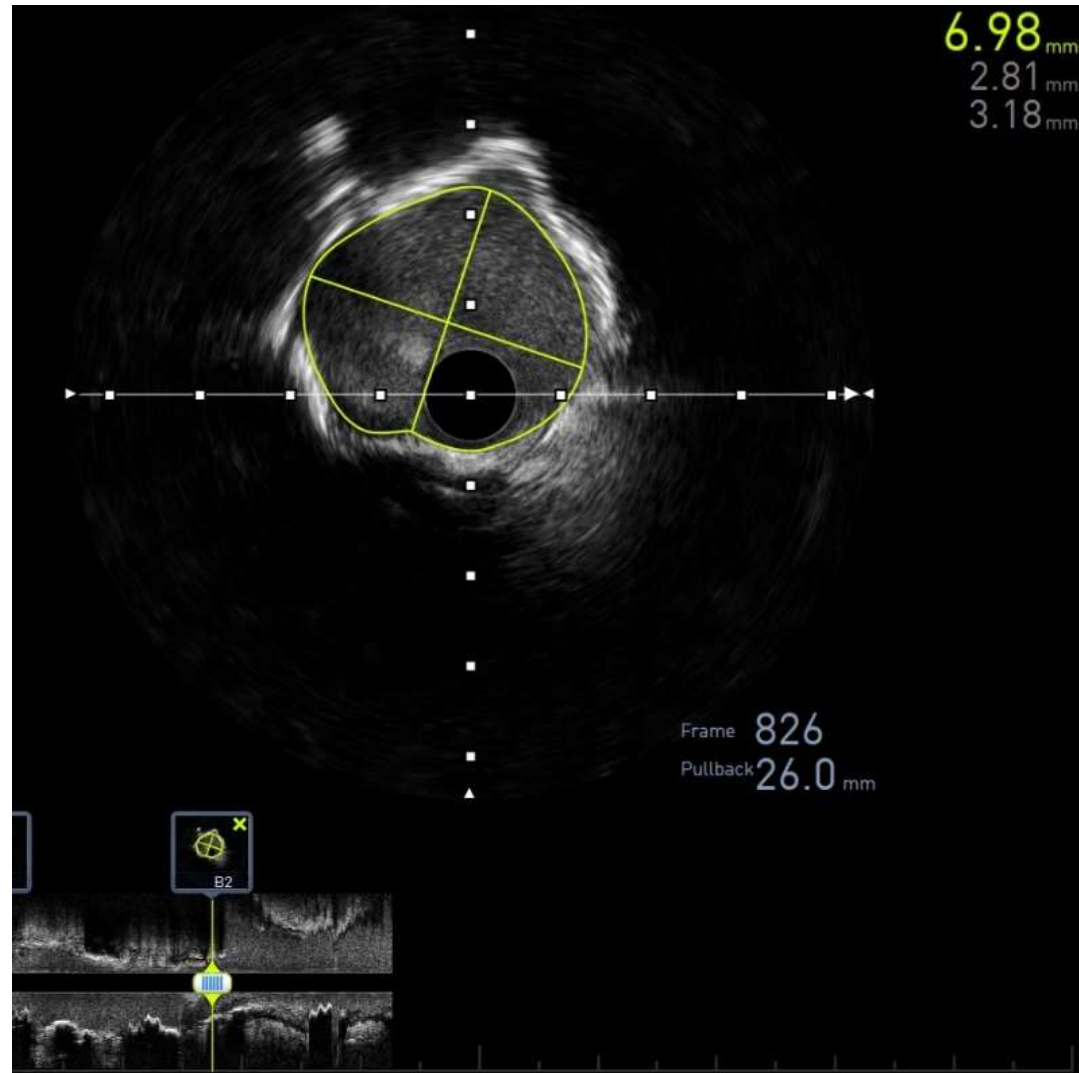
# Sequential predilatation Wolverine 3.0/15, and Scoreflex NC 3.5/15



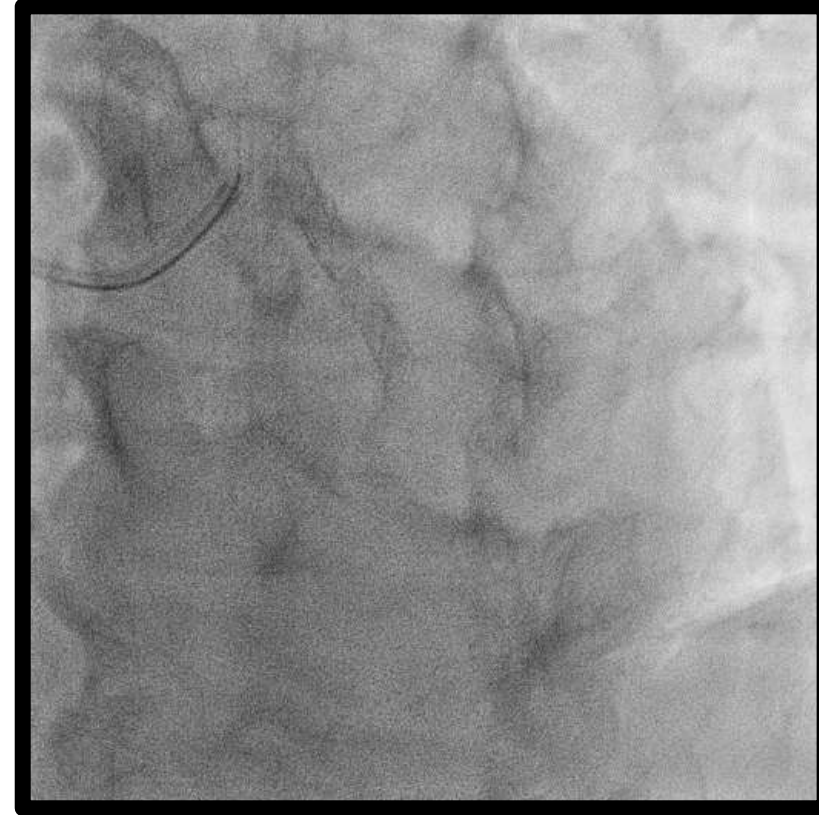
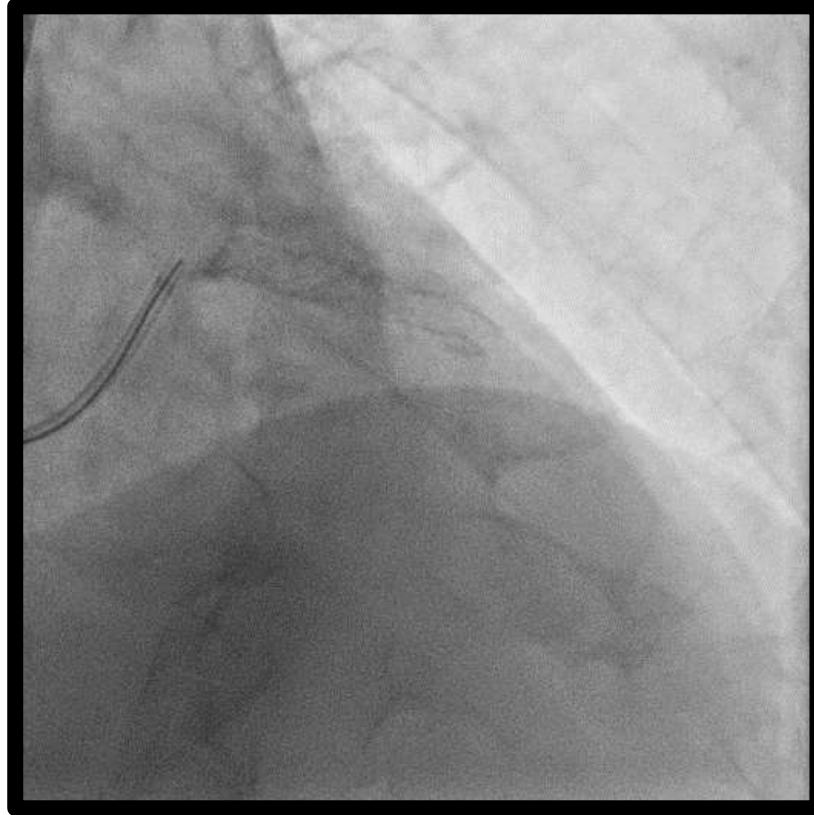
# DCB Sequent please NEO – 3.5/30mm



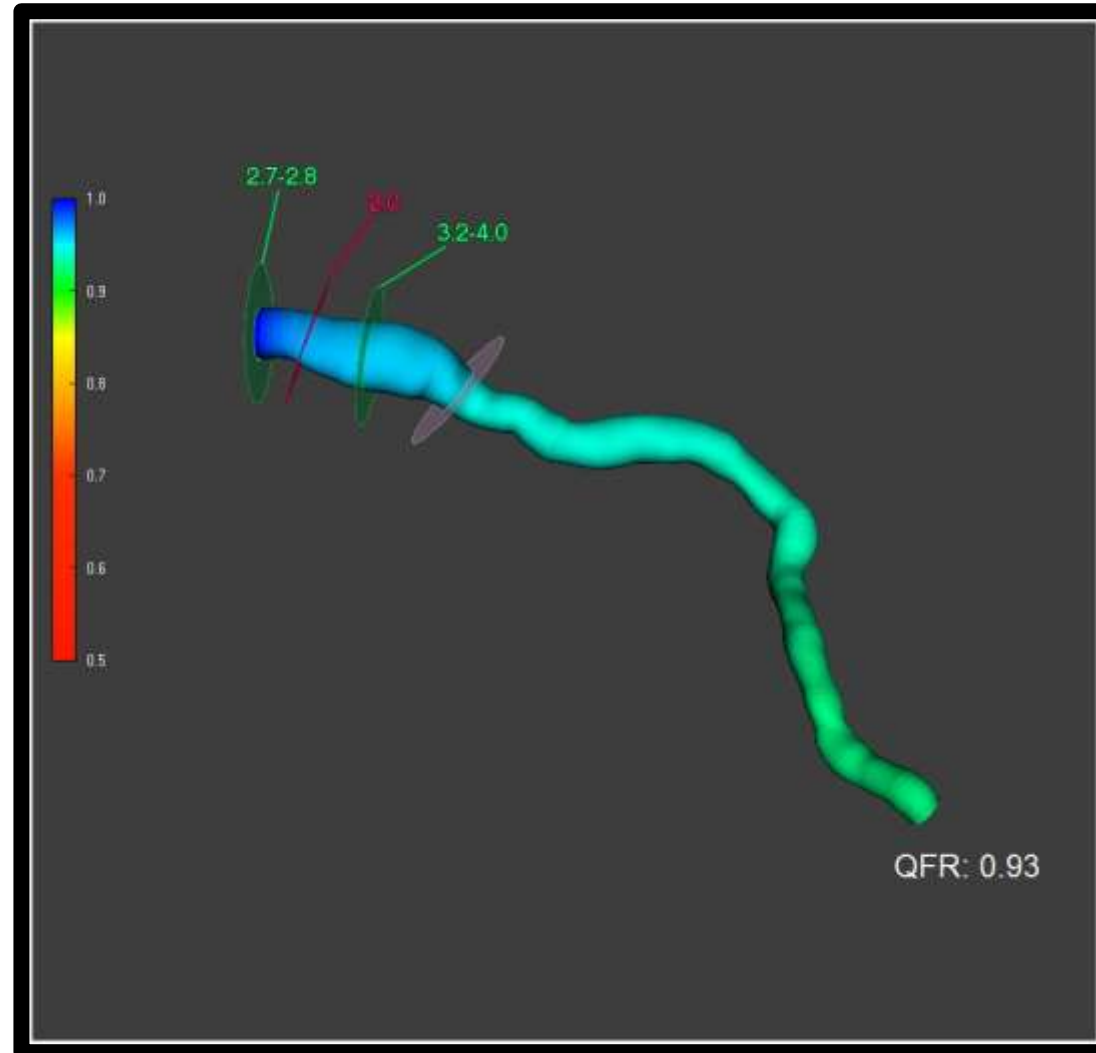
# Final IVUS – CSA improved to 6.98mm<sup>2</sup>



# Final shots



# QFR post PCI – 0.93



# Conclusion / Take-home Messages

- Emerging challenging, calcified ISR lesions with ‘older’ stents
  - ✓ IVUS ISR lesions to **investigate cause of ISR** and to decide on additional adjuncts required (IVL/atherectomy), and optimized angioplasty
  - ✓ Consider **IVL** as a modality to debulk **calcified lesions**, especially if we consider atherectomy is ‘relatively’ contraindicated for ISR cases
- The utility of **Quantitative Flow Reserve (QFR)** to assess **borderline lesions**. This case demonstrated diffuse moderate-severe ISR from ostial to proximal LAD, with the QFR confirming lesion significance