

# Life without Rotational Atherectomy ( & many devices)

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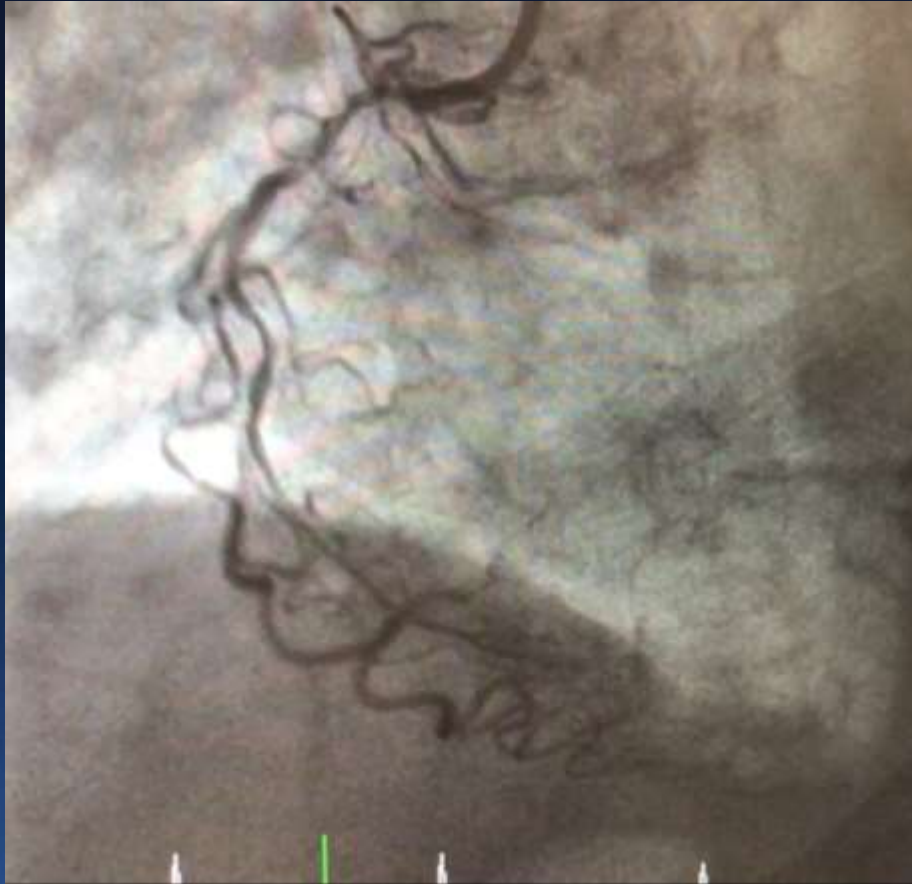


# Case

- **83 YO Thai male** presented to **OSH with progressive chest pain and increased shortness of breath x 1 week.**
- @ OSH, he was performed CAG and referred for further management.
- On arrival he was found to have hypotension **BP 80/50 mmHg with O2sat 85% on roomair**
- Dx: ACS-NSTE + cardiogenic shock +pneumonia

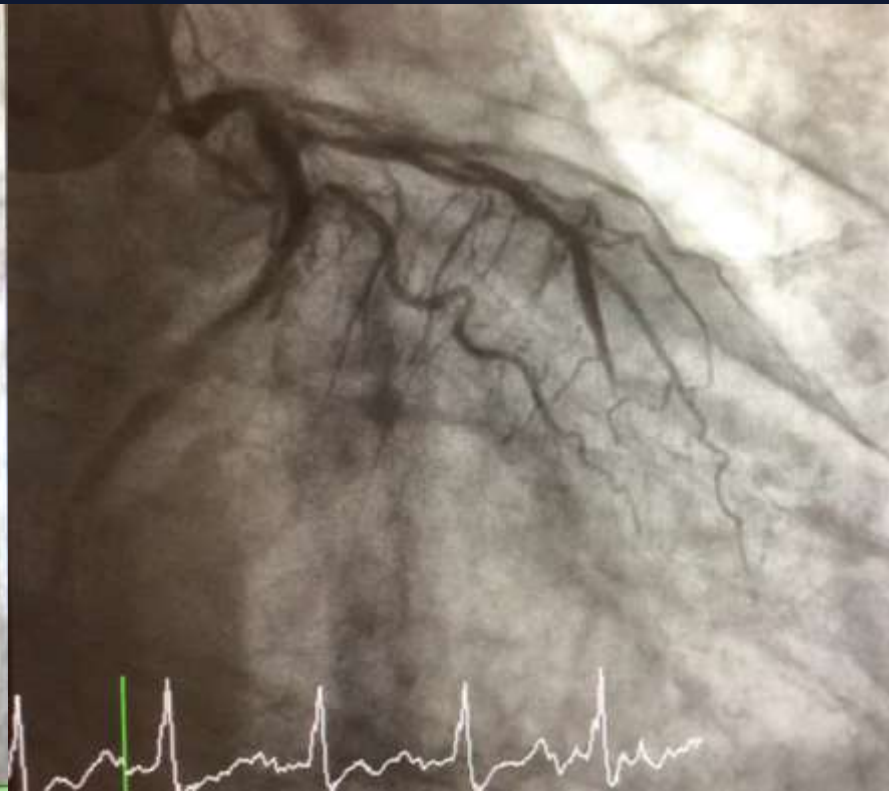
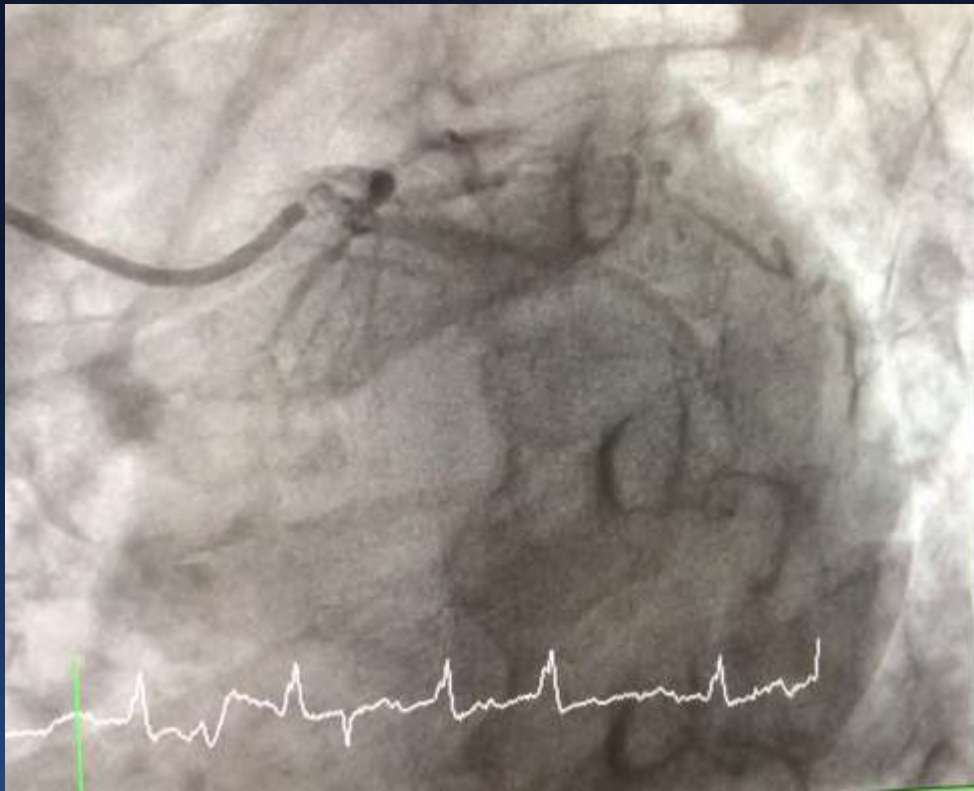
- **PMHx:**
  - Known severe AS
  - DM type II
  - Hypertension
  - CKD stage III
- Echo from OSH noted severely reduced LVEF

# CAG from OSH : RCA

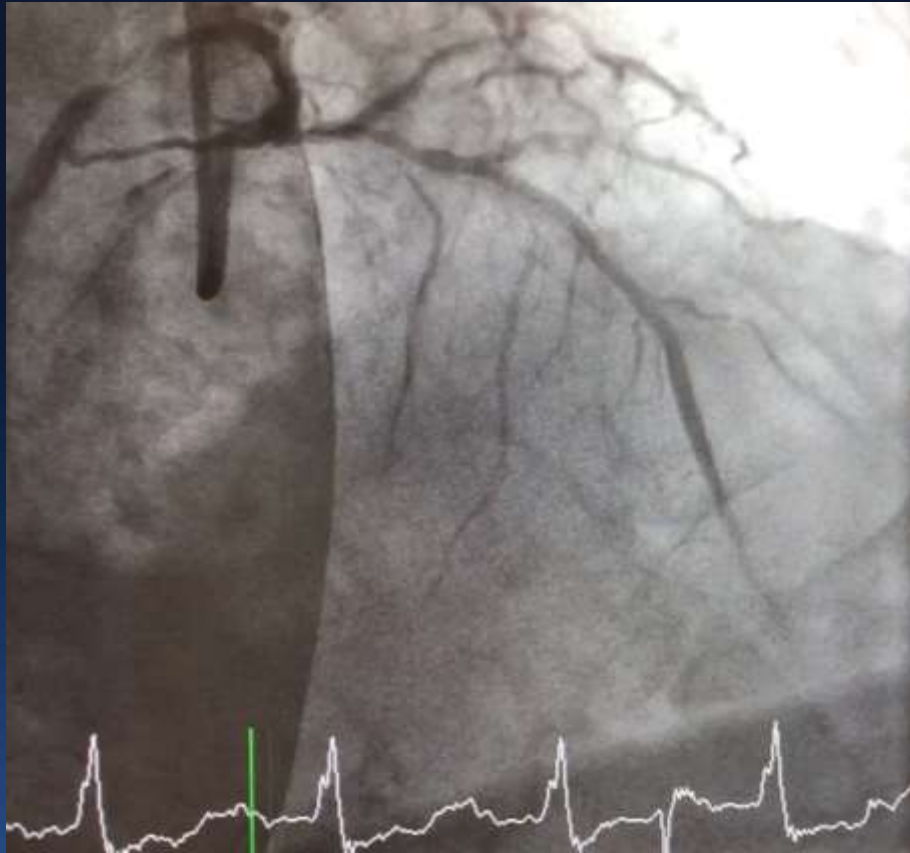


- Non-dominant RCA

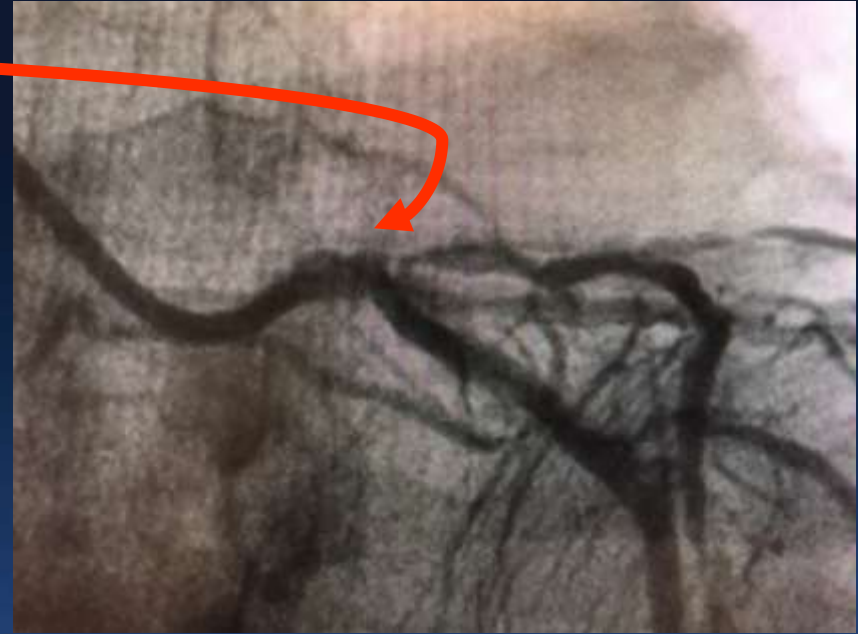
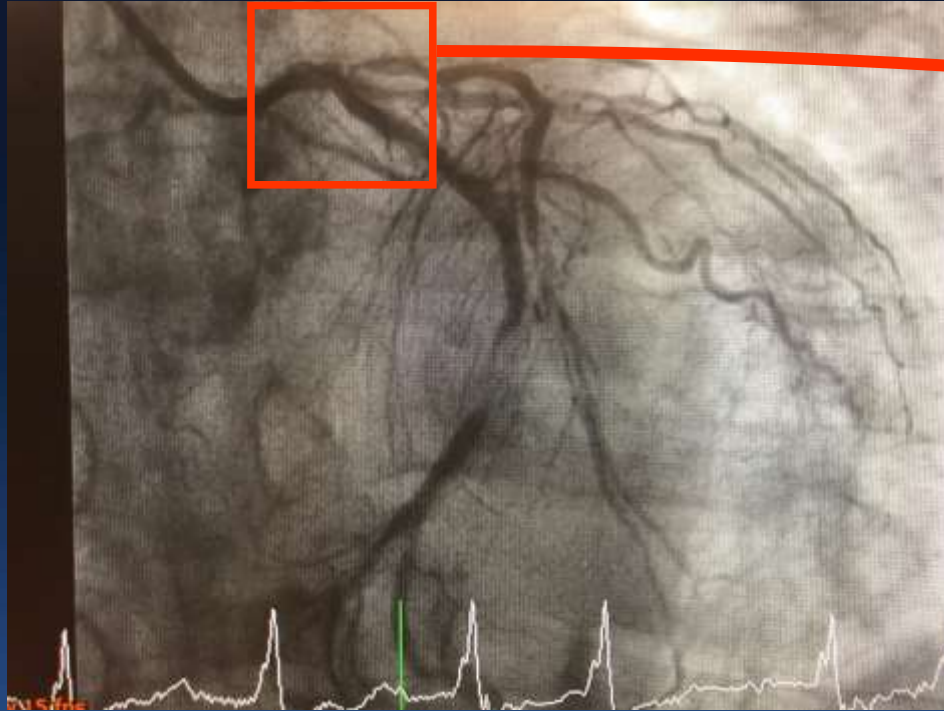
# CAG from OSH : LCA



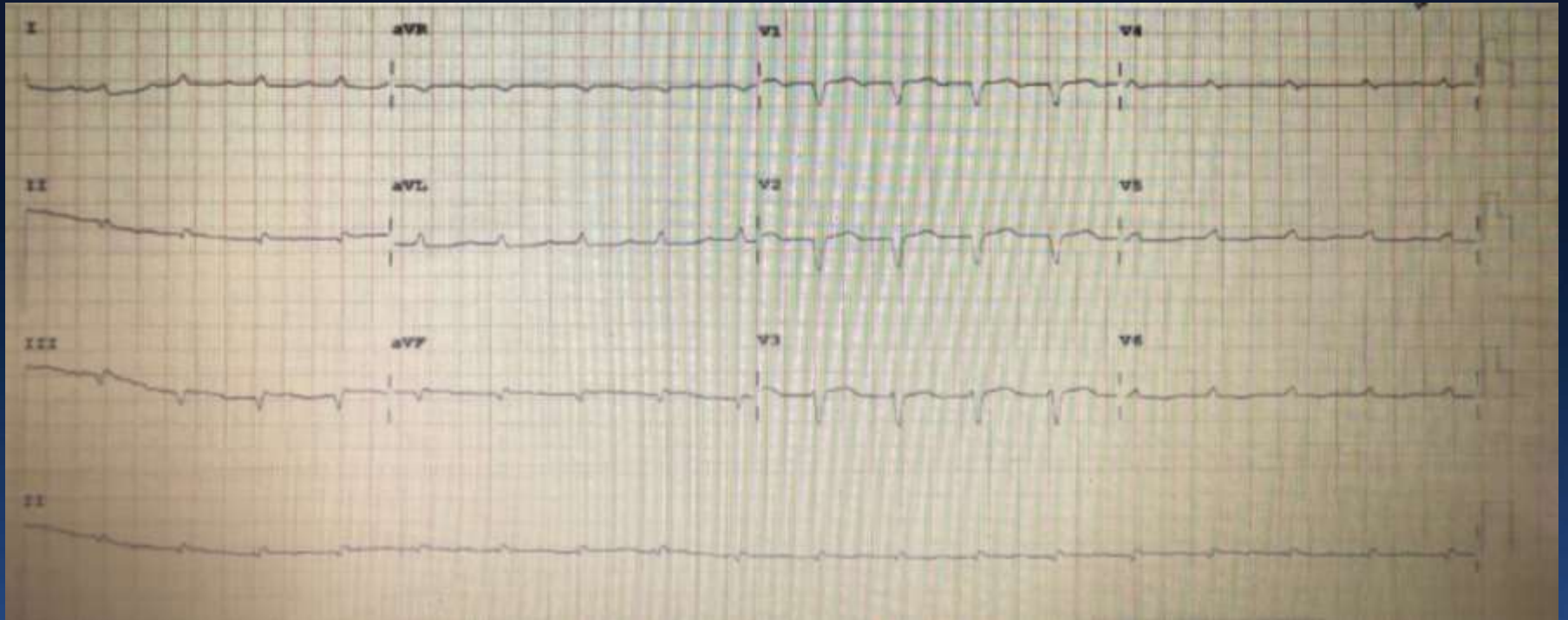
# CAG from OSH: LCA



# CAG from OSH: LCA



# EKG 12 leads on arrival



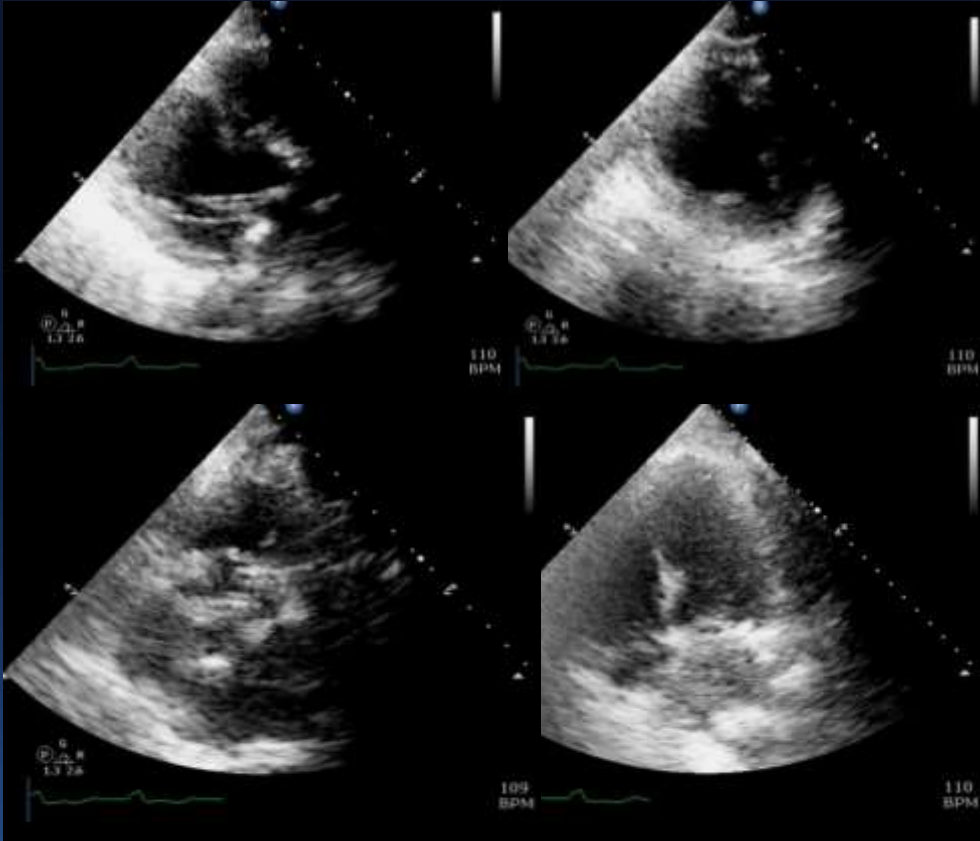
# CXR on arrival



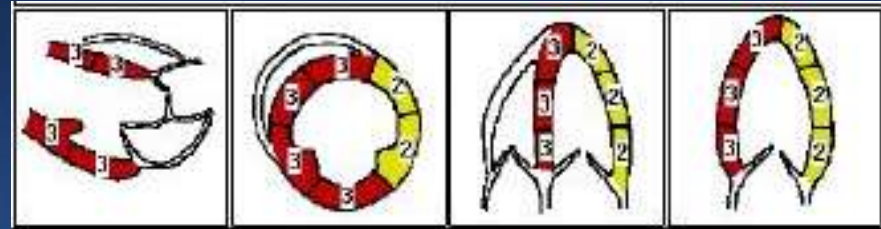
RLL infiltration



# Echocardiogram on arrival



- Echo showed severely reduced LVEF < 15-20%
- Critical AS, likely low flow - low gradient AS (stage D2)



Very calcified AV

# Labs @ our institution

~~Hb 11.4~~  
WBC 13.7      Plt 217  
~~Hb 34.1~~

|        |                    |          |
|--------|--------------------|----------|
| Na 133 | CL 97              | BUN 48.4 |
| K 4.55 | CO <sub>2</sub> 18 | Cr 1.96  |

**Troponin-T > 2000**

**Lactate 3.67**

**Patient was on high dose NE IV drip  
For hemodynamic support**

# Questions to be answered

## Cardiogenic shock with severe AS, low EF, calcified mvCAD

- What would you do next?
- **Can we perform CABG + AVR?**
- Need of advanced MCS ?
- Intervention to AS and mvCAD, which one should we do first?
- How do we deal with severely calcified vessels in this situation?
- Should we counsel the family for palliative care?

# CABG + AVR

STS Adult Cardiac Surgery Database Version 4.20

## RISK SCORES

Procedure: AVR + CAB

CALCULATE

Risk of Mortality: 38.972%

Renal Failure: 22.998%

Permanent Stroke: 5.175%

Prolonged Ventilation: 73.378%

DSW Infection: 0.199%

Reoperation: 15.748%

Morbidity or Mortality: 88.694%

Short Length of Stay: 2.108%

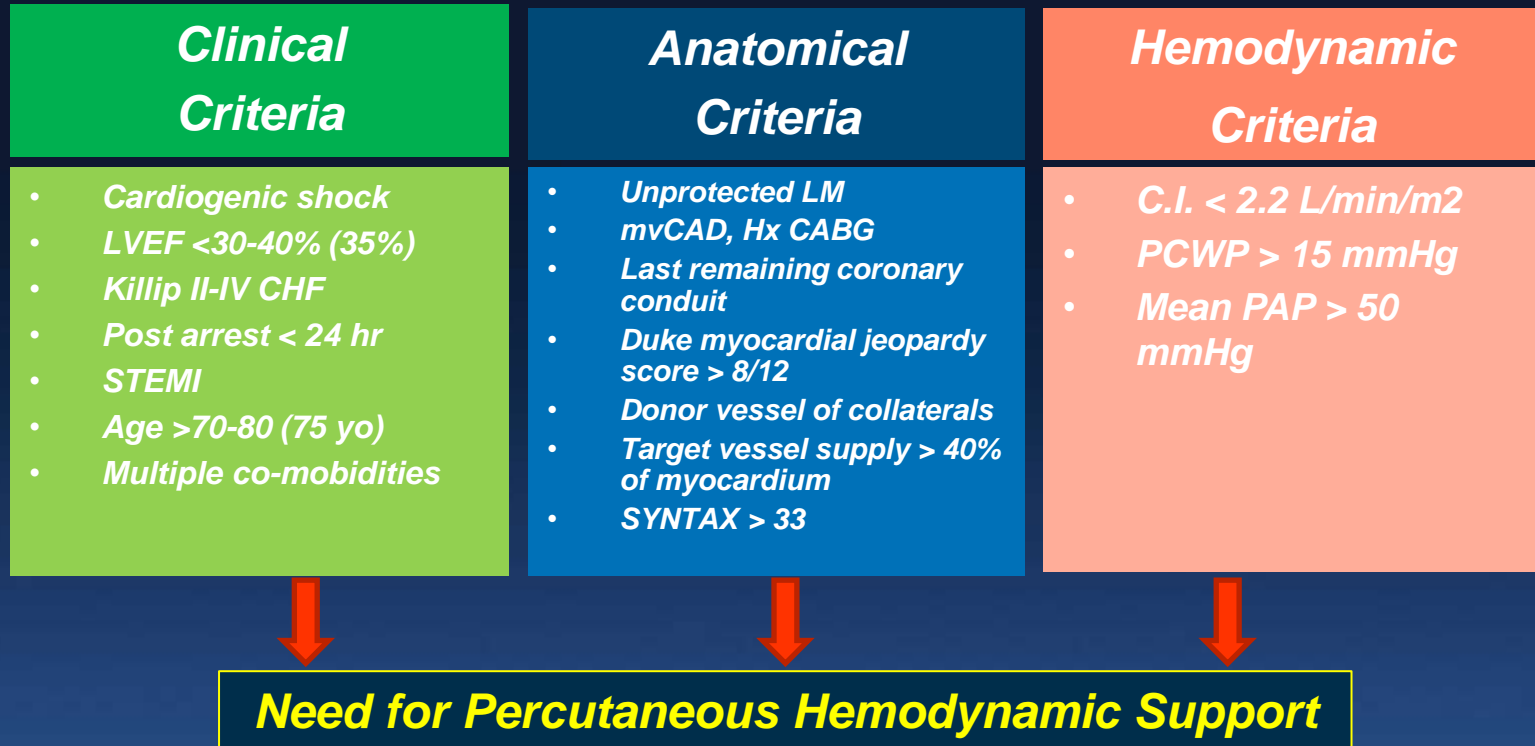
Long Length of Stay: 53.716%

*Nope x II*

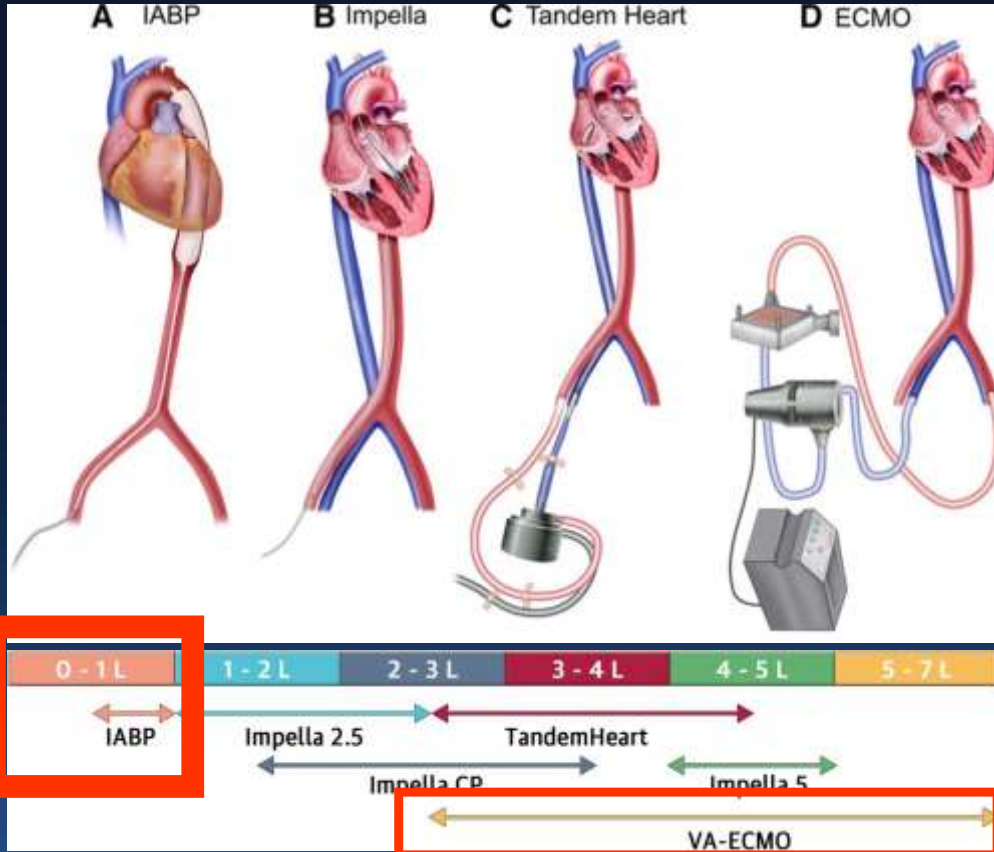


*CT Surgeon*

# CHIP (Complex Higher-Risk Indicated Patient)



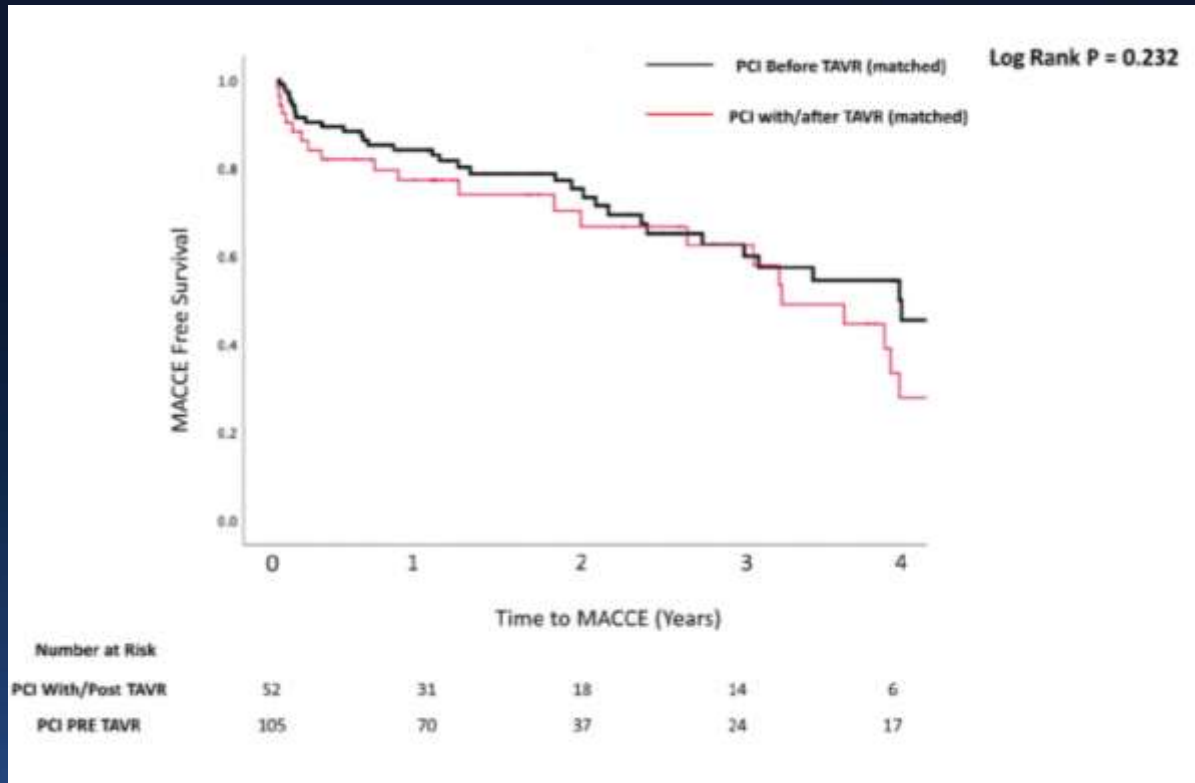
# Choice of Advanced MCS



Mandawat et al. CCI 2017

Atkinson et al. JACC 2016

# TAVI or PCI first?

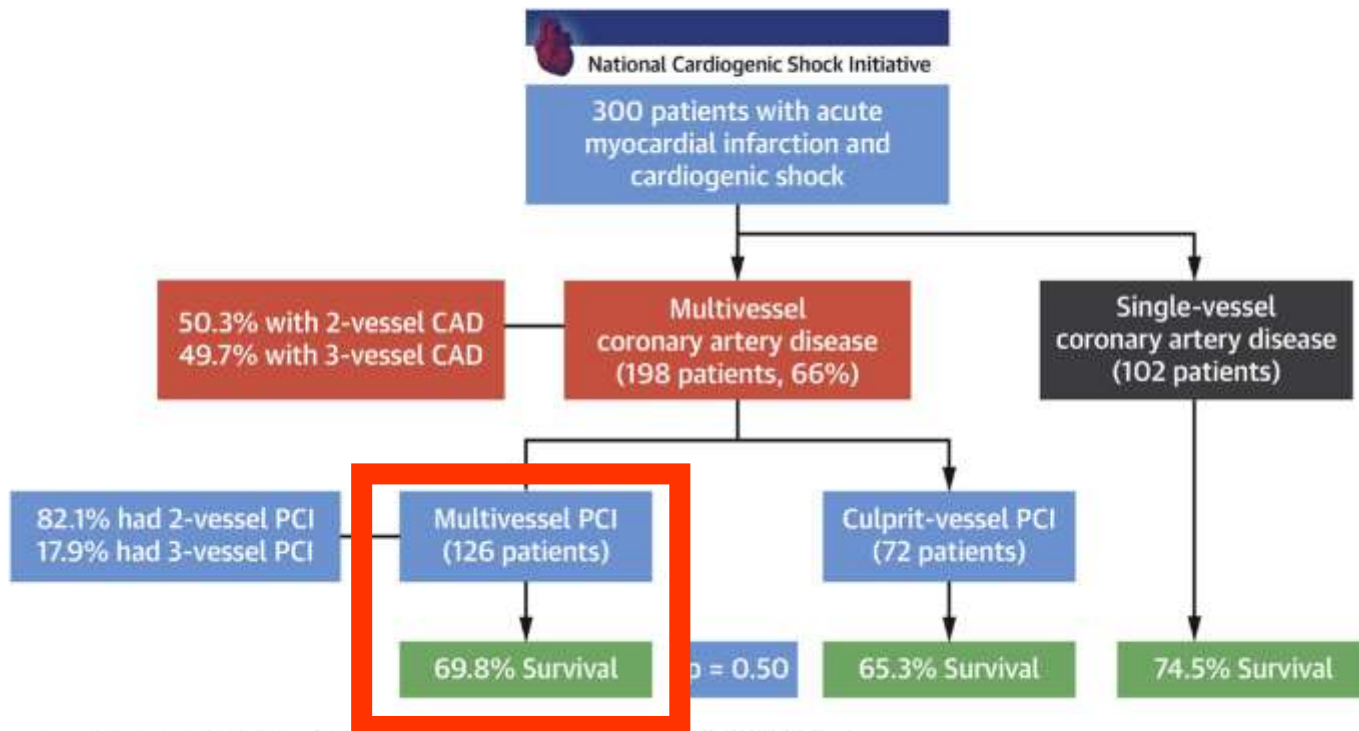


MACCE-free survival rate

Kumar et al. CCI 2020

# Multivessel PCI in cardiogenic shock

## CENTRAL ILLUSTRATION: Flowchart With Patient Selection



Lemor, A. et al. J Am Coll Cardiol Interv. 2020;13(10):1171-8.



# Lesion Preparation by Plaque Type for Coronary Artery



Optimize stent placement



**NC balloon**

**High/ Super-high pressure NC balloon**

Avoid Slippage

Avoid Plaque Shift



**Cutting Balloon Scoring balloon**

*Change Lesion Compliance*



**Rotational atherectomy**



**Orbital atherectomy**

**Laser**



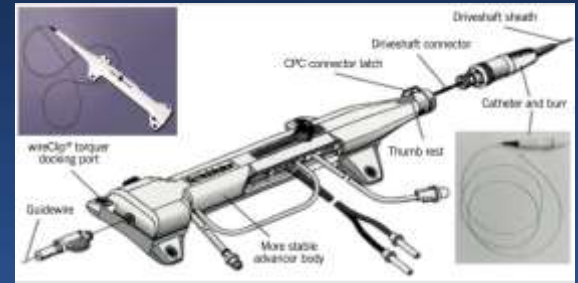
**Lithotripsy**

*\*Modified from Ramesh Daggubati, MD. Basic Rotational Atherectomy. SCAI*

# Rotational Atherectomy

## RA is not recommended :

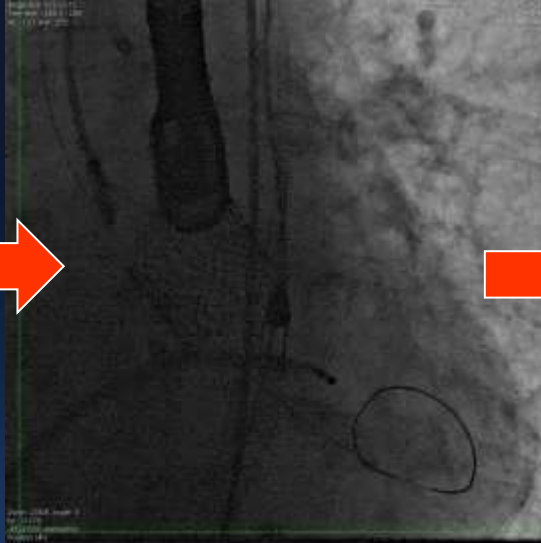
- Severe left ventricular dysfunction (**EF < 30%**)
- **Shock or hypotension**
- The target lesion is the sole remaining conduit
- The presence of dissection. The patient should be managed conservatively for approximately 4 weeks to permit the dissection to heal before treating the lesion with the Rotablator system.
- Lesion angulation in excess of 45°
- Occlusions through which a guide wire will not pass
- SVG lesions
- Angiographic evidence of thrombus
- Unavailability of CABG
- **Severe 3-vessel or unprotected LM disease**
- **Lesion length in excess of 25 mm**



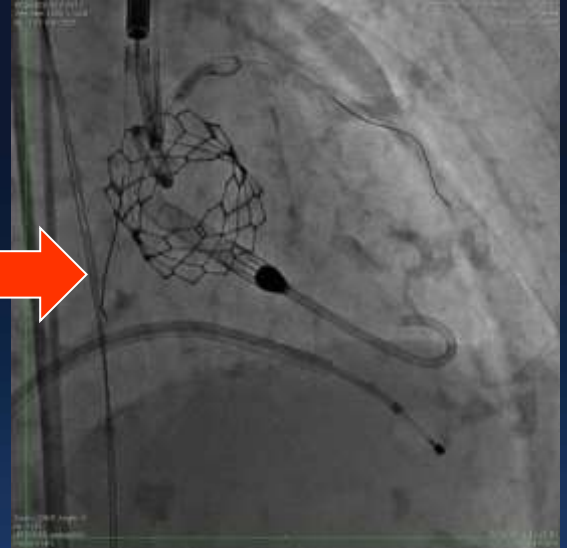
# I really wish for...



**TAVI**



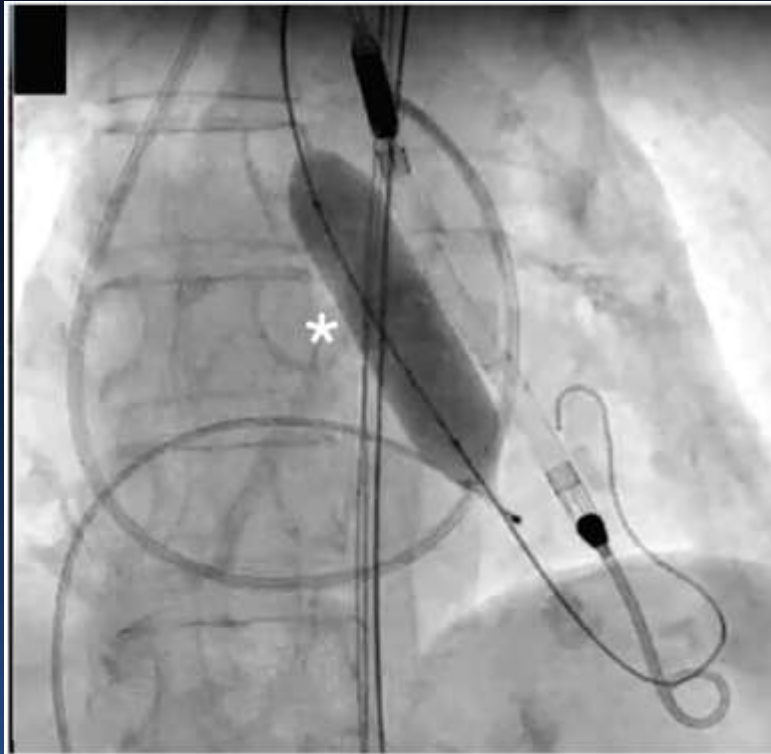
**Impella CP  
Via 14Fr E-sheath**



**PCI**

Credit: Ateet Patel M.D., Emory University, TVT2016

# I wish for....



- Balloon aortic valvuloplasty followed by Impella-assisted high risk PCI
- BAV to open AV for Impella placement

# What is possible ?

Clinical Case Report

Medicine®

OPEN

**Aortic stenosis complicated by cardiogenic shock treated by transcatheter aortic valve replacement with extracorporeal membrane oxygenation**

**A case report**

Jiabing Huang, MD, PhD, Pengfei Chen, MD, PhD, Xinqun Hu, MD, PhD, Jianjun Tang, MD, PhD, Zhenfei Fang, MD, PhD\*

**VA-ECMO → Protected PCI + TAVI**

## Other options...

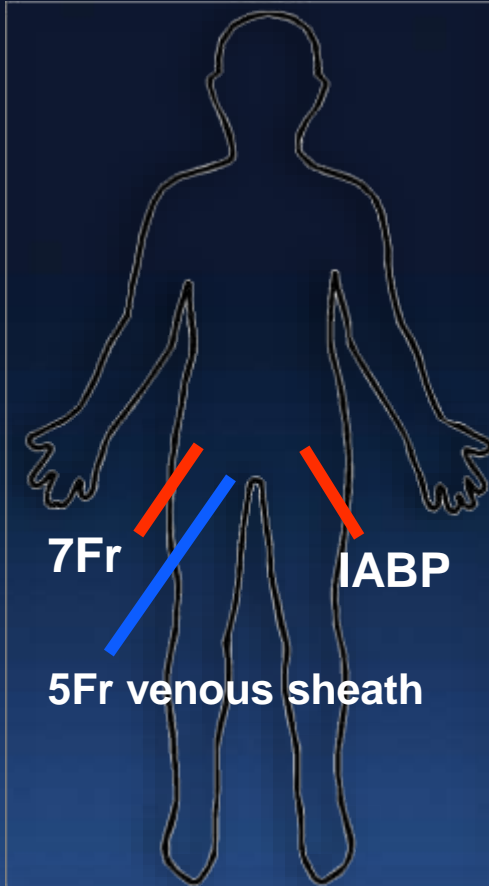
- **VA-ECMO/ IABP for support tonight → CABG + AVR in the morning**
- **CHIP PCI to mvCAD alone under IABP/ ECMO**
- **?? BAV → what if the patient develops significant acute AR**

## FACTs

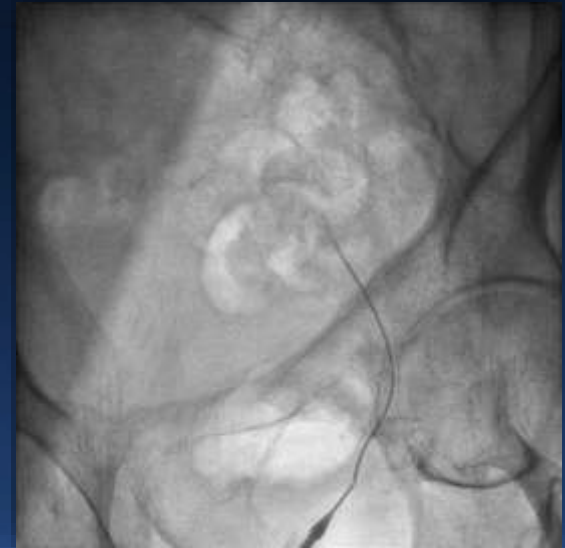
- Surgical turndown
- IABP or VA-ECMO are 2 options for MCS
- No TAVI as urgent or emergent option
- Concern about consequence of BAV
- RA for PCI to mvCAD may be too high risk in the current setting

# Prepare the access for IABP +/- possible VA-ECMO

7Fr 35 cm long sheath  
via Rt CFA

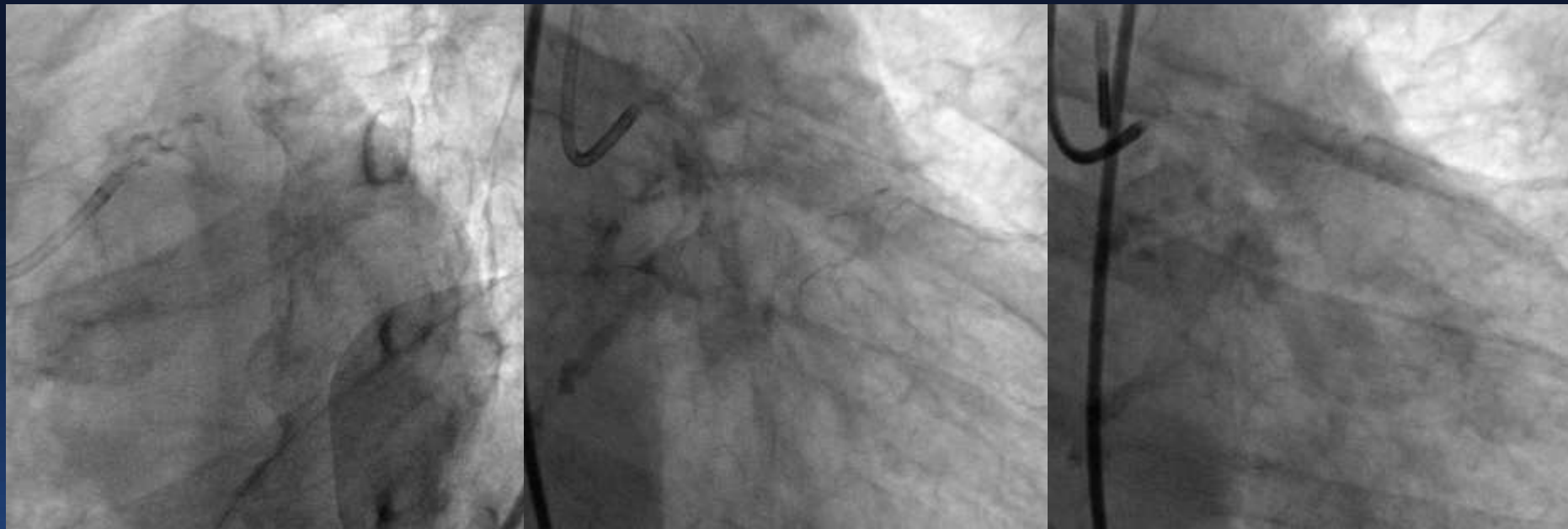


40 ml IABP via Lt CFA





# Left coronary system

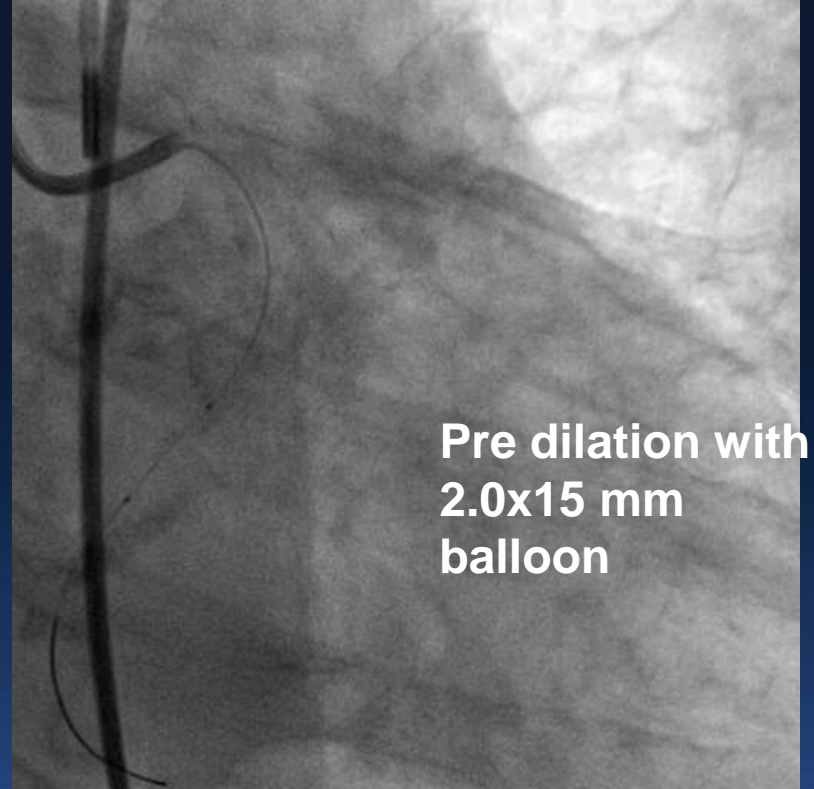


7 Fr EBU 3.5 guide catheter

# PCI to LCx

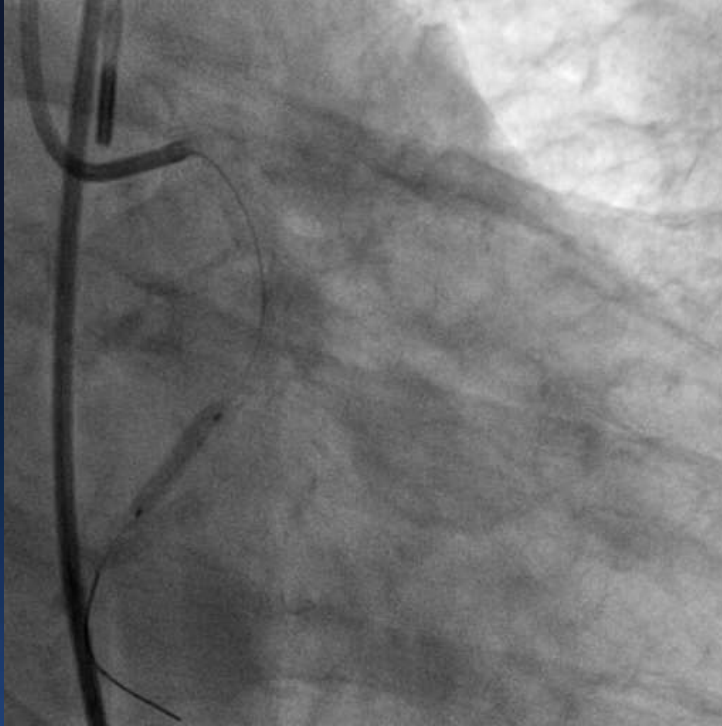


**7Fr EBU 3.5 Guide catheter**

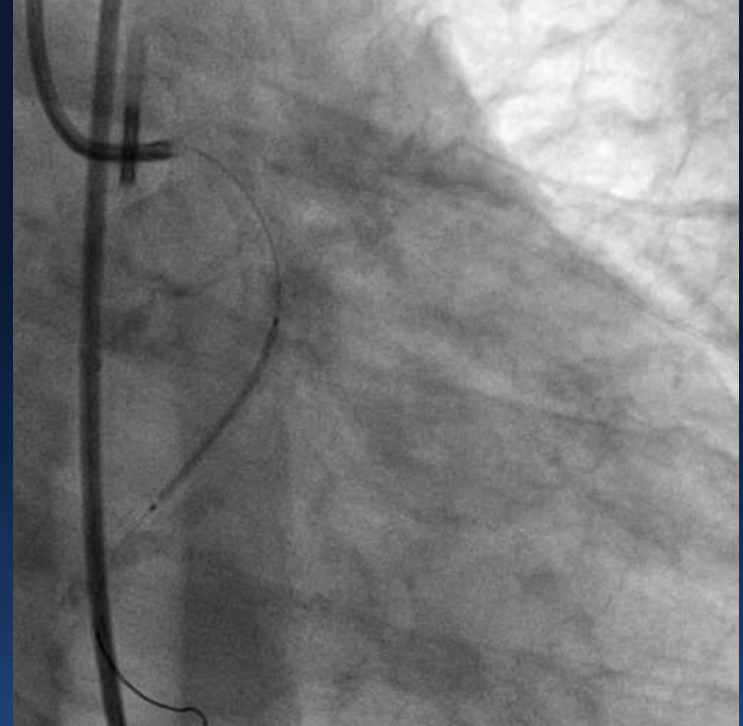


**Runthrough NS Xtra Floppy in LCx**

# PCI to LCx

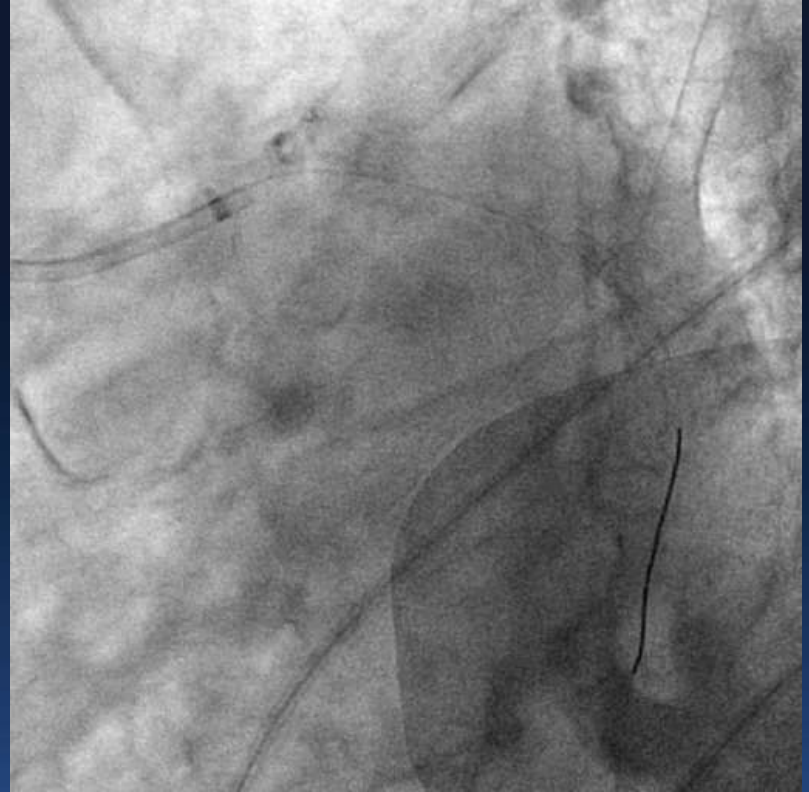
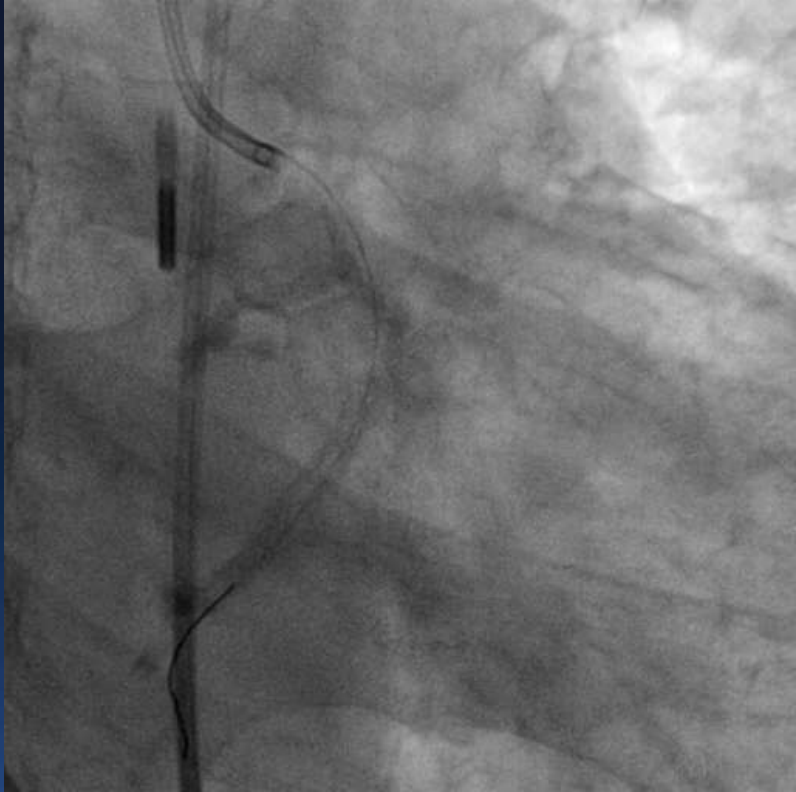


**2<sup>nd</sup> Pre dilation with 3.0 mm  
NC balloon**

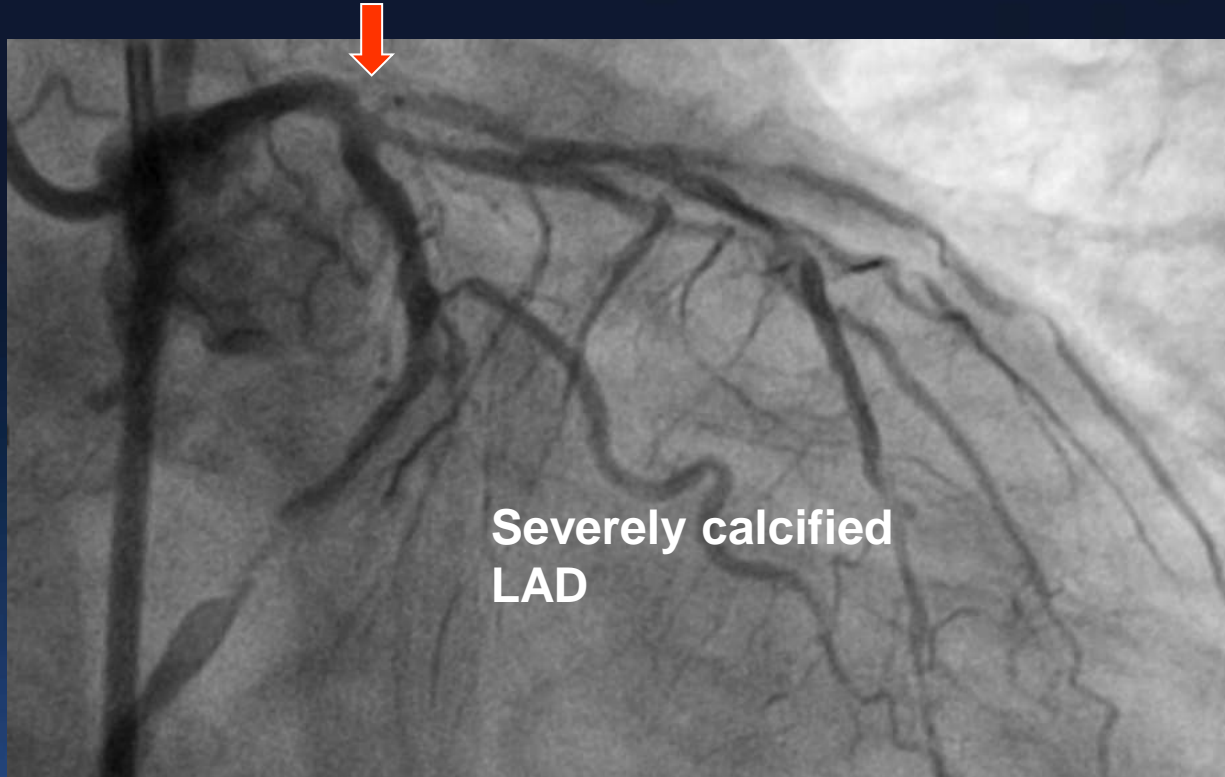


**DES 3.0x26 mm at 14 ATMs**

# Final result of LCx PCI

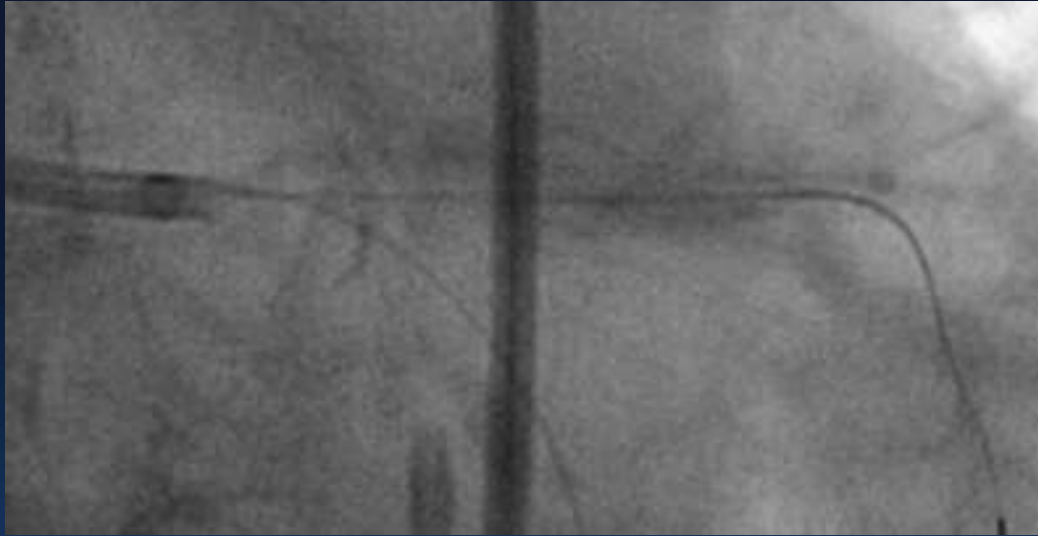


# How should we deal with calcified LAD ?

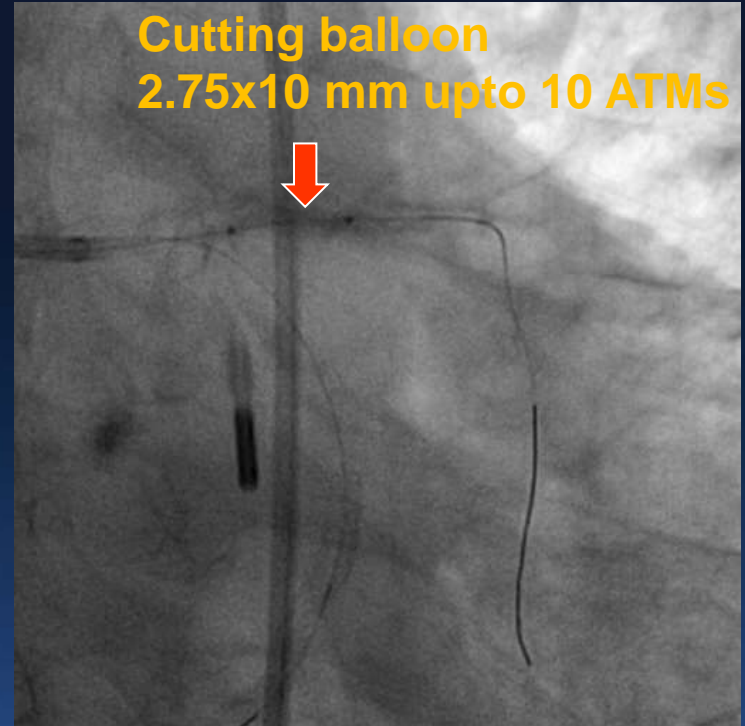


- Ad hoc rotational atherectomy at midnight?

# PCI to distal LM - LAD

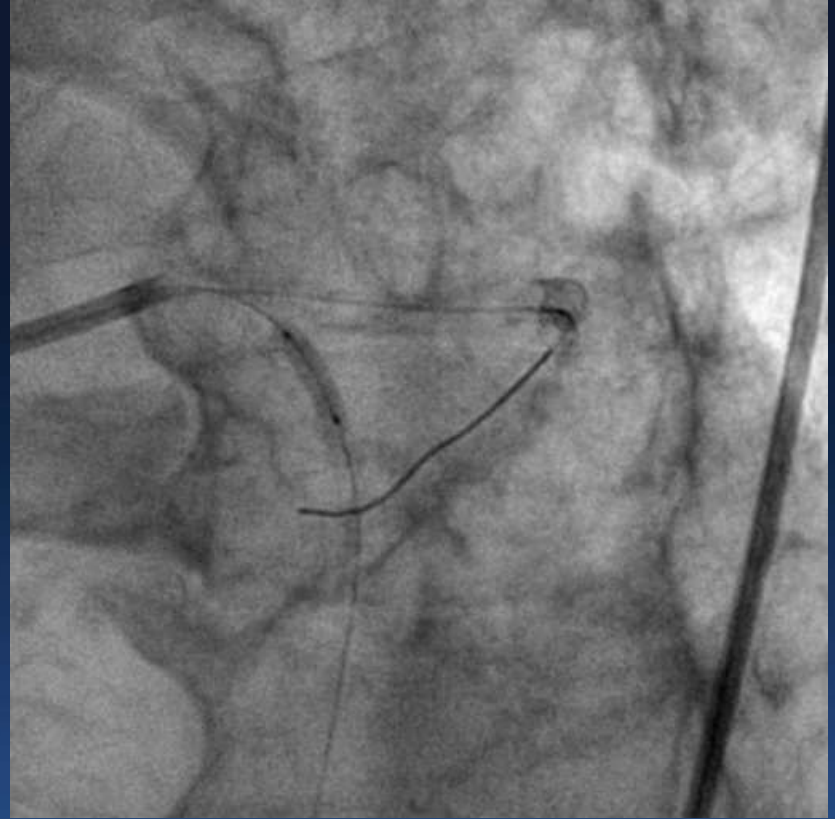
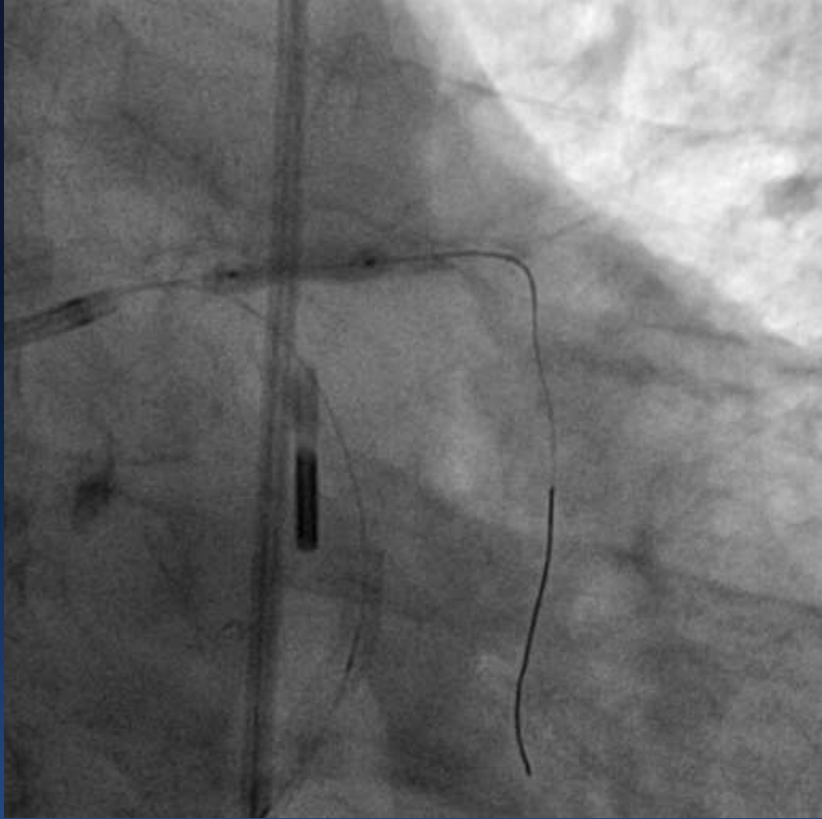


**Diffuse + severely calcified LAD**



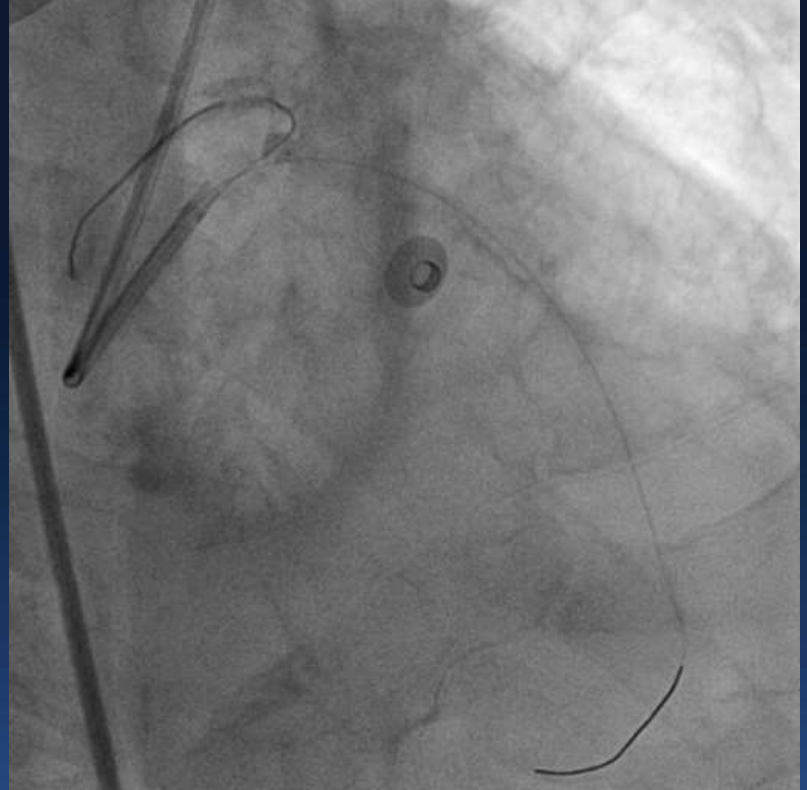
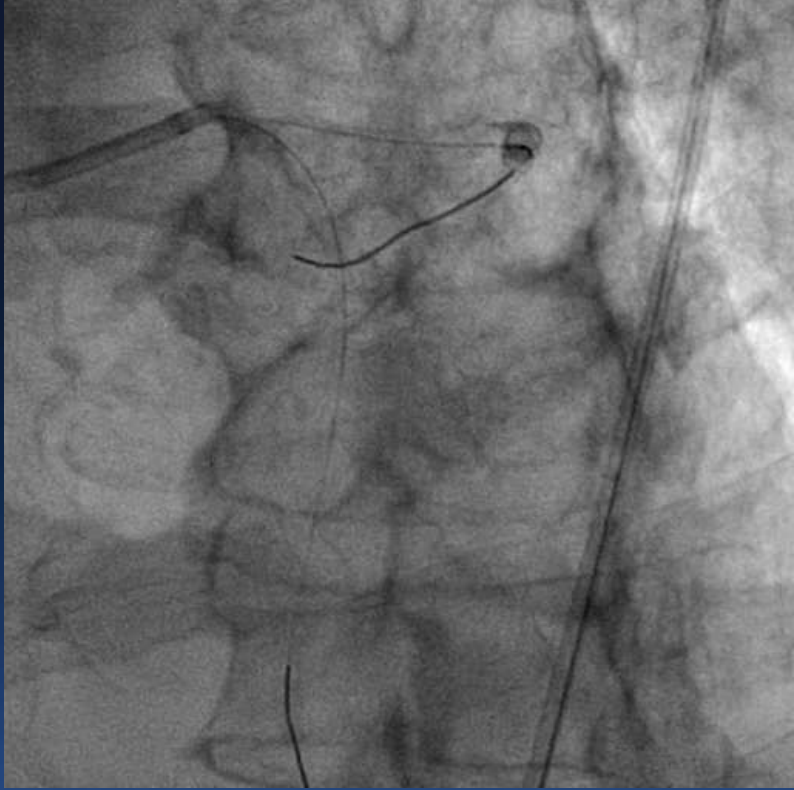
Can we avoid ad hoc rotational atherectomy?

# PCI to distal LM - LAD



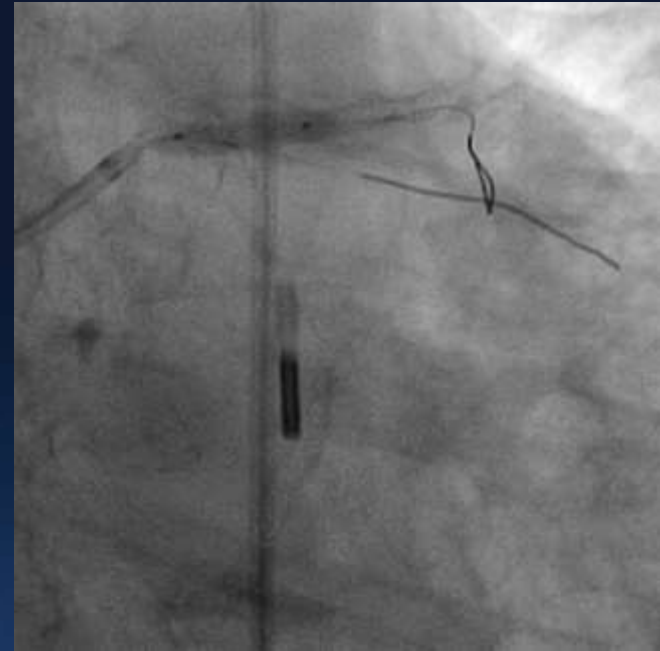
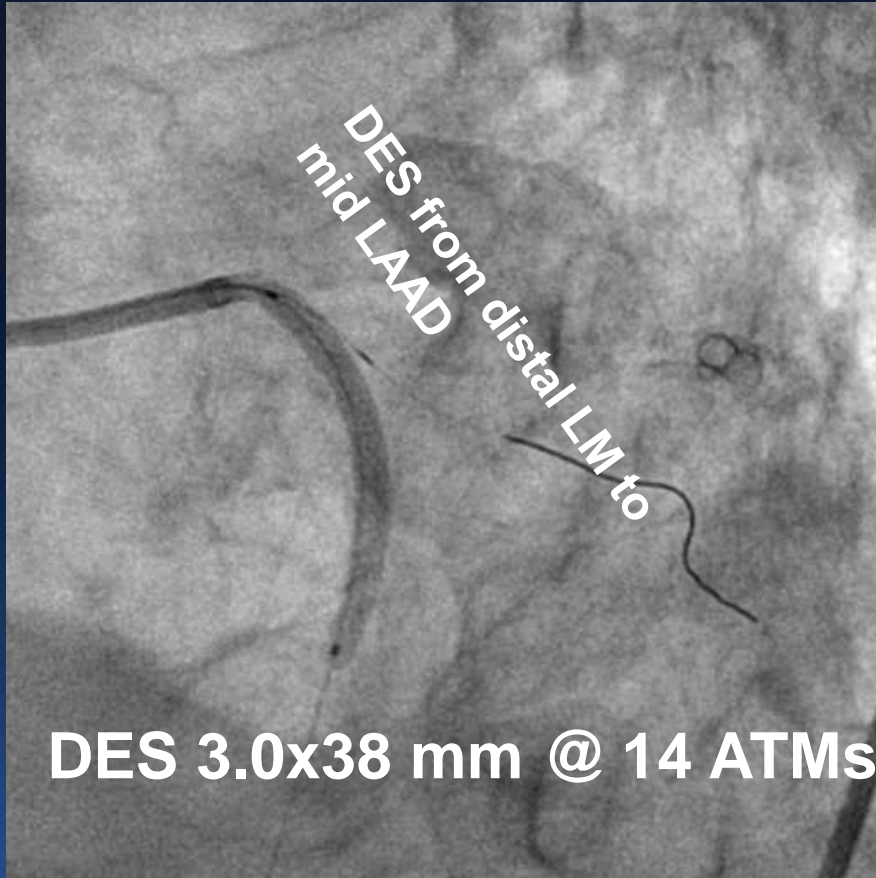
**Dilation with 3.0 mm NC balloon 16-22 ATMs**

# s/p Cutting balloon + NC balloon

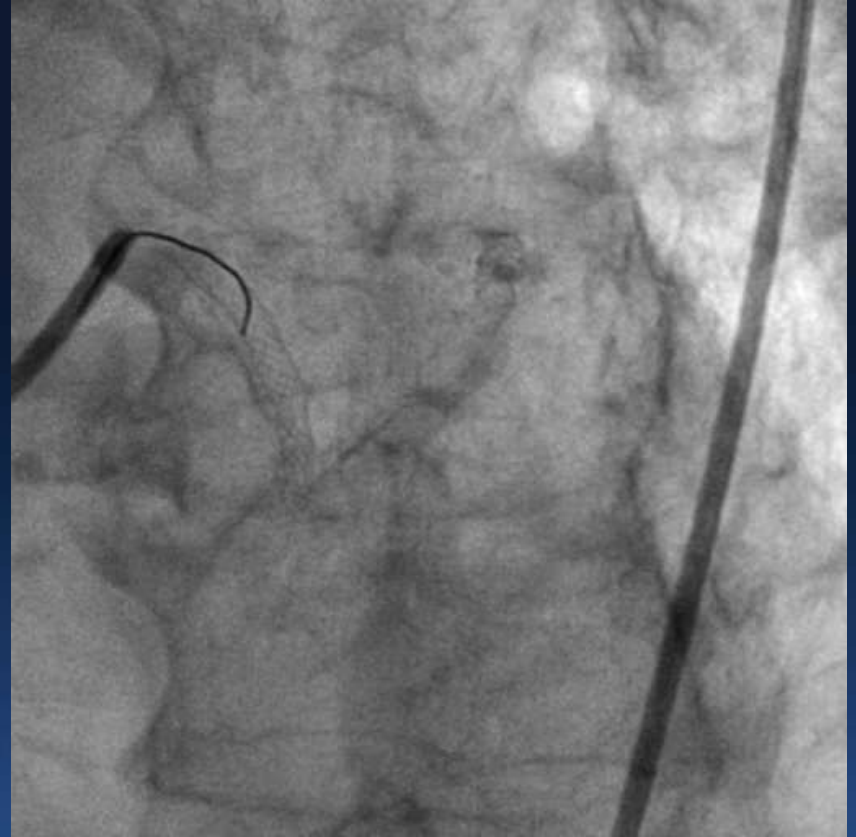
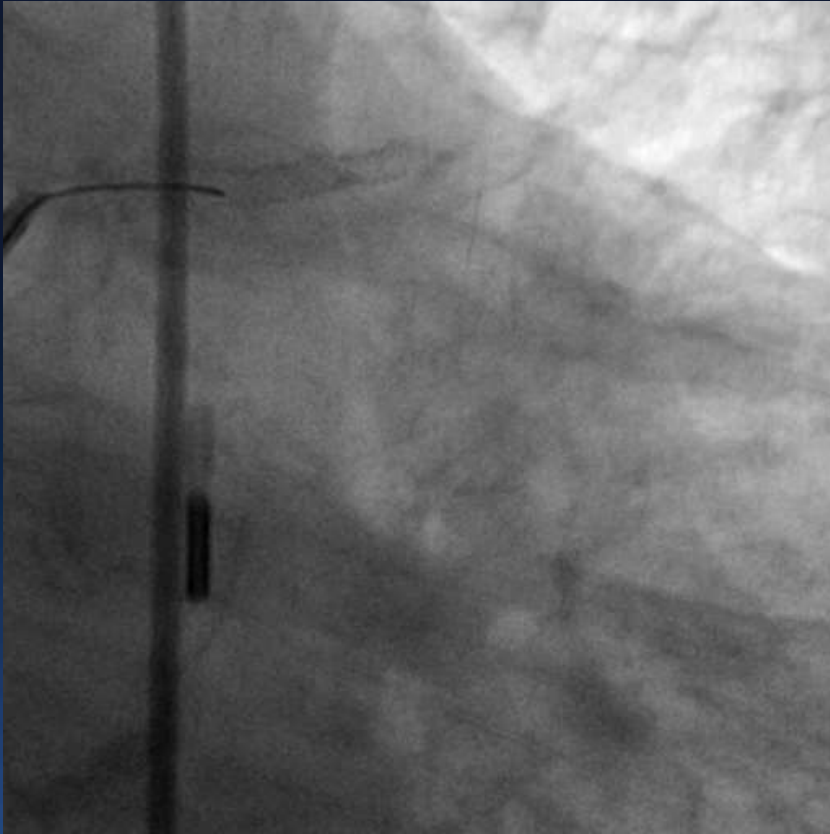




# Stenting to distal LM- LAD



# Final distal LM-LAD result

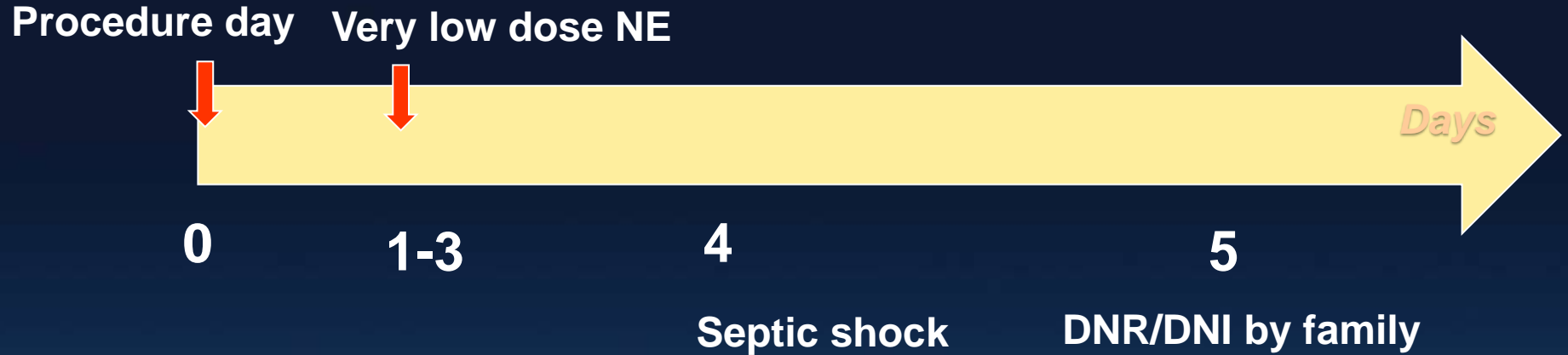


Able to wean down rate of NE drip in cath lab

# Post PCI Plan

- **Wean off IABP & vasopressors**
- **Treat pneumonia**
- **Consult heart team for elective TAVI**

# Hospital Course



**Win in the (1st) battle, but lost in the war....**

# Discussion

- Strategy for patient with AS + mvCAD with shock
- Need / type of advance MCS
- Strategy for plaque modification in patient with cardiogenic shock



***Thanks for your attention***

***Supawat Ratanapo, MD, FACC, FSCAI***