AMI and The Resurrection

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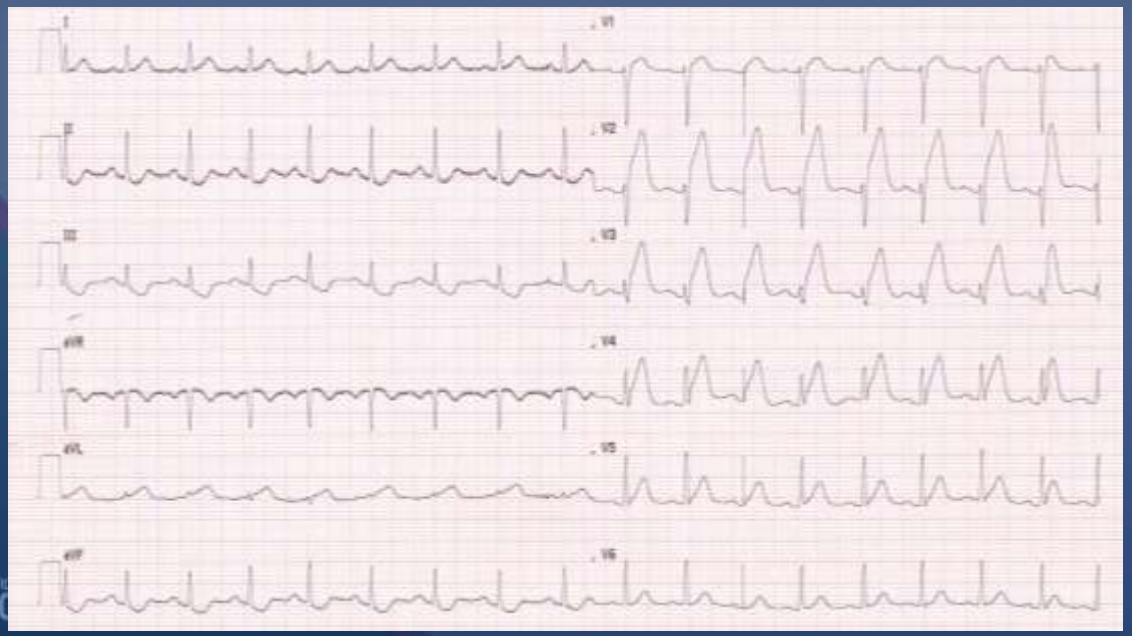
- 45 –year– old male presented with acute typical chest pain for 2 hr , radiate left arm , sweating
- No underlying disease / medication
- Risk factor : Heavy smoker
- BW 70 kg , Height 160 cm , BSA 1.73 m2
- Bp 114 /72 PR 100 bpm RR 18/min

  Jvp : not elevated

  Lungs : no crepitation

  CVS : no mm

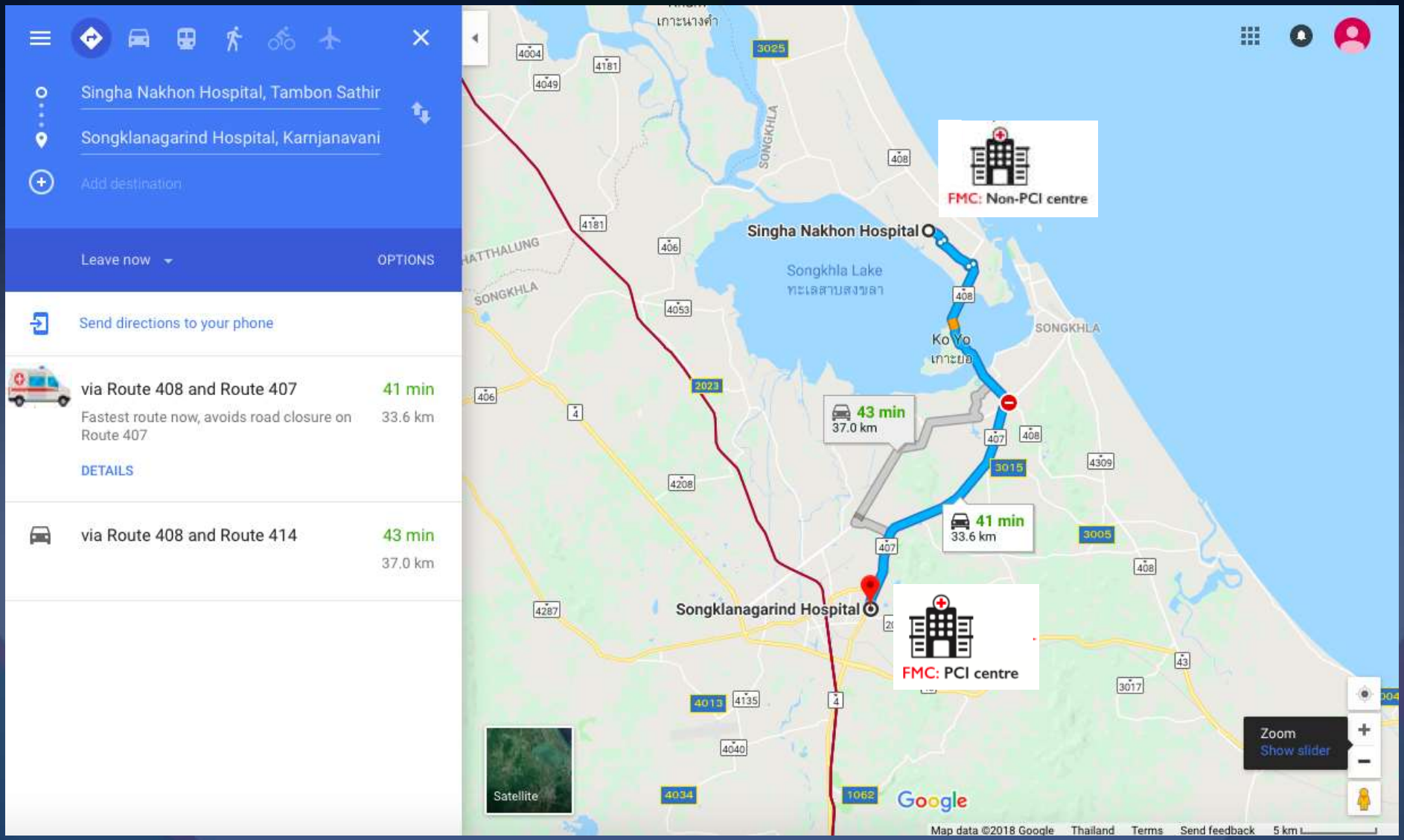


ECG : STE in lead V1-5 , avL with reciprocal change in II,III,avF

Diagnosis : Acute extensive anterior wall STEMI
Refer for primary PCI

Medication

Aspirin (81) 4 tab oral ,
Clopidogrel 600 mg ,
Morphine 3 mg v


Singha Nakhon Hospital, Tambon Sathir
Songklanagarind Hospital, Karnjanavani
Add destination
Leave now
OPTIONS
Send directions to your phone
via Route 408 and Route 407
41 min
Fastest route now, avoids road closure on Route 407
33.6 km
DETAILS
via Route 408 and Route 414
43 min
37.0 km
FMC: Non-PCI centre
Singha Nakhon Hospital
Songkhla Lake
ทะเลสาบสงขลา
Ko Yo
เกาะยอ
43 min
37.0 km
41 min
33.6 km
Songklanagarind Hospital
FMC: PCI centre
Satellite
Zoom
Show slider
Google
Map data ©2018 Google
Thailand
Terms
Send feedback
5 km

During transportation

- *(transfer time from first hospital to ER = 45 minutes)*
- On ambulance : VF –
  - CPR about 3 cycles /defib –> ROSC
- At our ER – cardiac arrest again– start CPR
- Initial ECG at ER = VF
  - Start CPR again for 15 min –> no sign of ROSC
  - persistent VF despite multiple defibrillation / amiodarone / xylocain
- However ,the patient still had some response , movable

What else could we do?

WHAT TO DO NEXT ?

A. Continue CPR and pray for luck

B. Continue CPR and move to cath lab immediately
(while CPR on the way to cath lab)

C. Place IABP bedside and move to cathlab

D. Apply autopulse machine and move to cathlab

E. Place another high level of hemodynamic support devices and transfer patient to cath lab

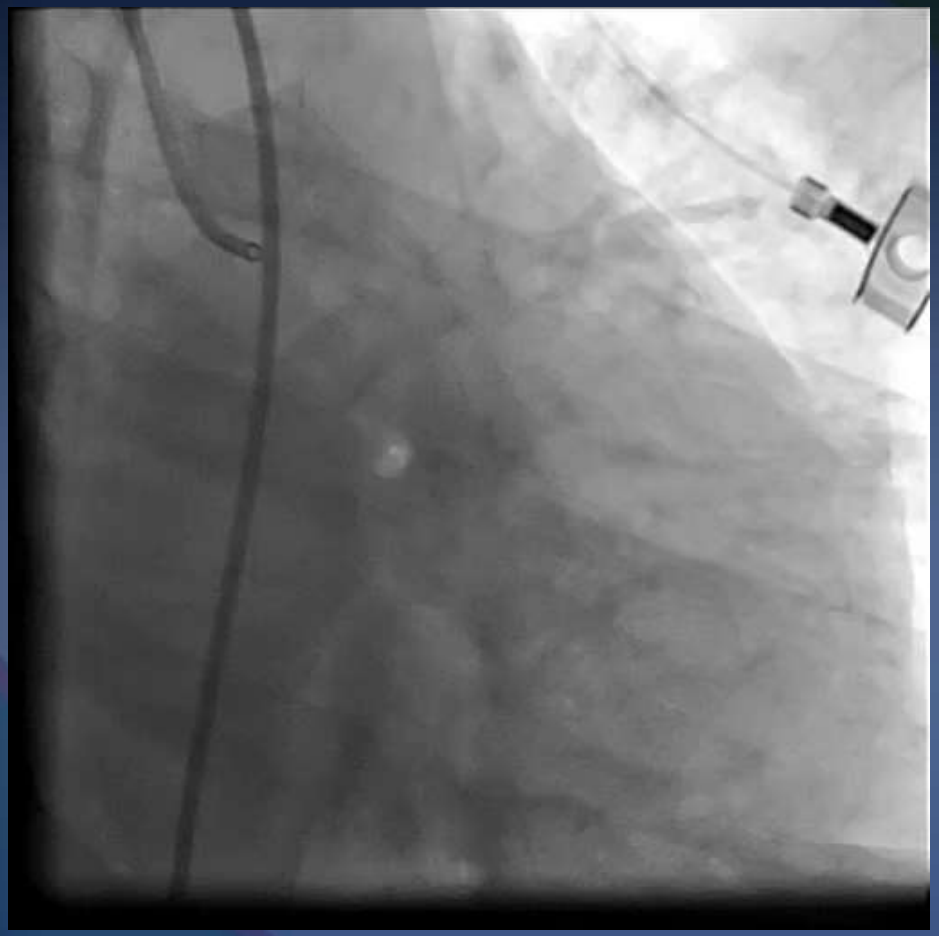
F. Let him go !

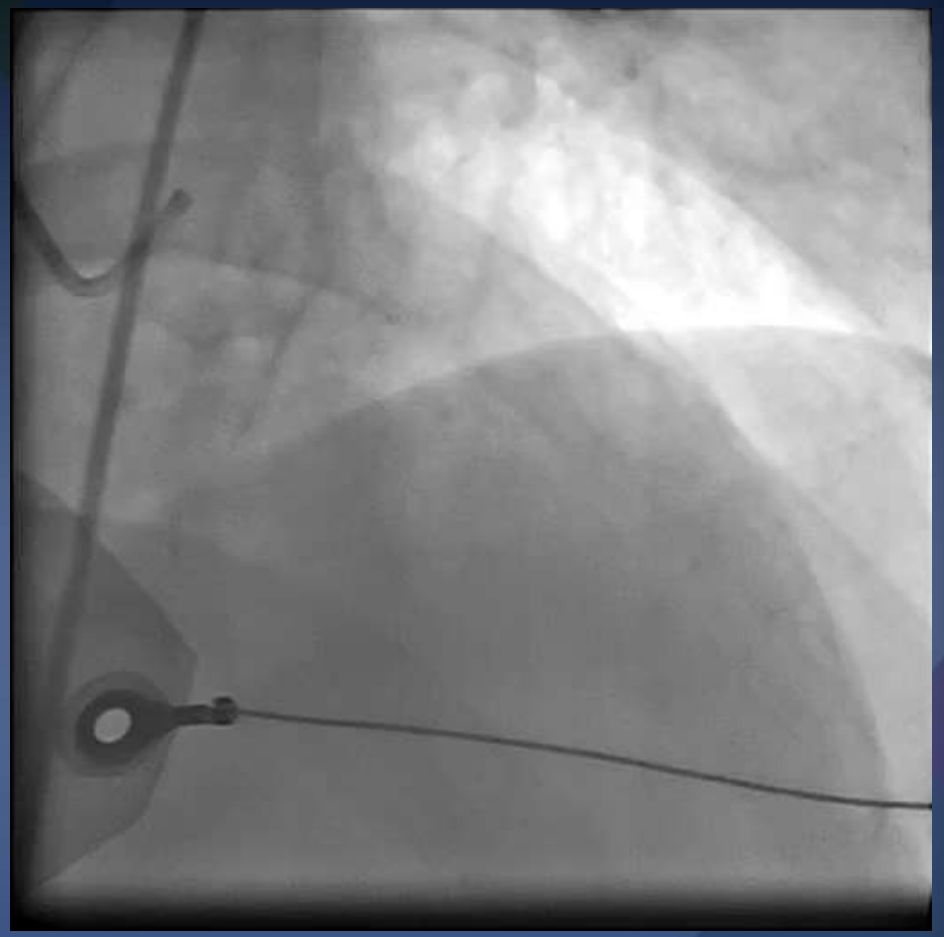
Activate ECMO team

- Limitation of equipment to initiate bedside VA – Ecmo at ER
- CPR all the way to OR (< 5 min to OR)
- Cannulate peripheral VA ECMO via Rt femoral (surgical –approach)
  - Arterial cannula 19 Fr
  - Venous cannula 24 Fr
  - Distal perfusion cannula 8 Fr
- ECG return to sinus with defibrillation after stabilize on VA – Ecmo
- Full support ECMO flow (4.2 lpm) + High dose inotrope : adrenaline (60:1) v 8 ml/hr + levophed (60:1) v 30 ml/hr
- Move directly to cathlab for primary PCI

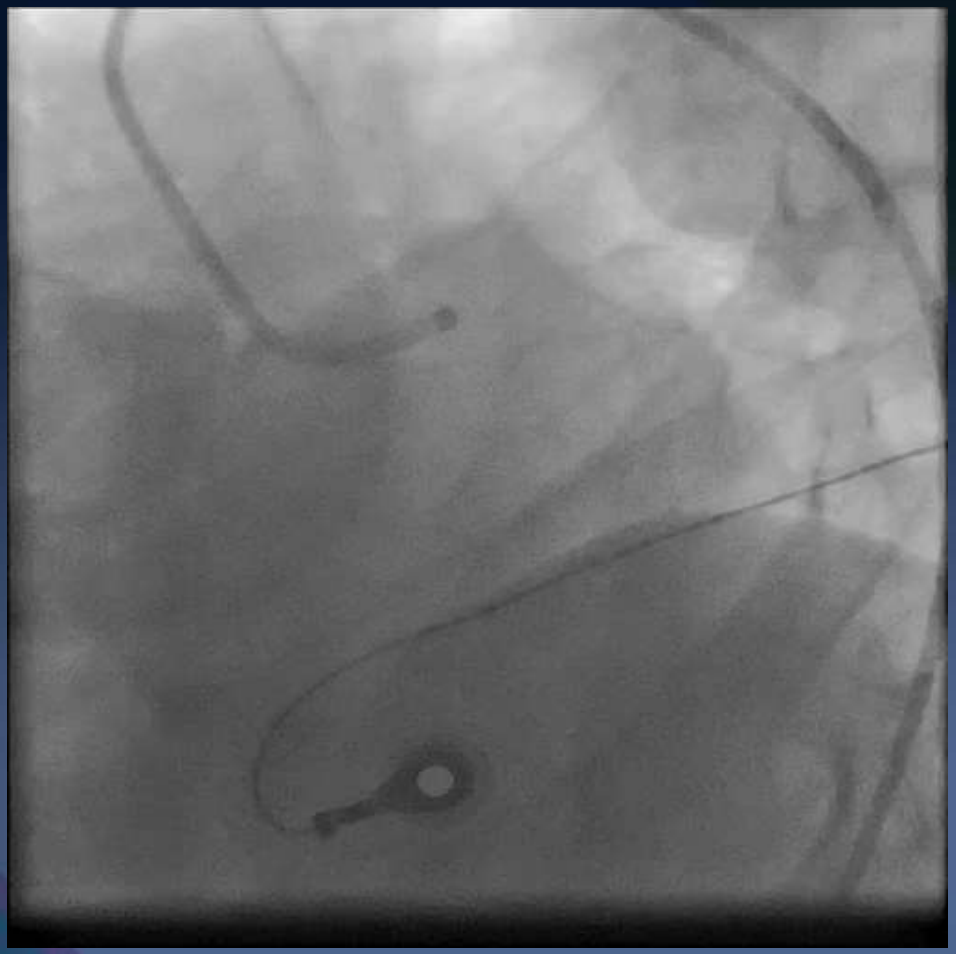
(total arrest time from ER to initiate ECMO flow = 50 mins)

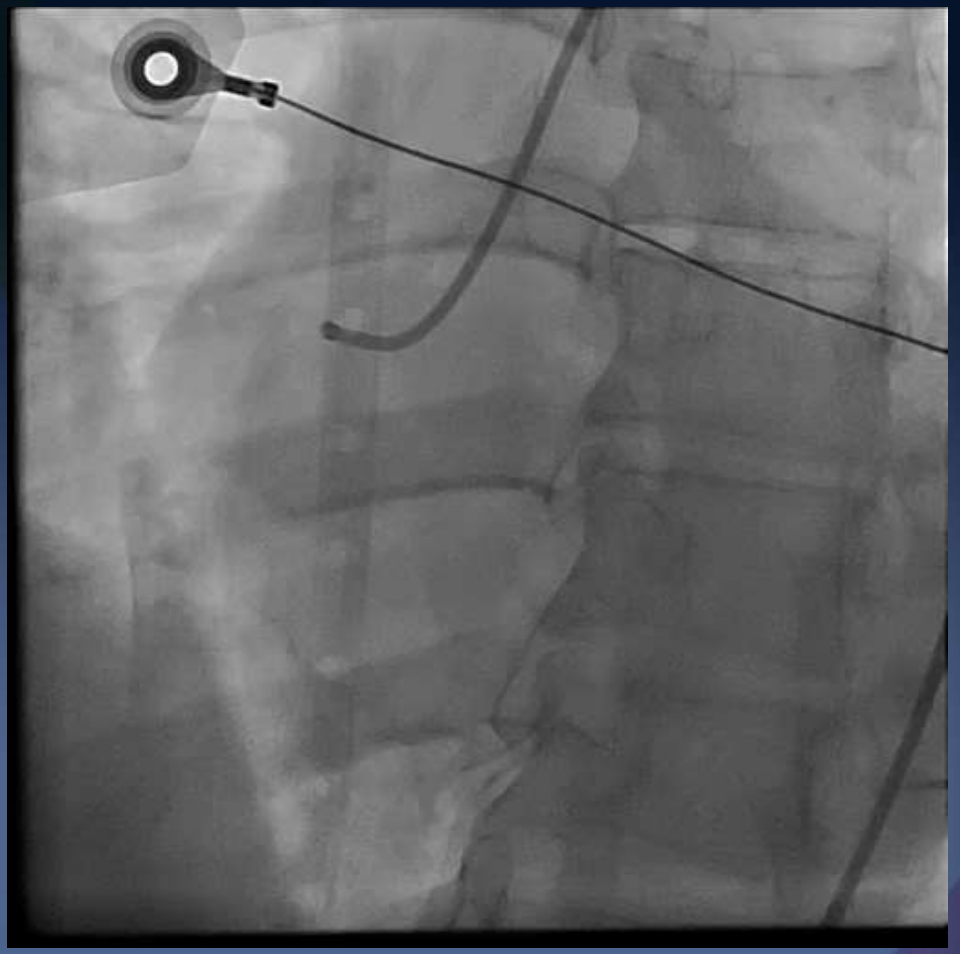
Coronary angiography





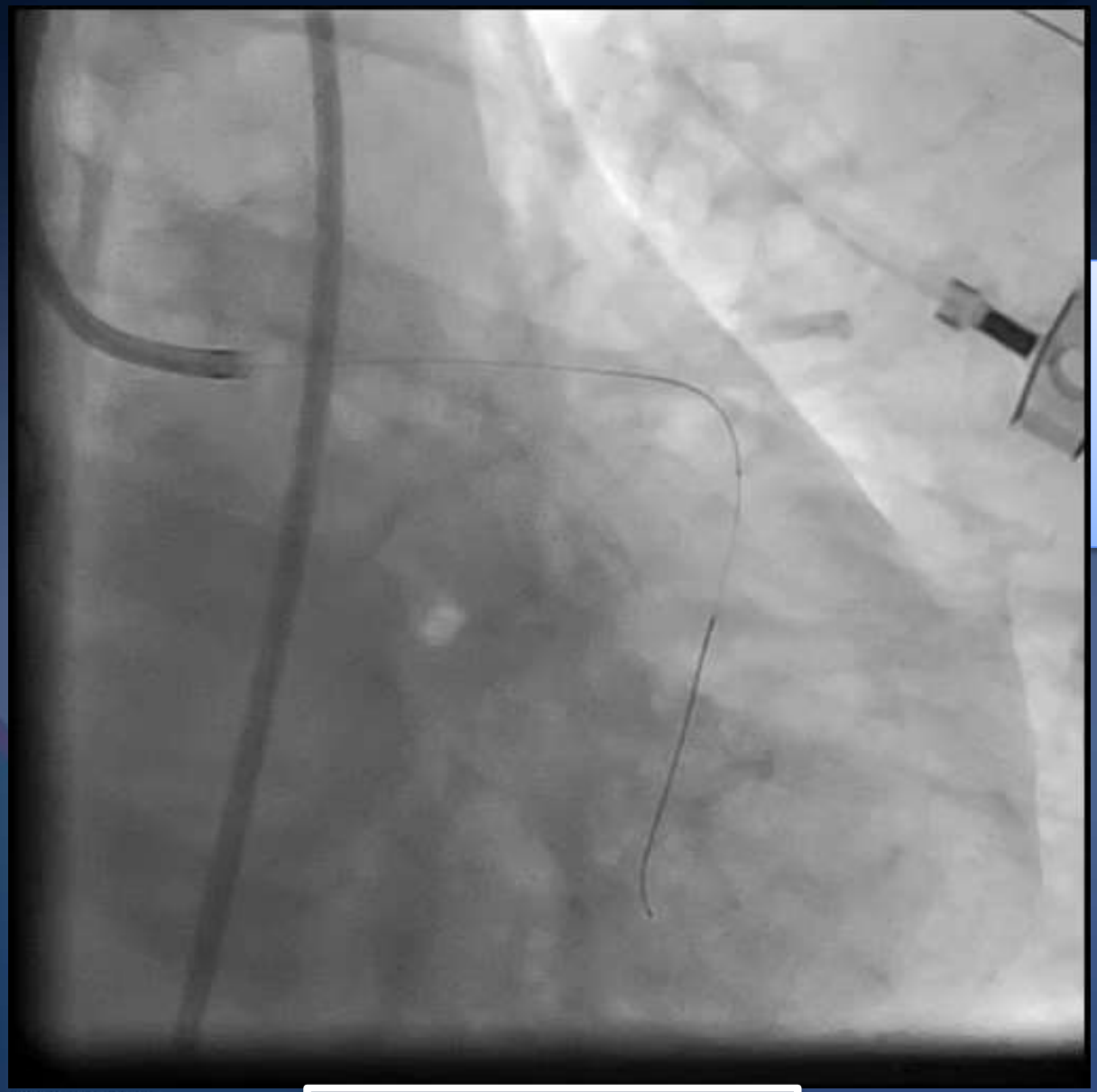
CAG left femoral approach
- u/s guided puncture
- JL4 JR 4 6 Fr





Finding

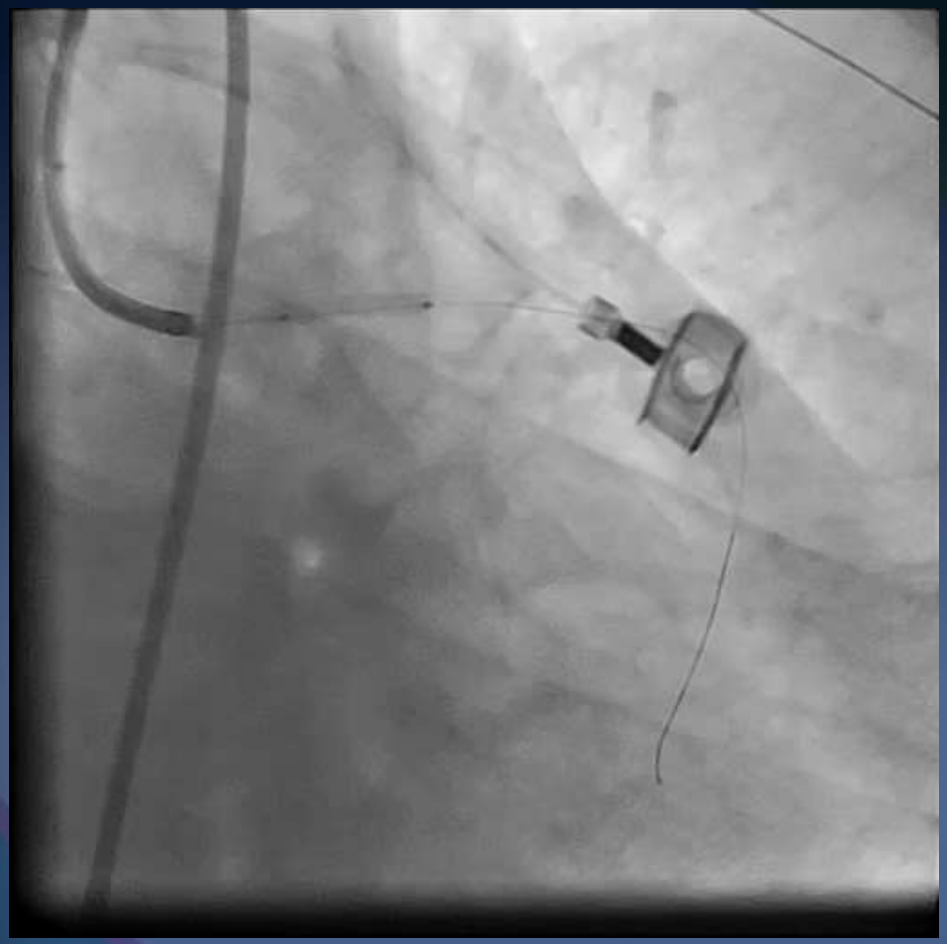
- Severe stenosis pLAD with thrombus , TIMI 2
- normal RCA
- MAP about 65 mmHg with minimal pulsatile on a line

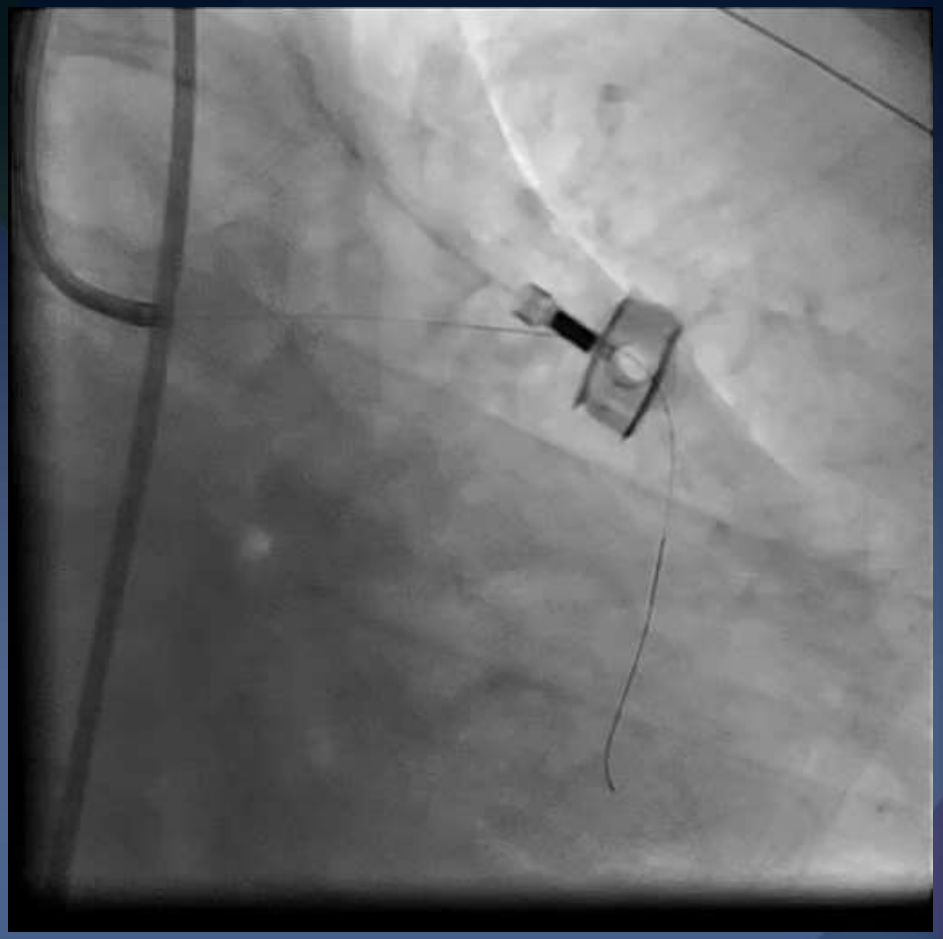


After first thromboaspirate

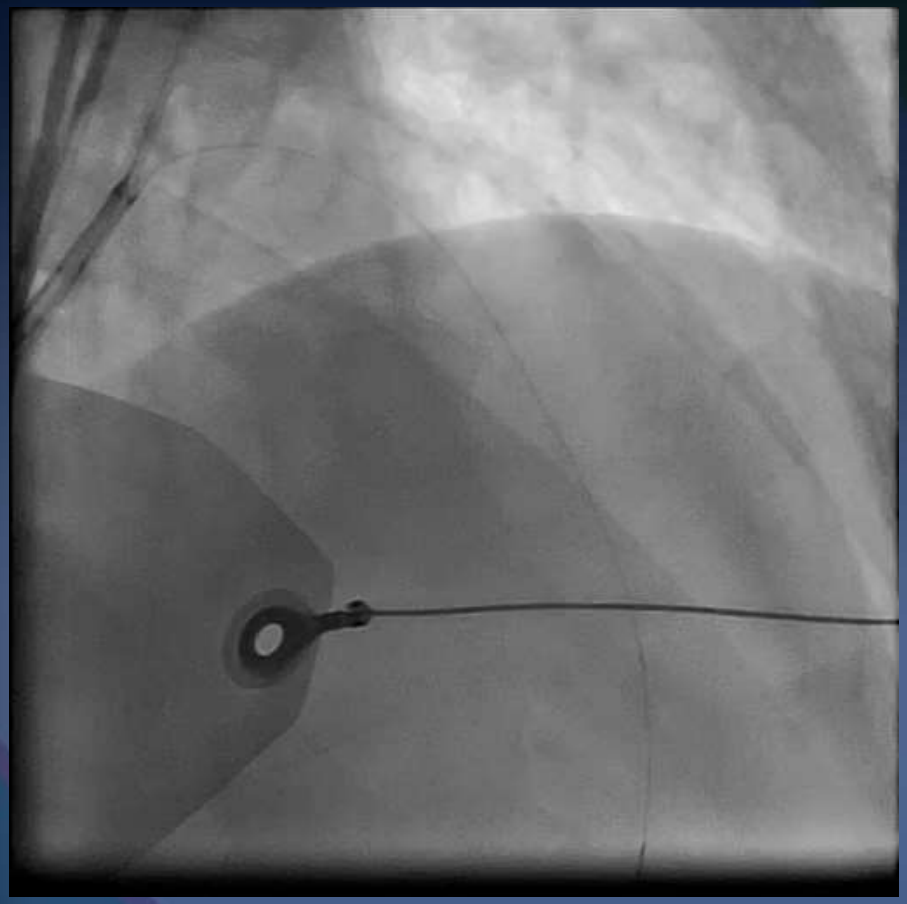
- Start primary PCI with XB 3.5 6 Fr guiding catheter
- Wiring into LAD and aspi rate thrombus
- Small thrombus obtained

Give Integrillin IC

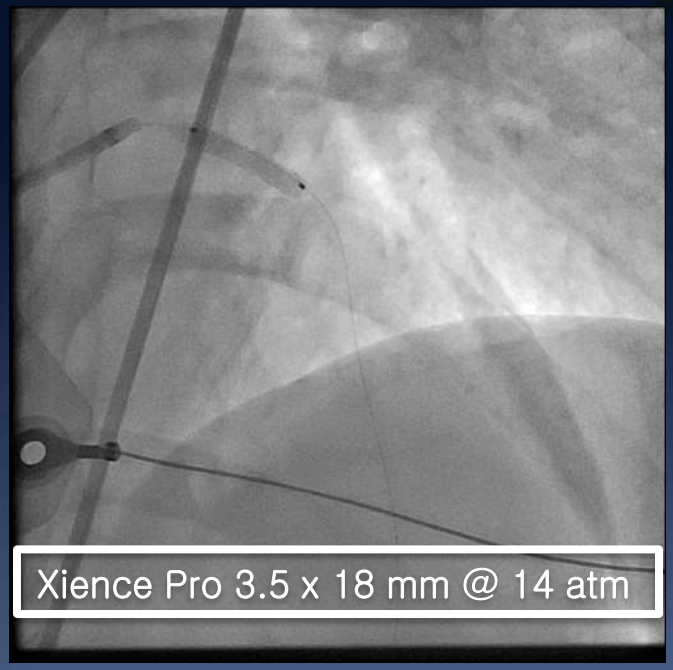




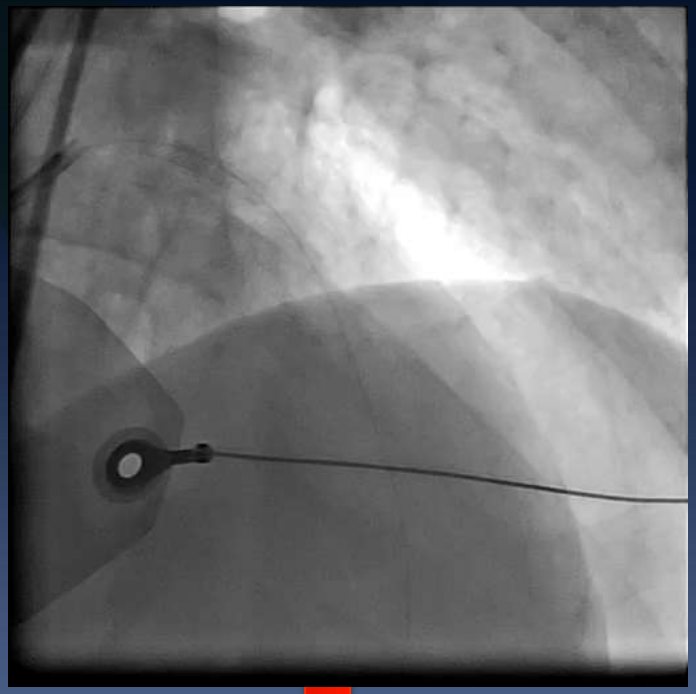
Balloon 2.5 x 15 mm @ 14 atm

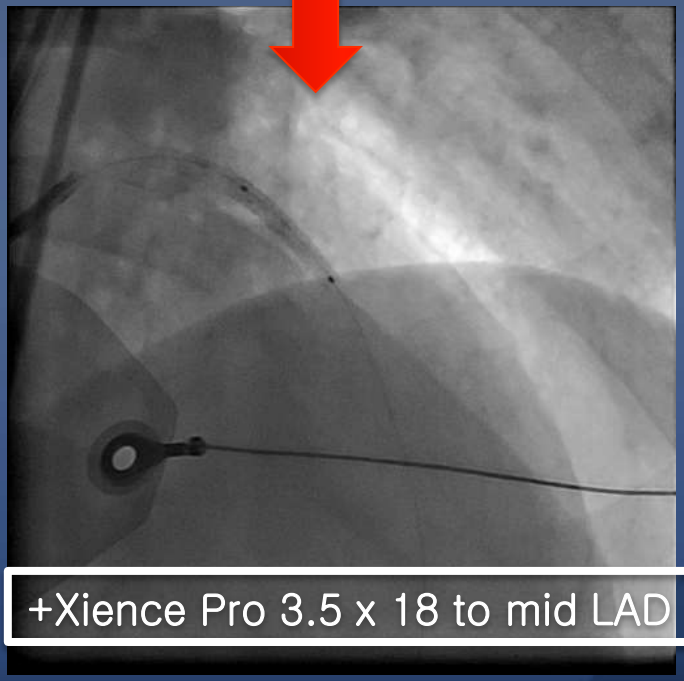


Xience Pro 3.5 x 18 mm @ 12 atm

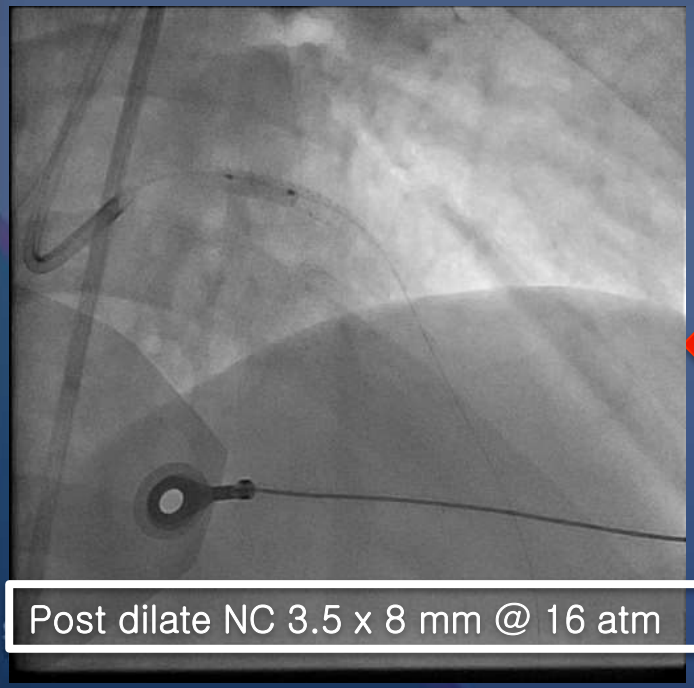


Xience Pro 3.5 x 18 mm @ 14 atm



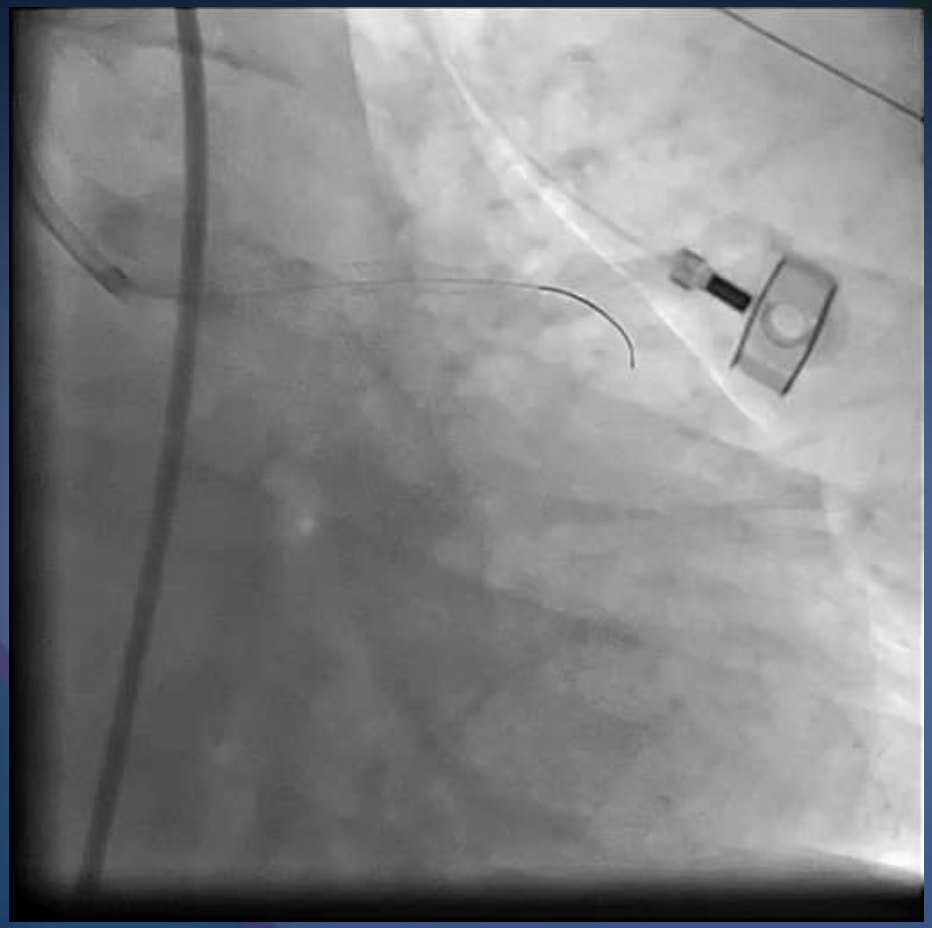


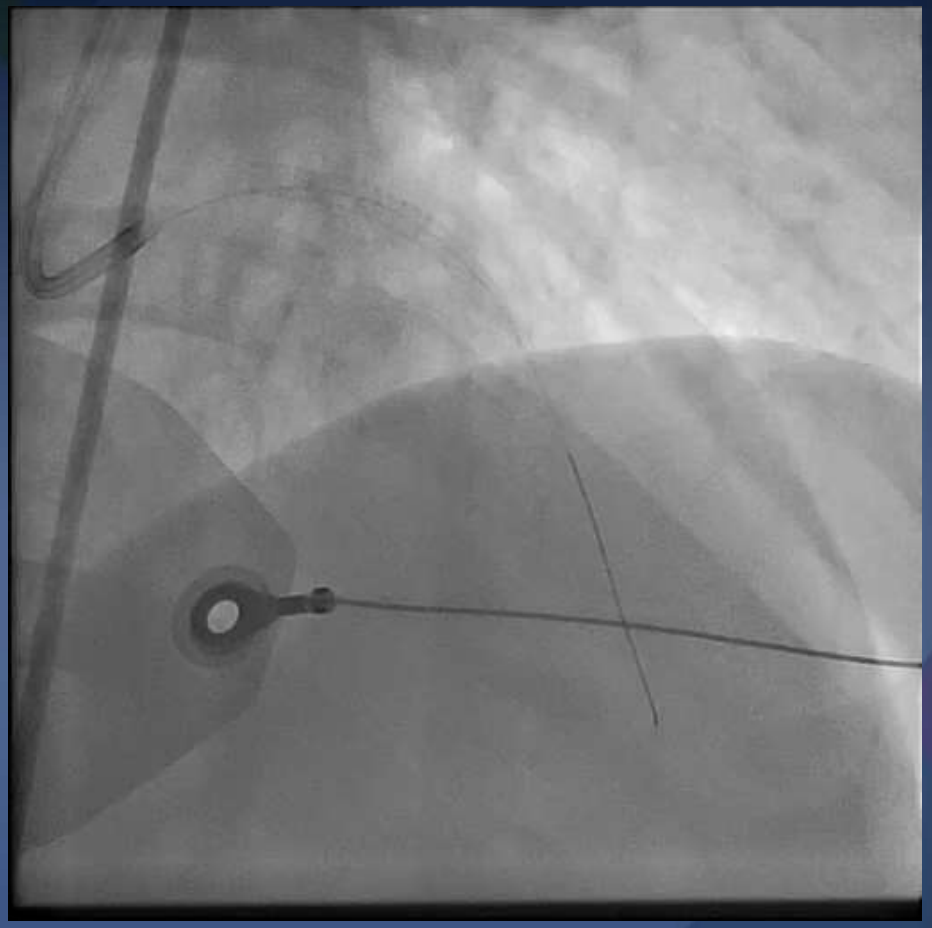
+Xience Pro 3.5 x 18 to mid LAD



Post dilate NC 3.5 x 8 mm @ 16 atm

Final angiogram





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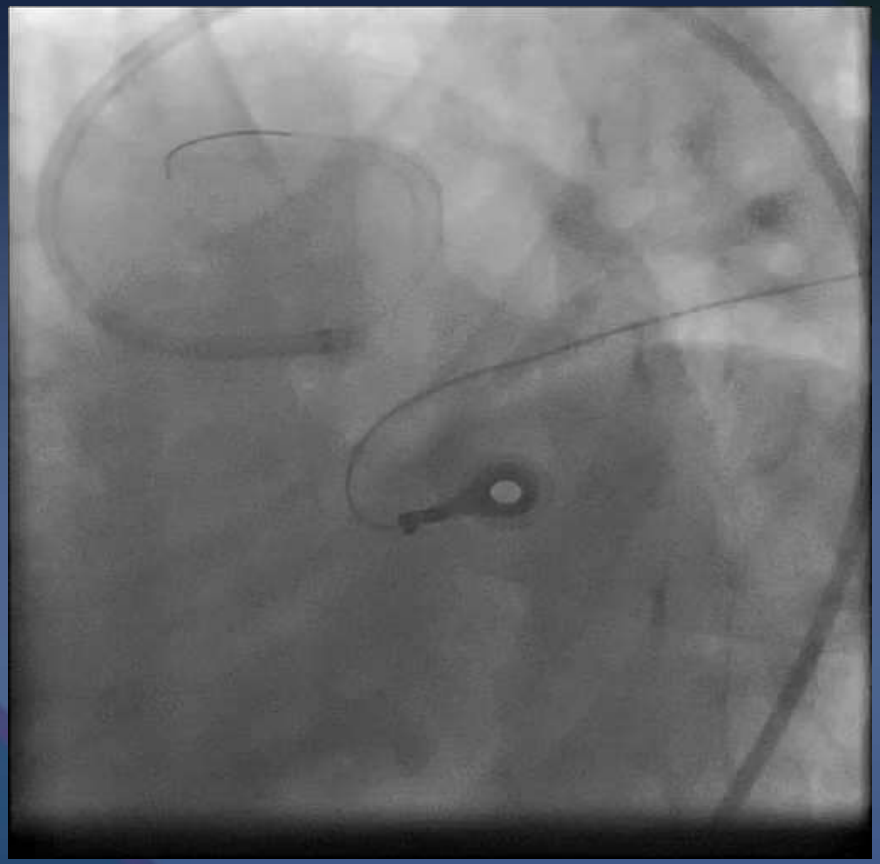
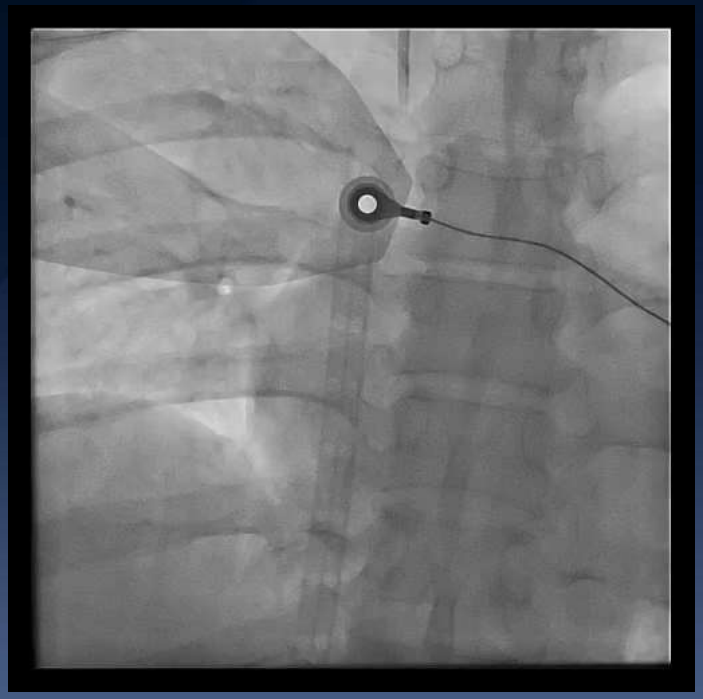
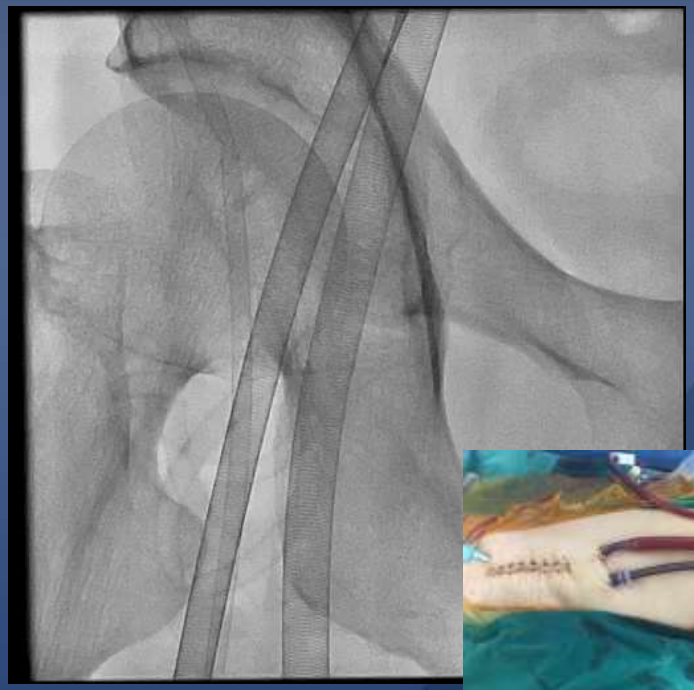






Check cannula position

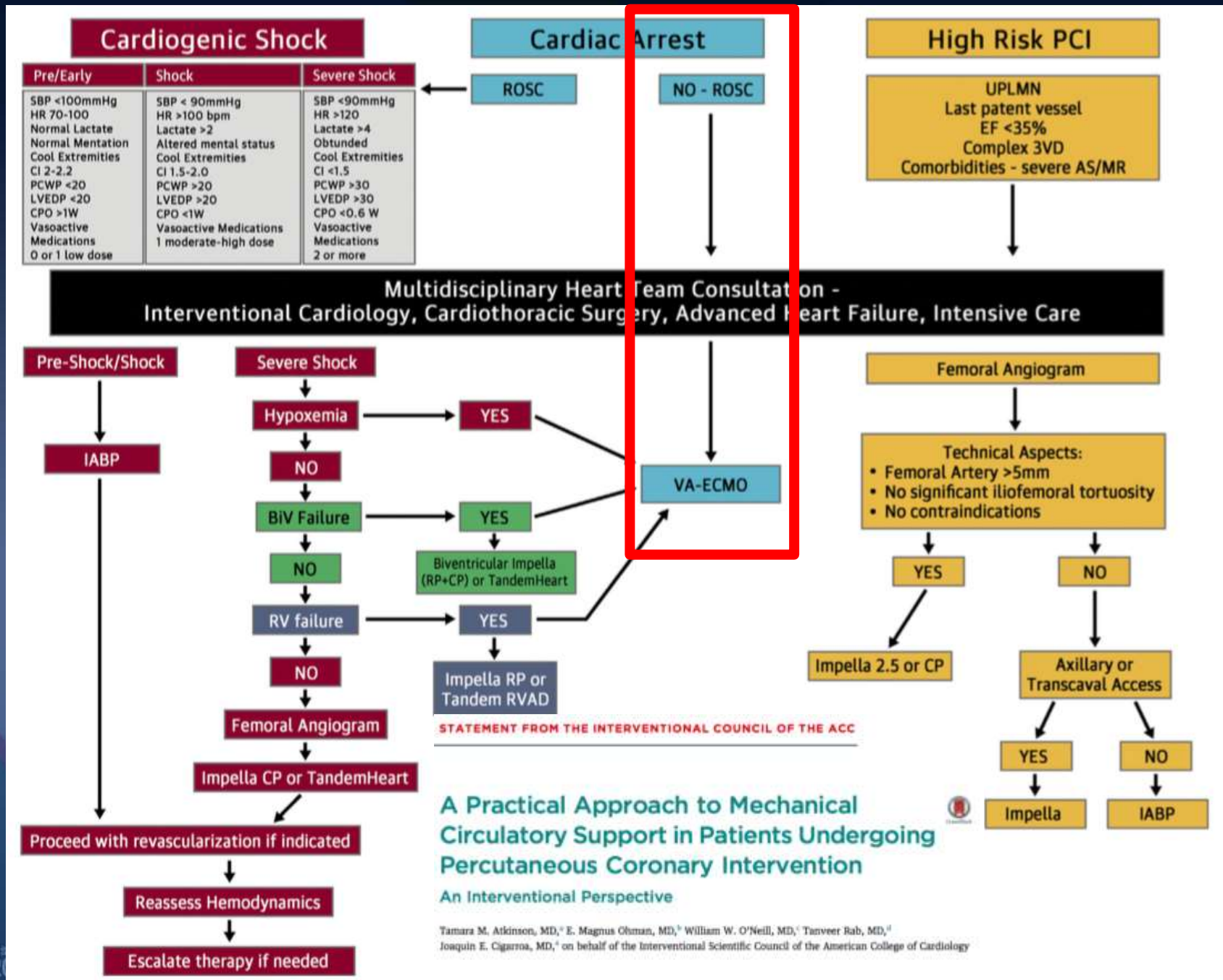
In-hospital course

- At ICU , Gradually gain conscious at ICU without need for therapeutic hypothermia
- Still on high dose inotrope but could taper down
- Echo : poor LVEF 20%, Global hypokinesia with akinesia of anterior wall
- Acidosis gradually improve pH7.2 -> 7.4 ,Lactate 9 -> 2
- De-cannulate on d3 , Extubate on d 4
- Renal function and ischemic hepatitis recovery
- 5 days stay in ICU and d/c on day 8 without significant neurological sequelae

First case ECPR in AMI -STEMI setting that survive in our center

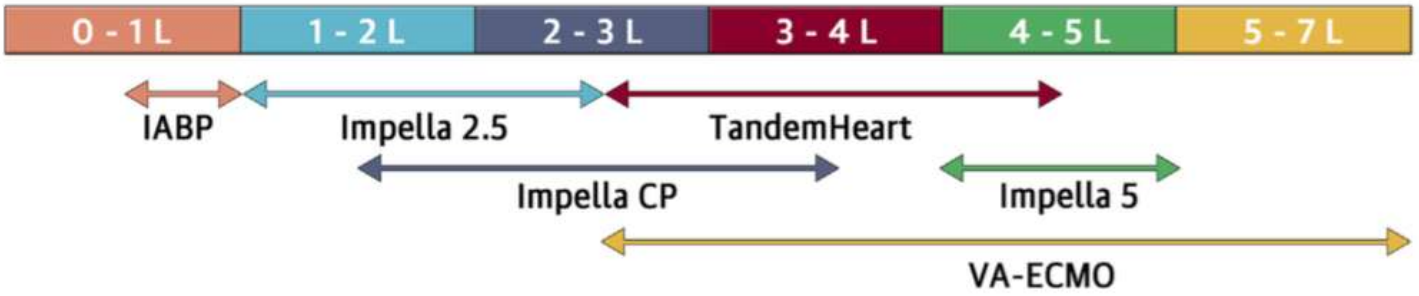
Conclusion

- Good quality CPR improve chance of survival especialy in-hospital cardiac arrest
- VA - Ecmo in CPR (Ecmo-CPR) is viable option for refractory cardiac arrest from STEMI
- But survival on ECMO depends on
  - Case selection
  - Early activation / cannulation to minimize low flow time (arrest to support time)
  - Rapid revascularization for encourage LV recovery
- Working as a team is the key to improve patient outcome (Heart team + ICU team + ER team + perfusionist)
- Choose the right mechanical circulatory support device to the right patient (IABP doesn't work in cardiac arrest patient)


Cardiogenic Shock
Pre/Early
SBP <100mmHg
HR 70-100
Normal Lactate
Normal Mentation
Cool Extremities
CI 2-2.2
PCWP <20
LVEDP <20
CPO >1W
Vasoactive Medications
0 or 1 low dose
Shock
SBP < 90mmHg
HR >100 bpm
Lactate >2
Altered mental status
Cool Extremities
CI 1.5-2.0
PCWP >20
LVEDP >20
CPO <1W
Vasoactive Medications
1 moderate-high dose
Severe Shock
SBP <90mmHg
HR >120
Lactate >4
Obtunded
Cool Extremities
CI <1.5
PCWP >30
LVEDP >30
CPO <0.6 W
Vasoactive Medications
2 or more
Cardiac Arrest
ROSC
NO - ROSC
High Risk PCI
UPLMN
Last patent vessel
EF <35%
Complex 3VD
Comorbidities - severe AS/MR
Multidisciplinary Heart Team Consultation -
Interventional Cardiology, Cardiothoracic Surgery, Advanced Heart Failure, Intensive Care
Pre-Shock/Shock
IABP
Severe Shock
Hypoxemia
YES
NO
BiV Failure
YES
NO
Biventricular Impella (RP+CP) or TandemHeart
RV failure
YES
NO
Impella RP or Tandem RVAD
Femoral Angiogram
Impella CP or TandemHeart
VA-ECMO
Femoral Angiogram
Technical Aspects:
• Femoral Artery >5mm
• No significant iliofemoral tortuosity
• No contraindications
YES
NO
Impella 2.5 or CP
Axillary or Transcaval Access
YES
NO
Impella
IABP
Proceed with revascularization if indicated
Reassess Hemodynamics
Escalate therapy if needed
STATEMENT FROM THE INTERVENTIONAL COUNCIL OF THE ACC
A Practical Approach to Mechanical Circulatory Support in Patients Undergoing Percutaneous Coronary Intervention
An Interventional Perspective
Tamara M. Atkinson, MD,[a] E. Magnus Ohman, MD,[b] William W. O'Neill, MD,[c] Tanveer Rab, MD,[d]
Joaquin E. Cigarroa, MD,[e] on behalf of the Interventional Scientific Council of the American College of Cardiology

Level of circulatory support from MCS devices

FIGURE 2 Comparison of MCS Devices and Their Impact on Cardiac Flow



Four main families of devices exist for percutaneous MCS, which includes IABP, Impella (Abiomed Inc., Danvers, Massachusetts), TandemHeart (CardiacAssist, Inc., Pittsburgh, Pennsylvania), and VA-ECMO. Each device provides a different level of cardiac flow and device selection should be tailored to the level of support needed. Abbreviations as in Figure 1.

E-CPR : Save the day !!

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Thank you