Challenges in severely eccentric calcified lesion

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Conflicts of Interest

- I have NOTHING to disclose concerning this presentation

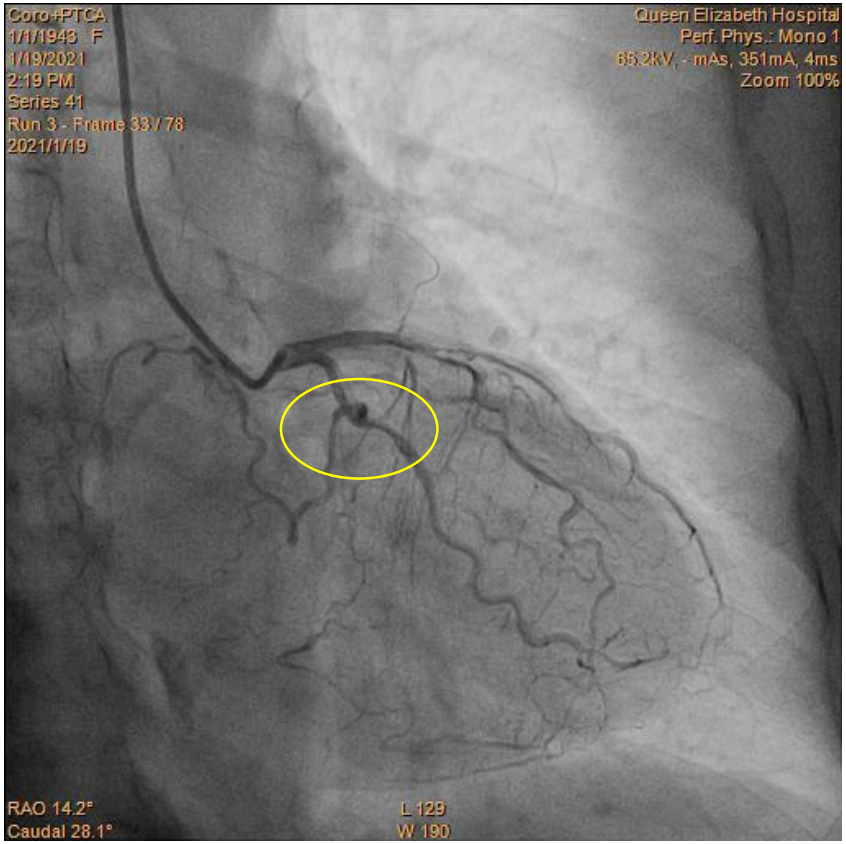
Case History

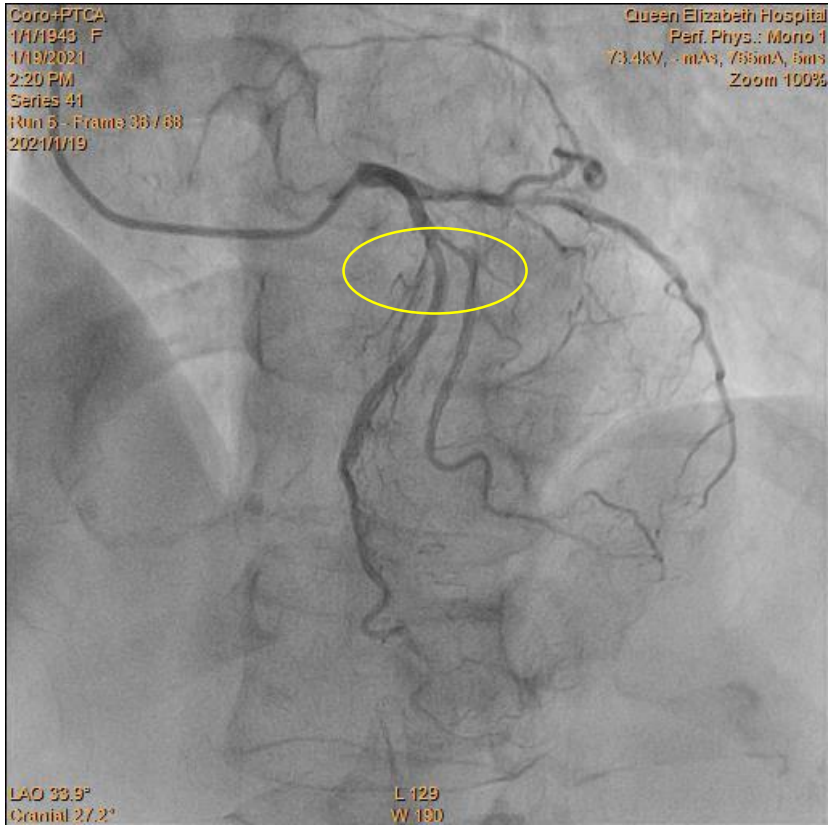
- F/78
- HT DM Hyperlipid IHD on maximal medical therapy
- Increasing angina on exertion
- Echo : EF good , mild inferior wall hypokinesia , mild MR
- CT Coronary ： Moderate LAD/ LCX lesion
  Severe calcified m-RCA eccentric lesion

  RFT： eGFR = 45 ml/ min
- For coronary angiogram and PCI
- DAPT (Aspirin and Ticagrelor)
- RRA – Default mode

Coronary Angiogram (Left)

- LAD/ LCx – Moderate lesion

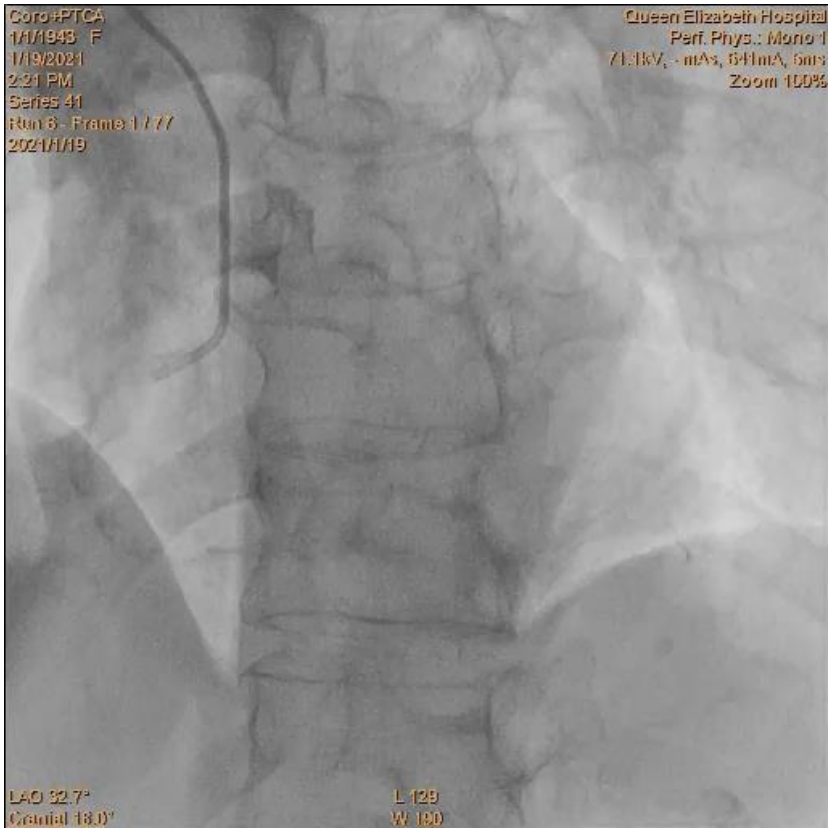


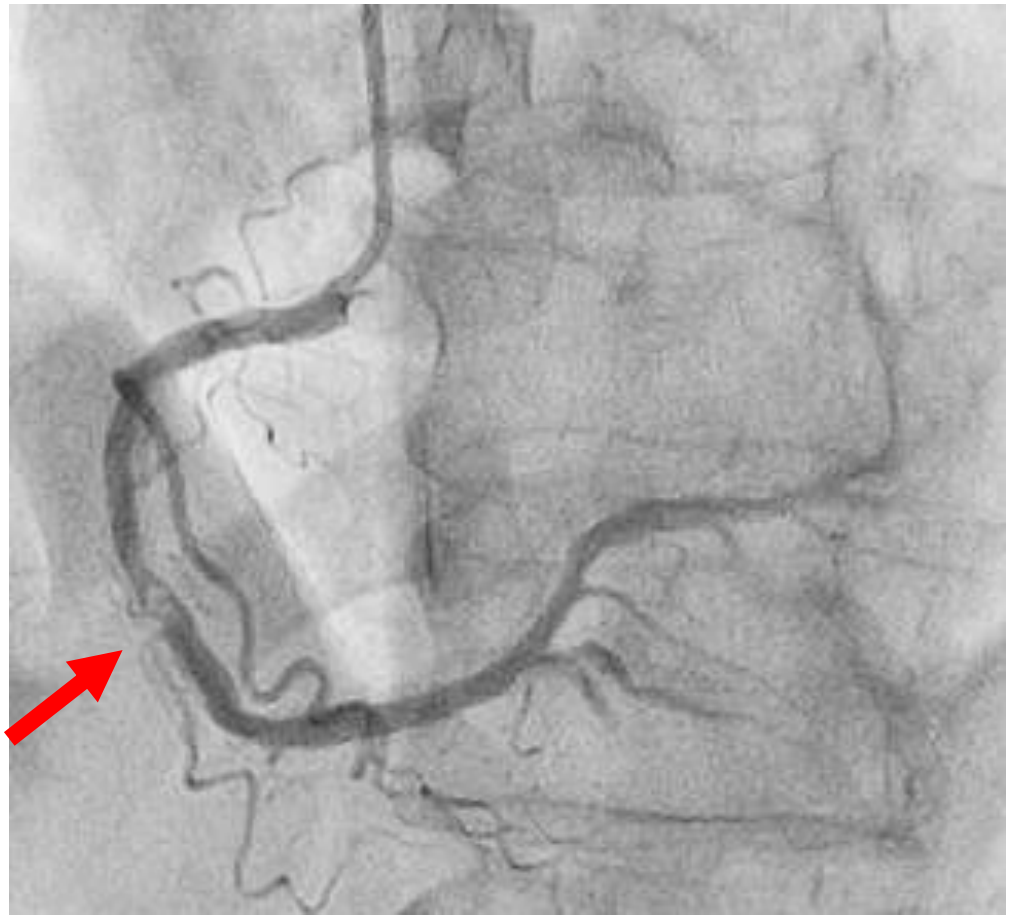


Functional Test : iFR of LAD = 0.93, iFR of LCX = 0.94

Functionally NOT significant

Coronary Angiogram (Right)





FOCAL Eccentric Calcified very tight RCA Lesion 99% (subtotal)

Competitive flow to PDA

PCI Strategies

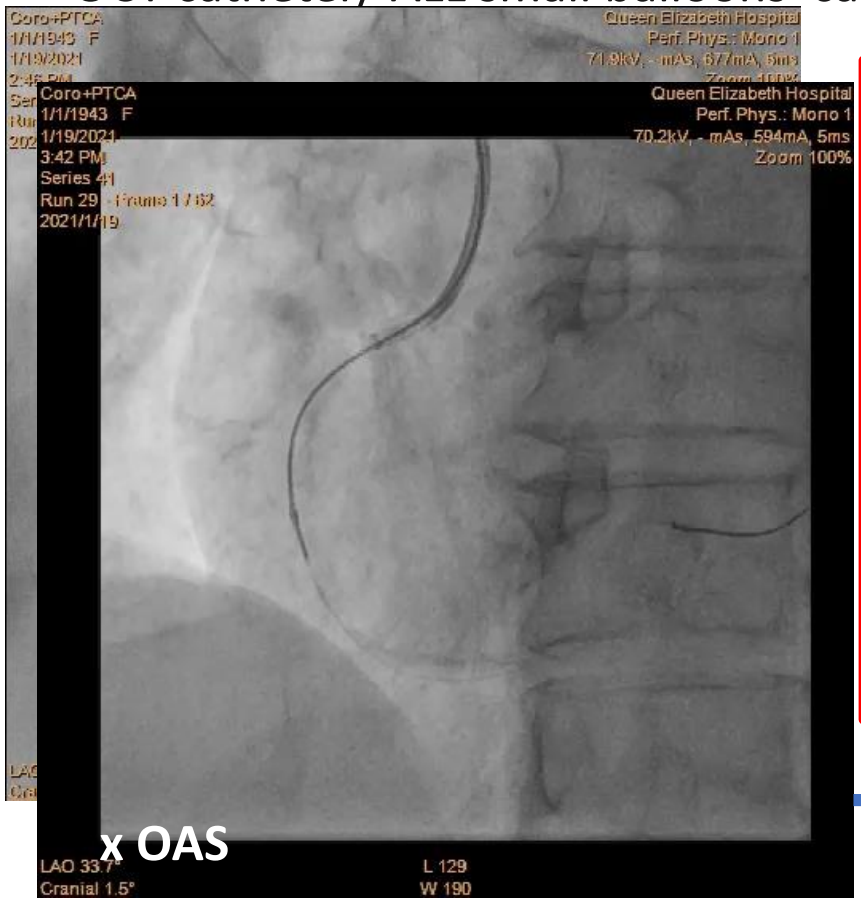
- Functional Assessment of Moderate Lesions of LAD (iFR- 0.93)
  LCX (iFR -0.94)
- then PCI to Culprit RCA Lesion :
  (Very Severe, Heavily Calcified Eccentric plaque)

"IMPORTANT" FACTORS TO CONSIDER :

- Small balloon → then High pressure NC balloon ?
- Scoring Balloon ?
- Very high pressure OPN balloon ?
- Role of Atherectomy devices – Rotablator or Orbital Atherectomy ?
- Intravascular Lithotrypsy with Shockwave balloon ?
- Role of Intravascular Imaging (OCT or IVUS) ?

PCI to RCA

- OCT First to accurately assess calcified lesion before decide final strategy
- 7F Slender IL 3.5 Guide, Runthru GW fail to cross after repeated attempts
- Microcatheter with tapered GW – Fielder XTR – Cross tight lesion
- OCT catheter/ ALL small balloons cannot cross lesion

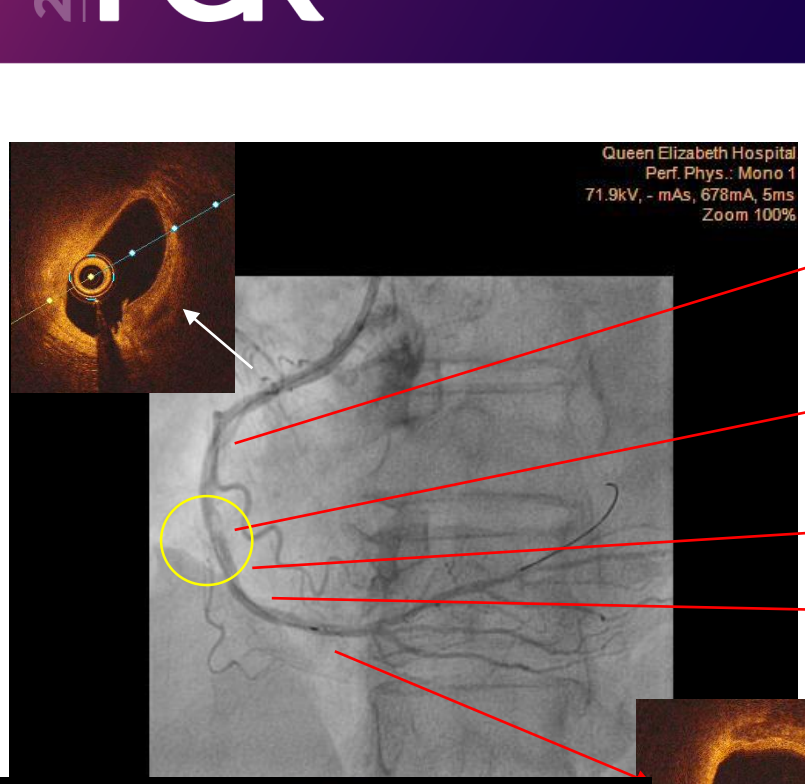


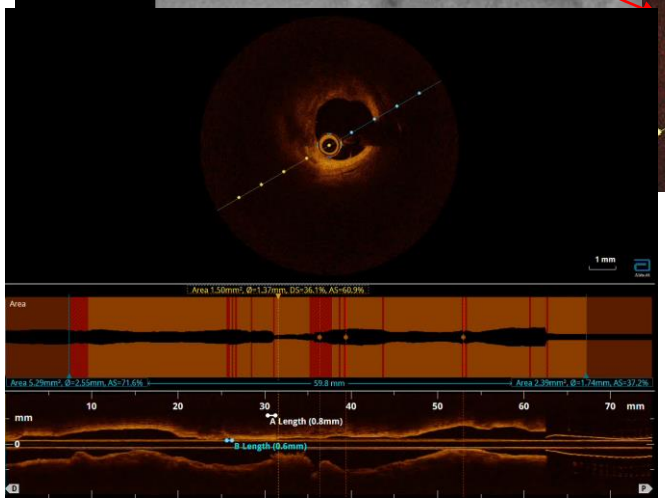
Decided for Diamondback 360 – Orbital Atherectomy
(Differential Sanding for lesion preparation) :

Marked eccentricity
Tight heavily calcified lesion
Sizable RCA diameter
OAS – bidirectional sanding – less chance of complication of trapped burr
Smaller microparticles – 2um; less chance of distal embolization causing slow flow

Exchange to Viper GW
1.25 mm crown ; Slow speed 80000/min
Several Runs

POST- Orbital Atherectomy (OAS) to m-RCA - OCT



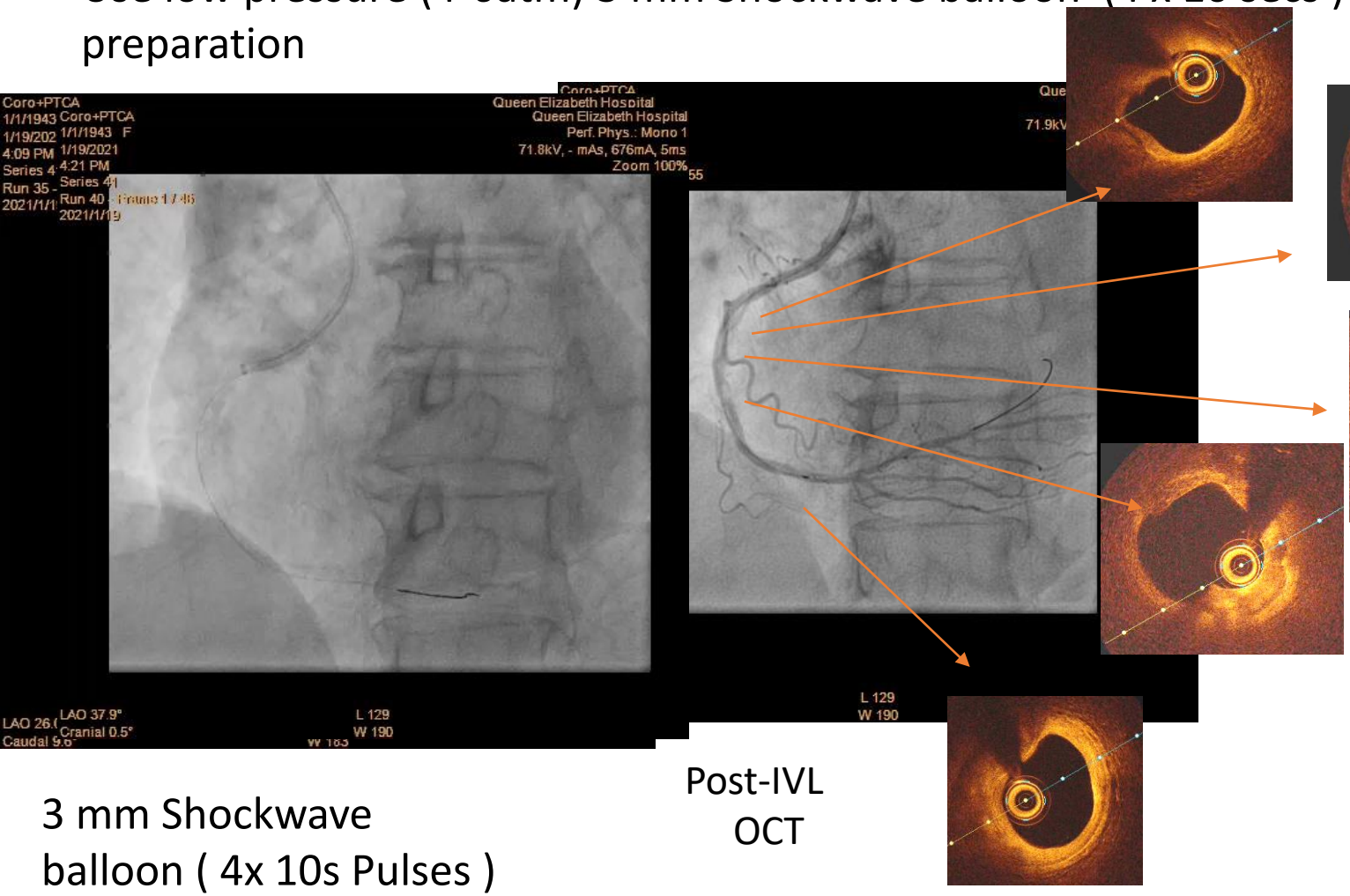


OCT – some breakage of the calcium

But still severe heavily calcified burden

IVL- Shock wave balloon to m - RCA

- Instead of using high speed OAS (120,000 rpm) creating a larger orbit; and run the risk of perforation
- Use low pressure (4-6atm) 3 mm Shockwave balloon (4 x 10 secs) x better lesion preparation



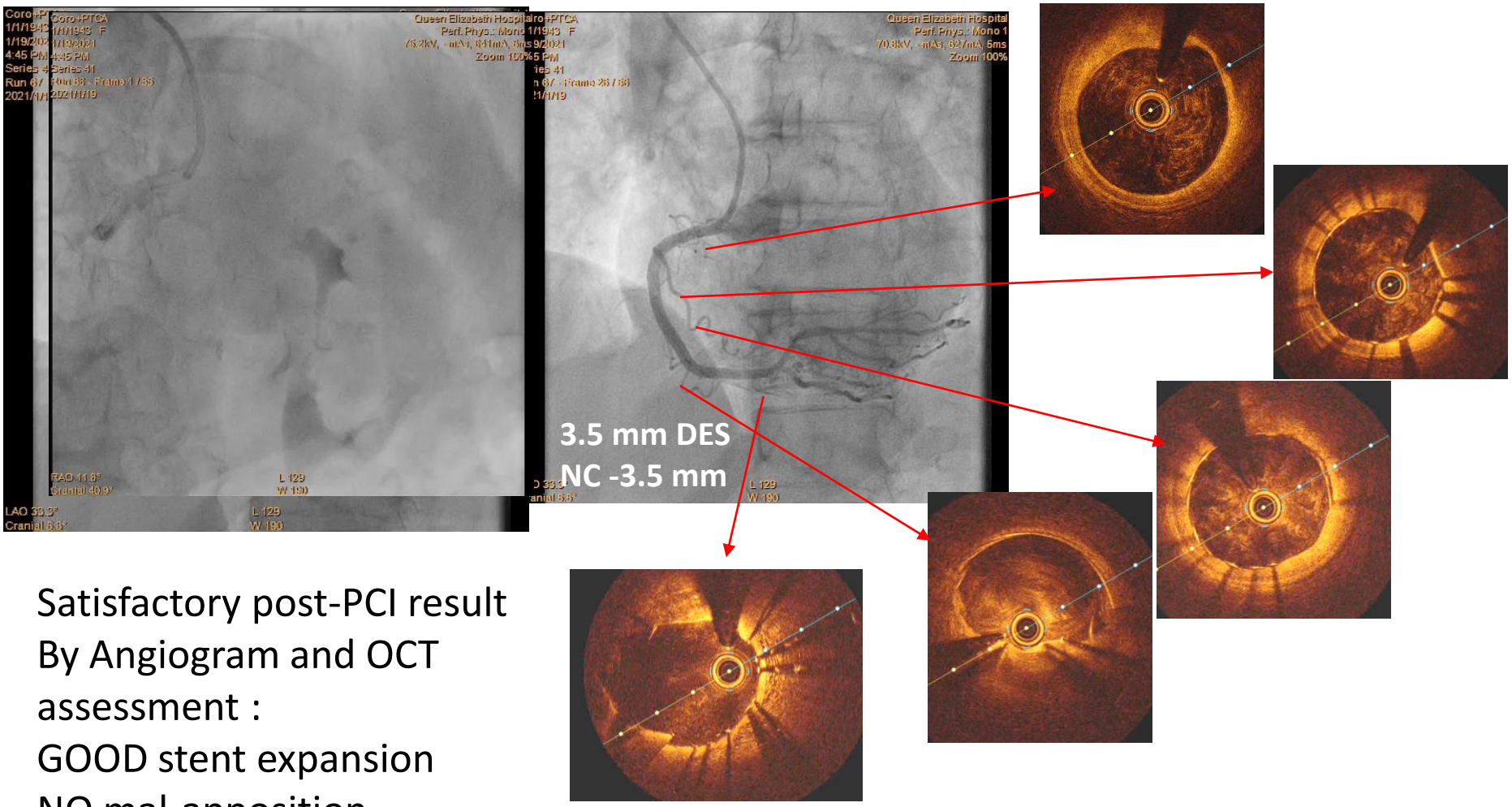
3 mm Shockwave balloon (4x 10s Pulses)

Post-IVL OCT

OCT- satisfactory expansion of the lumen after IVL

POST PCI to RCA

DESs to RCA with HP balloon dilatation and OCT Assessment



Satisfactory post-PCI result
By Angiogram and OCT assessment :
GOOD stent expansion
NO mal-apposition
NO Edge dissection

TAKE HOME MESSAGE

- Severe calcified lesion still poses great therapeutic challenge in current day PCI
- Adequate Lesion preparation is most important key for successful PCI
- Intravascular Imaging (OCT > IVUS) if feasible is a valuable tool to accurately assess the calcium nature (arc, thickness; length) before deciding final strategy
- For uncrossable lesion; Atherectomy with either Rotablator or OAS is the only possible tool for lesion preparation
- This case illustrates that even in severely calcified eccentric lesion; the complimentary role of low speed OAS and Low pressure Shockwave balloon are safe and effective to ablate the calcium before successful stenting
- OCT or IVUS is important to optimize the PTCS result in heavily calcified lesion