Mechanical Support Devices in High-Risk and/or Complex PCI

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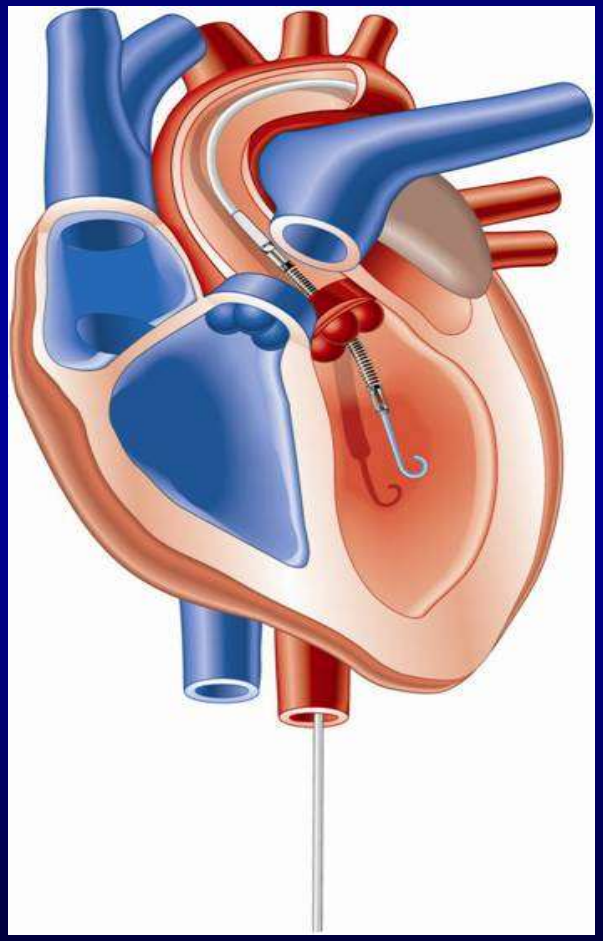
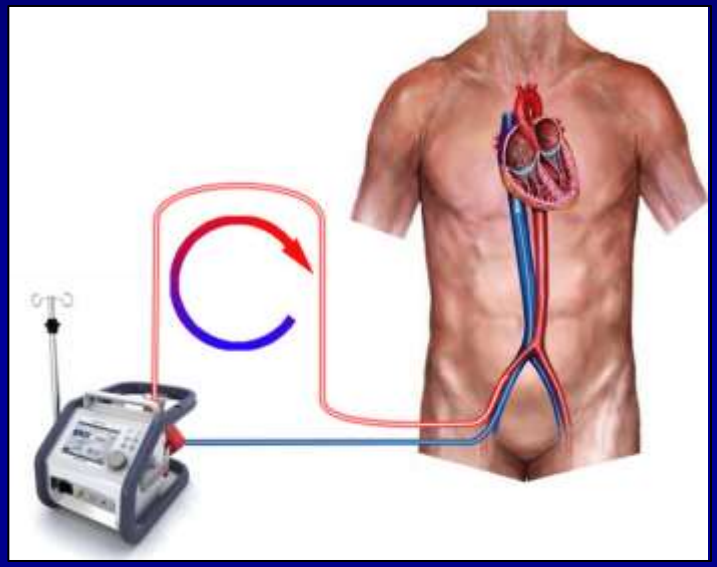
Percutaneous LV Assist Devices

IABP

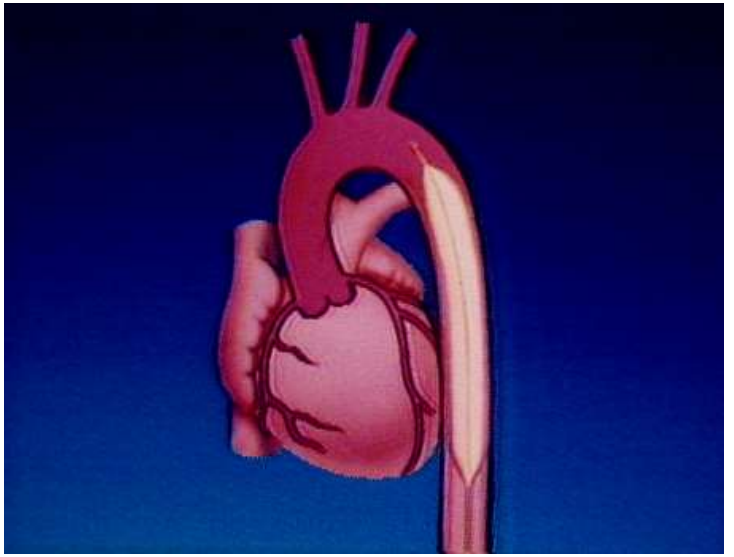
IMPELLA

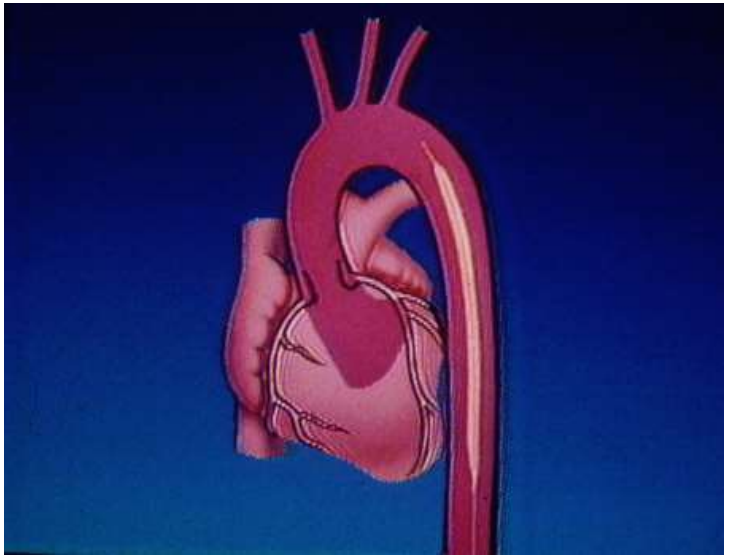


ECMO



PCI with IABP





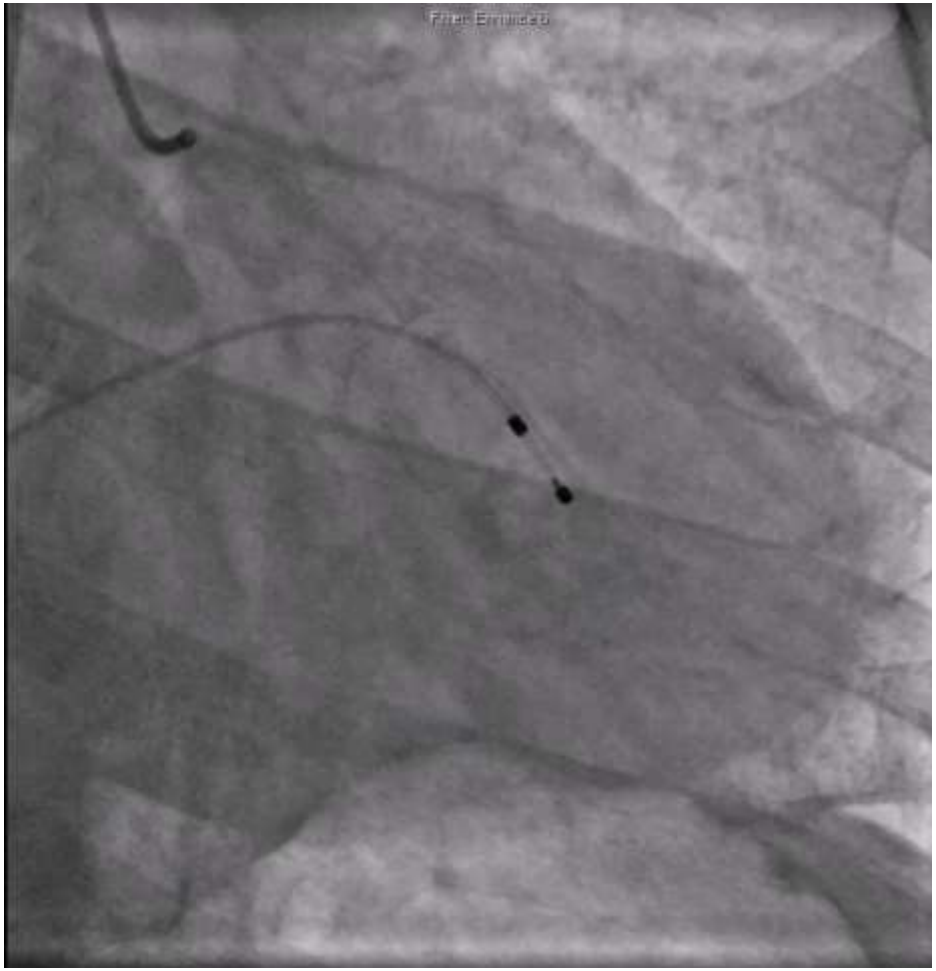
Advantages

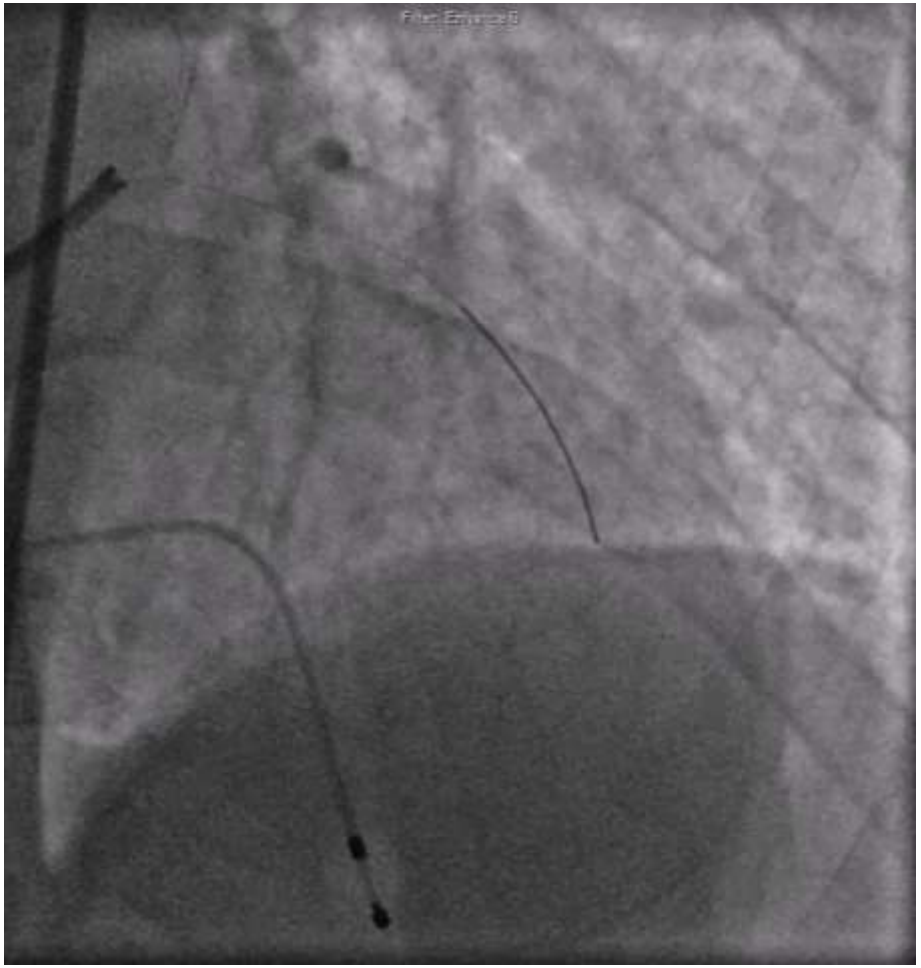
- Easy
- Inexpensive ($800)
- 7F and 8F

Disadvantages

- Increases cardiac output by 0.5 L/m

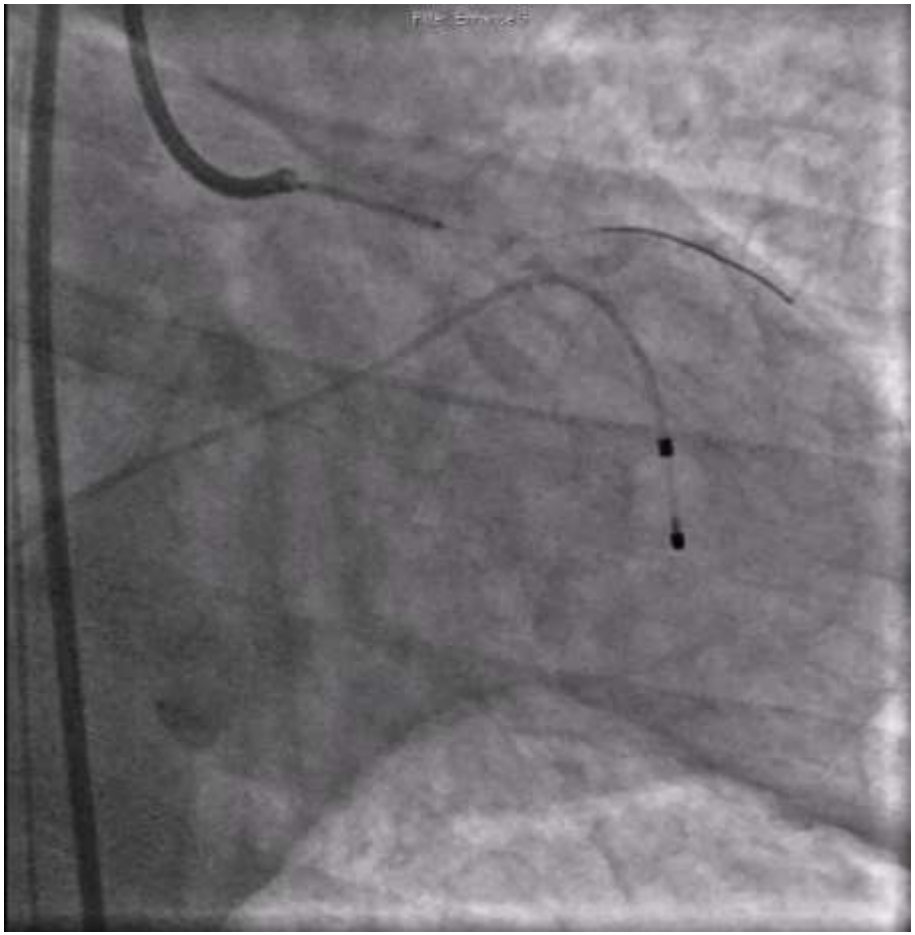
ULMCA PCI
With IABP

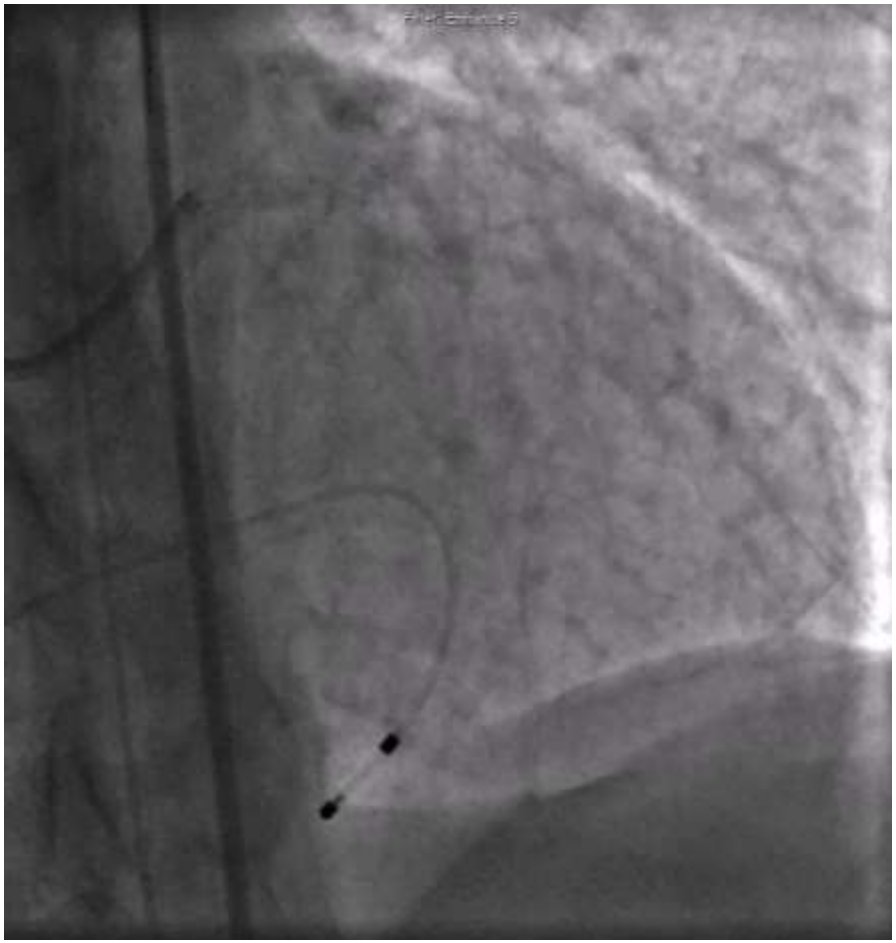




68 y.o. male with chest pain, ST-elevation in V1-V6, shock on inotropes

ULMCA PCI
With IABP

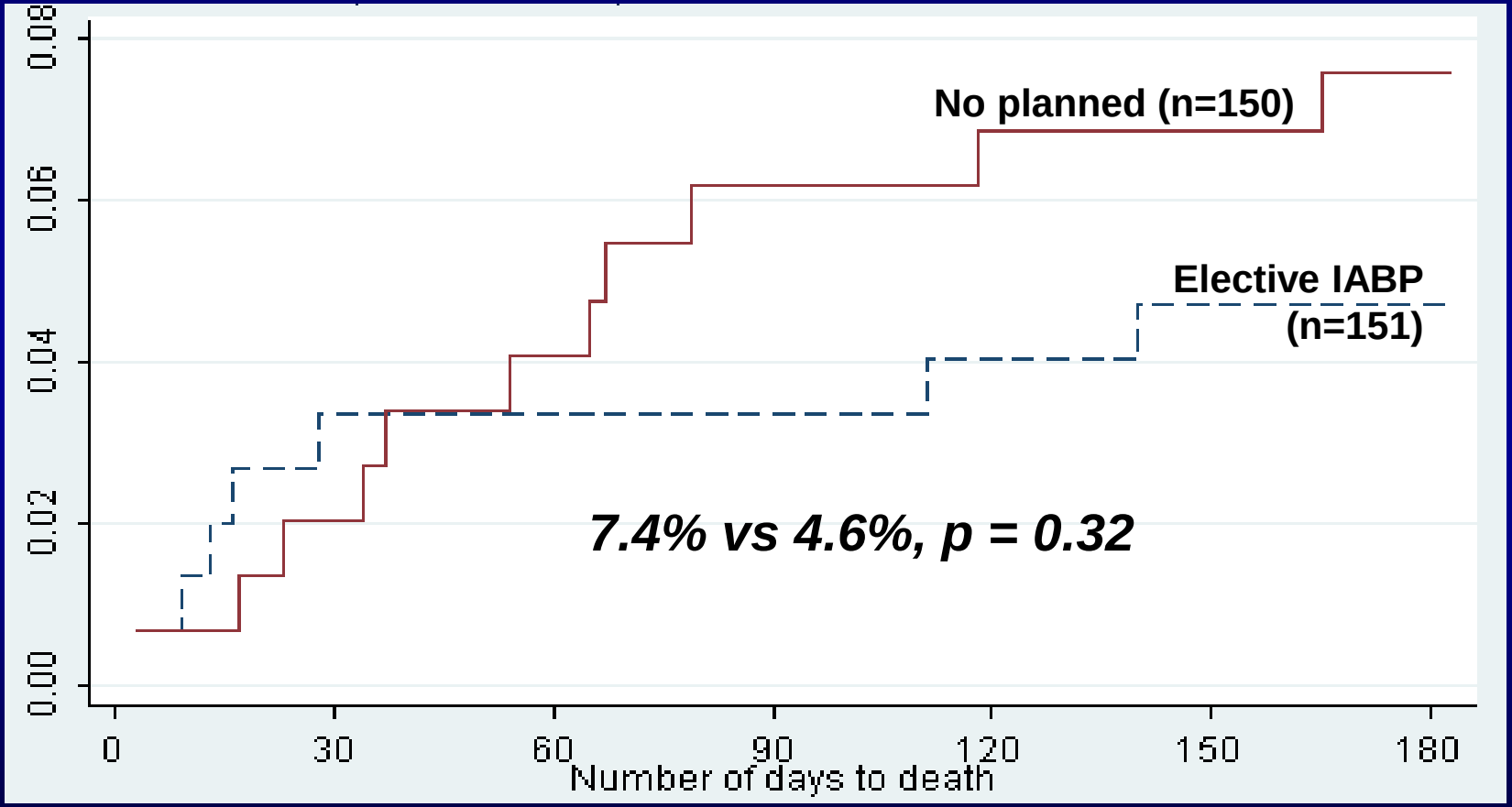




68 y.o. male with chest pain, ST-elevation in V1-V6, shock on inotropes

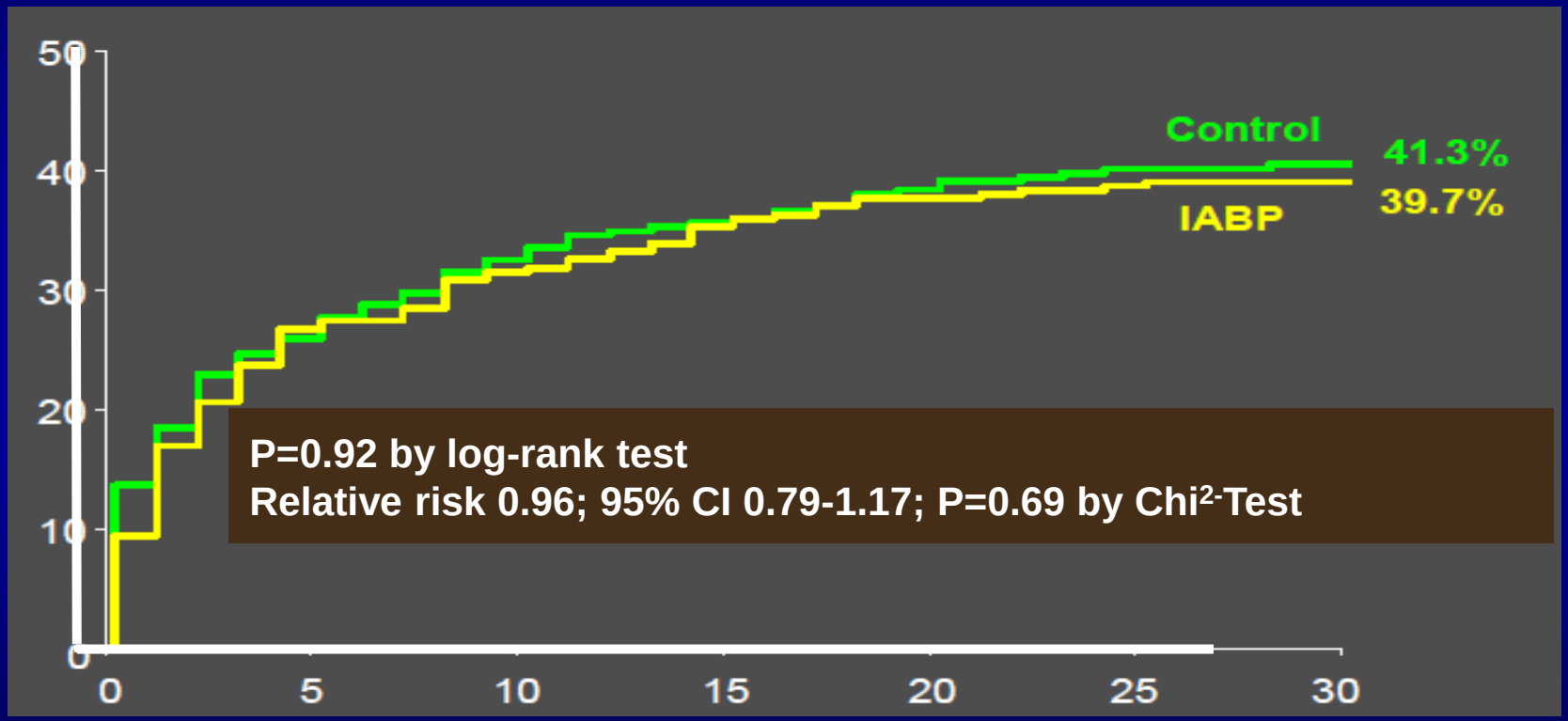
Balloon-pump assisted Coronary Intervention Study: *BCIS-1*

Kaplan Meier 6 month mortality



Perera D et al. JAMA 2010;304:867.

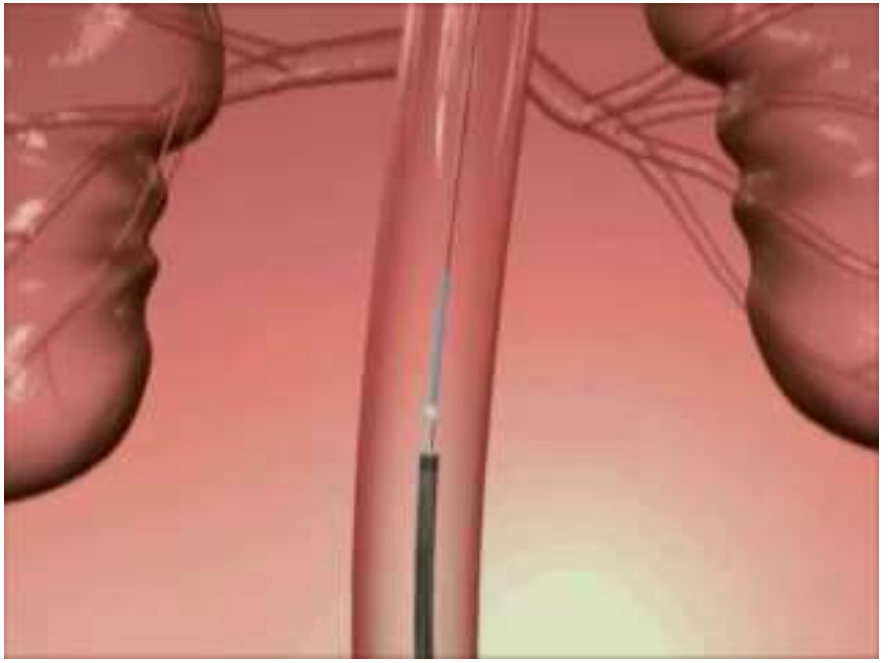
IABP-Shock II Trial
Primary Study Endpoint:
30-day Mortality



Time After Randomization (Days)

Thiele H et al. NEJM 2012;367:1287.

PCI with Impella



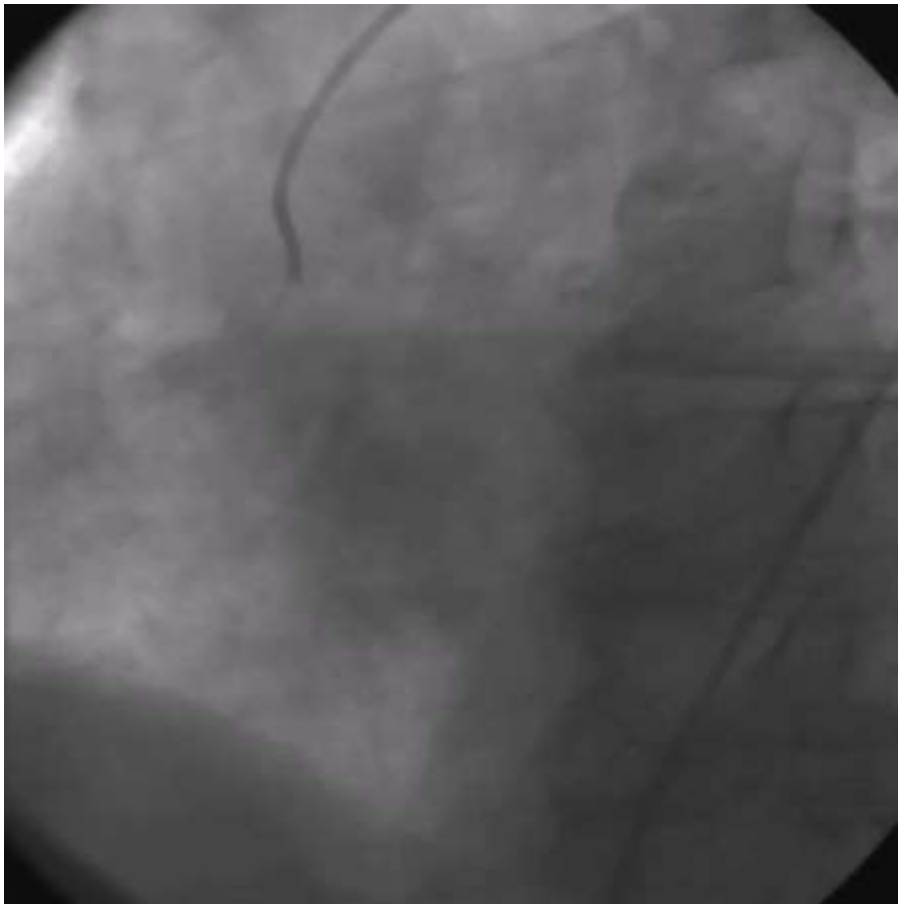
Advantages

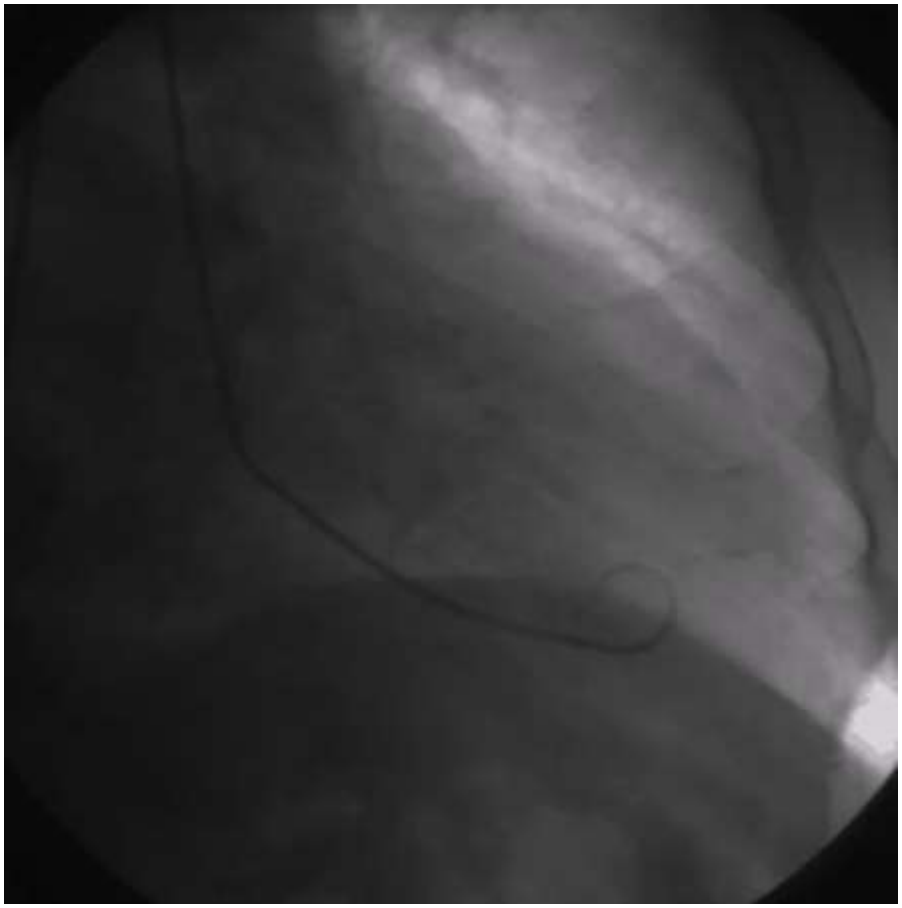
- Augment cardiac output by 3.5 L/min
- Use up to 7 days
- Does not require stable cardiac rhythm or native cardiac output/blood pressure signal for optimal function
- Unloads left ventricle

Disadvantages

- Requires 14 F catheter
- Non-pulsatile flow
- $20,000

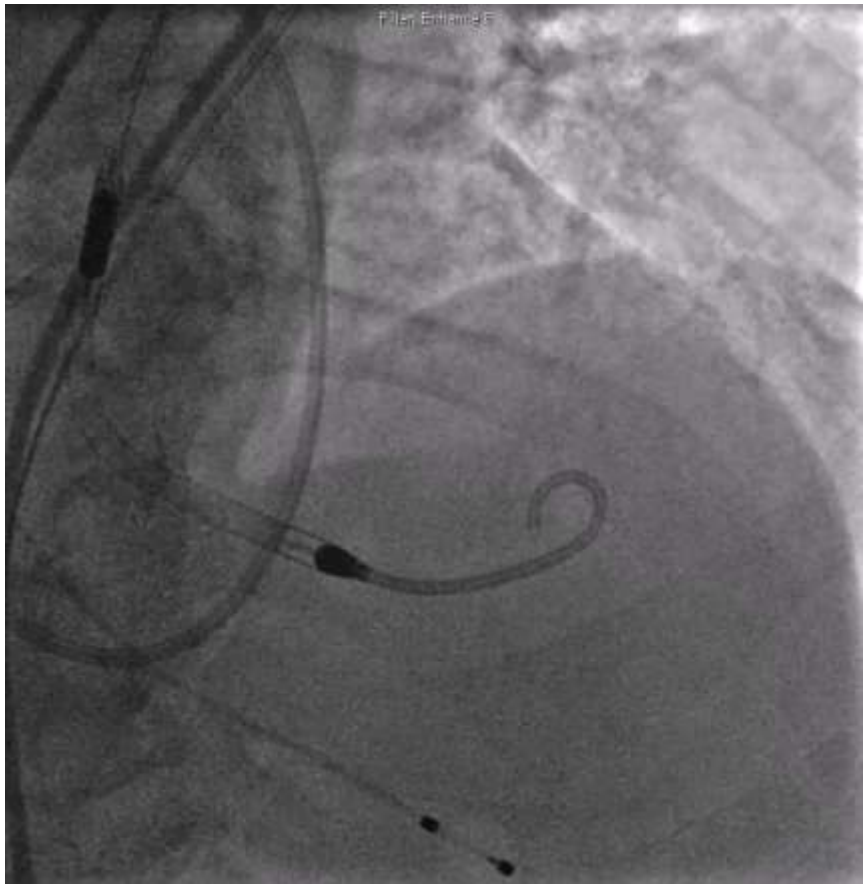
ULMCA PCI
With Impella



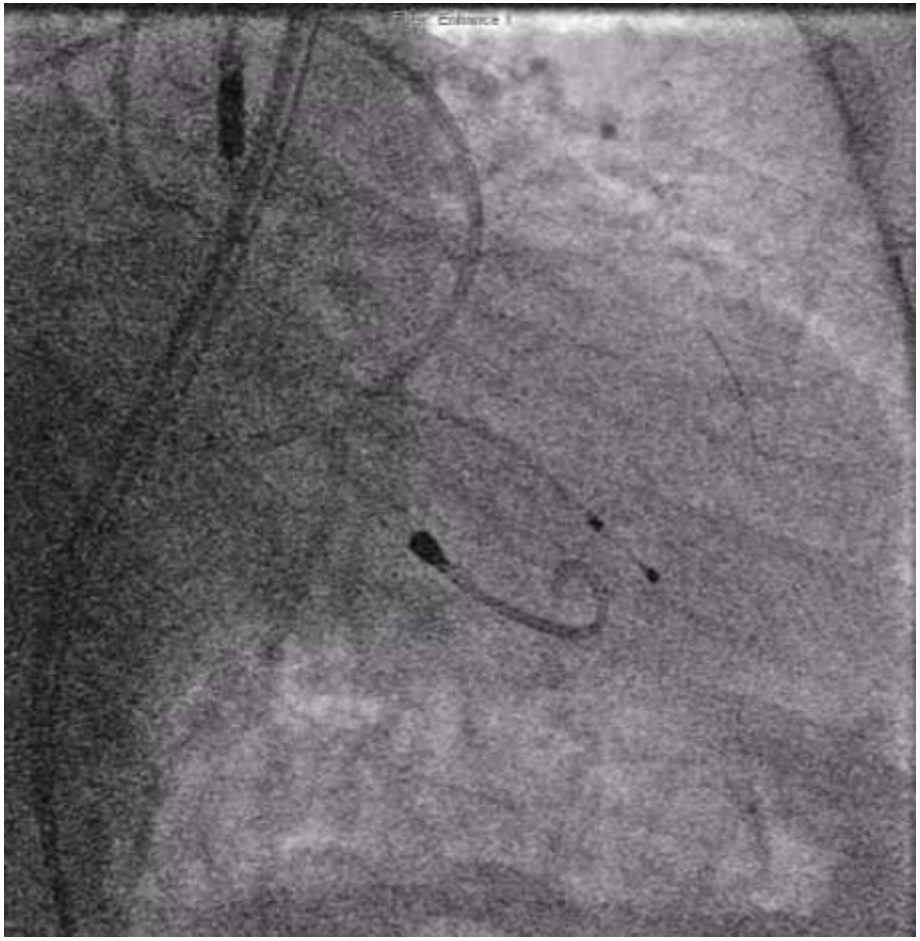


85 y.o. male with CKD, polio presents with NSTEMI

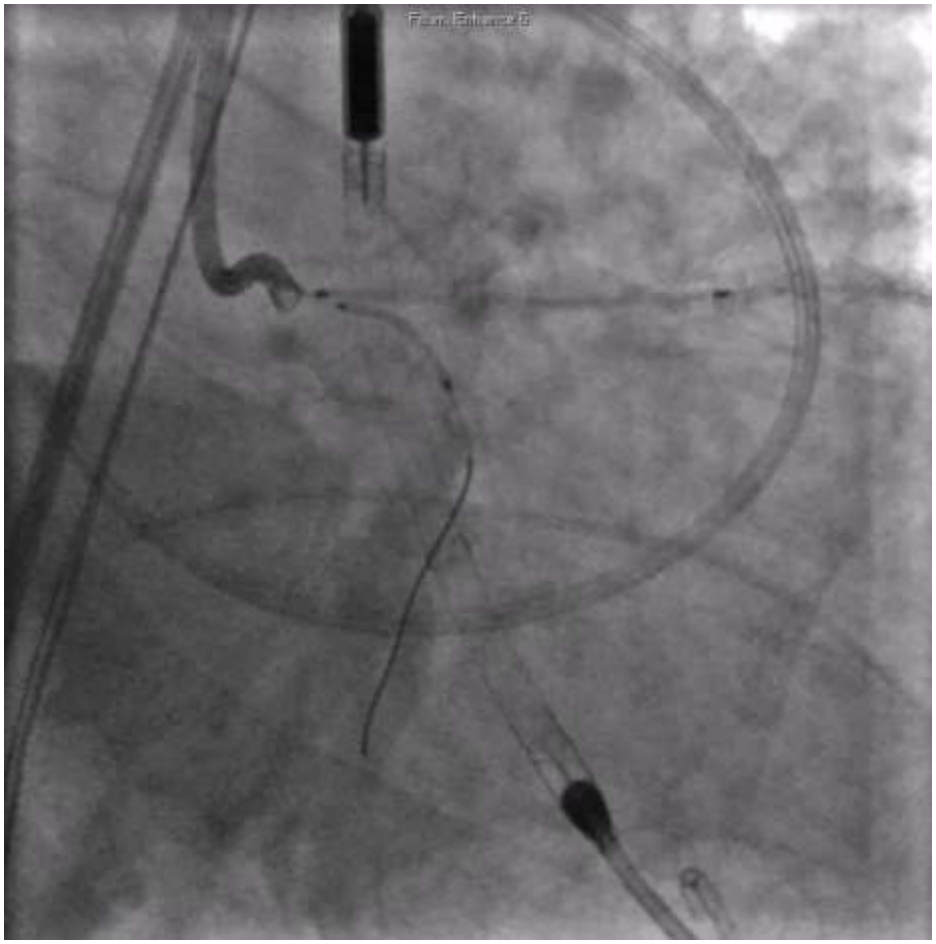
ULMCA PCI
With Impella



ULMCA PCI With Impella

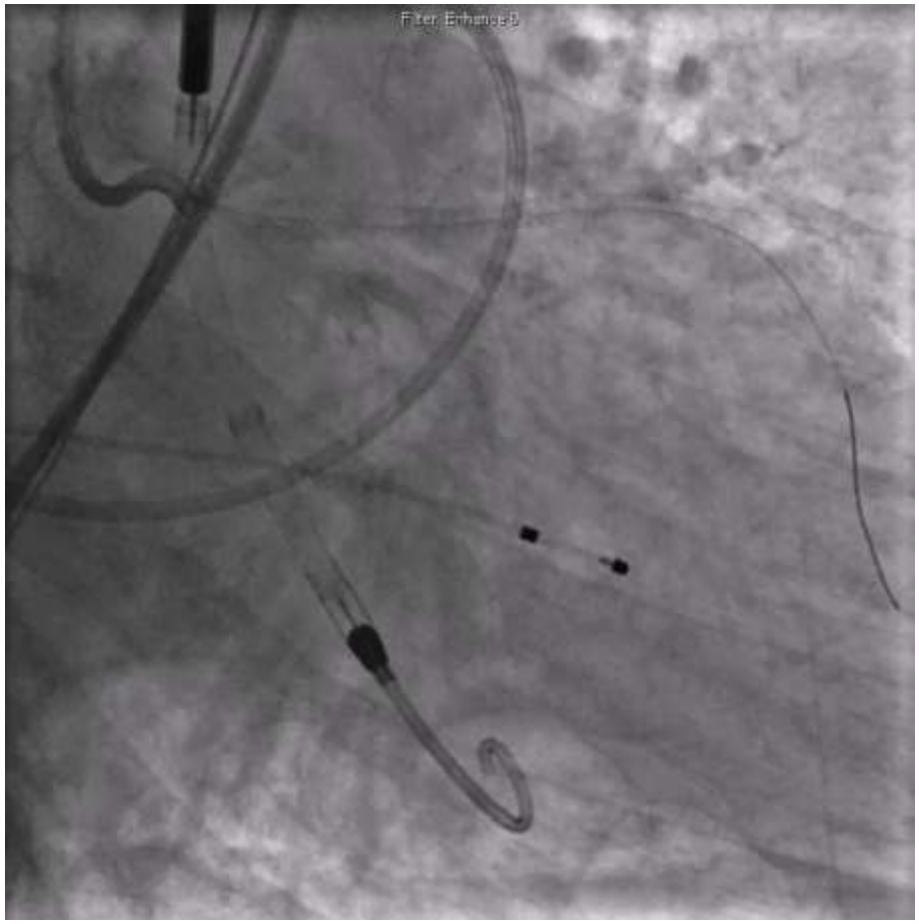


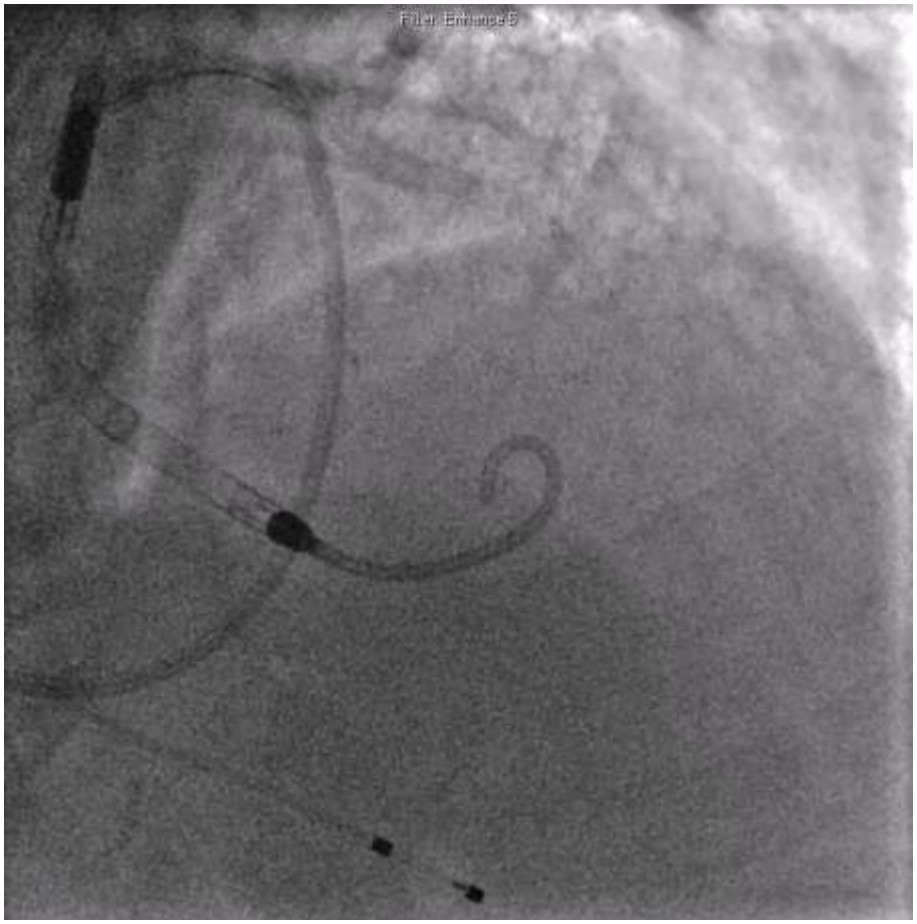
Rotational atherectomy



Crush technique

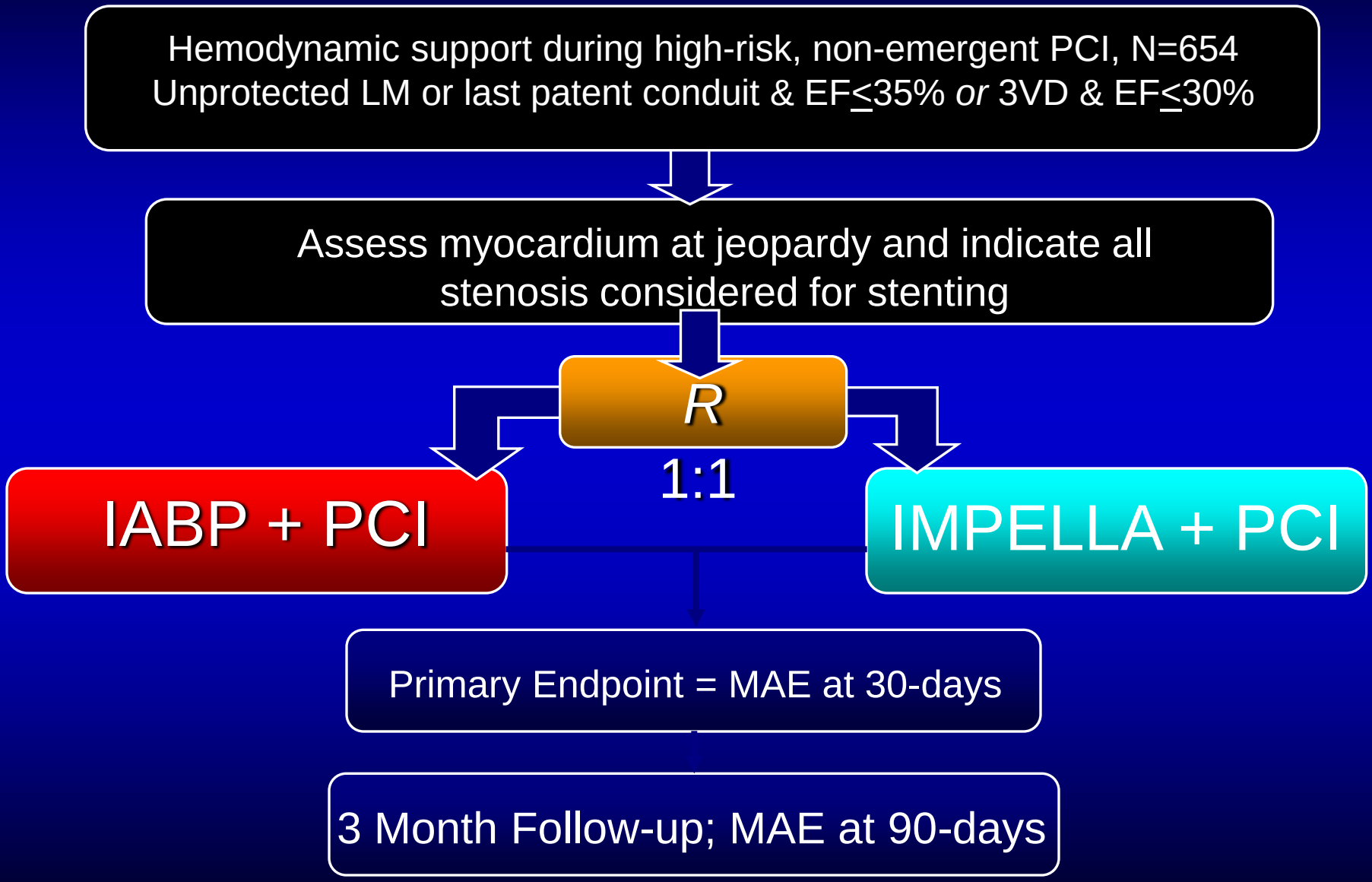
ULMCA PCI
With Impella





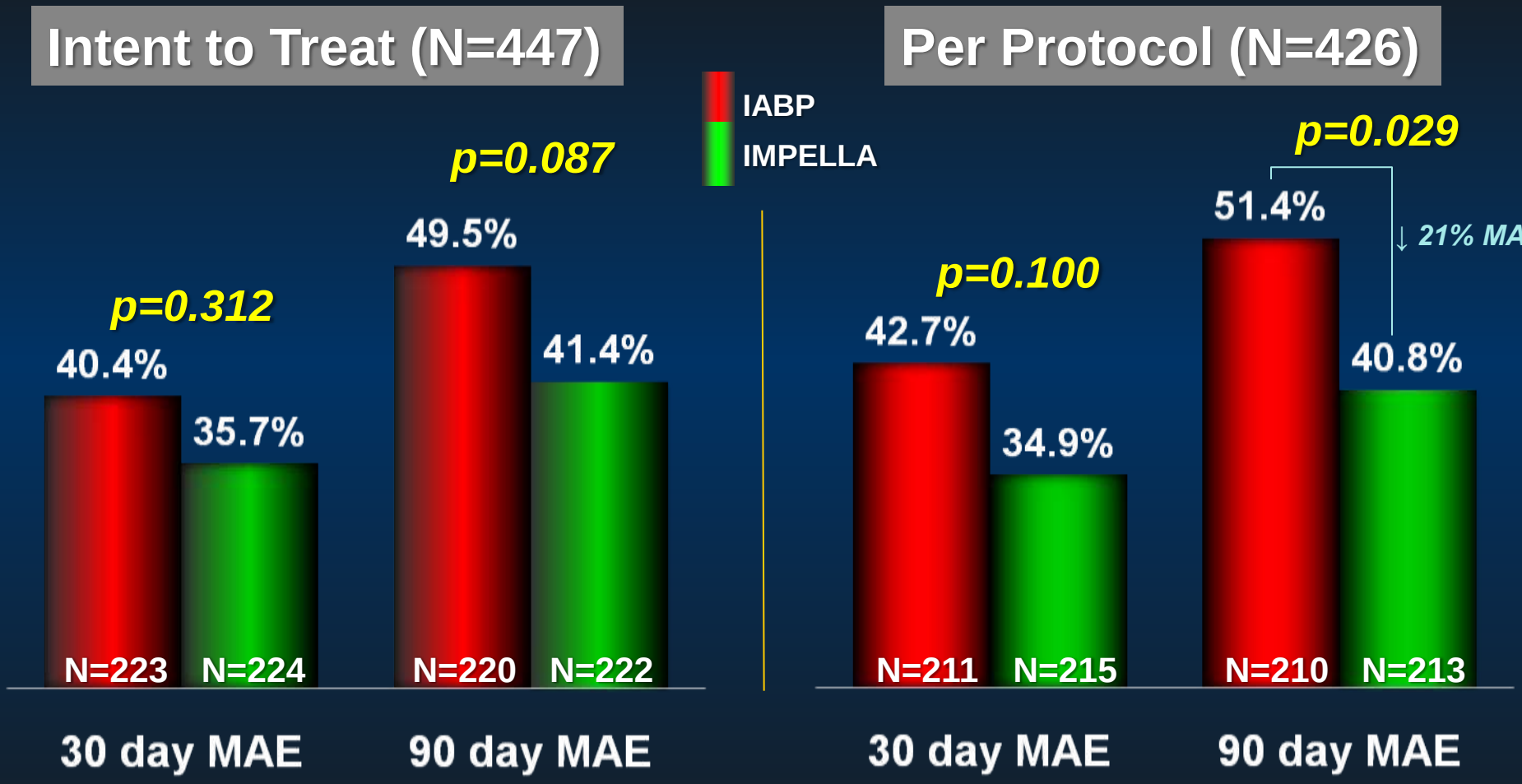
Final angiography

PROTECT II Trial Design



O'Neill et al, Circulation. 2012;126:1717

PROTECT II MAE Outcome



MAE= Major Adverse Event Rate

Per Protocol= Patients that met all incl./ excl. criteria.

PCI with ECMO

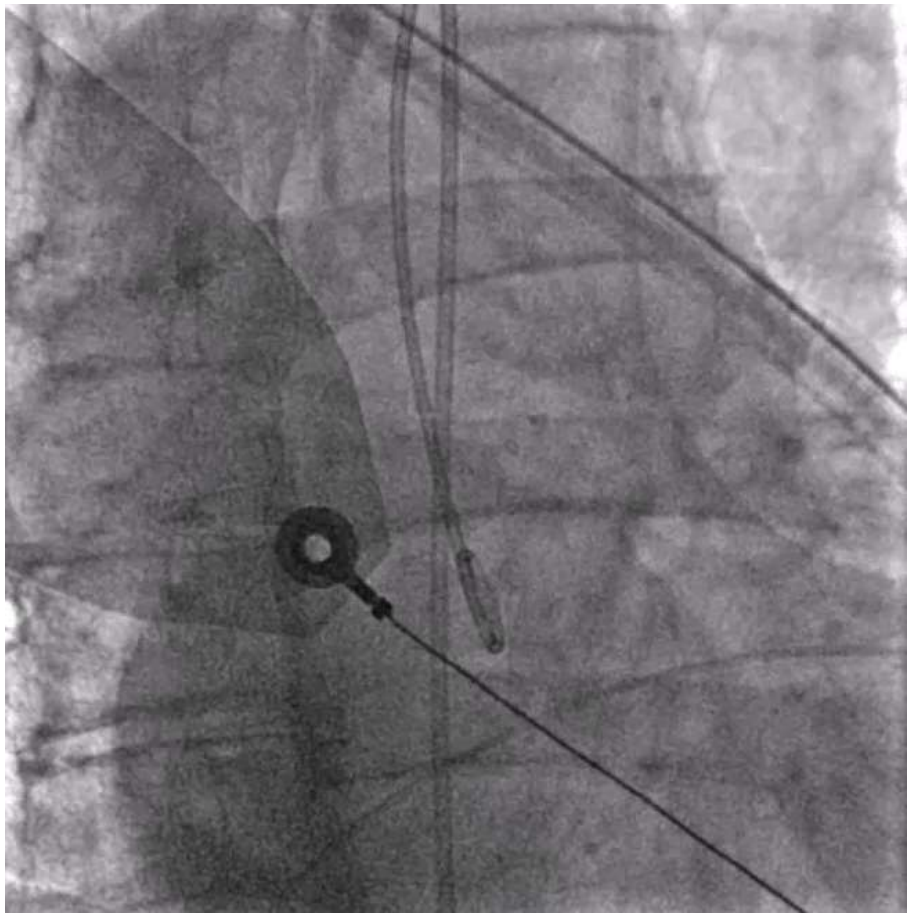
Advantages

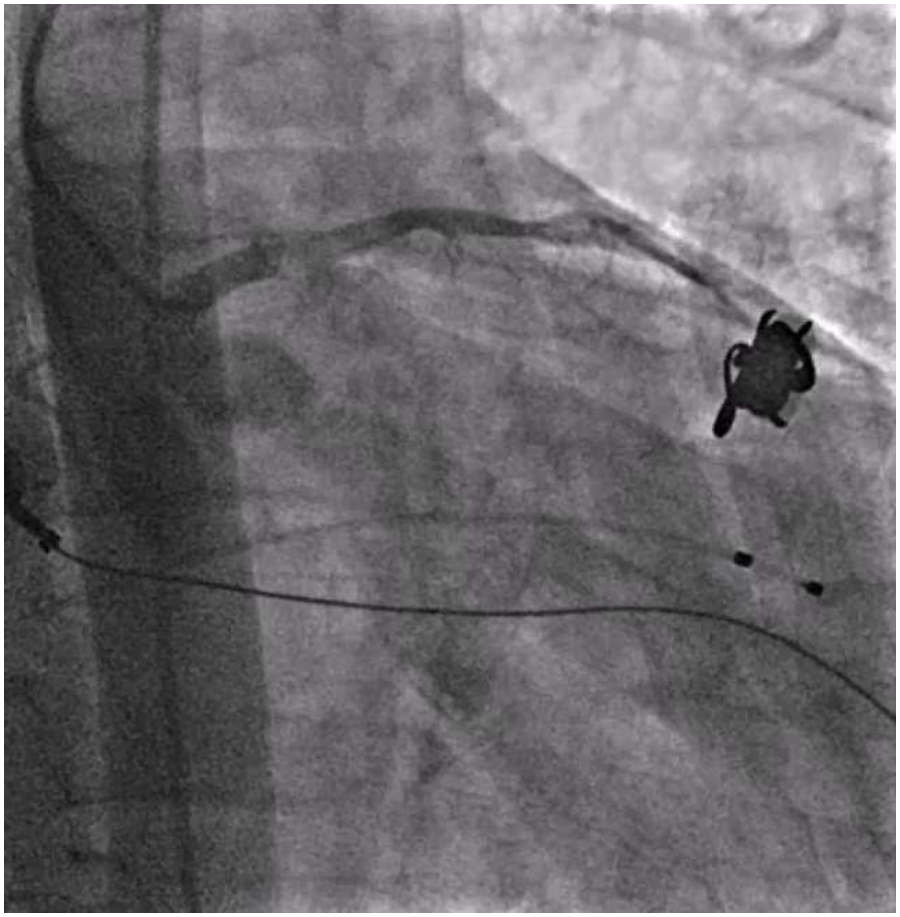
- Augment cardiac output by >4.5 L/min
- Use up to several weeks
- Does not require stable cardiac rhythm or native cardiac output/blood pressure signal for optimal function
- Does not require fluoroscopy

Disadvantages

- Requires 21F and 18F catheters
- Non-pulsatile flow
- Increases afterload
- $25,000

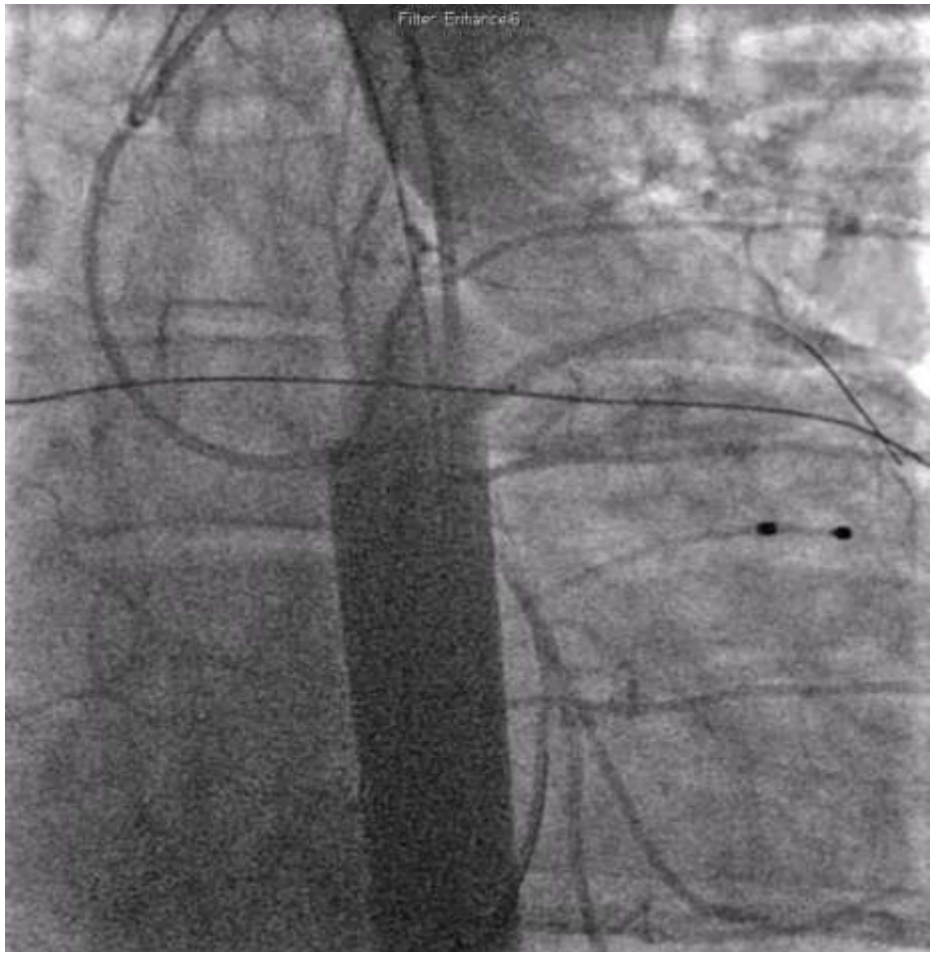
ULMCA PCI
With ECMO



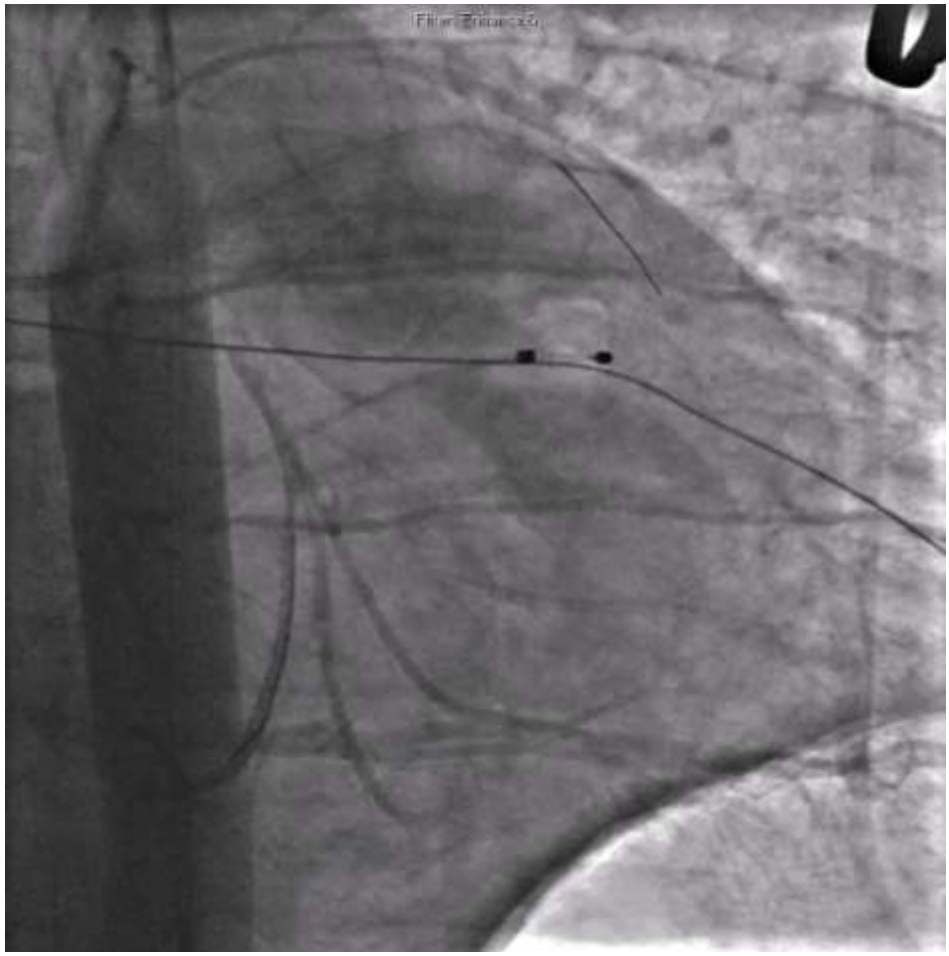


49 y.o. male with inferior ST-elevation and cardiac arrest in ED

ULMCA PCI With ECMO

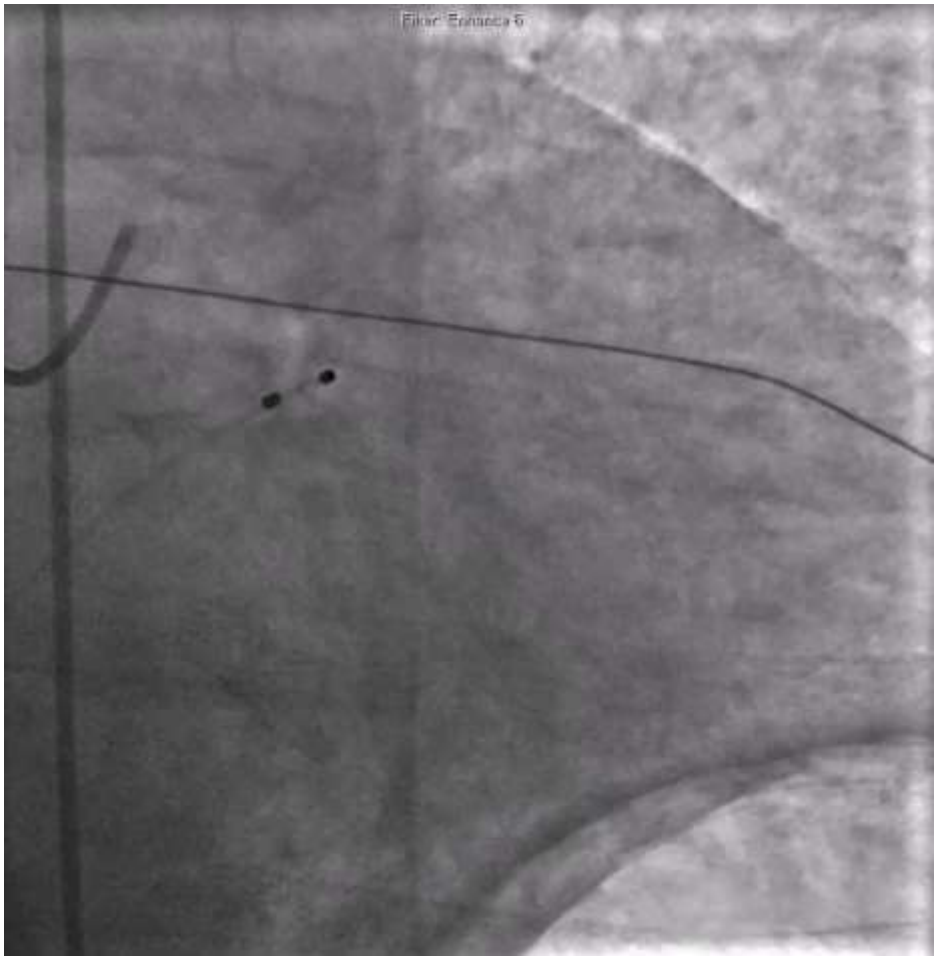


LM stent across LCX
ECMO inserted

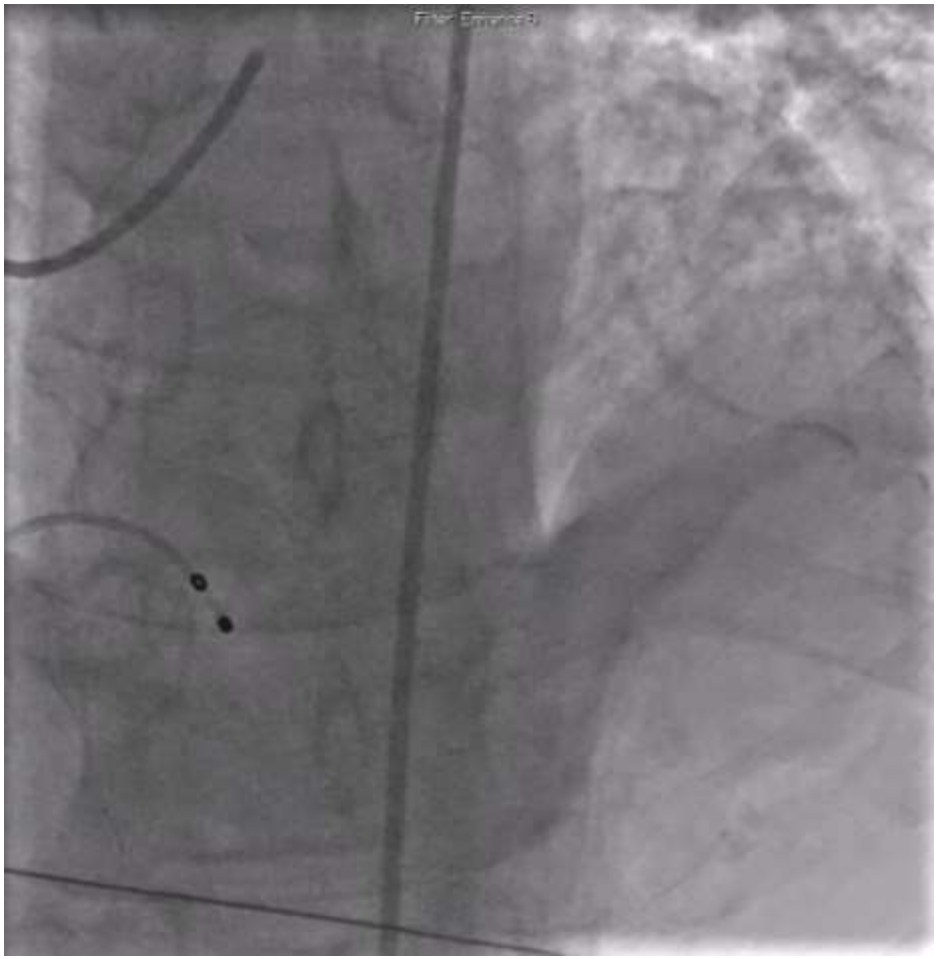


Compromise of LCX

ULMCA PCI With ECMO

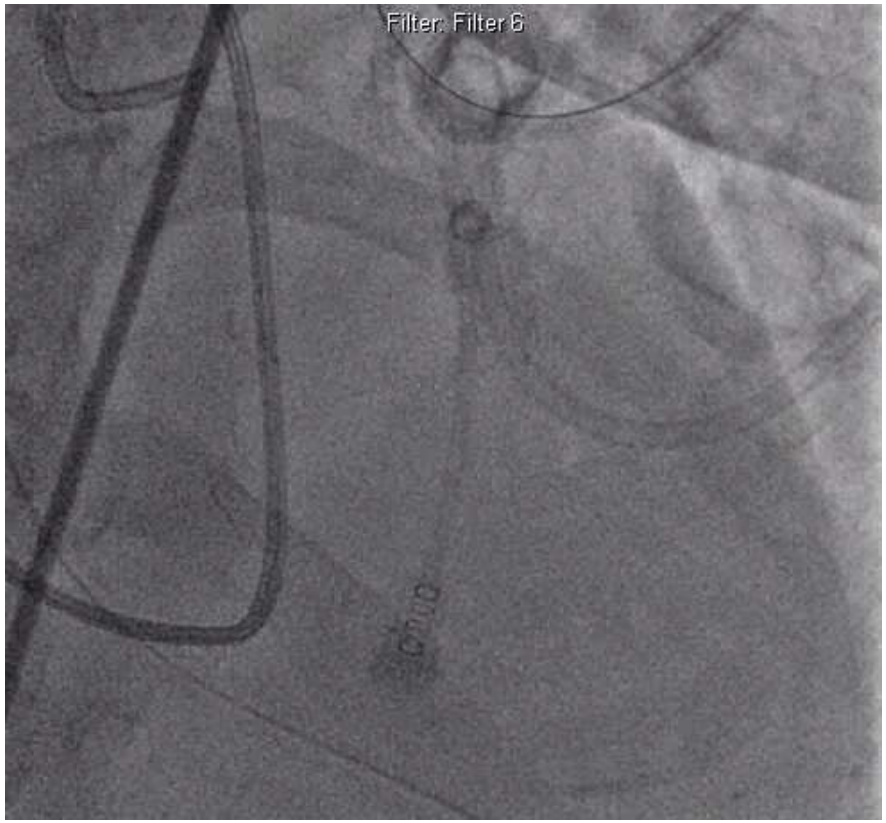


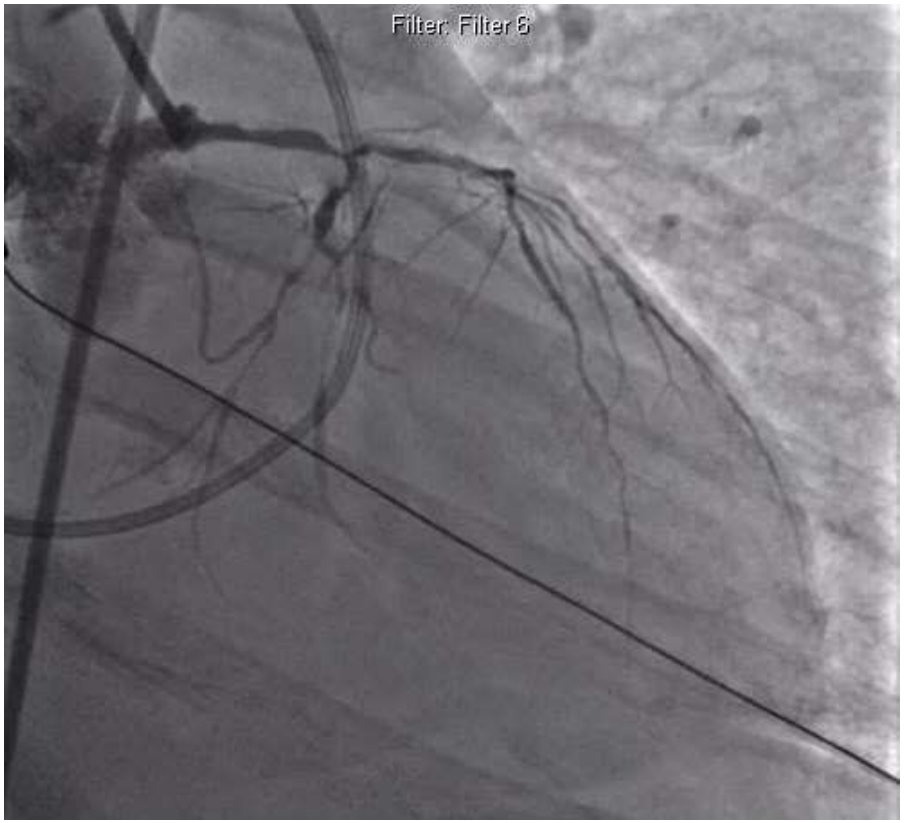
Final angiography



Ventricular fibrillation

ULMCA PCI
With ECMO

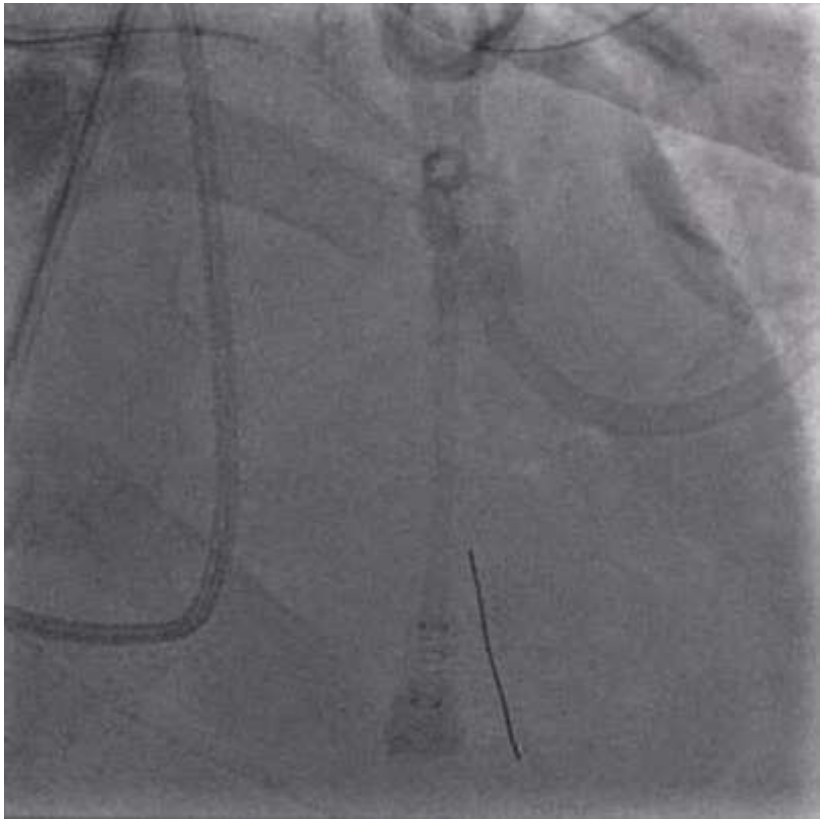


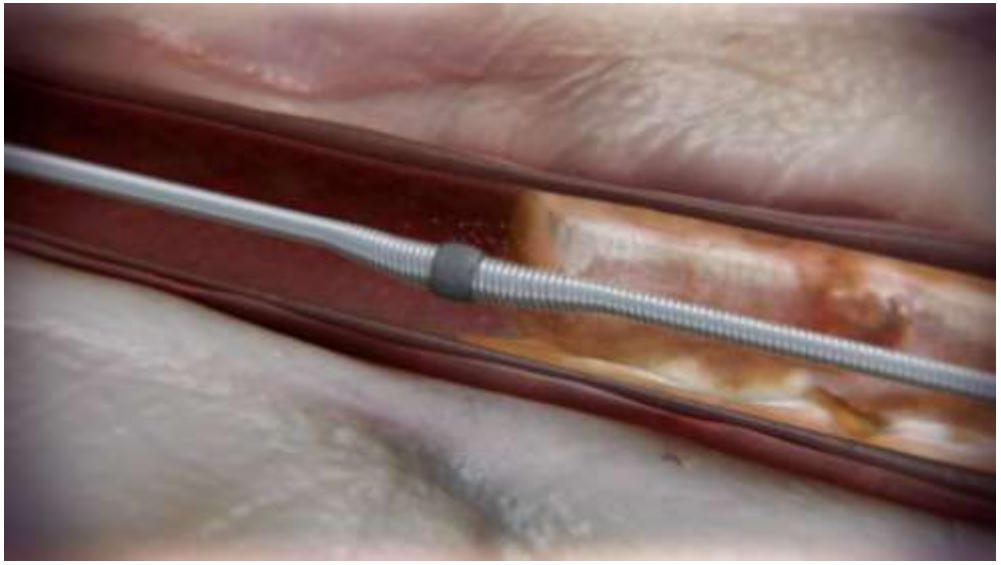


48 y.o. male with DM who presents with MI, cardiac arrest, cardiogenic shock, on ECMO

Orbital Atherectomy

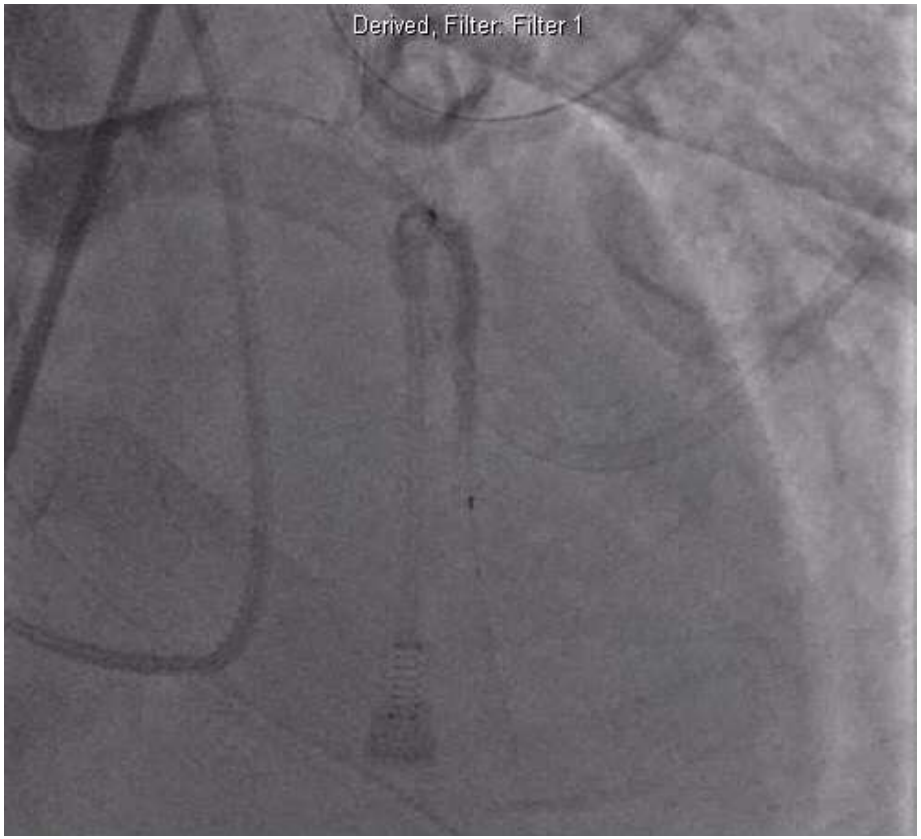
Differential Sanding and Centrifugal Force

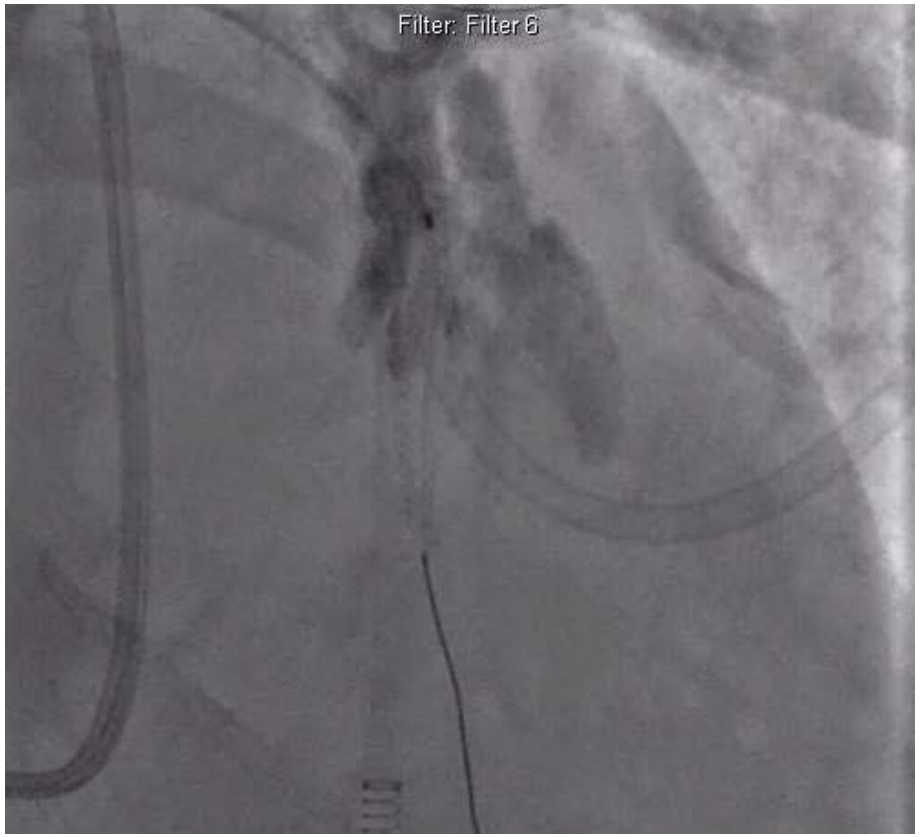




Unique MOA treats 360˚ of the vessel.The diamond coated crown sands away calcium and allows healthy elastic tissue to flex away minimizing injury to the vessel.

ULMCA PCI With ECMO

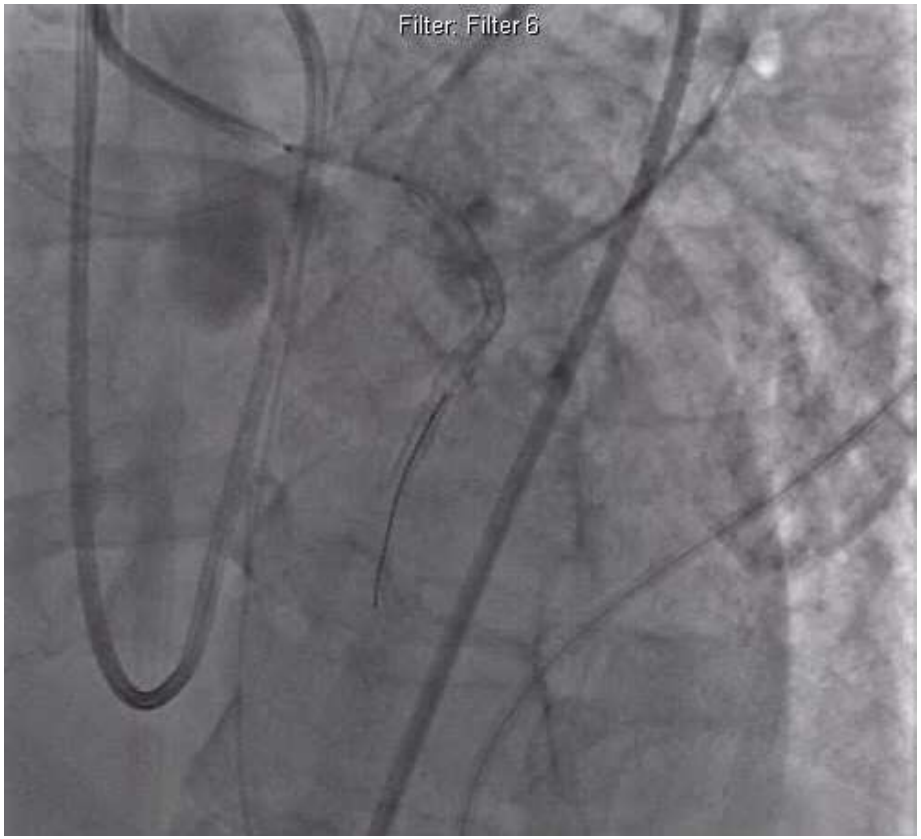




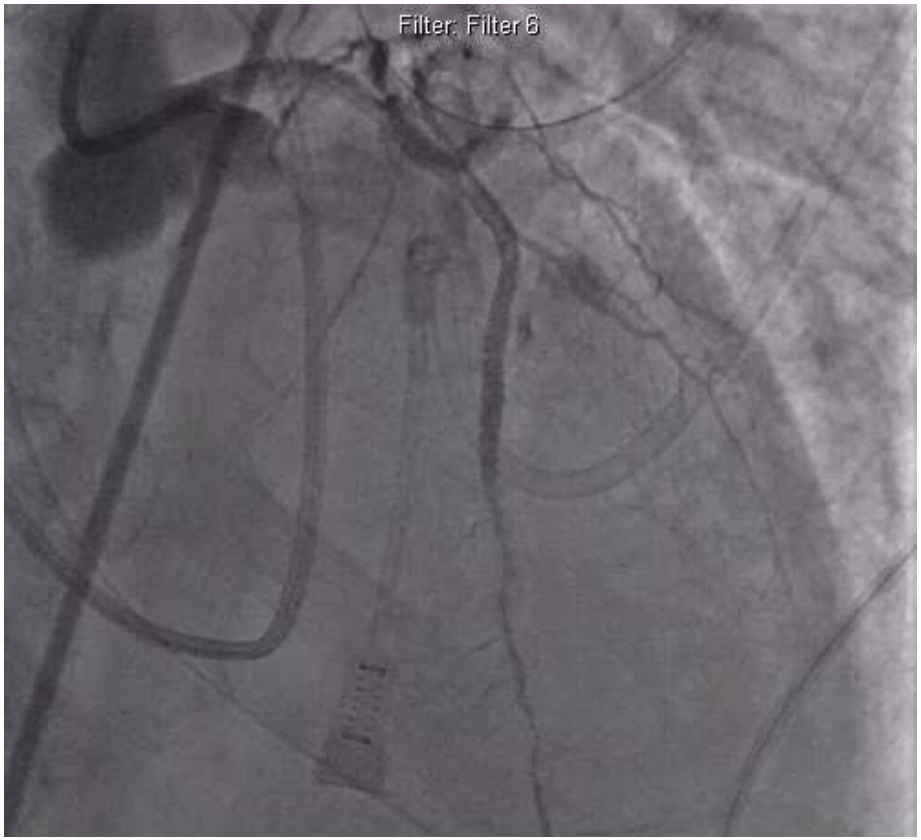
2.75 x 38 mm EES

Grade 3 perforation

ULMCA PCI With ECMO

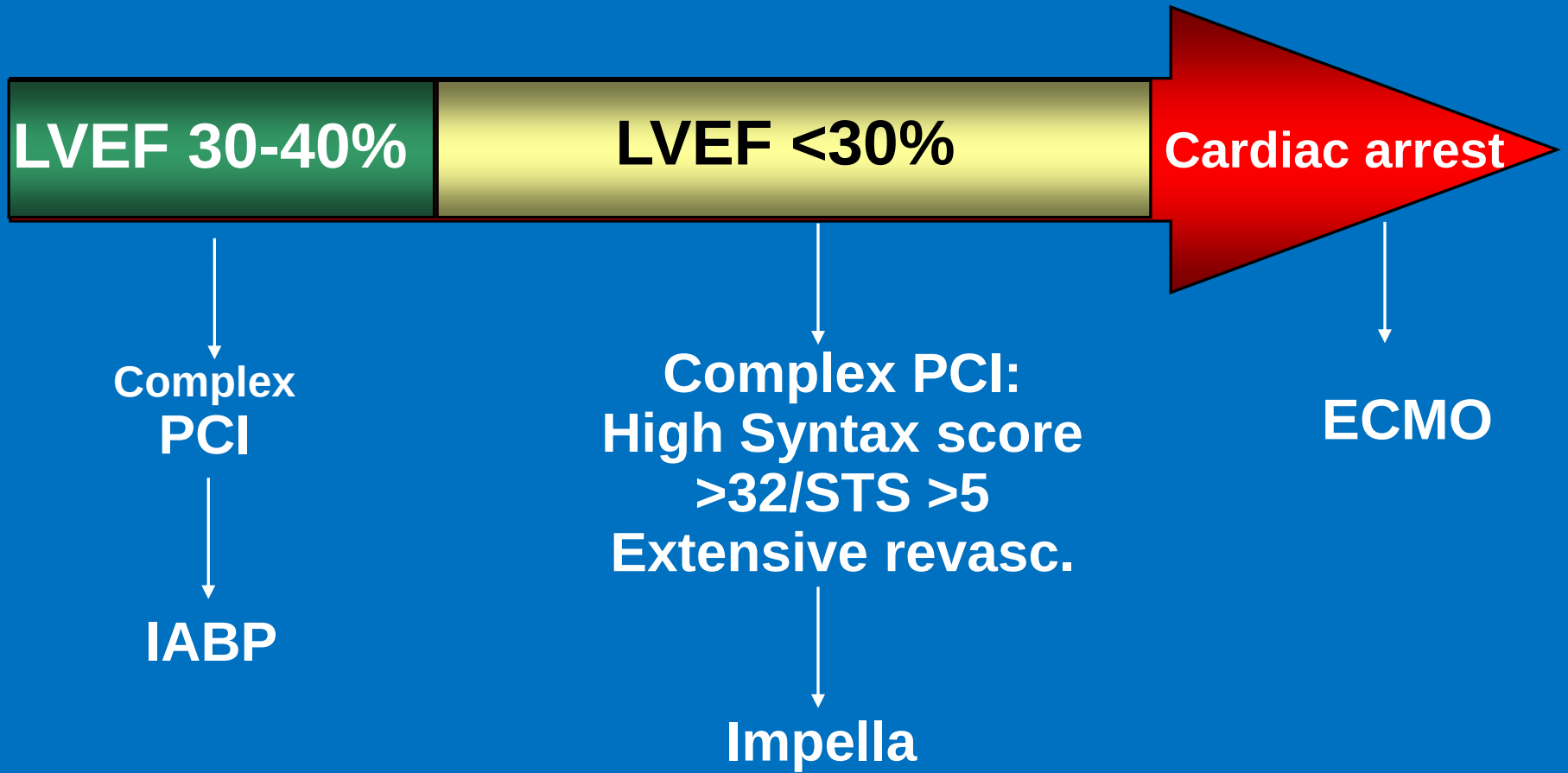


LM stenting in LAO cranial



Final angiography after covered stent

LV Support during High-Risk PCI: LVEF + Lesion Complexity



John Wooden

“Failing to prepare is preparing to fail.”