



## **Complete revascularisation for no option critical coronary artery disease**

**OCT guided rotablation + shockwave lithotripsy CHIP multi-vessel PCI  
(LMCA + LAD + LCx + RCA)**

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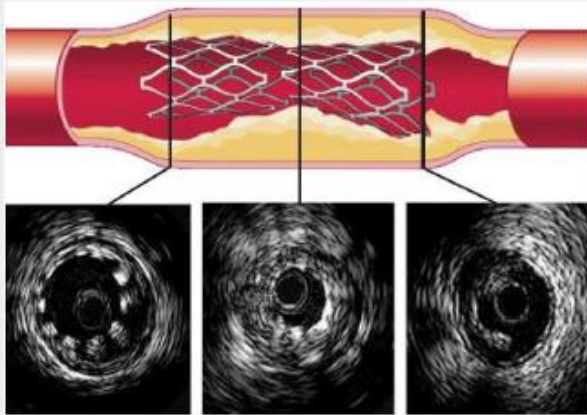
**BHARATHI RAJAA SPECIALTY HOSPITAL, CHENNAI, INDIA**

## CORONARY CALCIFICATION and CHALLENGES in PCI

### Prevalence of Severe Calcification

US & EU PCI patients<sup>3,4</sup>

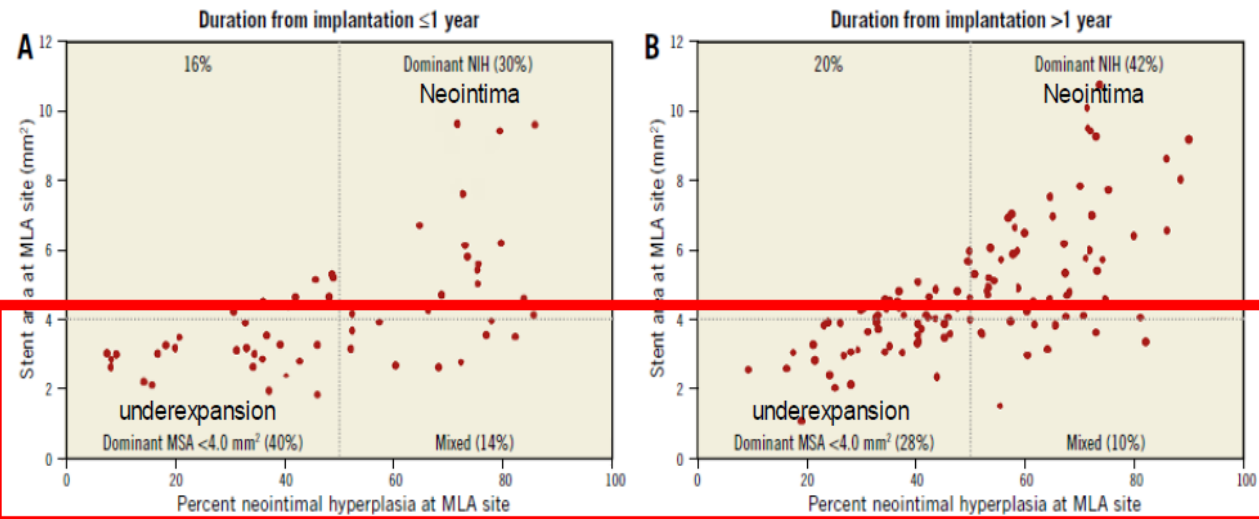
6% to 20%



Shows incomplete apposition, incomplete expansion and an edge tear.<sup>12</sup>

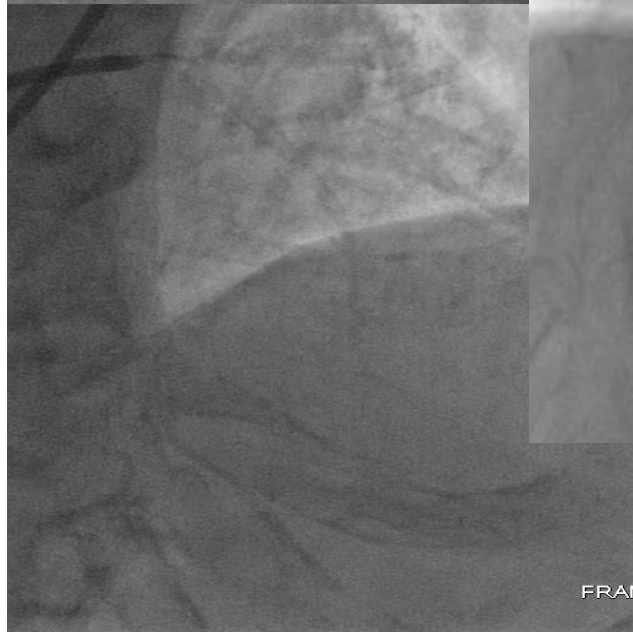
- Angiography underestimates intensity of calcification
- Dense and thick calcium poses challenges and adds complexities to PCI:
  - poor expansion
  - incomplete dilatation
  - dissection
  - stent under expansion – malapposition / asymmetric expansion etc

Under-expansion contributes to early and late stent failure

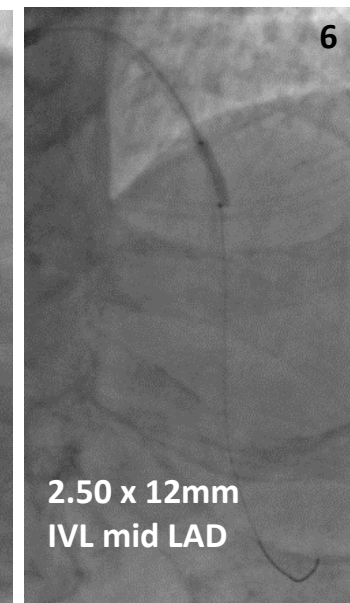
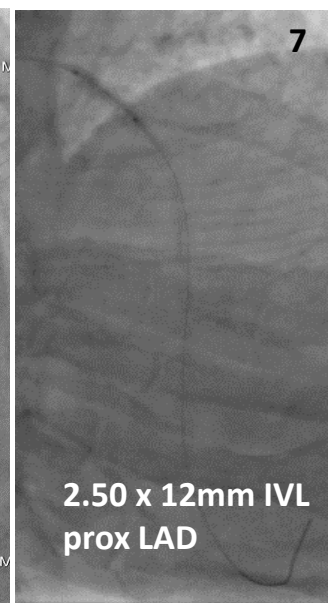
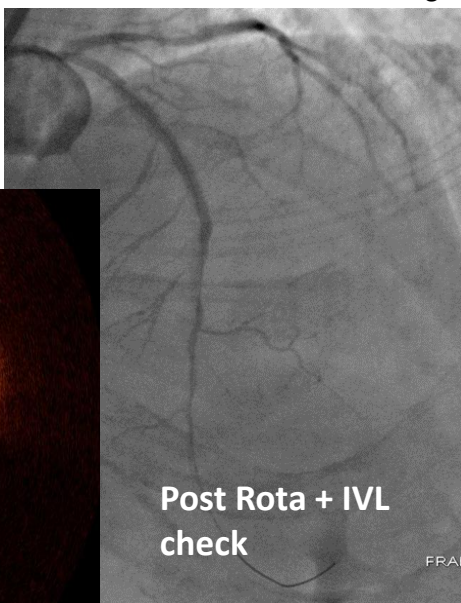
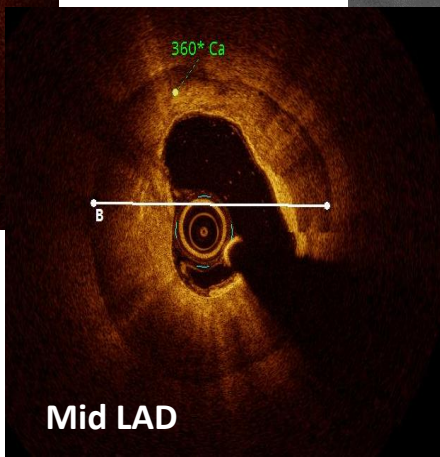
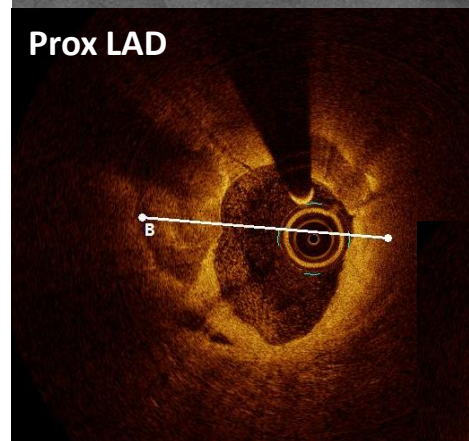
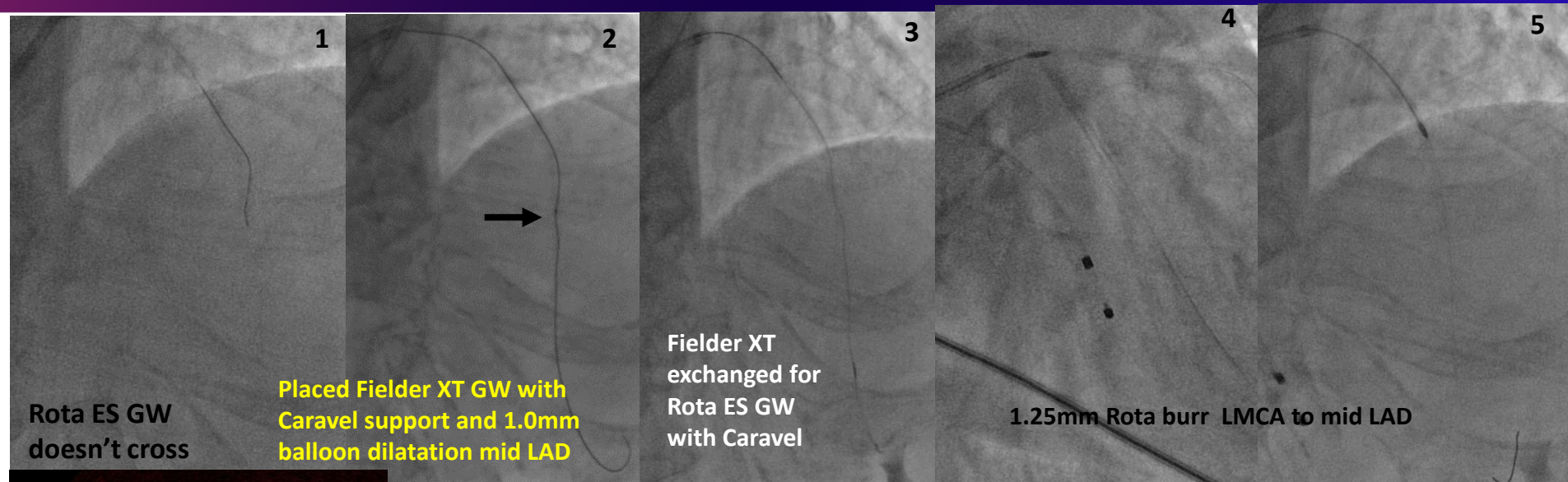


## 76yrs, male diabetic, hypertension, hypothyroidism, dyslipidemia, CKD – eGFR 58ml/min

- H/o ACS – AW NSTEMI Jan 2019 – Acute Pulmonary edema – LVEF ~32%, SR
- CAG: 2019 - heavily calcified LMCA + 3 vessel disease
- **2 CTS opinion rejection – target vessels unsuitable for grafting**
- Optimal medical treatment + heart failure medications, DAPT. LV EF ~50% in 6 months. NYHA Class II
- Acute pulmonary edema from ACS NSTEMI in Feb 2020 – LVEF ~36%, PAH+
- Repeat coronary angiography and CHIP revascularisation discussed
- Staged CHIP complete LMCA + 3 VESSEL PCI done – March 2020 (OCT guided) during COVID 19 lock down



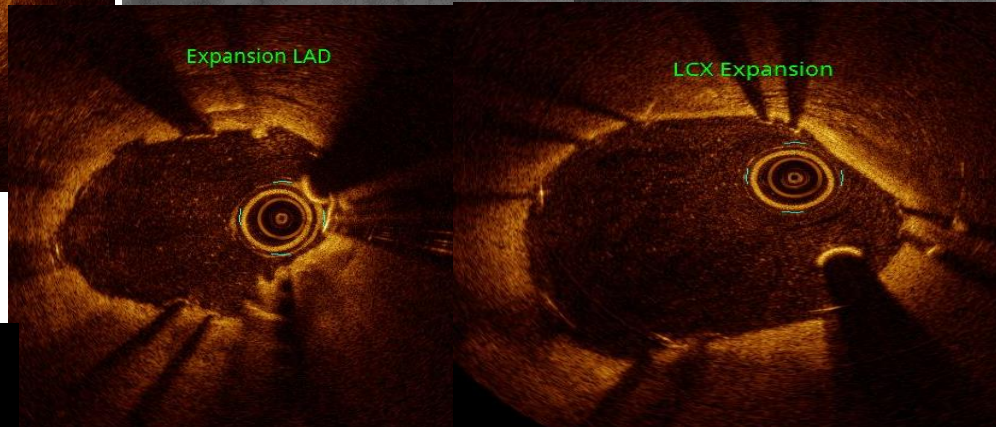
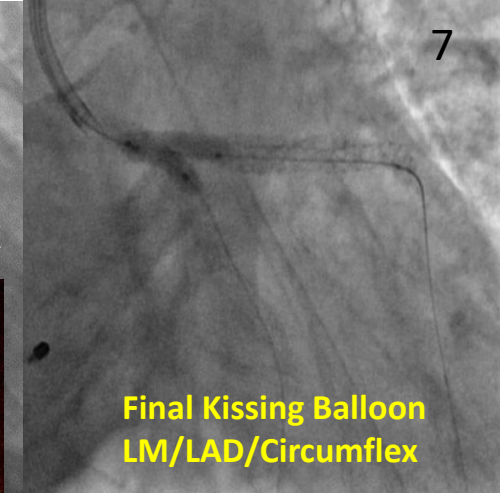
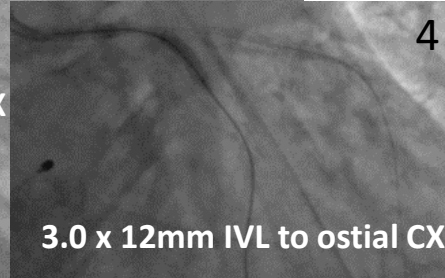
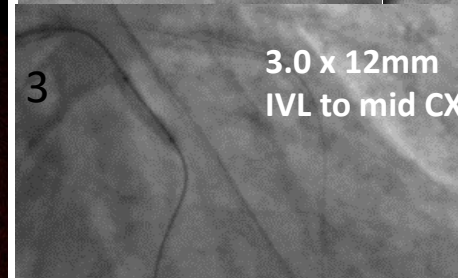
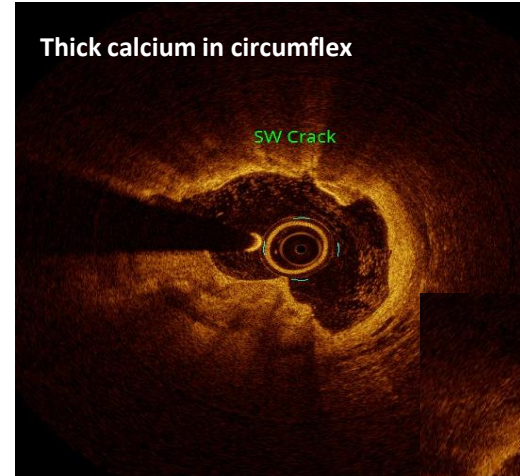
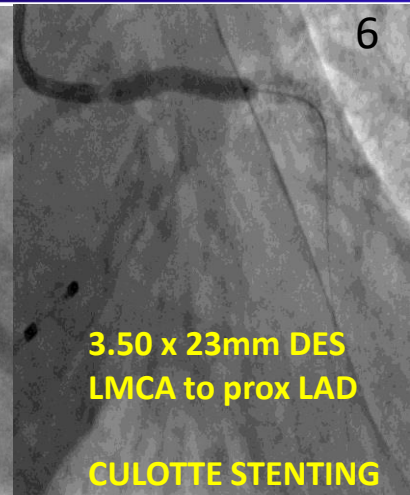
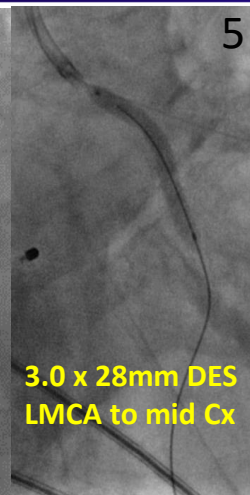
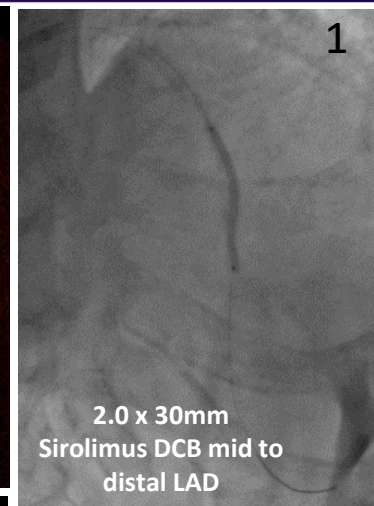
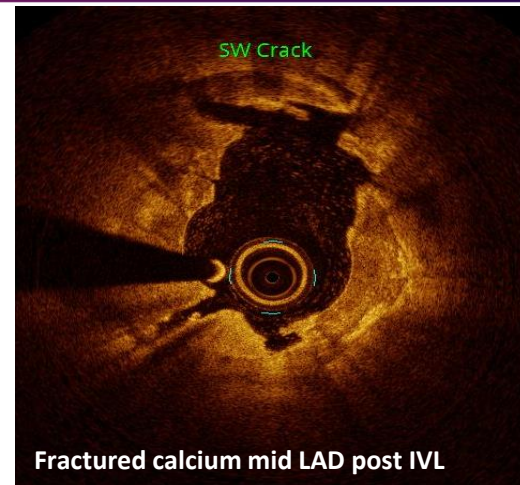






## Stage 1 CHIP PCI to LM, LAD and Circumflex

### Normal Saline OCT runs



A Area: 4.75mm<sup>2</sup> Mid LAD  
Mean Diameter: 2.45mm  
Min: 2.10mm Max: 2.80mm

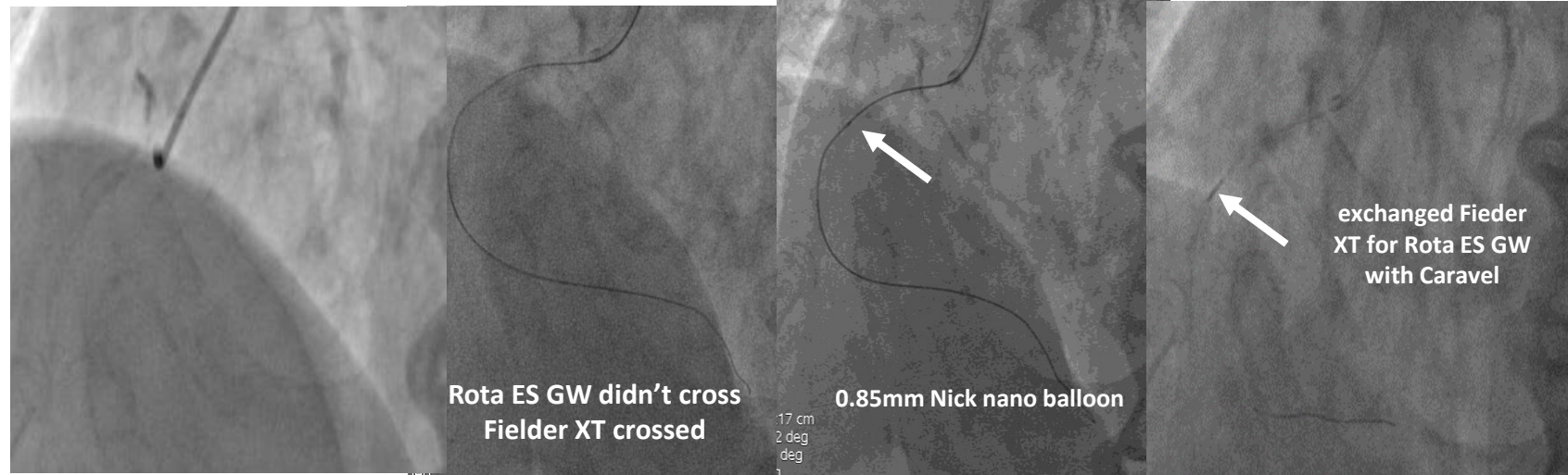
A Area: 7.81mm<sup>2</sup> Mid LCx  
Mean Diameter: 3.14mm  
Min: 2.78mm Max: 3.59mm

# LMCA LAD LCx Rota – shock wave (rotatripsy) successful CHIP PCI

Contrast volume 180ml



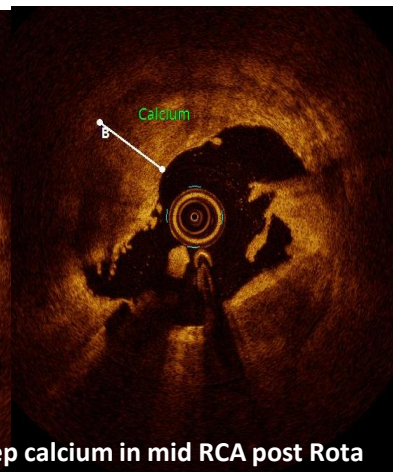
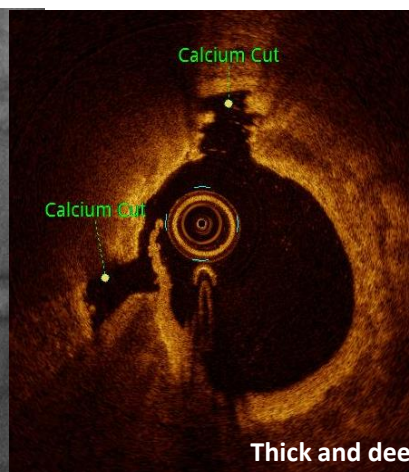
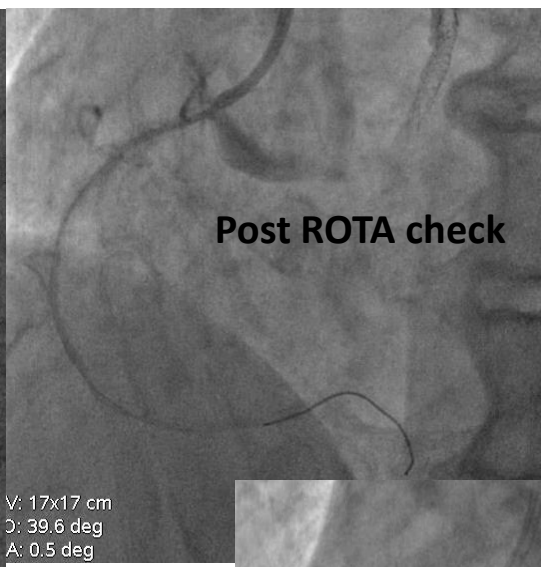
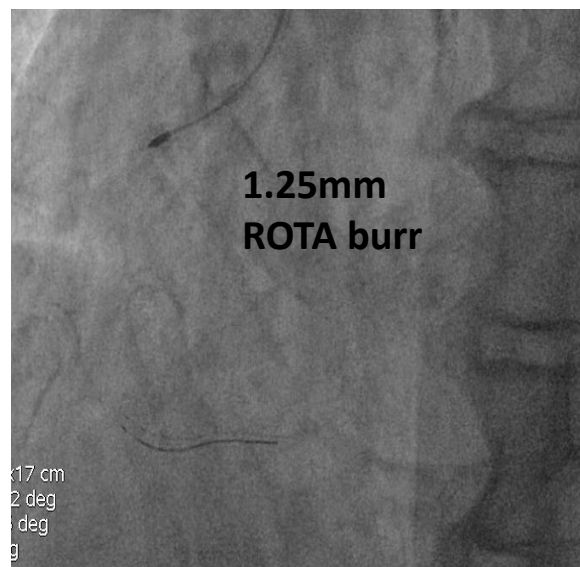
## STAGE 2 CHIP COMPLEX PCI to RCA – 36hours later



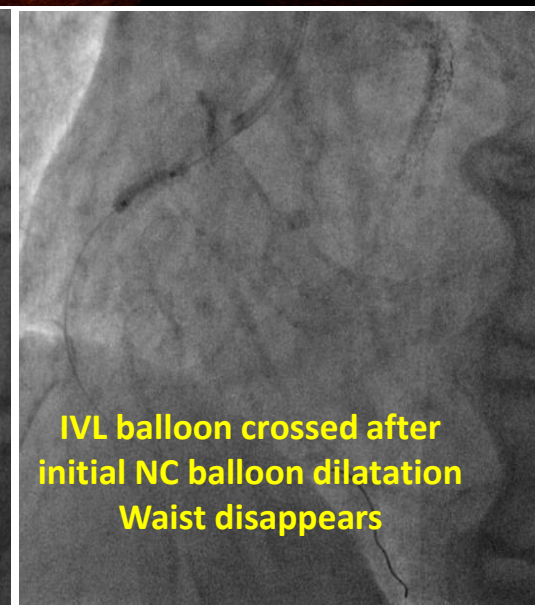
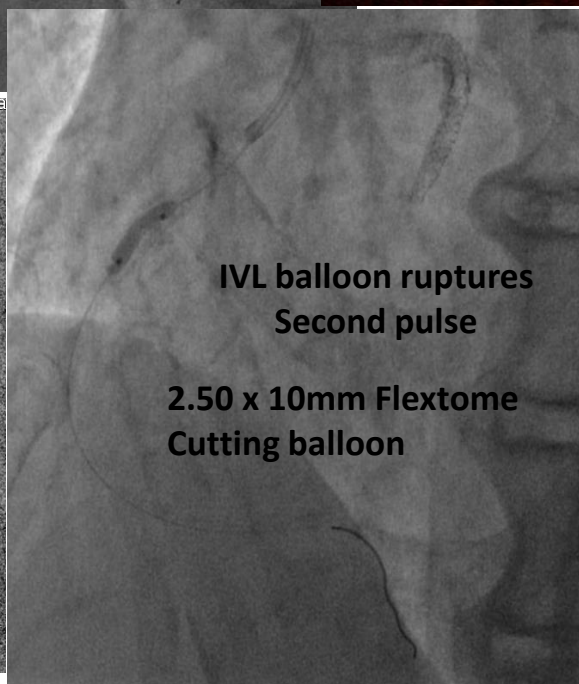
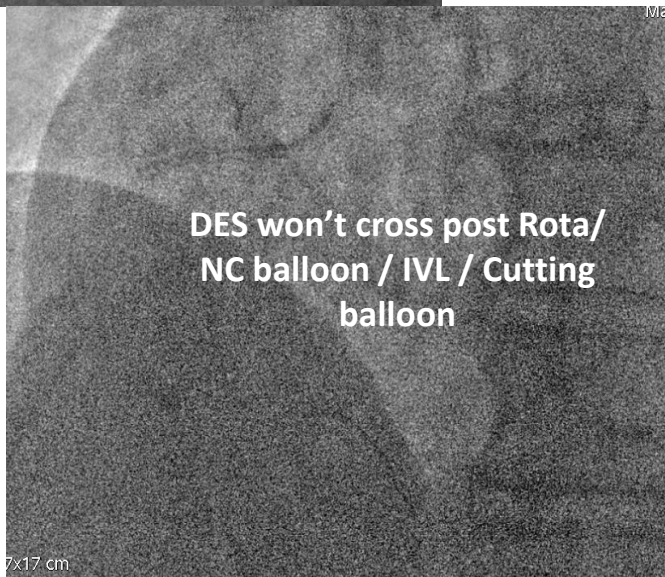


## STAGE 2 CHIP COMPLEX PCI to RCA – 36hours later

### Normal Saline OCT runs



Thick and deep calcium in mid RCA post Rota





# **Stage 2 Successful CHIP: ROTA / NC balloon / IVL (rupture) / Cutting balloon / DES CALCIFIED RCA – Contrast volume 100ml**

Balloon assisted  
Guide extension &  
DES delivered

2.75 x 36mm DES mid to distal RCA

2.75 x 40mm DES ostial to mid RCA

3.0mm NC balloon  
Ostial RCA

Diagnostic RCA  
angiogram

2x12 cm  
6.6 deg  
1.4 deg

**Discharged to home in 5 days**

**No post PCI ACS / Heart  
failure**

**No AKI**

**Procedures done during lock  
down and hence closely  
staged both CHIP PCI**



**M**orphology  
**L**ength  
**D**iameter



Plaque modification /  
debulking / IVL  
Stent  
Post Dilate

**M**edial Dissection  
**A**pposition  
**X**pansion

**MLD → MAX**

**NOW INDEED THERE IS AN OPTION FOR NO OPTION CAD**

Imaging in PCI has given a  
wealth of information to bring  
out optimal procedural and  
long term results

Imaging and Rotablation with  
Lithotripsy (Rotatripsy) is indeed  
a great leap and boon to engage  
high risk CHIP PCI for a  
successful procedural outcome  
in symptomatic complex critical  
coronary artery disease