

COMPLEX PCI 2023

Calcium challenges: Where to shock- From left main to bifurcations.

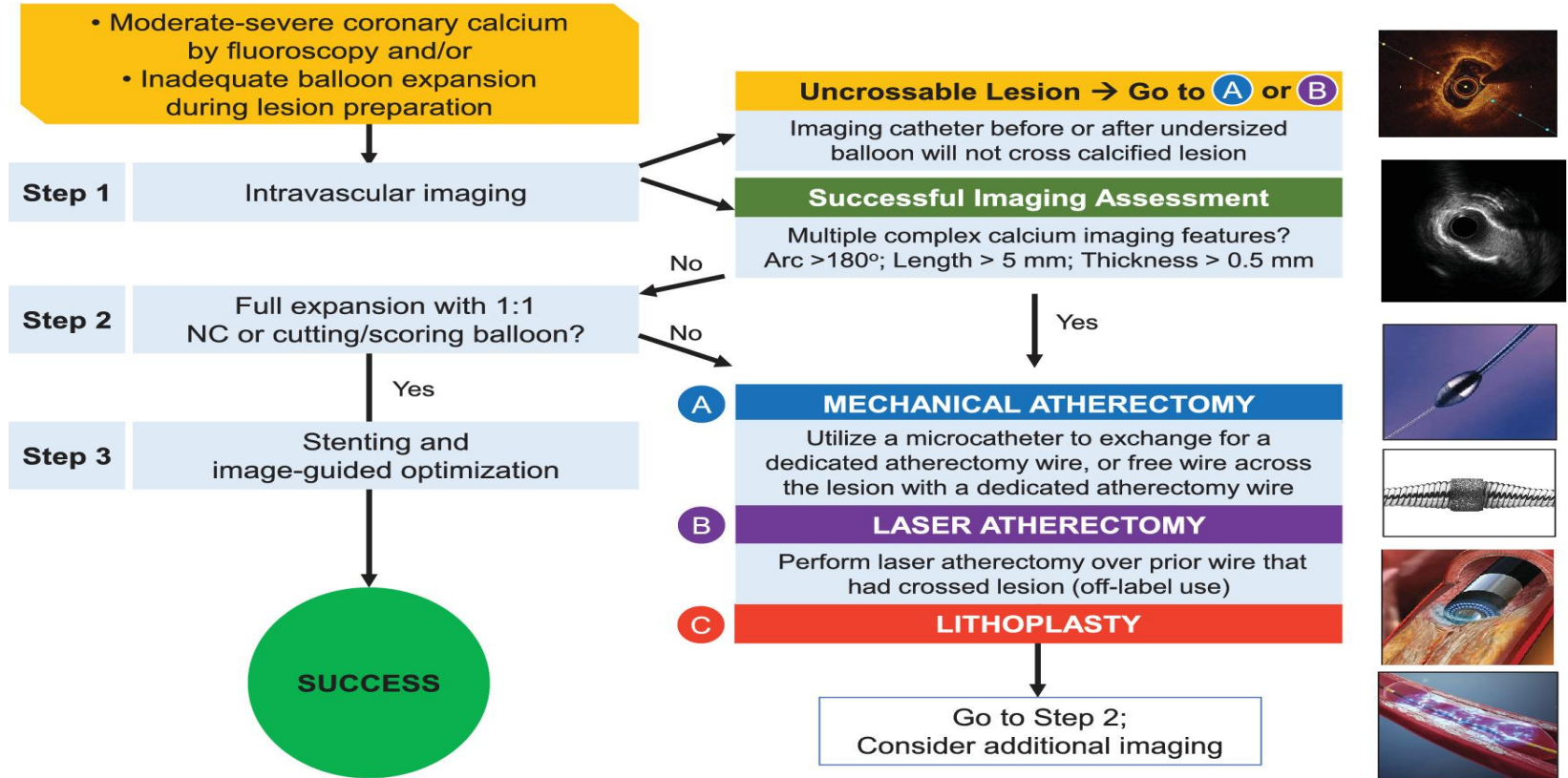
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Disclosure

- Nil of note

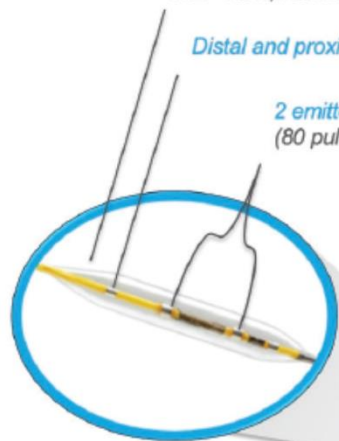
SCAI position statement on optimal percutaneous coronary interventional therapy for complex coronary artery disease



Integrated 12mm SC balloon facilitates energy transfer;
 IVL=4 atm; Nominal=6atm; RBP=10 atm

Distal and proximal marker bands

2 emitters that pulse once per second
 (80 pulses/catheter)



Generator

COMPACT & RECHARGABLE
 Portable, IV-pole Mountable
 Battery-Powered
 No External Connections



Connector

SIMPLE & QUICK
 Smart Magnetic
 Connection
 Push-Button Activated



Catheter

INTUITIVE & SAFE
 RX System
 Any .014" Guidewire
 Standard PCI Technique
 80 Lithotripsy Pulses

Diameter (mm)	Length	Max Pulse Count	Guidewire	Guide	Length	Crossing Profile Range*
2.5 – 3.0 – 3.5 – 4.0	12mm	80	0.014"	6F	138cm	0.044" +/-0.002

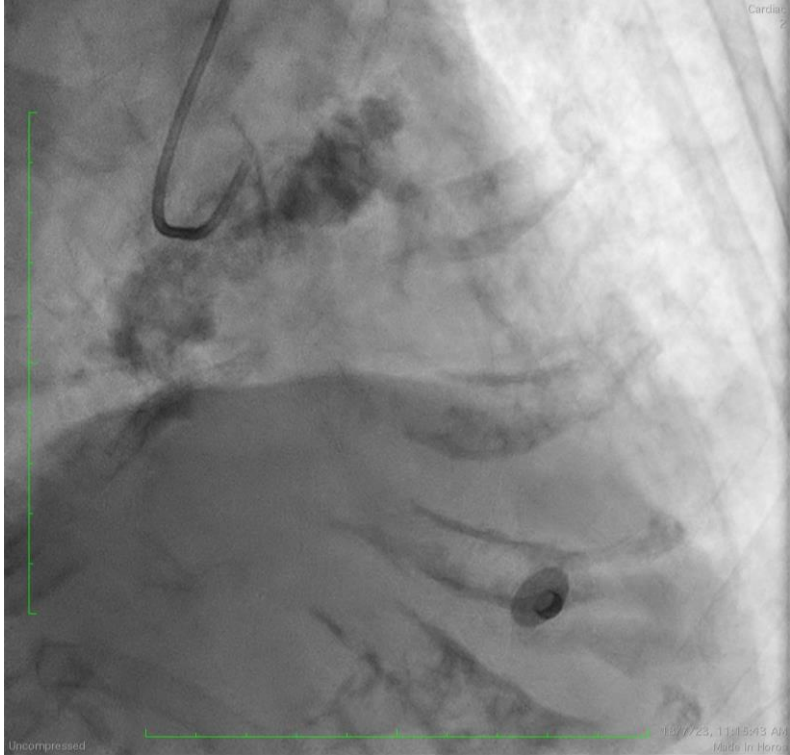
Personal experience

- 60 cases (over 23 months)
- 13 LM, 36 LAD, 10 RCA, 1 Cx
- 14 rotational atherectomy followed by shockwave
- 7 required guide extensions to deliver
- Predominantly 3.5-4mm balloons

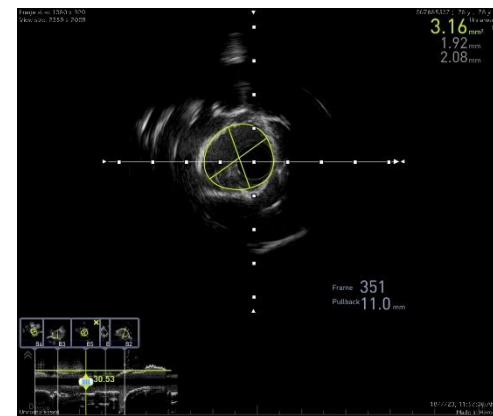
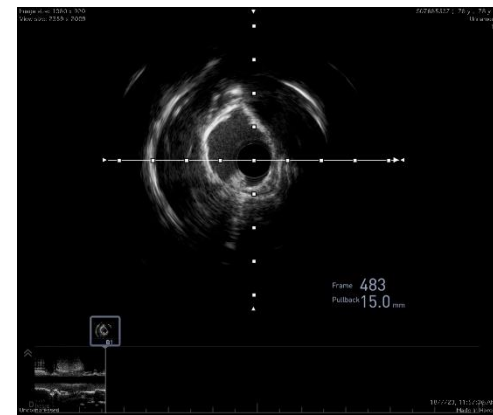
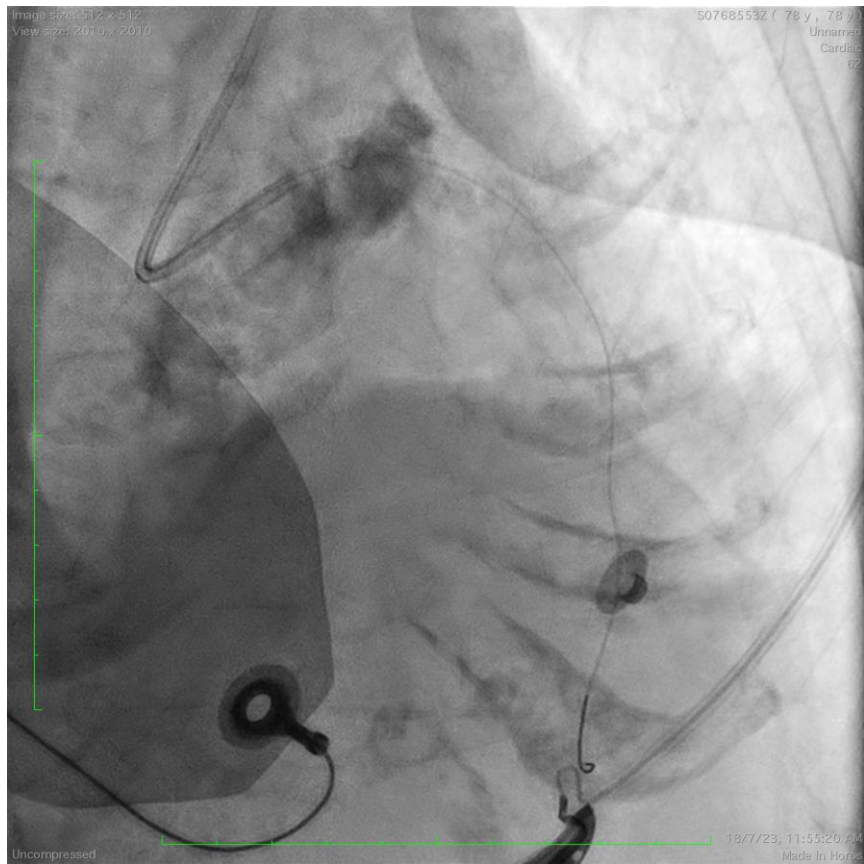
Case 1 (De-novo/ Rota shock)

- 78 female
- Moderate MS. Frail. Porcelain aorta. CKD eGFR 30. BMI 16.
- Known left main disease since 2019.
- NSTEMI 2023, medically managed initially.
- Daily chest pain
- Drop in LVEF 55%→ 35%

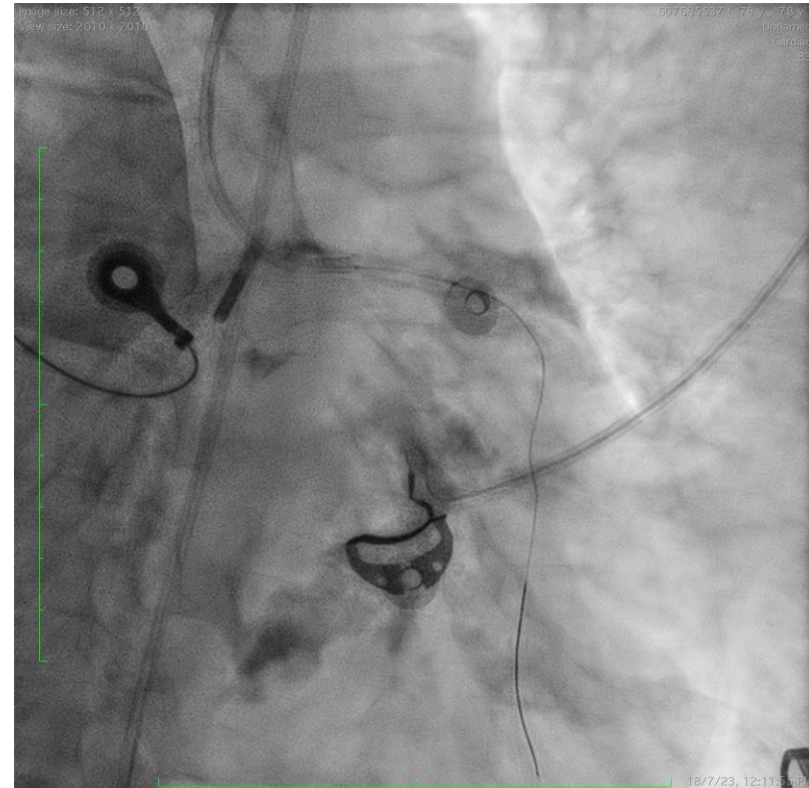
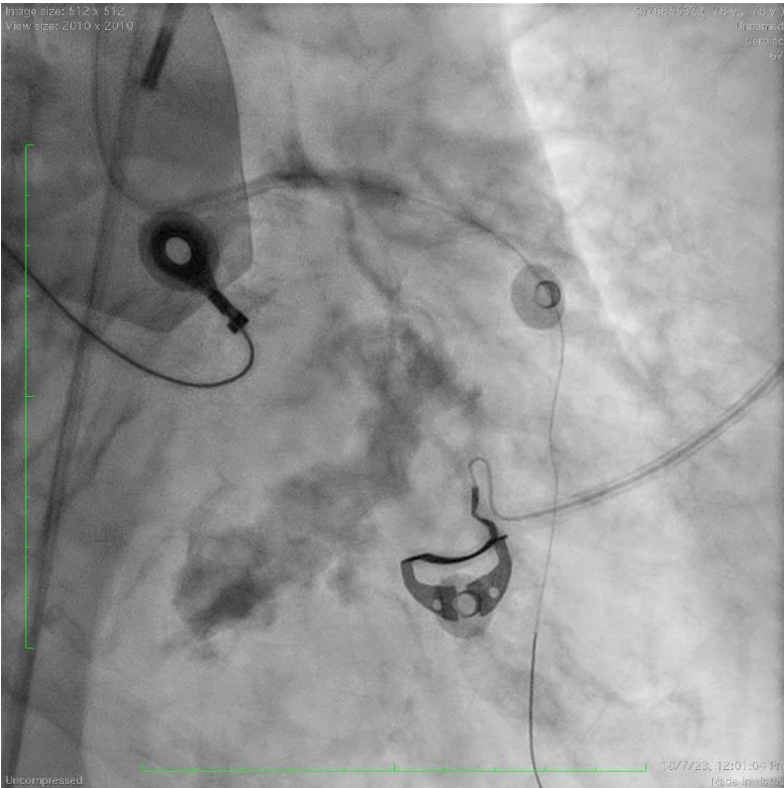
Diagnostic



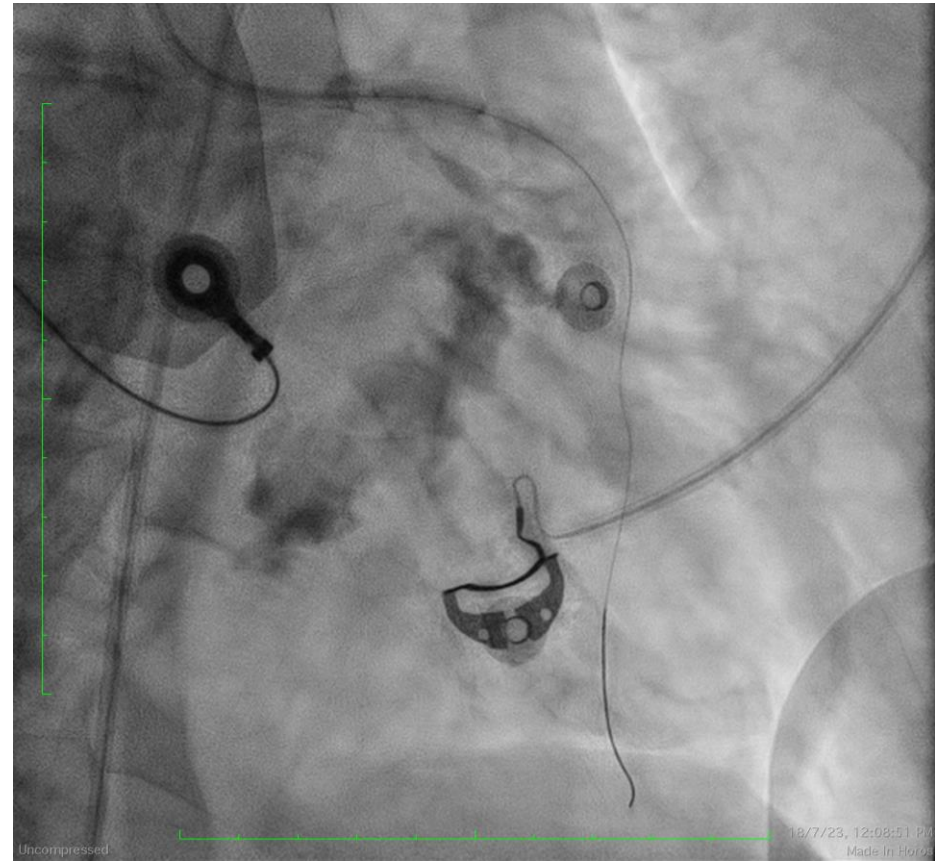
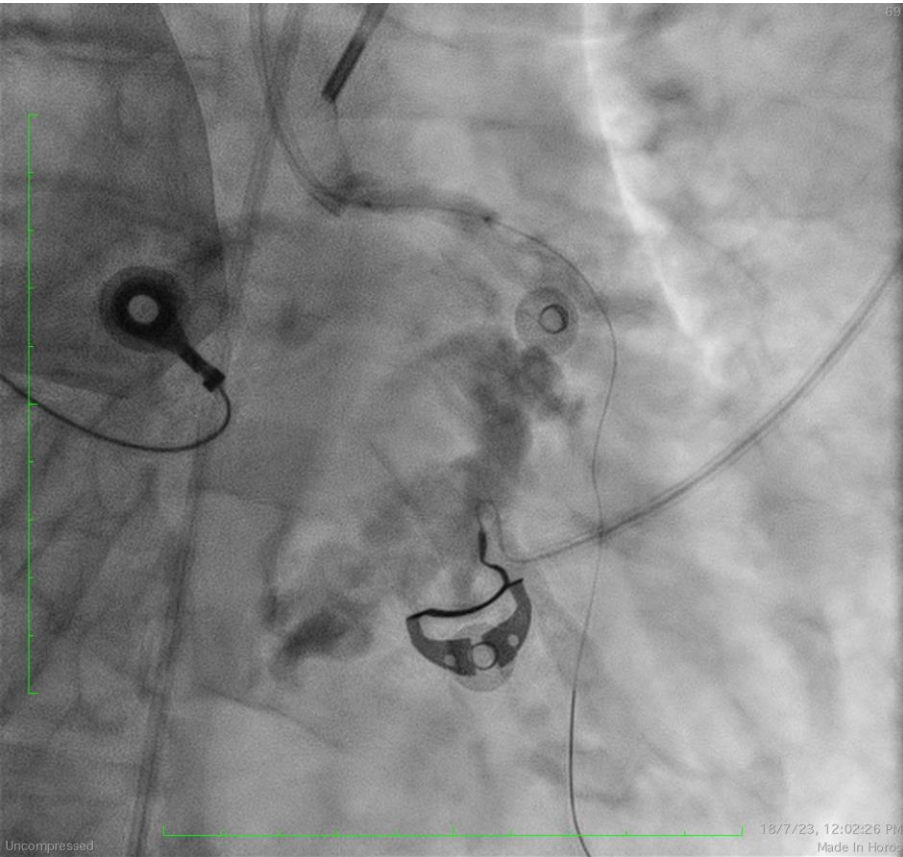
Post rotational atherectomy and NC



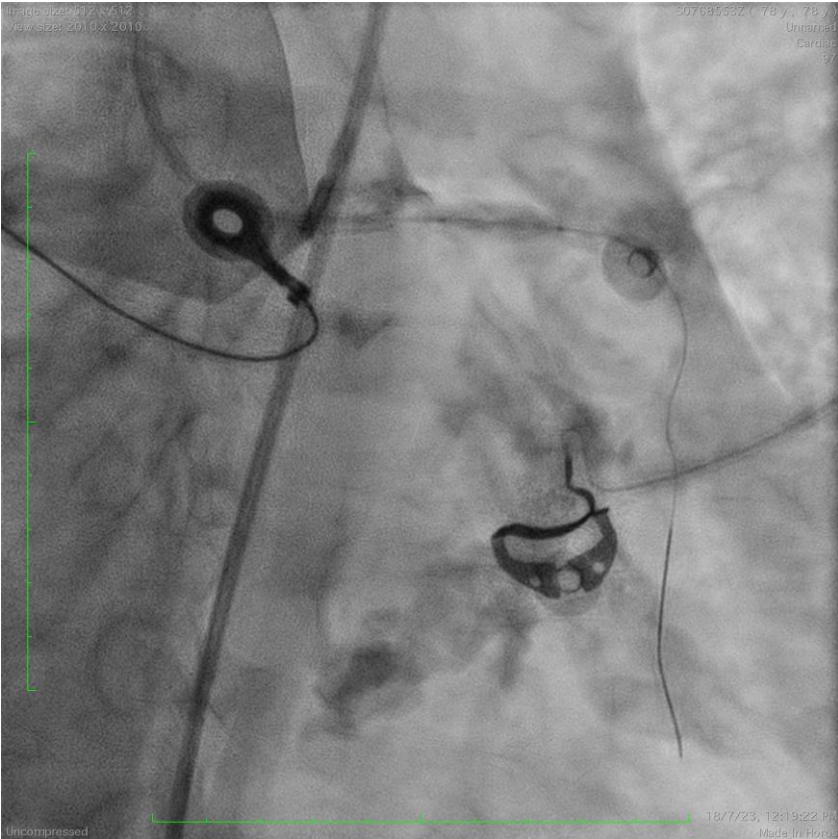
High pressure 3.5mm NC



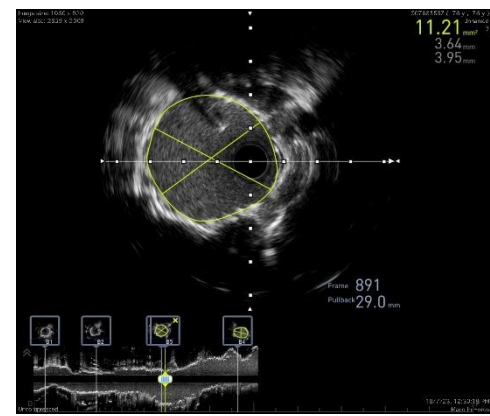
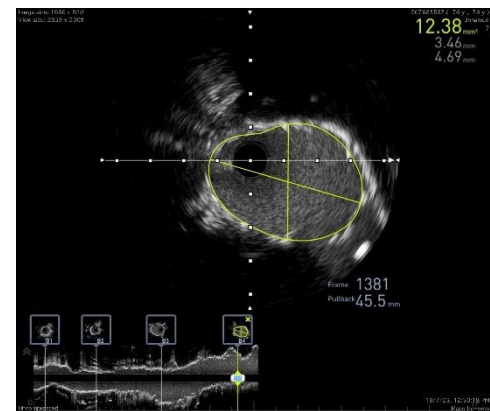
Shockwave 3.5mm



NC after shockwave



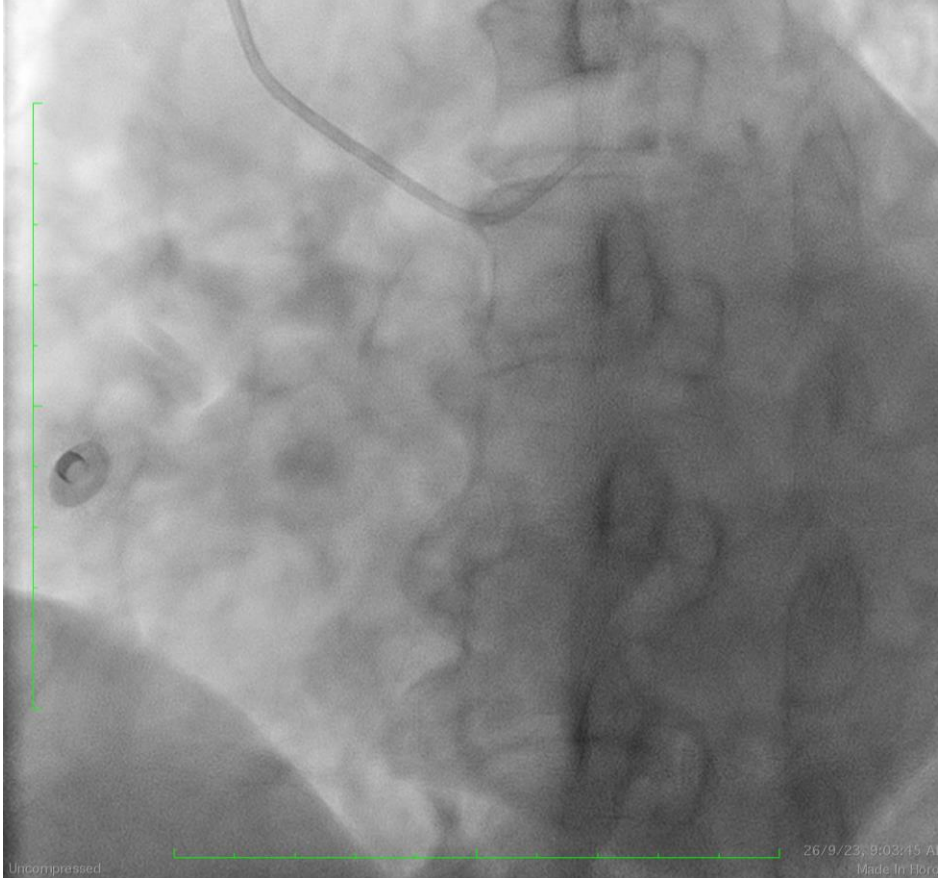
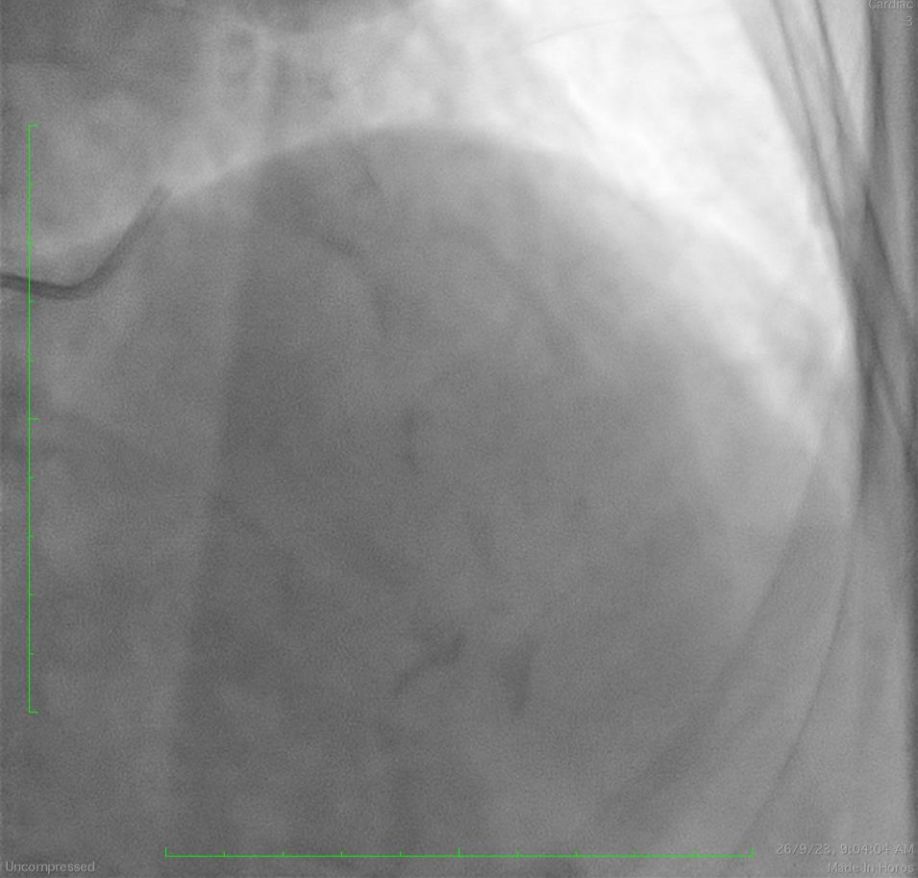
Post PCI



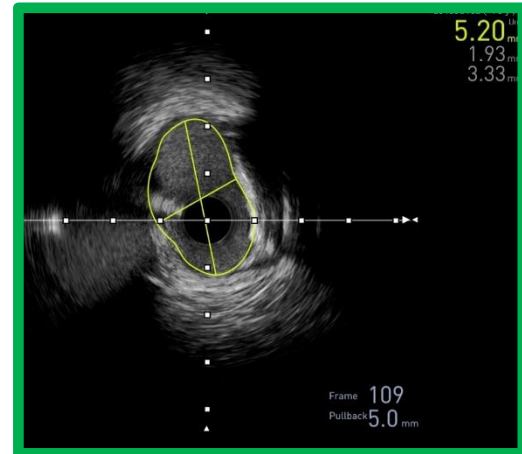
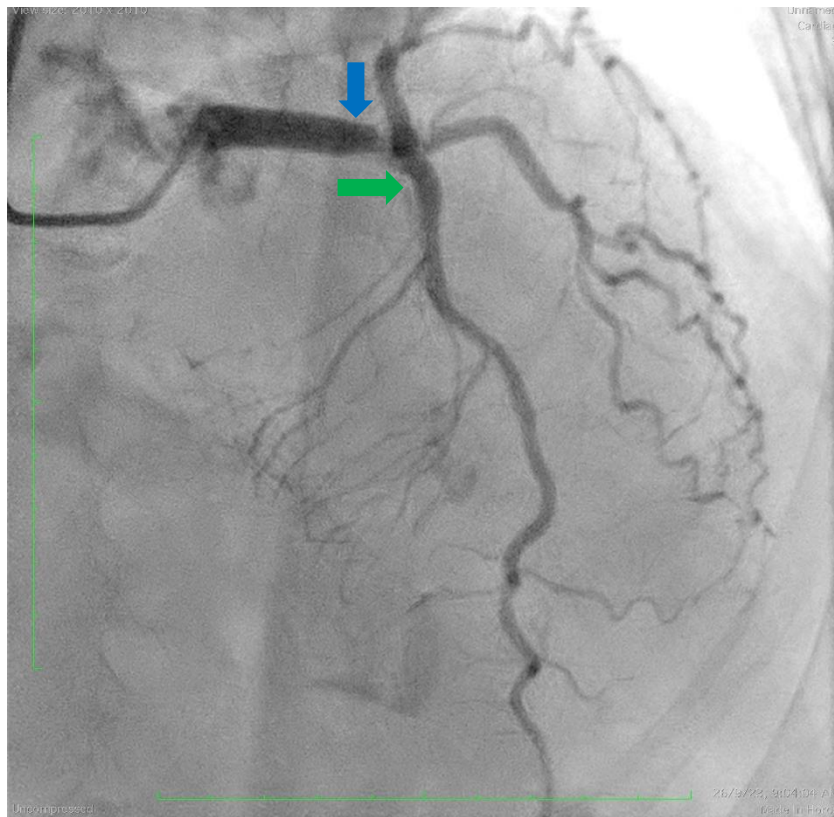
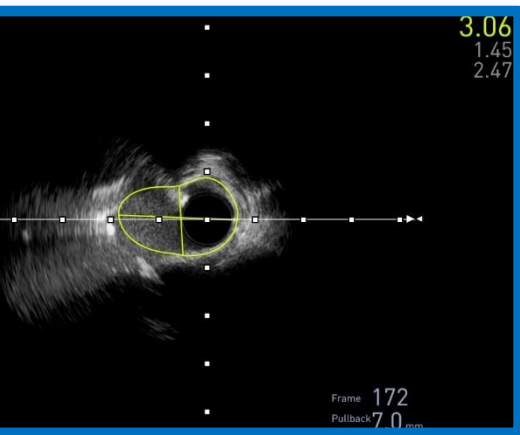
Case 2 (De-novo, shock only)

- 75 female
- Unstable angina
- Good LV function

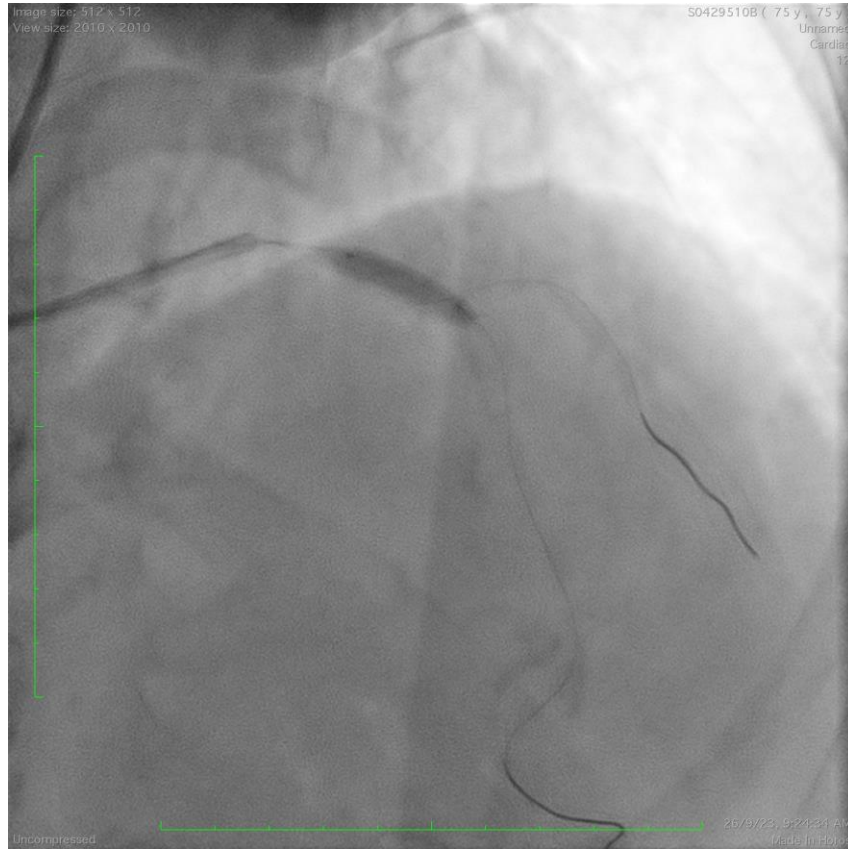
Diagnostic angiogram



IVUS

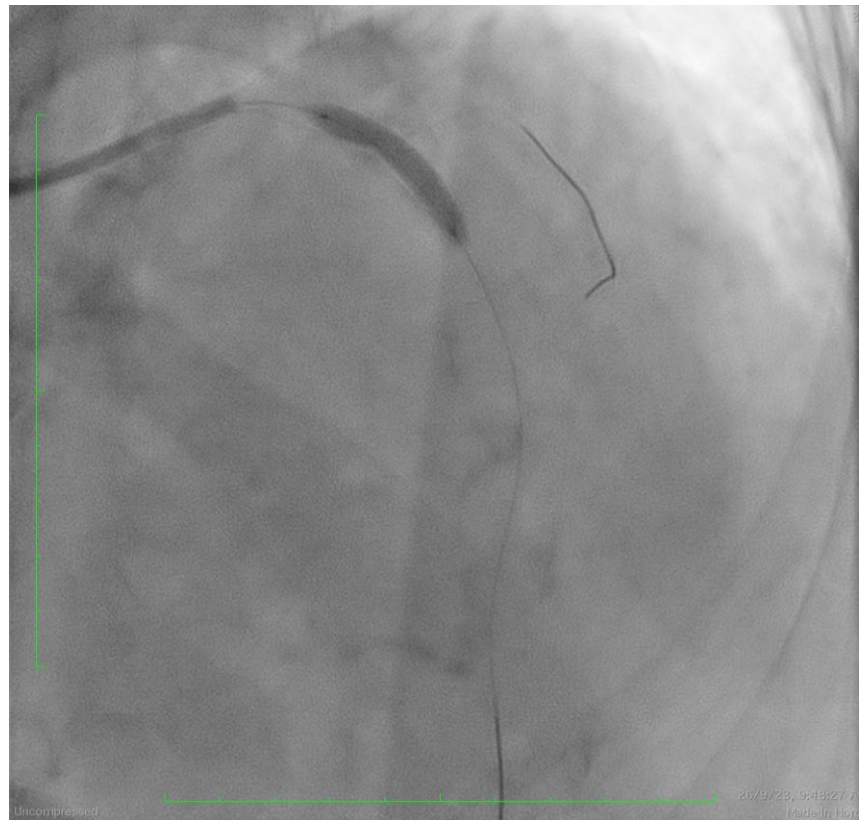
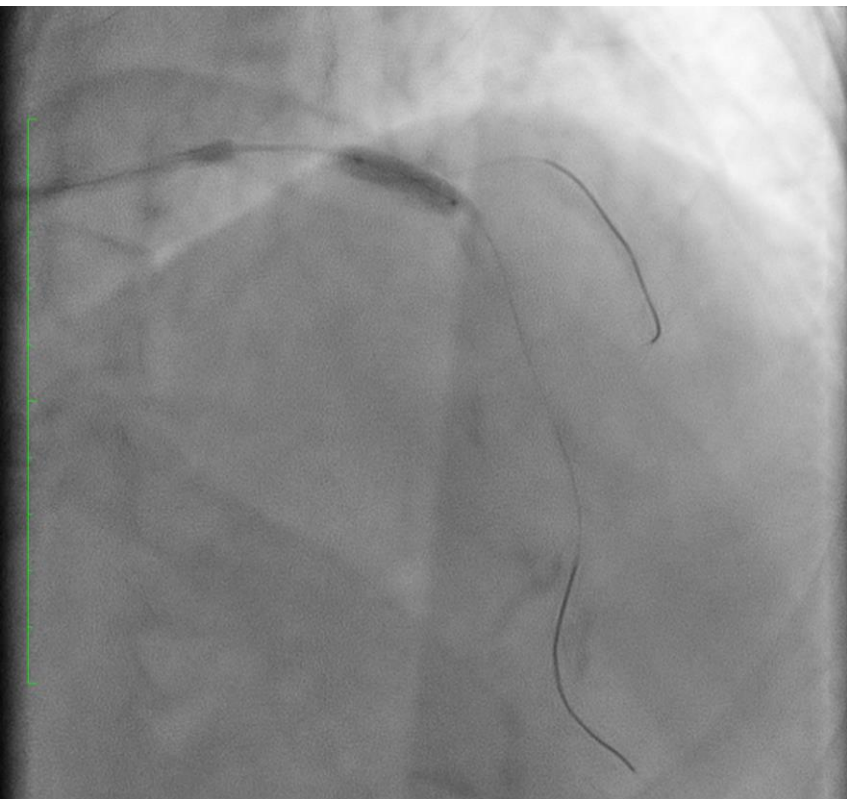


Prep with 4.0mm NC balloon

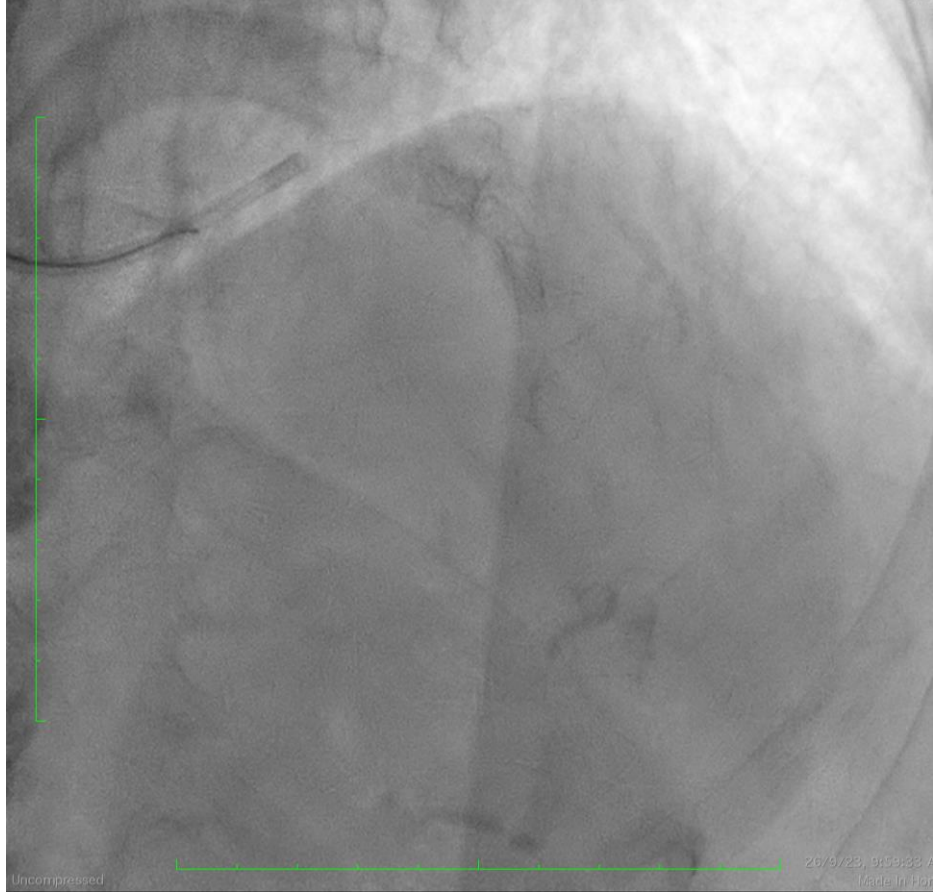


4mm NC, 4mm cutting balloon

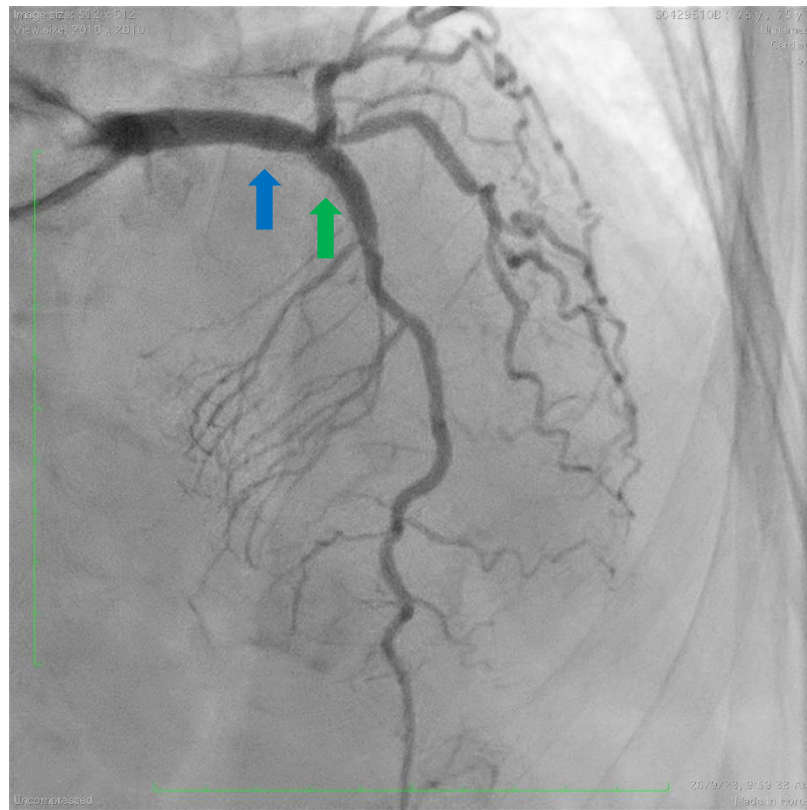
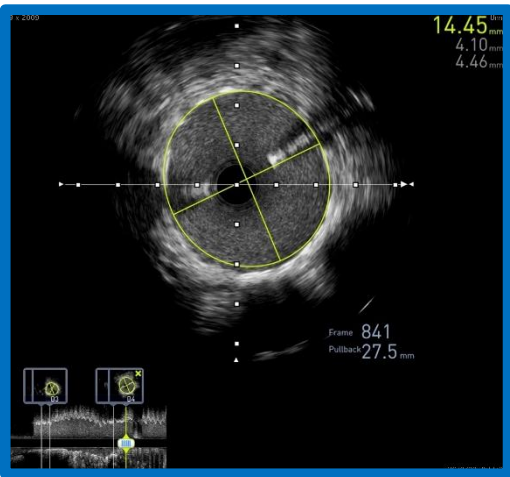
4mm Shockwave and stent



Final results



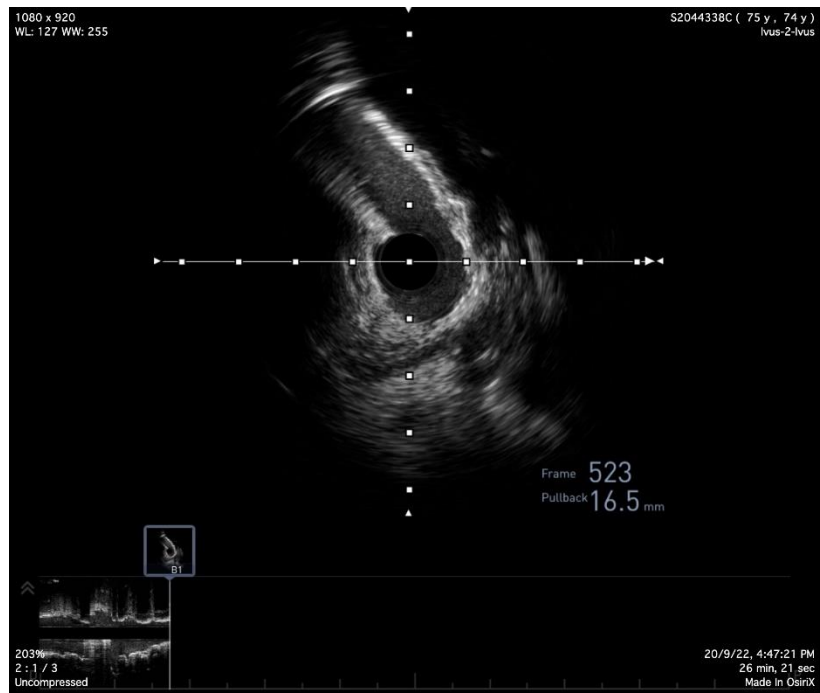
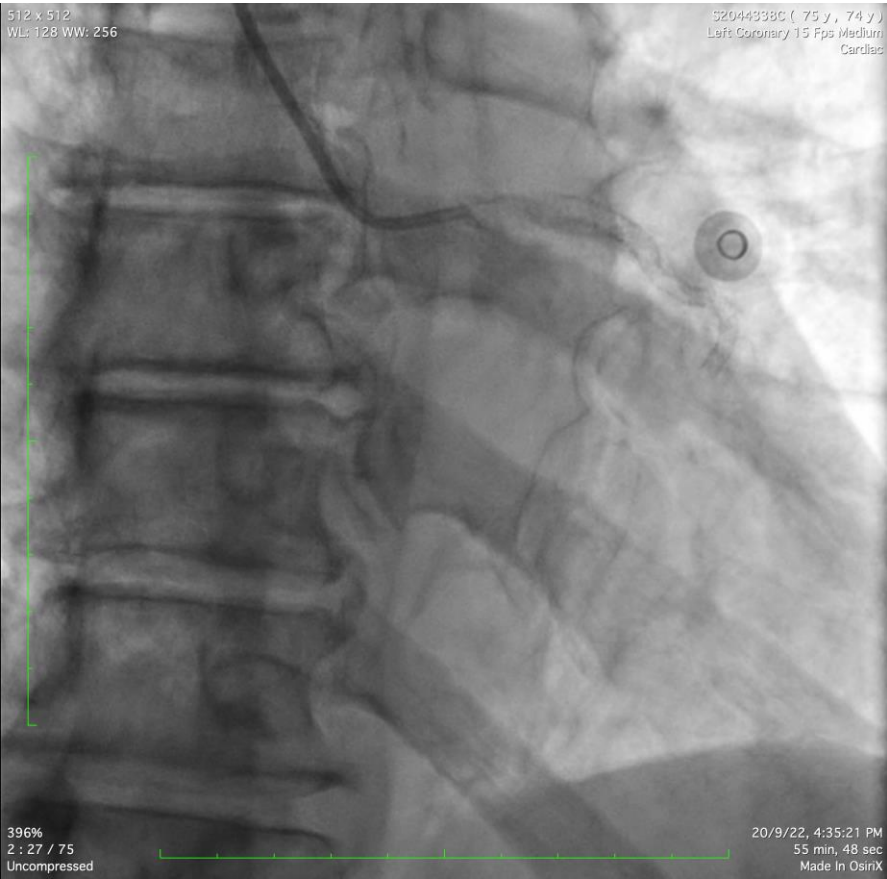
Final IVUS



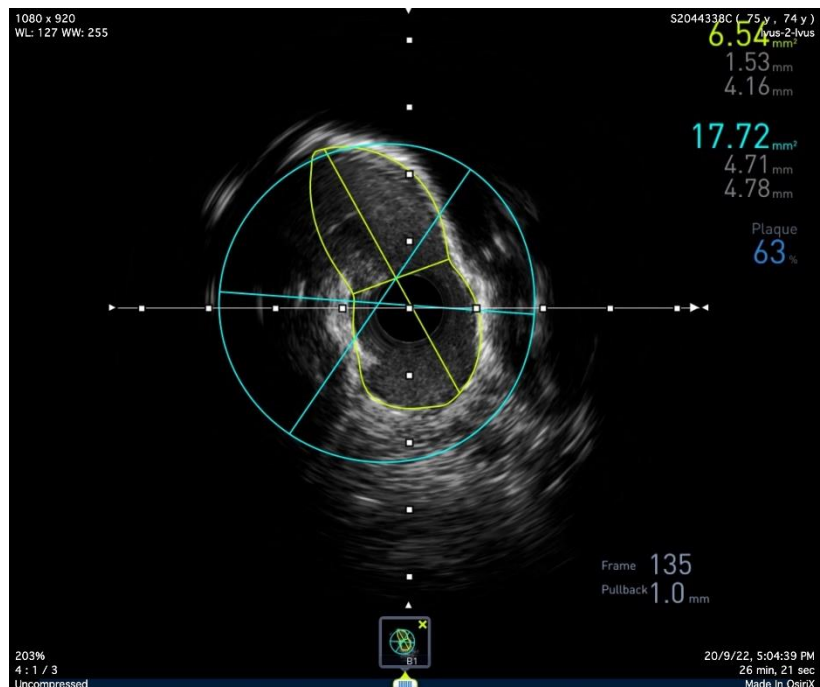
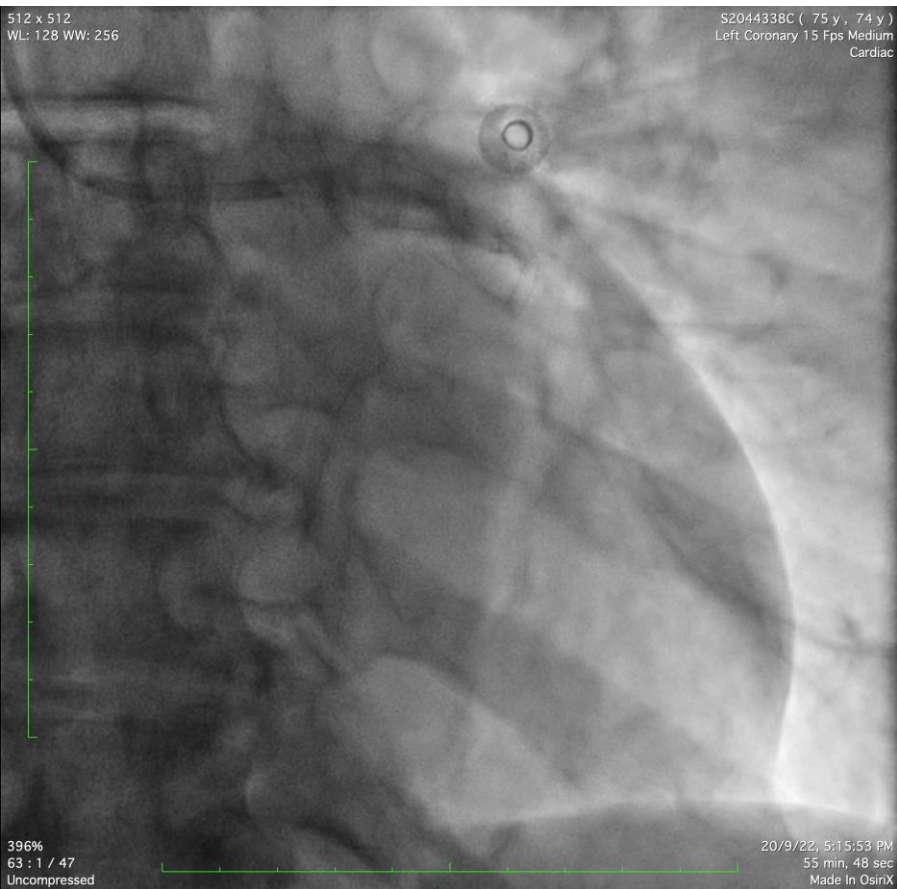
Case 3 (Under expanded stent)

- 74 male
- Right below knee amputation
- Diabetes mellitus
- Prev PCI 2015: “ PCI dLM, prox to mid LAD”

Pre PCI



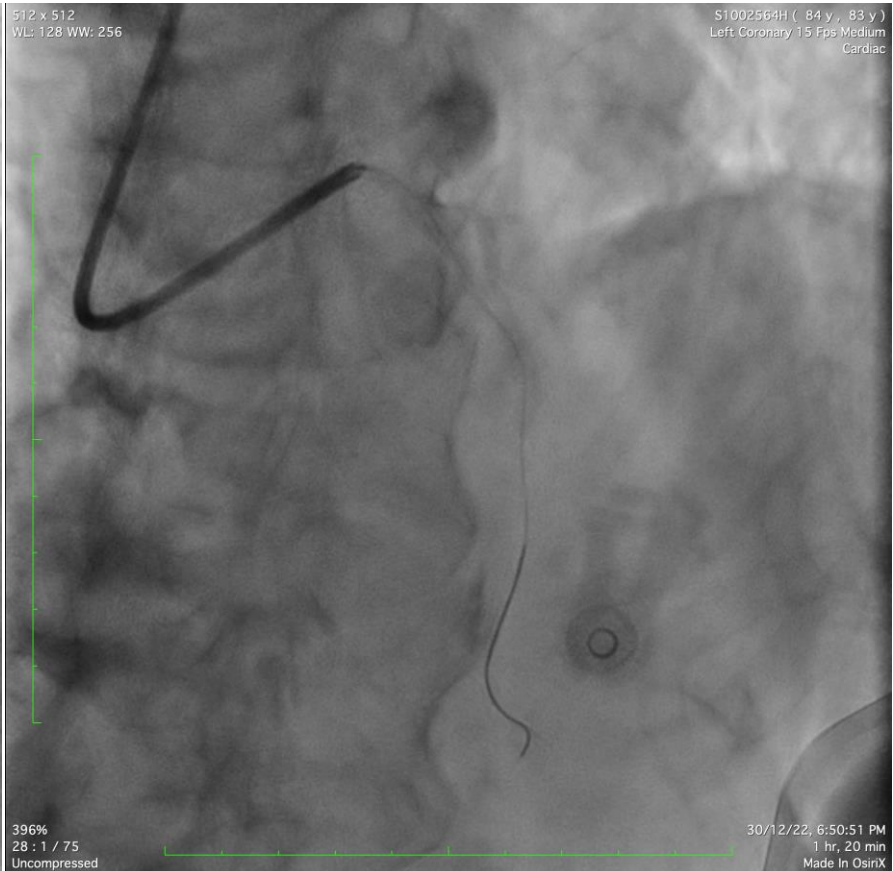
Post Shockwave 3.5mm



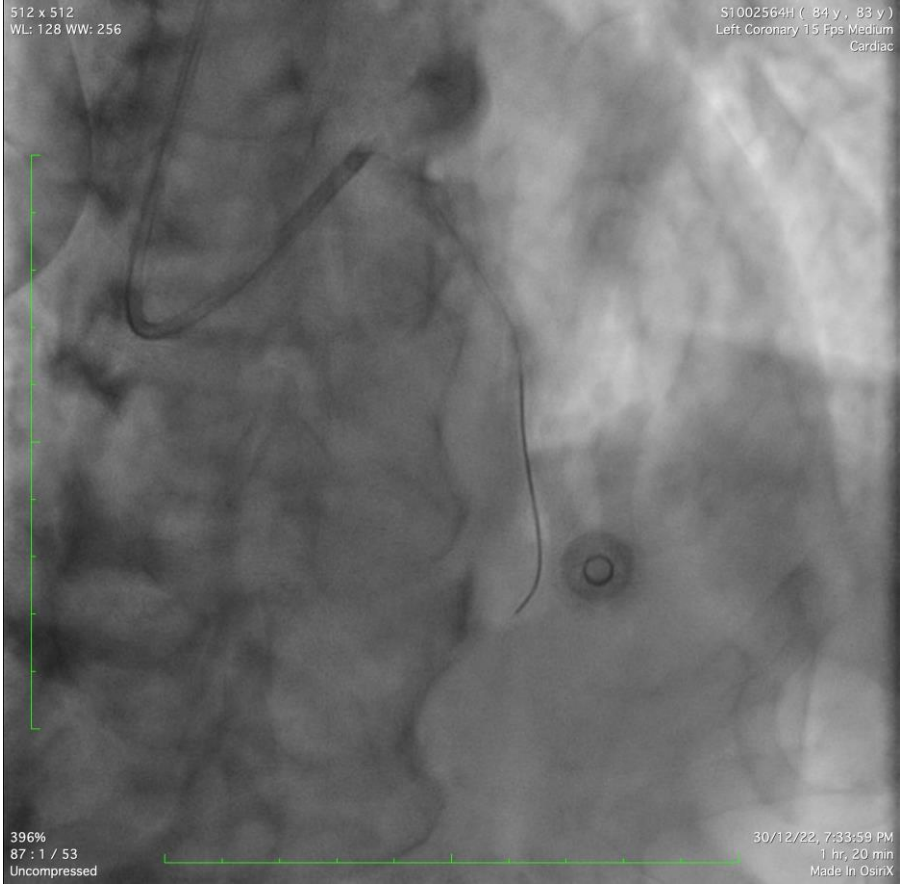
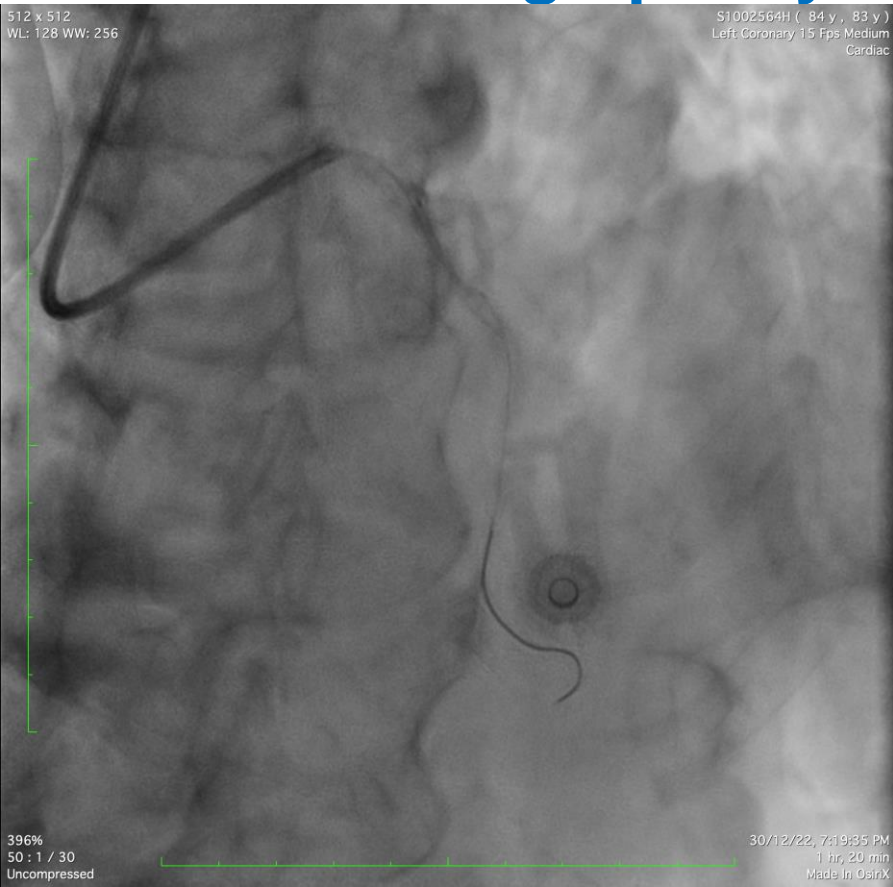
Case 4 (stent regret)

- 84 female
- HTN
- Anterior STEMI presentation

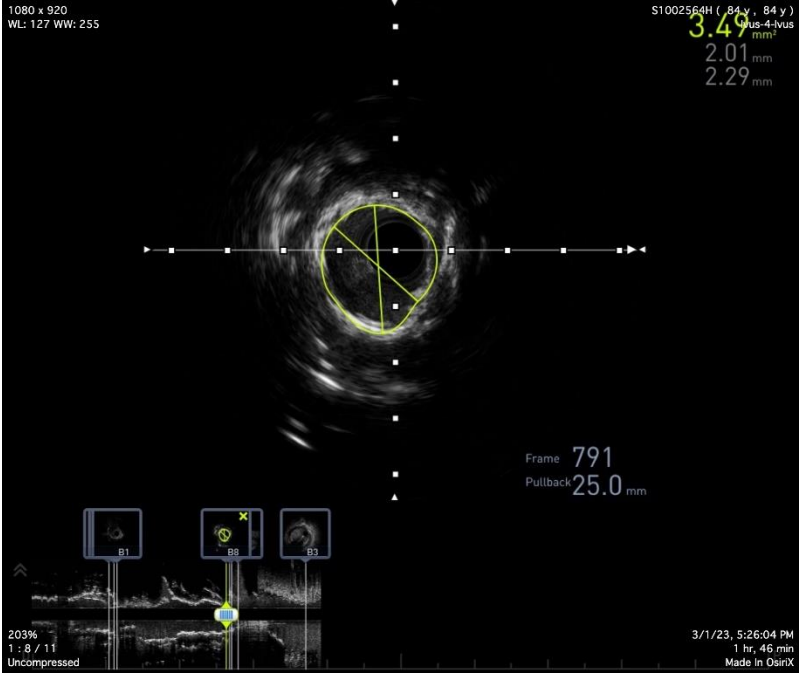
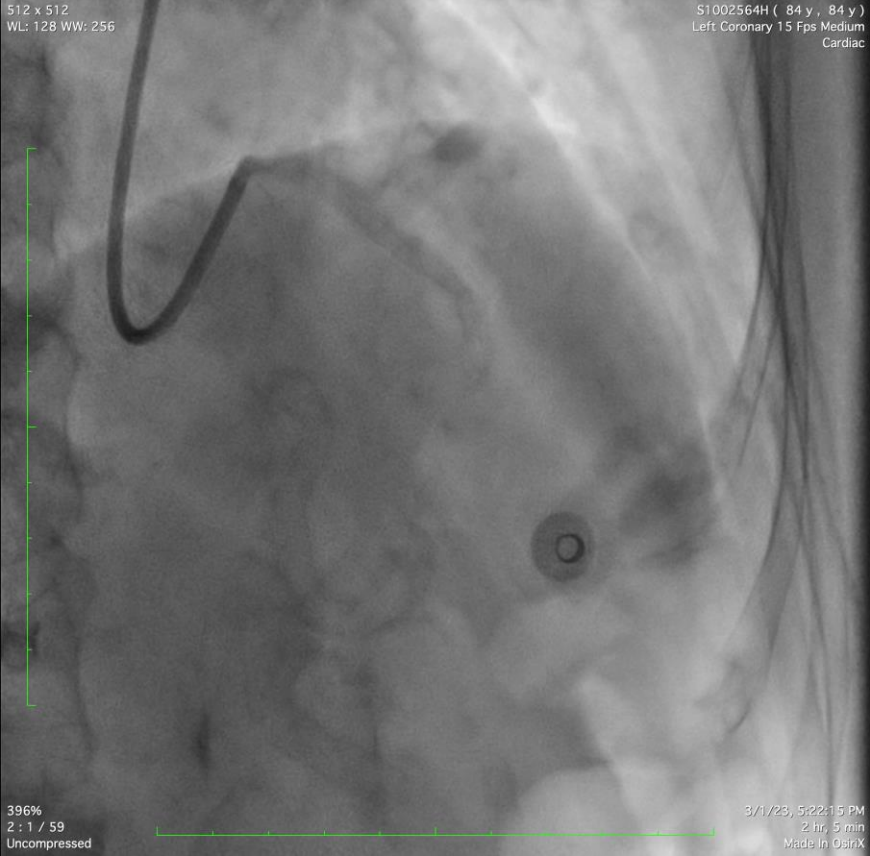
Diagnostic and wire shot



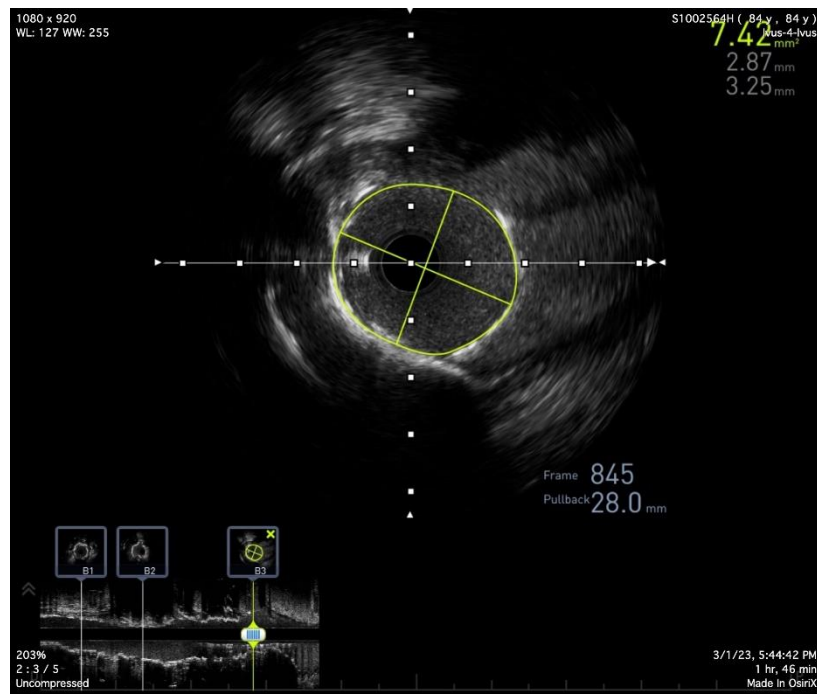
Balloon angioplasty



Optimisation of PCI results



Post Shockwave 3.0mm and NC 3.0mm



The effects of shockwave lithotripsy on drug eluting stents

Pulses	Synergy	Resolute Integrity	Xience Alpine	Cre8
20	0	0	0	0
50	II	I	0	0
80	III	II	II	0

Stent architectural deformation assessment (ADA) grade

Grade 0 - no damage

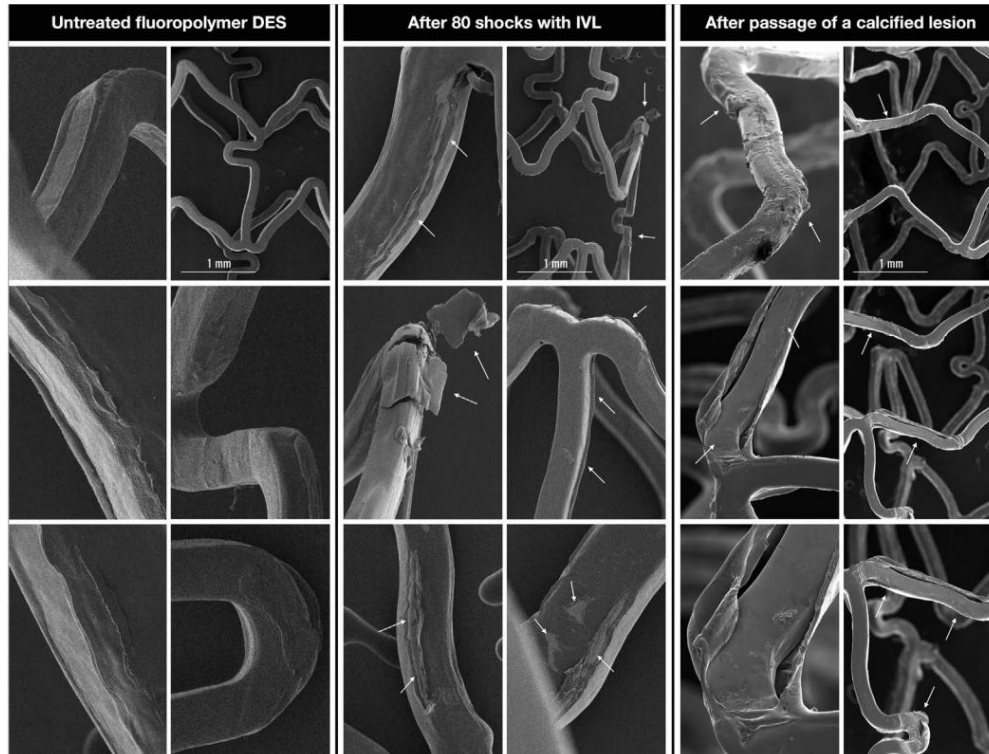
Grade I – presence of cracking, pitting or blister formation with no peeling of polymer or drug

Grade II – presence of partial thickness peeling of polymer or drug

Grade III – presence of full-thickness peeling of polymer with visible underlying metal surface

Grade IV – visible disruption to the metal architecture of the stent.

In vitro effect of IVL on the polymer of a drug eluting stent passage



Tips

- Dilution is 50% normal saline and 50% contrast.
- Don't inflate until you have fully crossed the lesion.
- Works better on denovo disease rather than bail out.
- Can be delivered in split pulses to reduce ischaemic time.
- Able to maintain 2 wires (Bifurcation)

Conclusion

- Offers a unique treatment option which is potentially lower risk than other calcium modifying treatment available today.
- It does not replace debulking.
- Imaging is crucial to evaluate results (pre prep, post prep, post stent)
- Cost effectiveness and therefore case selection.
- Well tolerated even if utilized within high risk subgroups.
- Off- label usage in stent under-expansion in calcified lesion.

