Calcium Everywhere

Mohammed Majid Akhtar
Cardiology Registrar in Coronary & Structural Heart Intervention
St. Bartholomew's Hospital, London, UK

Consultants:
Dr Dan Jones, Consultant Cardiologist
Dr Mick Ozkor, Consultant Cardiologist

PATIENT BACKGROUND
(July 2020 During COVID-19 Pandemic)

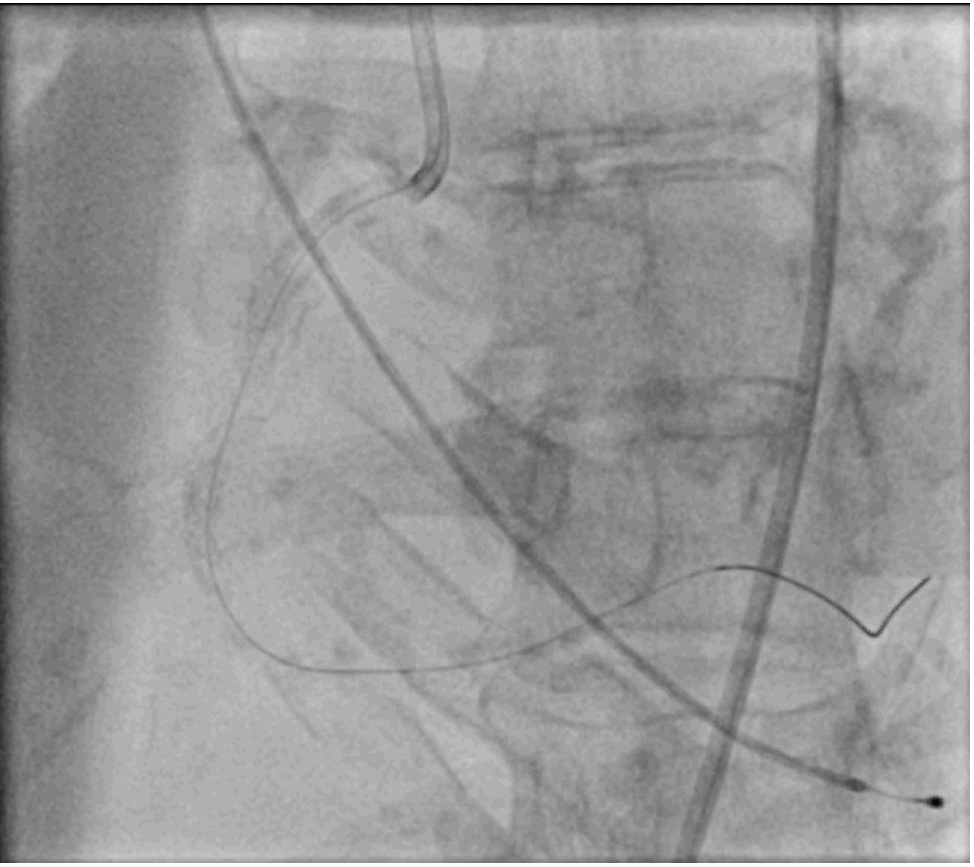
79 Year old independent female with:
Type 1 DM – Insulin pump / HTN / TIA / CKD 5 (eGFR 15)
Asthma / Chronic Anaemia

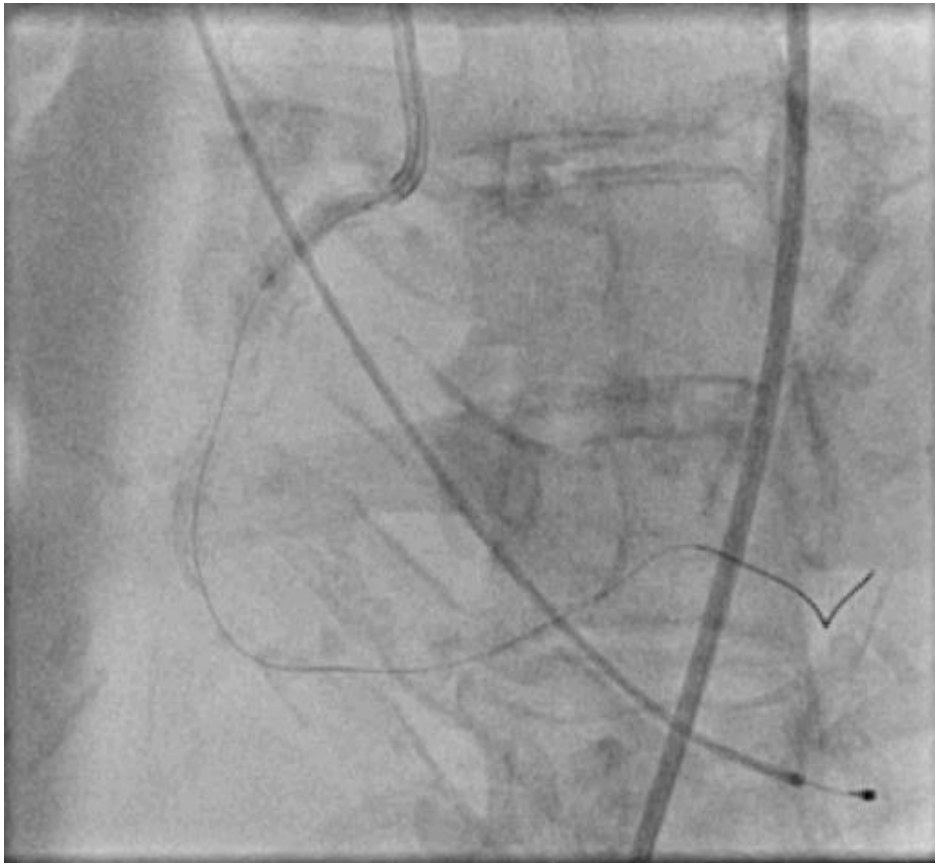
Admitted to local hospital with central chest pain and dyspnoea
4/12 progressive reduced ET (NYHA 3) and recent PND / orthopnoea.
ECG: SR PR 250ms LBBB QRS 135ms
TnT: 476 → 600
TTE: Severe AS/AR (PG53, AVA 0.7cm^2, LVEF 45%)
Angiogram → Critical calcific ostial RCA disease →complicated by pulmonary oedema
CT TAVI → Agatston 994; Annulus 2.98cm^2; SoV 3.1x3.0x2.8cm; good calibre iliofemorals; LCA height 15mm and RCA height 17mm **– CTS turn down comorbidities**

3 days later developed further CP and pulmonary oedema on the ward → Diuresed. Further attempted PCI to RCA 2 days later → Acute pulmonary oedema (O_2 sats 81%) prior to radial access → Abandoned and transferred ITU for CPAP and diuresis.

On ITU → Further deteriorating Haemodynamics and respiratory function
Repeat TTE: LVEF 30% with Mixed AoV disease (Severe AS and AR)

ITU to Cath Lab → Electively Intubated (GA) and Diastolic BP 20mmHg





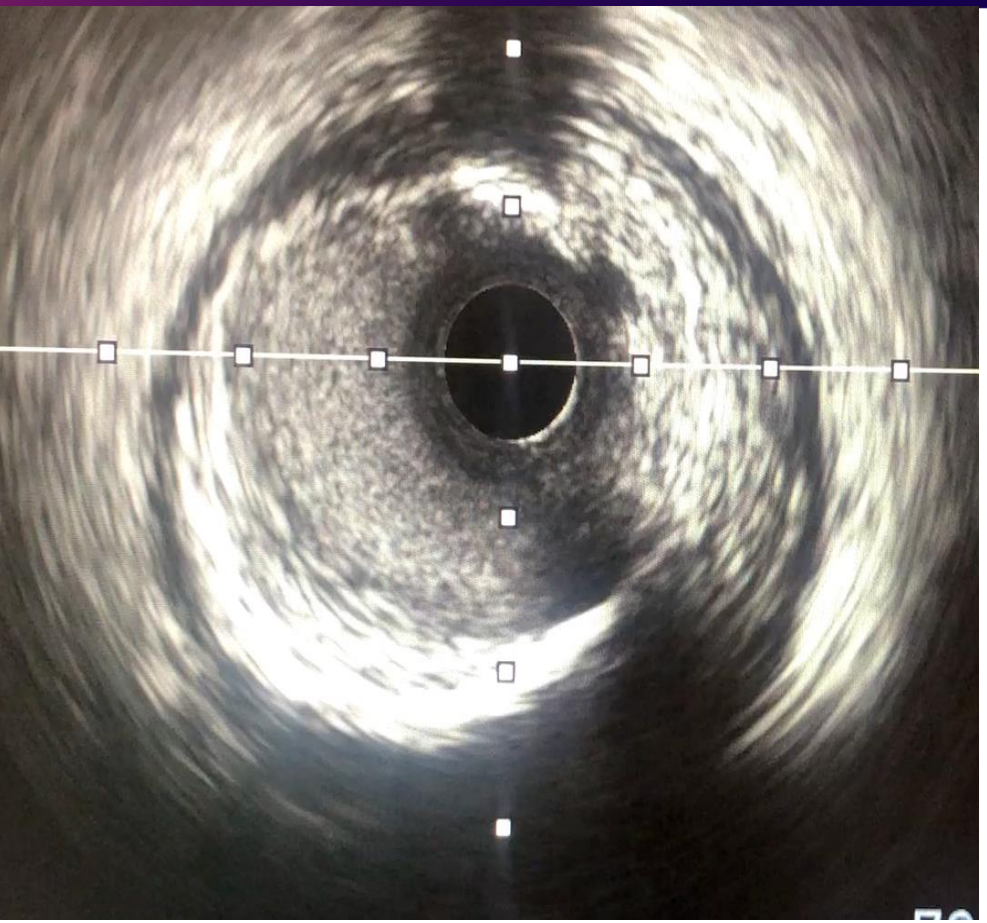
Right Femoral Artery 4Fr → Proglidex2 → 10Fr RFA sheath

LFA 6Fr Sheath; RIJ Temporary Pacing Wire

7Fr JR4 Side hole Guide catheter to RCA
Choice floppy wire to distal vessel

Proximal RCA pre-dilated with 2.5x15mm TREK balloon and 3.5x20mm NC → under-expanded balloon

Coronary Procedure - IVUS



IVUS of the RCA shows diffuse atheroma with concentric proximal and mid-vessel calcification with severe proximal disease.

3.5x12mm Shockwave balloon to mid-RCA from mid to proximal RCA → multiple therapies administered.

Coronary Procedure – Intravascular Lithotripsy

3.5x12mm Shockwave balloon to ostial-RCA → multiple therapies administered.

Further pre-dilatation with 3.5x20mm NC balloon

Synergy 3.5x38mm DES to proximal RCA

Deliberate decision not to leave many stent struts outside the RCA ostium to minimise the risk of interaction and deformation with transcatheter heart valve

Coronary Procedure – Stent Optimisation

Synergy stent post-dilated with 4x20mm NC Balloon

Disease off the distal edge of the stent…

Coronary Procedure – Final Results

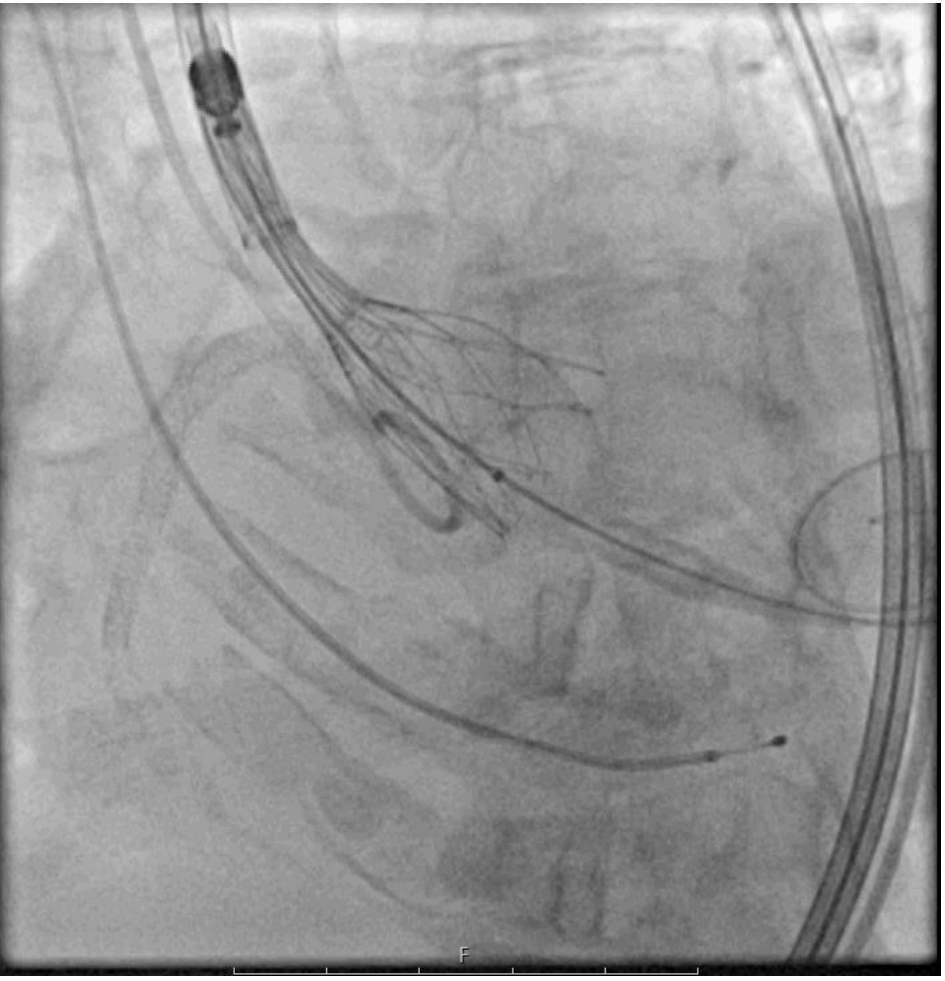
Overlapping 3x16mm Synergy at distal stent outlet and post dilated

Pre-dilatation Balloon Aortic Valvuloplasty

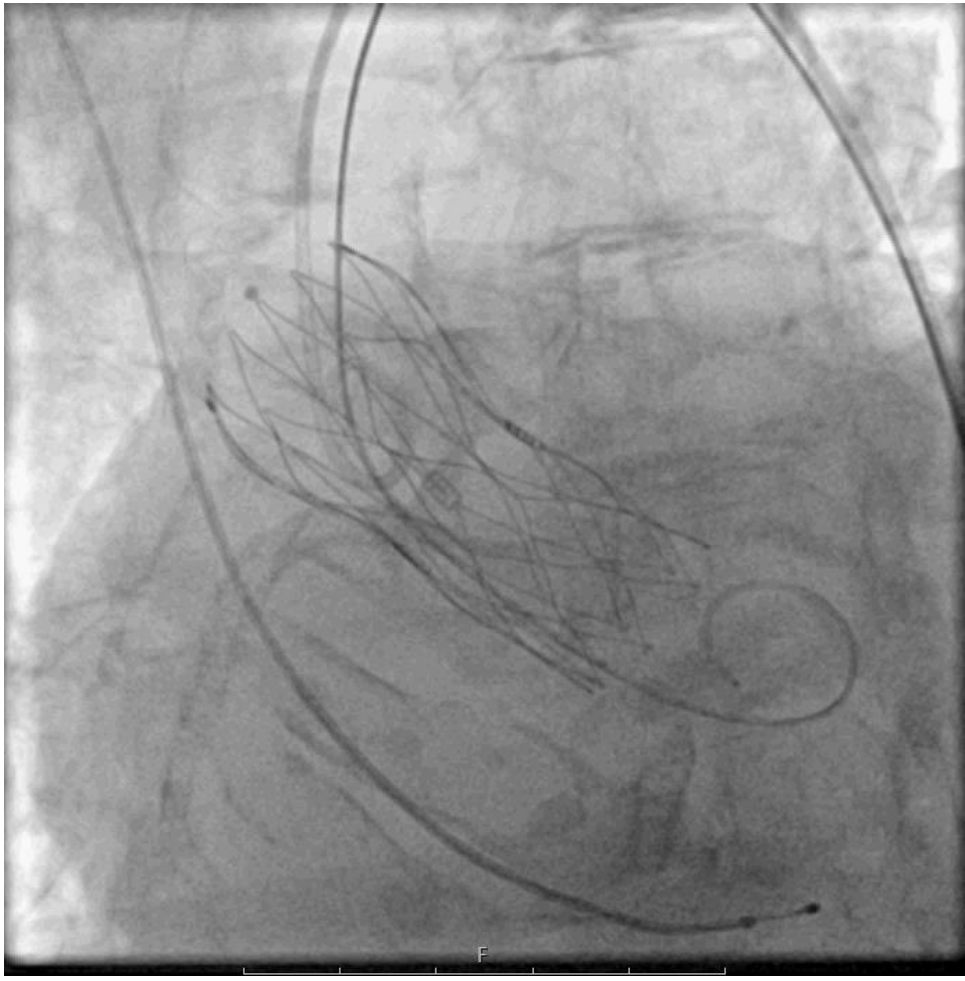
5Fr Pigtail from LFA to the aortic root.
10Fr RFA sheath upsized to 14Fr Cook sheath.
Aortic Valve Crossed with JR4 catheter from RFA.
Safari wire to LV Apex.

18mm Balloon Aortic Valvuloplasty with VACS II Balloon pre-dilatation.

TAVI – Transcatheter Heart Valve



23mm Portico Self Expanding Transcatheter Heart Valve Deployed at the aortic annulus

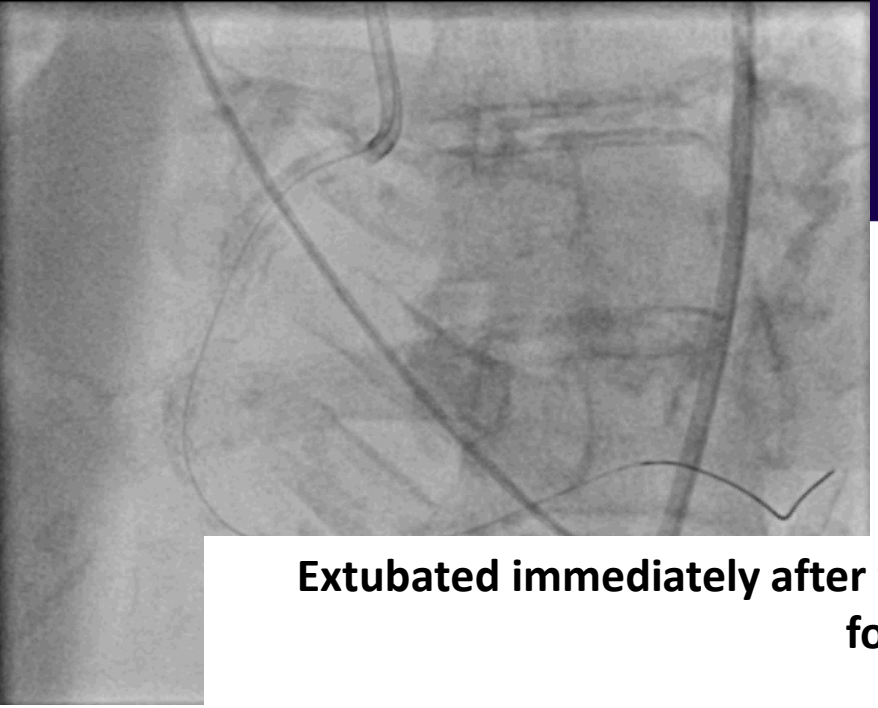


Moderate AR post valve deployment

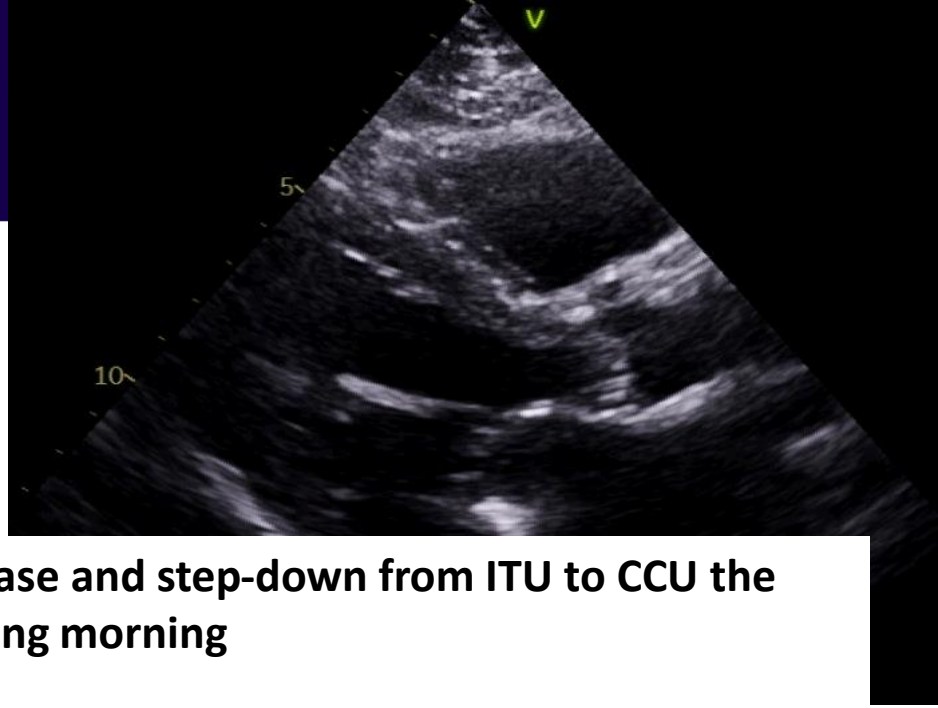
TAVI – THV Post Dilatation

22mm Balloon Aortic Valvuloplasty with VACS II balloon to post-dilate the Portico valve

Mild AR post Valve deployment



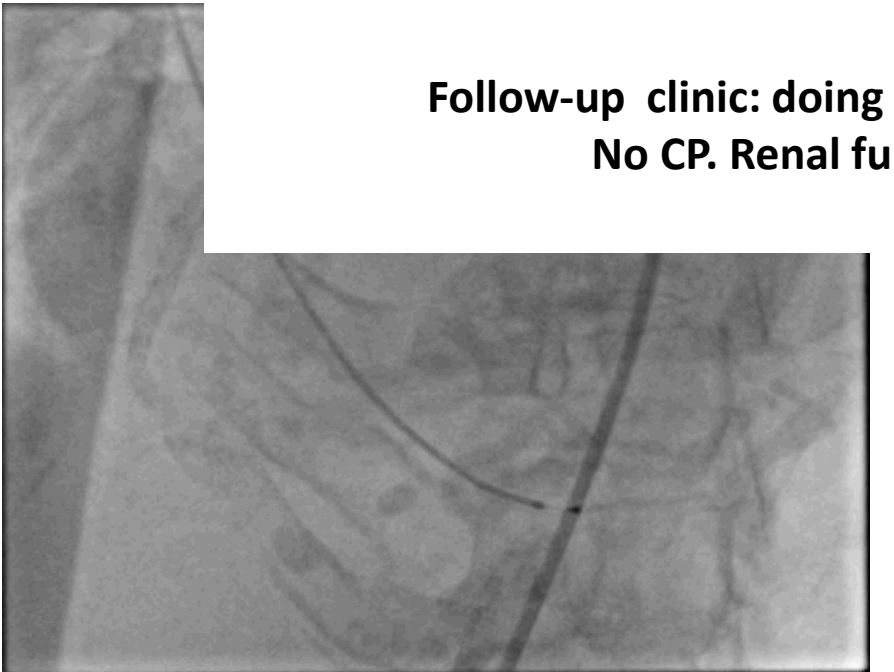
P
R
E



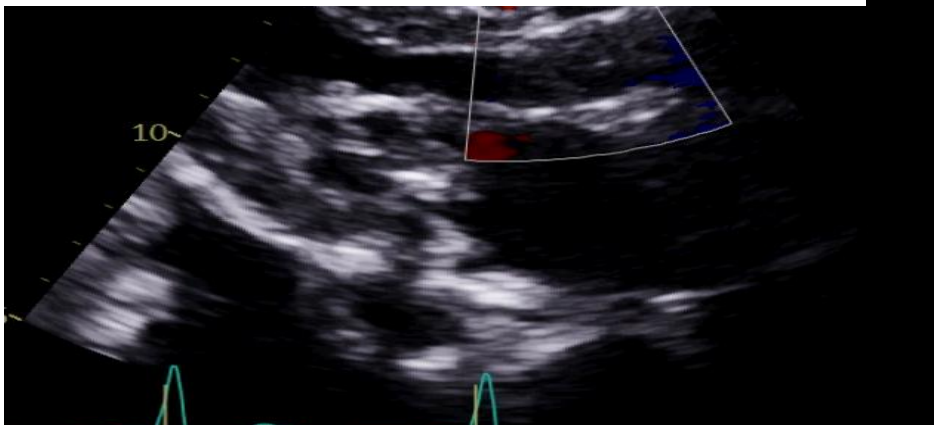
Extubated immediately after the case and step-down from ITU to CCU the following morning

DISCHARGED DAY 5 Post-Procedure; no need for RRT or pacing.

Follow-up clinic: doing well → back to baseline and NYHA 2.
No CP. Renal function continues to improve.



S
T



CONCLUSIONS

Intravascular Lithotripsy is suitable for calcium modification in concentrically calcified lesions and may be a useful alternative to rotablation particularly in ostial coronary lesions.

Robust data is lacking on the role of pre-procedural coronary revascularization in patients with symptomatic aortic valve disease. However, given the presence of chest pain and critical ostial RCA disease, we planned to treat the CAD pre-TAVI to abate further CP symptoms.

Selective coronary engagement and complex techniques including rotablation or IVL may be more challenging post Transcatheter valve intervention.

In patients undergoing TAVI and ostial coronary stenting, avoiding excessive stent protrusion into the aorta is important to minimise the risk of inadvertent stent deformation on valve deployment, or THV pre- or post dilatation.

- Simultaneous kissing balloons of chimney stents and valves have been used to minimise the risk of deformation (not used in this case).

Complex coronary and valve intervention can be undertaken with modest contrast usage (290mls in this case) to minimise risk of acute renal injury.

Thank you