



**28-30
JANVIER
2026**

MARSEILLE
PALAIS DU PHARO

Protected Complex PCI... Really?

Die Another Day...

Frédéric BOUISSET

Disclosures

I currently have or have had over the past year, an affiliation or financial interests or interests of any order with a company or I received compensation or fees, or research grants with a commercial company:

Consulting fees: Abbott Medical; Boston Scientific; Elixir Medical; GE Healthcare; Shockwave; CoreAaslt BV; Optima Education Ltd; Cathflow

Background

Why We Got Here?

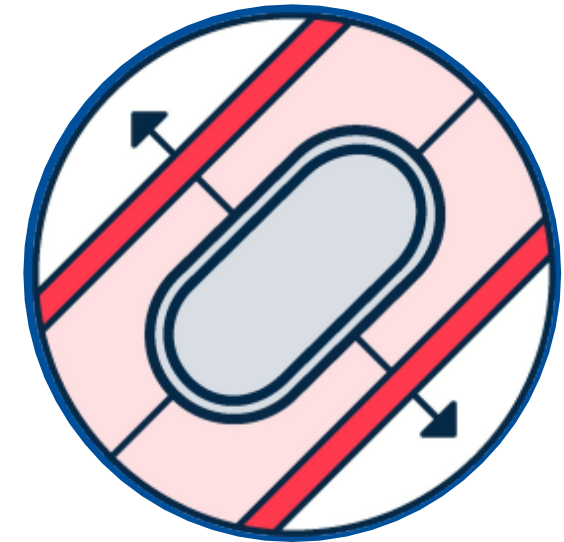
Management of Ischemic Heart Disease in Patients With Advanced Heart Failure



All patients should receive **OMT and ICD/CRT**.



When patient/anatomy are suitable, **CABG should be prioritized**

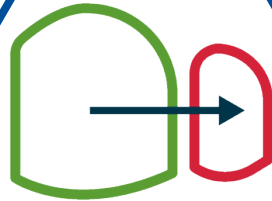


If surgery is declined, **PCI may be considered in selected cases.**

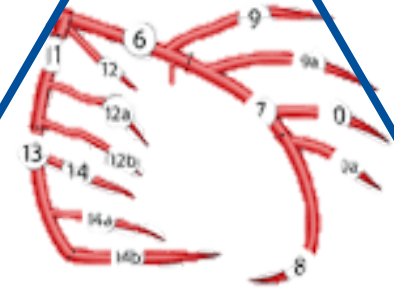
What is a Complex and High Risk PCI (CHIP)?



Patient Comorbidities

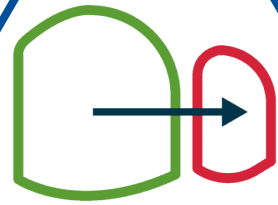


**Hemodynamic
Compromise**



Complex CAD

Benefit of Mechanical Circulatory Support?

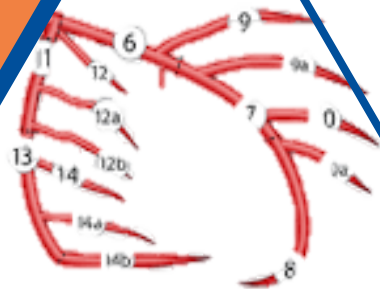


Hemodynamic
Compromise

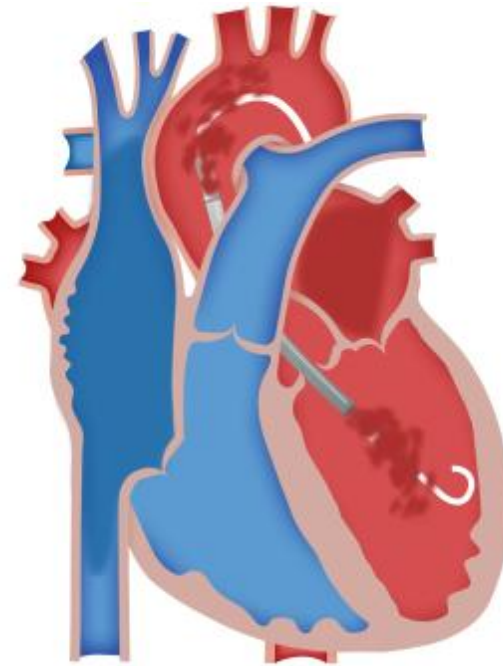
CHIP



Patient Comorbidities



Complex CAD

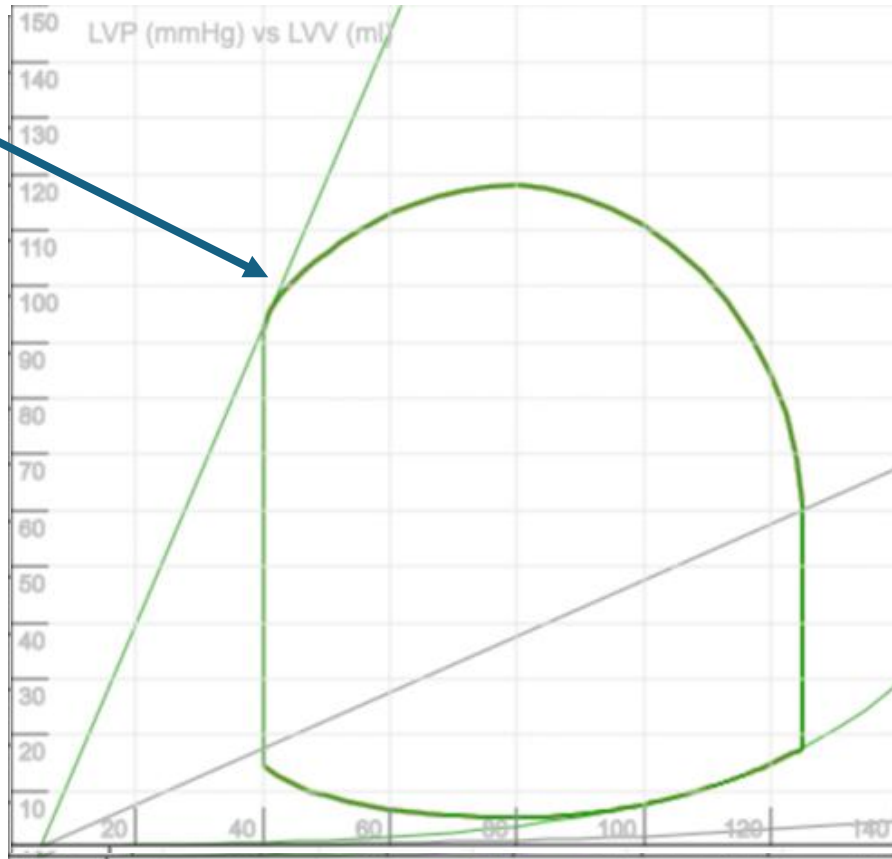


Rationale for Mechanical Circulatory Support?

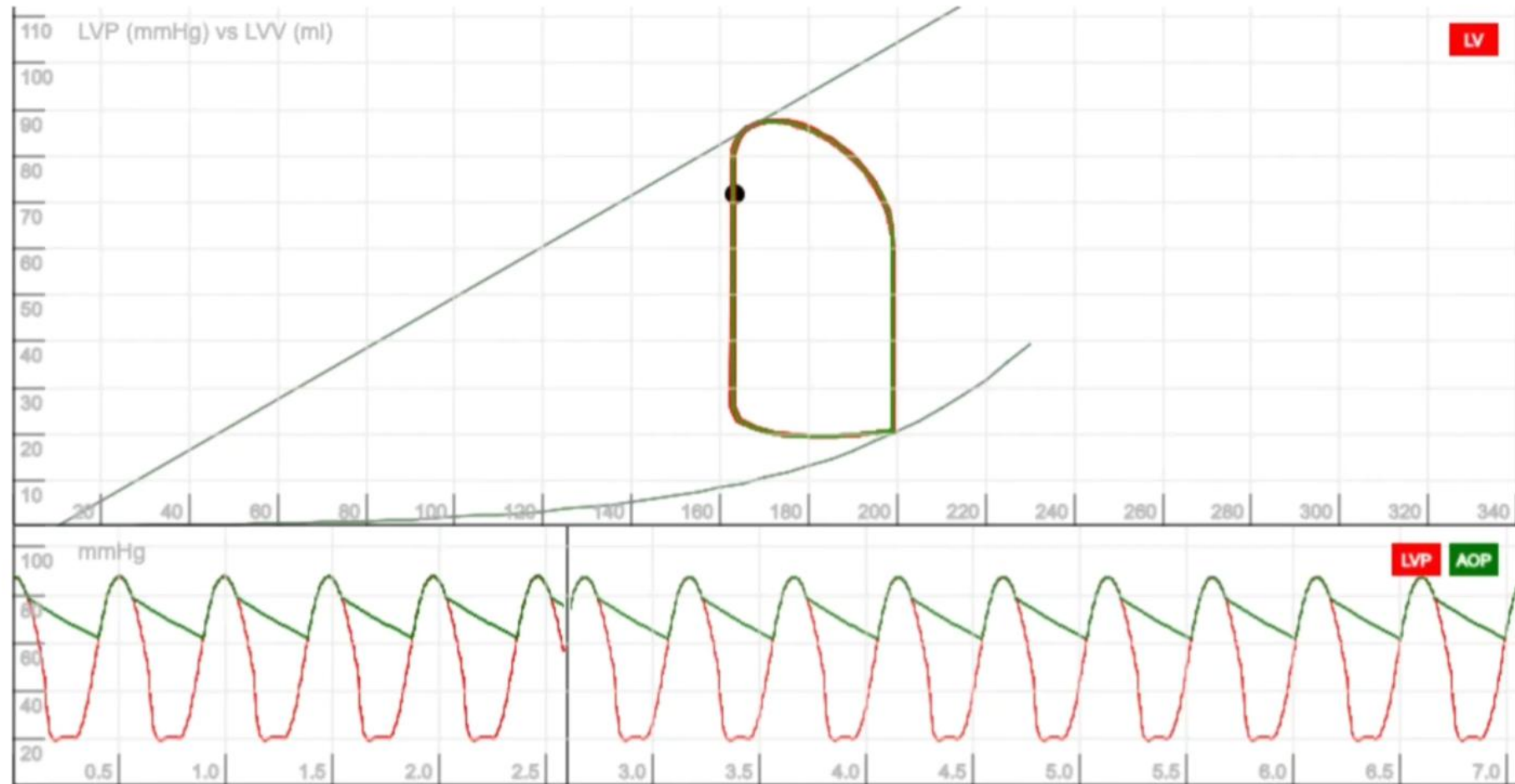
Mechanics Before Machines

How is this different in severe LV dysfunction?

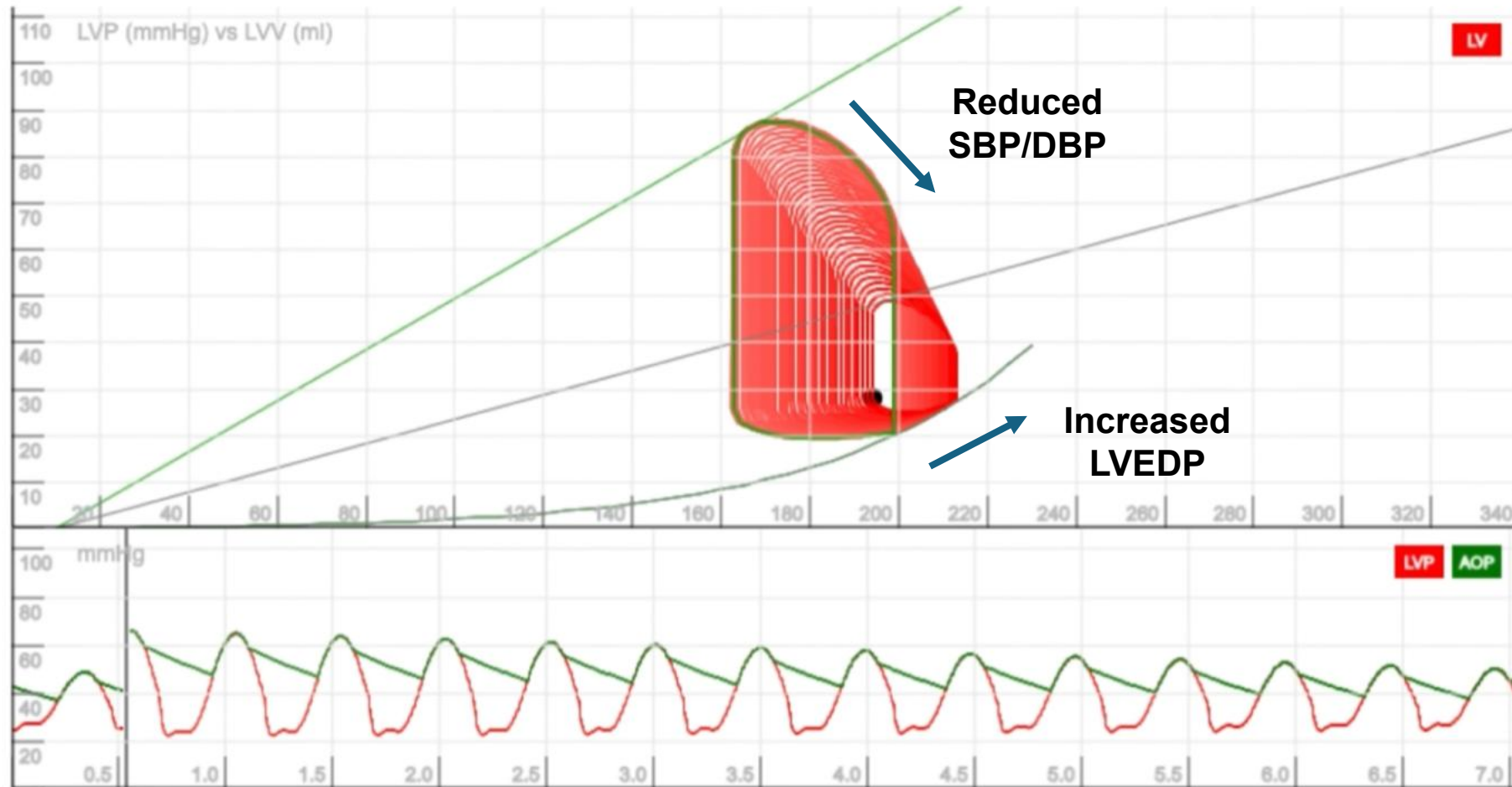
Normal LV function



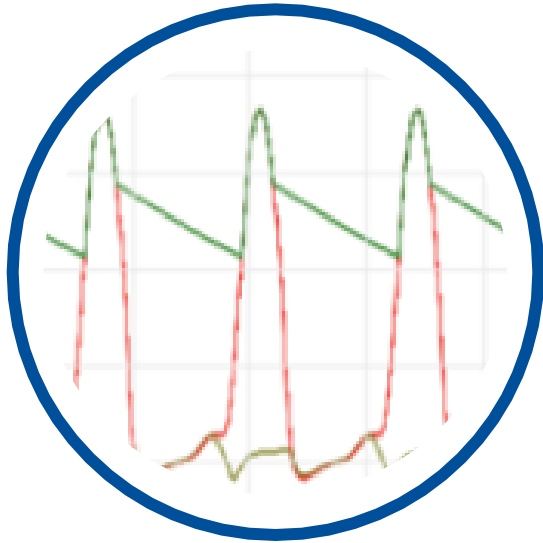
What is the result of ischemia in a 'vulnerable' heart?



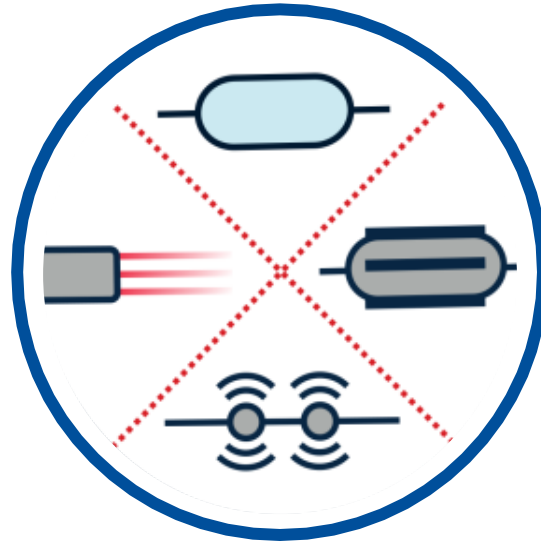
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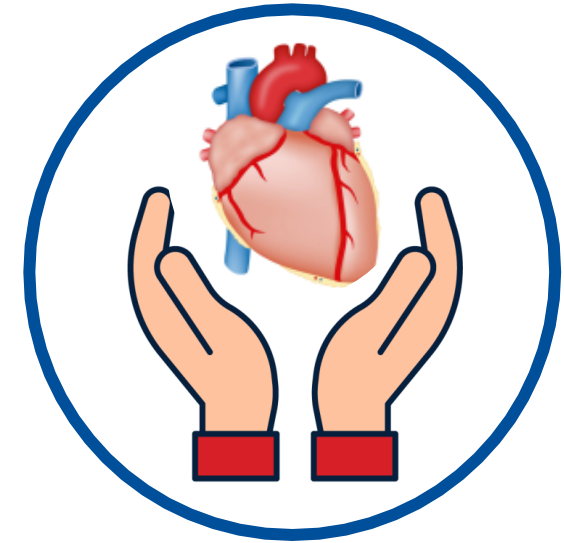
Objectives of Mechanical Circulatory Support



**Maintain
hemodynamics**



**Facilitate safe, complete
and optimized
revascularization**

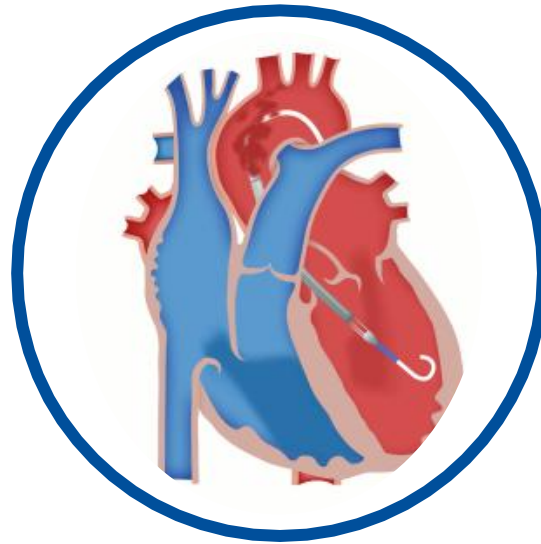


**Acceptable safety and
management profile**

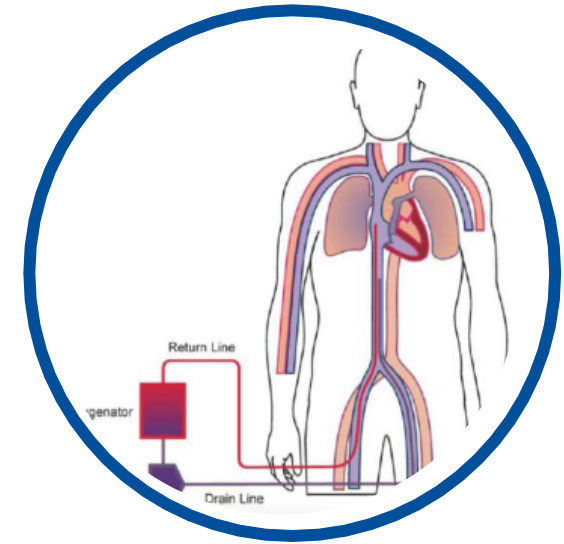
Options for mechanical circulatory support in HR PCI



IABP



pLVAD

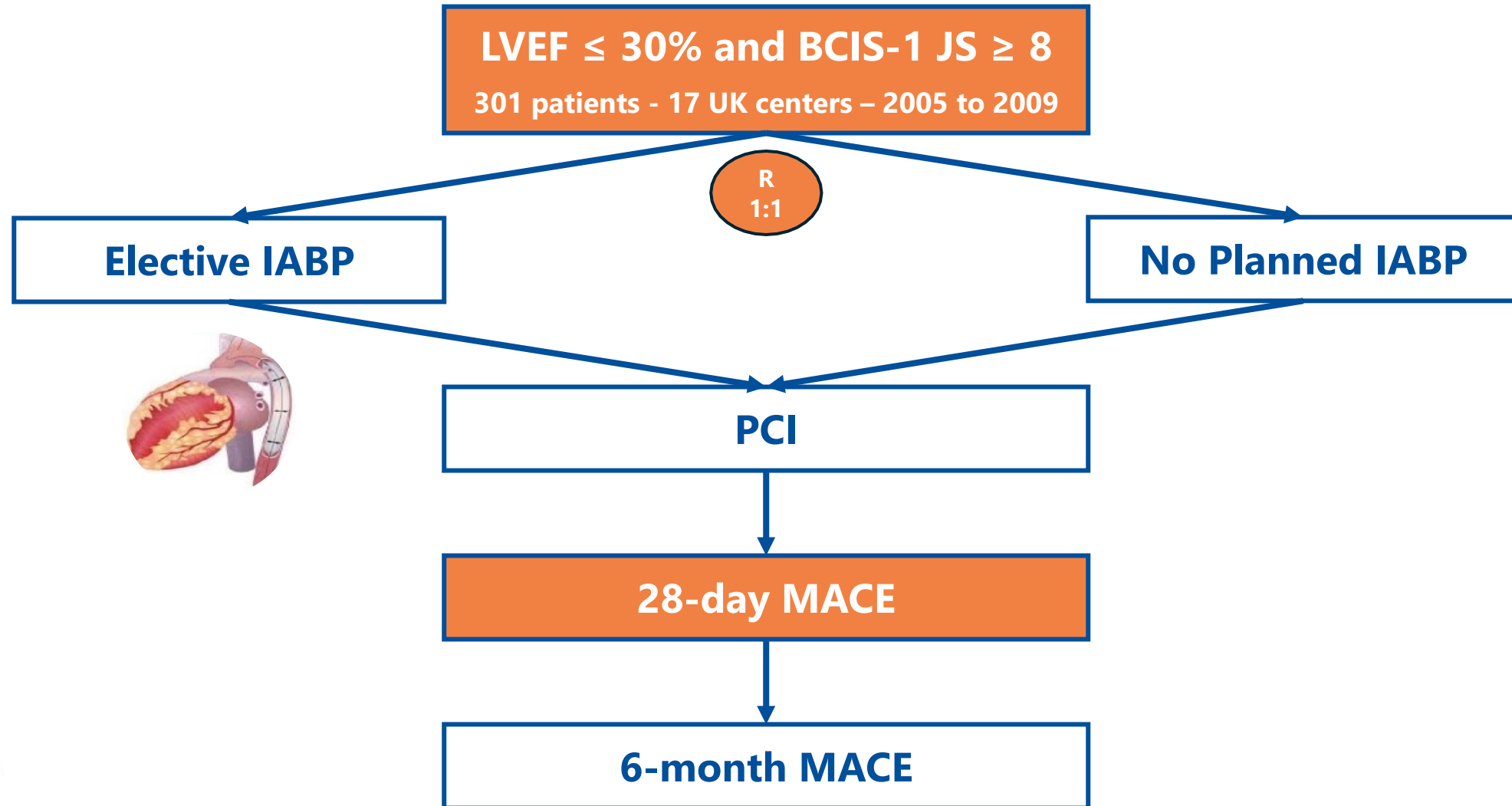


VA-ECMO

Evidence for Mechanical Circulatory Support?

Promise vs Proof

Balloon pump-assisted Coronary Intervention Study (BCIS-1)¹



Balloon pump-assisted Coronary Intervention Study (BCIS-1)^{1,2}

Table 2. Trial Outcomes

Variable	No. (%)		OR (95% CI) ^a	P Value
	Elective IABP (n = 151)	No Planned IABP (n = 150)		
Primary end point MACCE ^b	23 (15.2)	24 (16.0)	0.94 (0.51-1.76)	.85
MI	19 (12.6)	20 (13.3)	0.93 (0.48-1.83)	.85
Death	3 (2.0)	1 (0.7)	3.02 (0.31-29.37)	.34
CVA	2 (1.3)	0		
Further revascularization	1 (0.7)	4 (2.7)	0.24 (0.03-2.20)	.21
Secondary end points				
6-mo mortality	7 (4.6)	11 (7.4) ^c	0.61 (0.24-1.62)	.32
Bleeding				
All	29 (19.2)	17 (11.3)	1.86 (0.93-3.79)	.06
Major	5 (3.3)	6 (4.0)	0.83 (0.20-3.36)	.77
Minor	24 (15.9)	11 (7.3)	2.39 (1.07-5.61)	.02
Procedural complications	2 (1.3)	16 (10.7)	0.11 (0.01-0.49)	<.001
Access-site complications	5 (3.3)	0		.06 ^d

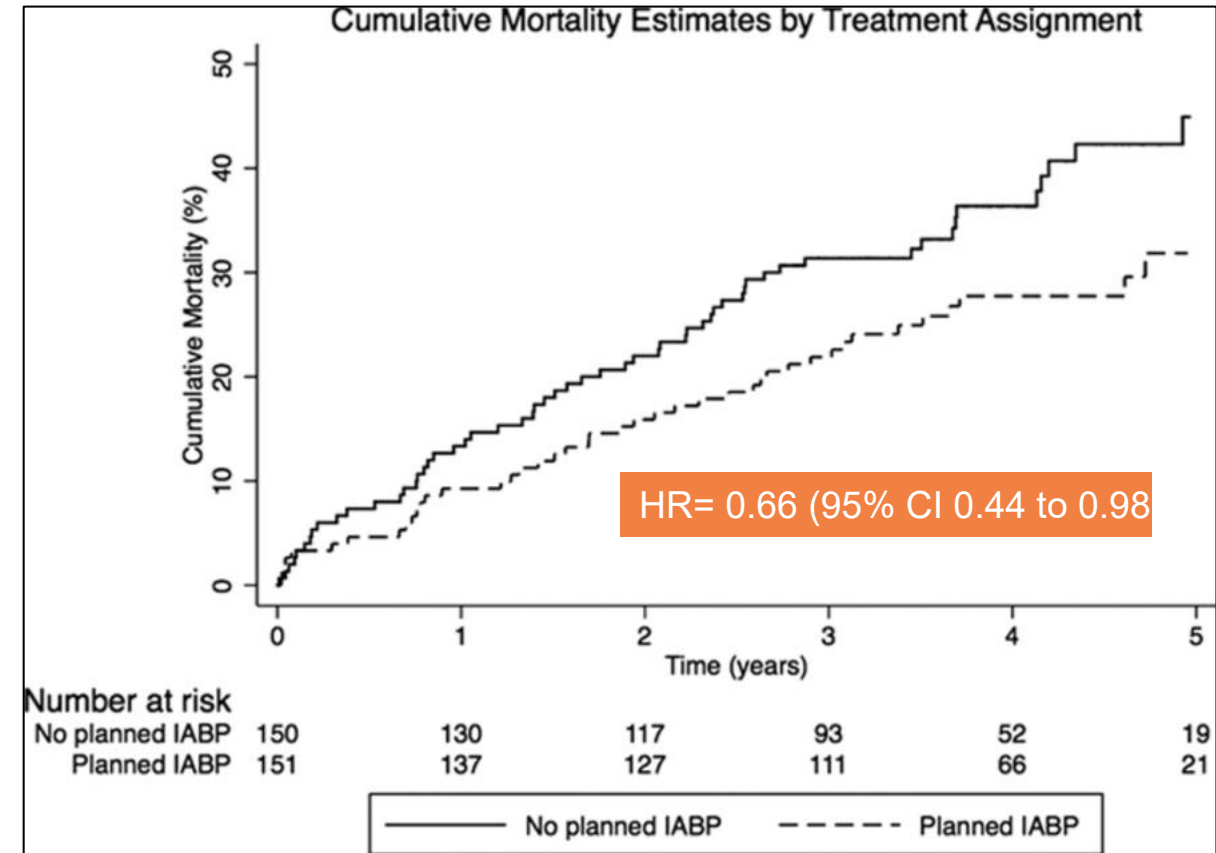
Abbreviations: CI, confidence interval; CVA, cerebrovascular accident; IABP, intra-aortic balloon pump; MACCE, major adverse cardiac and cardiovascular events; MI, myocardial infarction; OR, odds ratio.

^aOdds ratios are unadjusted.

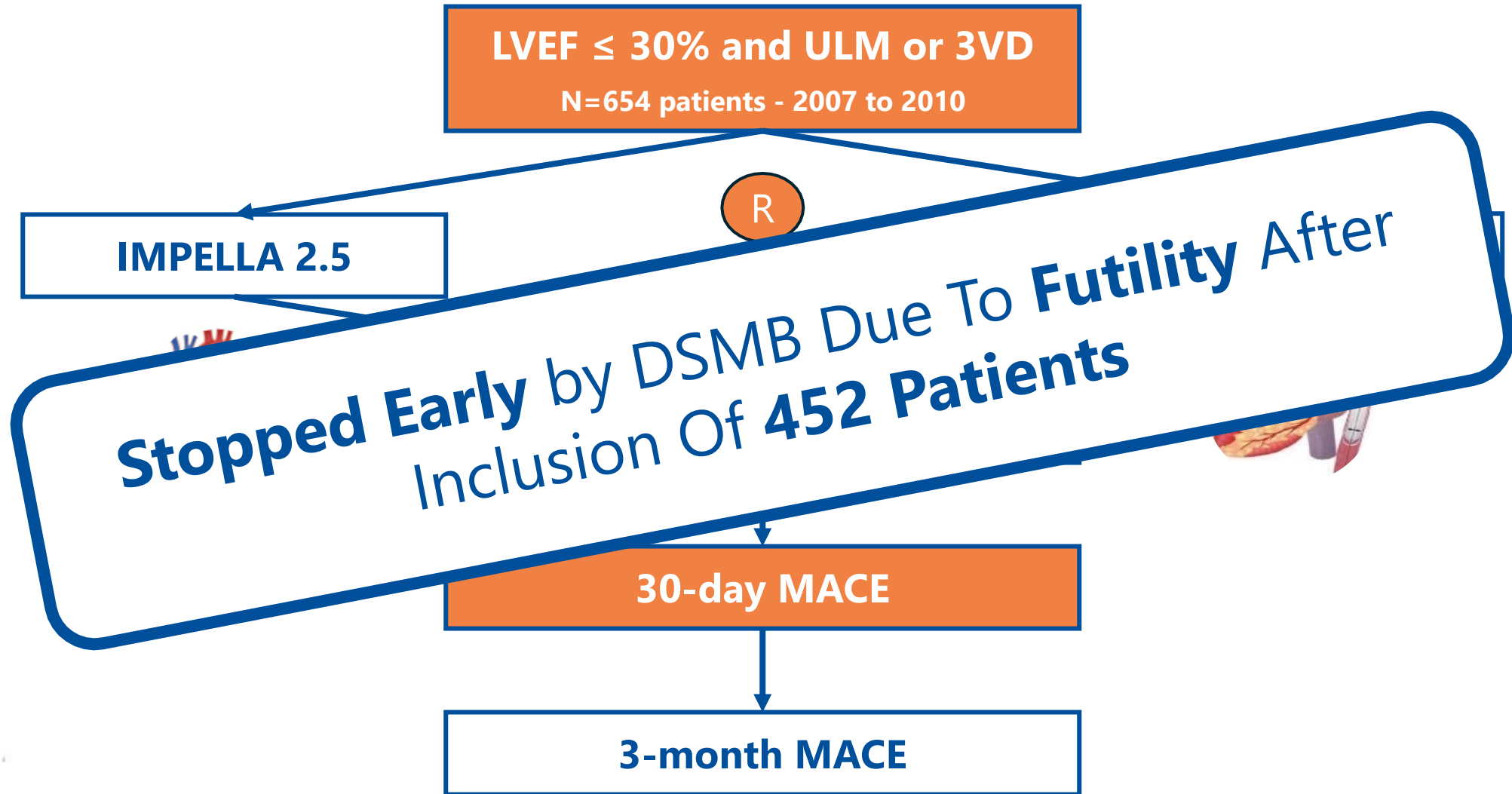
^bMACCE is hierarchical (death > MI > CVA > further revascularization); the sum of individual end points is greater than the total composite primary events, because 1 patient had an MI and died and 2 patients had MIs and further percutaneous coronary interventions.

^cData unavailable for 1 patient.

^dBy Fisher exact test.



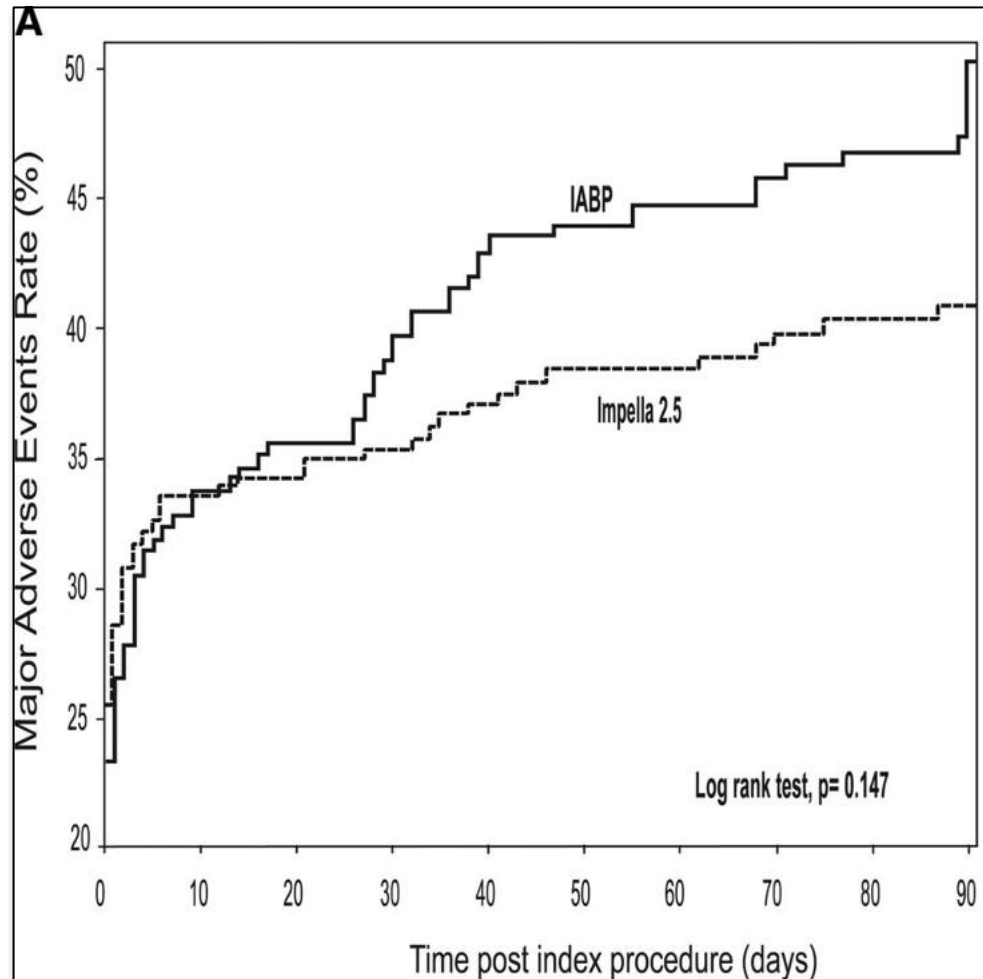
PROTECT II Trial¹



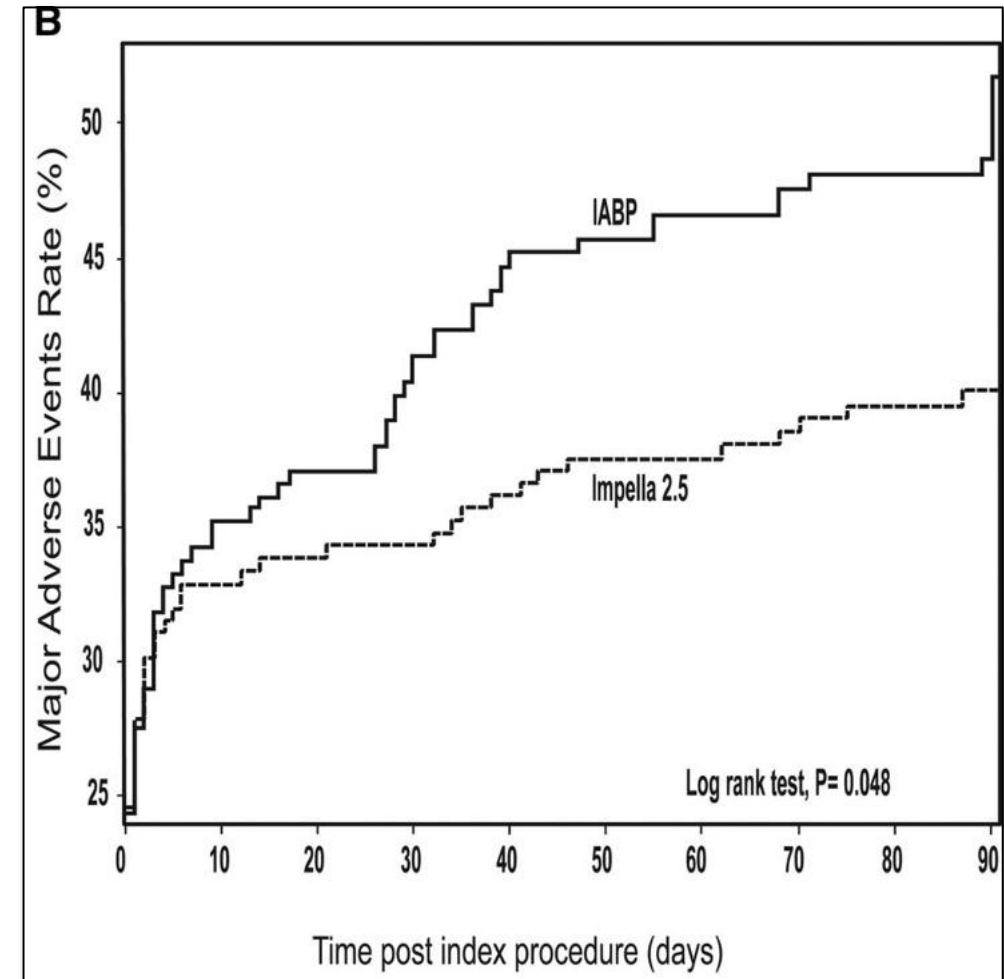
1: O'Neill *et al* Circulation 2012

PROTECT II Trial¹

Intention-to-treat



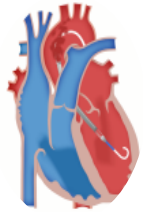
Per-protocol



What is coming?

**LVEF \leq 35% + BCIS JS \geq 8 +
Complex PCI**

300 patients – 21 UK centers – 2021 to
2025



Expected 2026

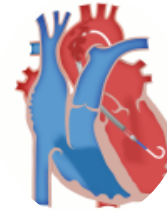
PCI

12-month MACE

Ryan M et al, Circ Cardiovasc Interv 2024

**LVEF \leq 40% + Complex PCI + PCI
decision validated in Heart-Team**

1,252 patients – 120 Europe/US/Canada Center
– 2021 to 2025



Expected 2027

PCI

3-year MACE
(with minimum 1-year fu
for all patients)

Mangner N et al, Eurointervention 2025

We Remain Facing A Dilemma....

Pro

**Per procedural stability
and comfort**

**Complete revasc with
the proper tools**

Perception of safety



Con

Cost

Vascular complications

Lack of proven benefit

Lack of clear consensus

From Theory To Practice

Making the Call

Case Example #1

54-year-old

Male



59 Kg 1m69

Past medical history

- **Dilated Cardiomyopathy** diagnosed in 2013 with medical Follow-up discontinued since 2017
- **Severe depression** with failure of ECT and poor self-care

On admission

- **Cardiogenic shock**

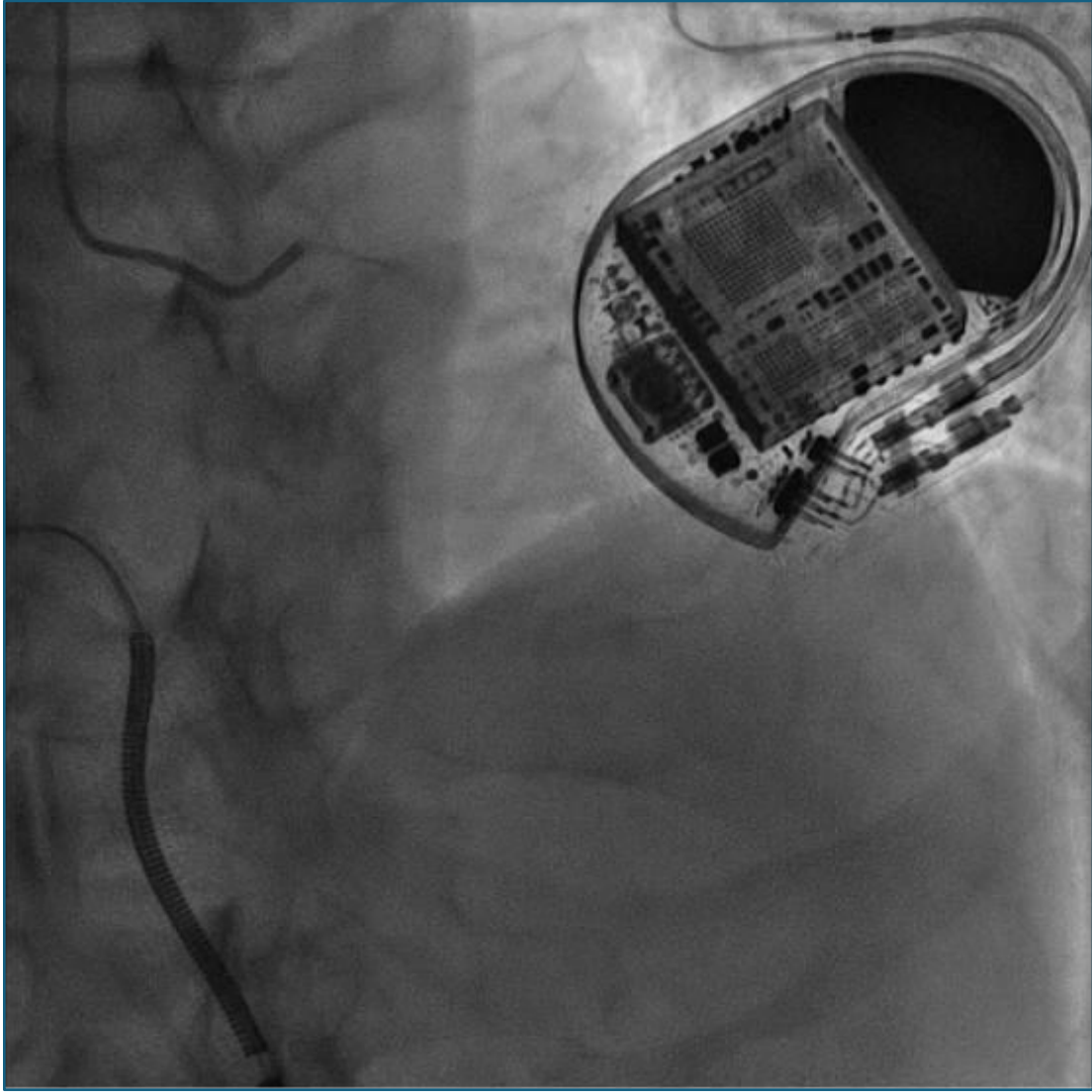
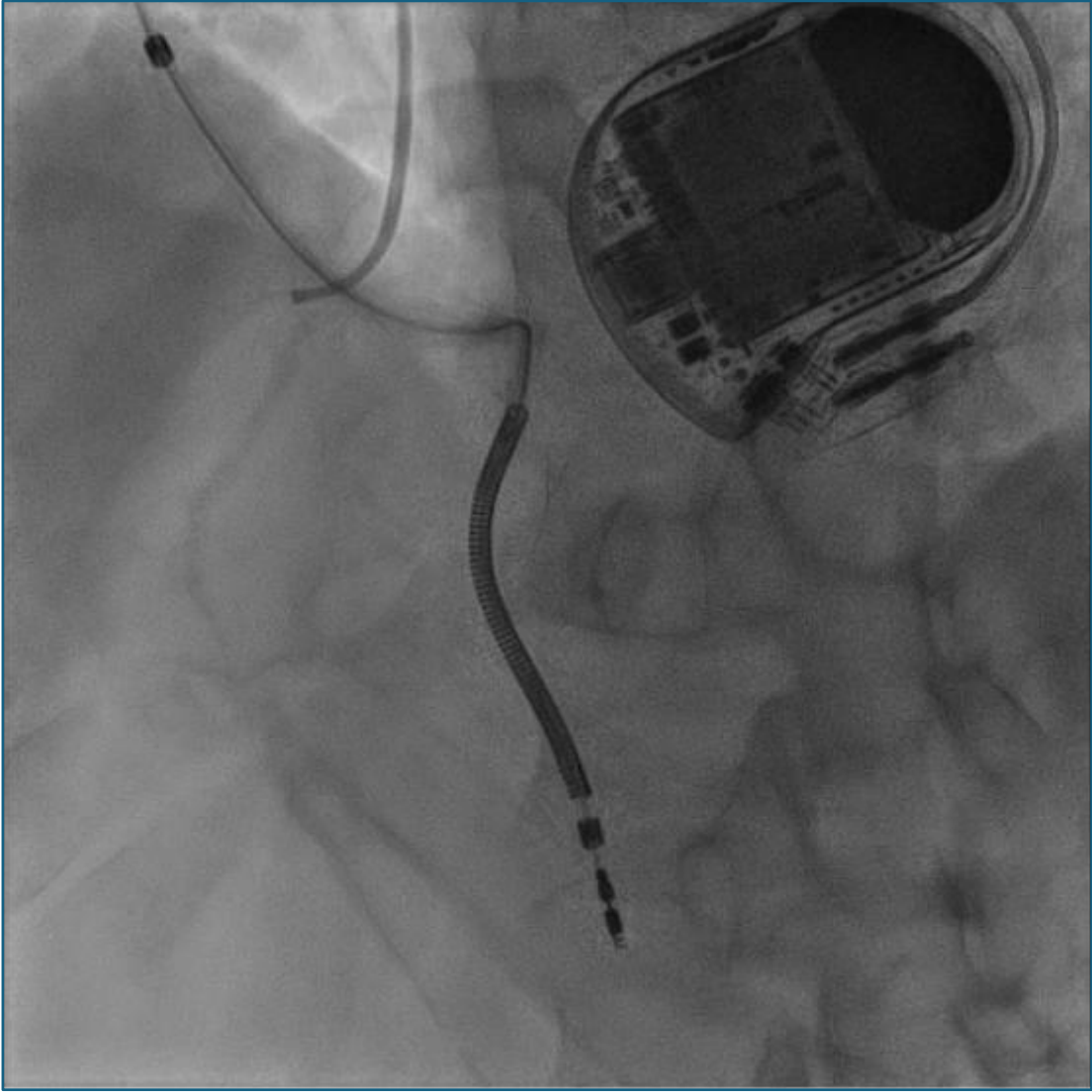
TTE:

- **LVEF:** 12%
- **LVEDV** 215 ml
- **LVOT VTI:** 8 cm
- **Tricuspid annular S' wave:** 9 cm/s
- **TAPSE:** 17 mm

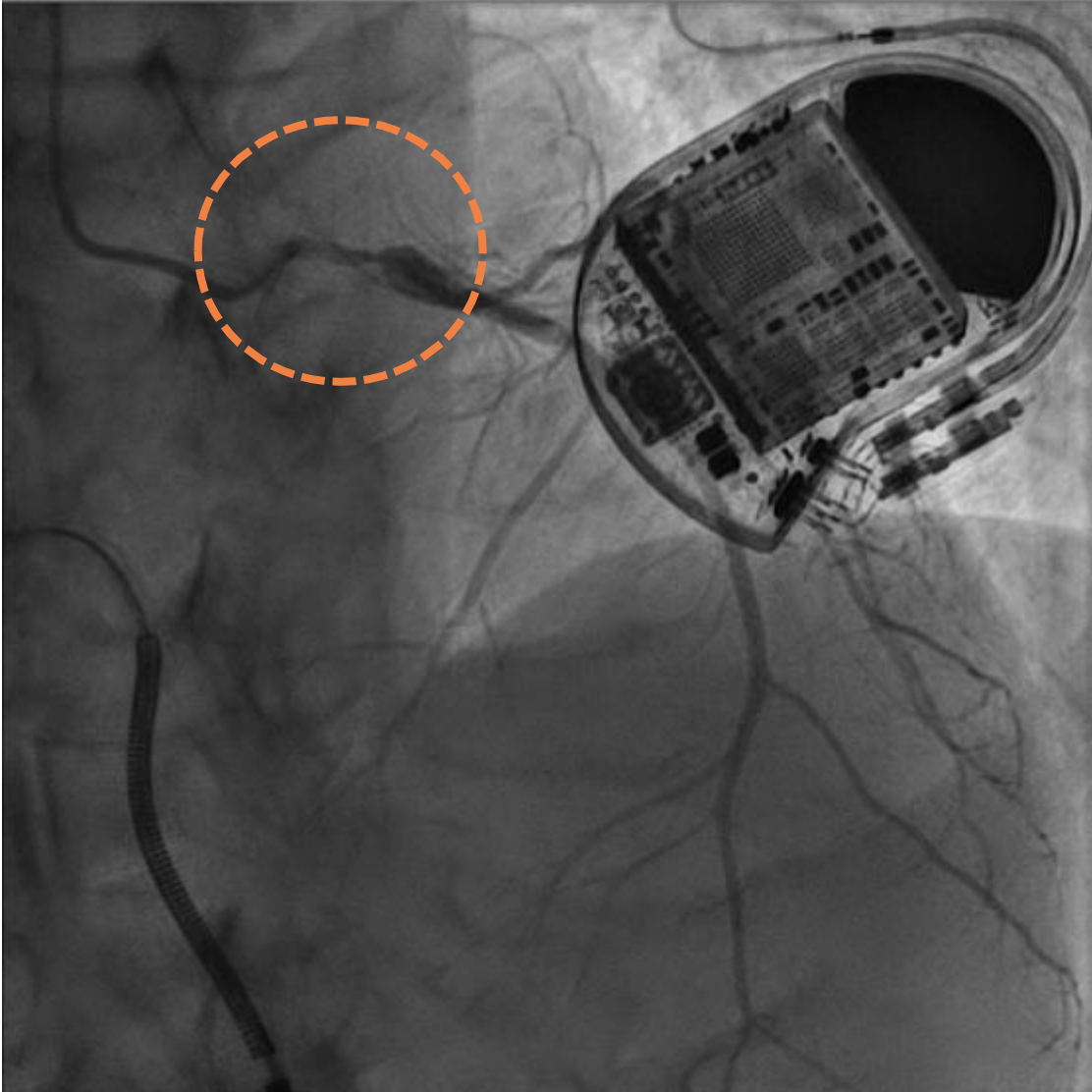
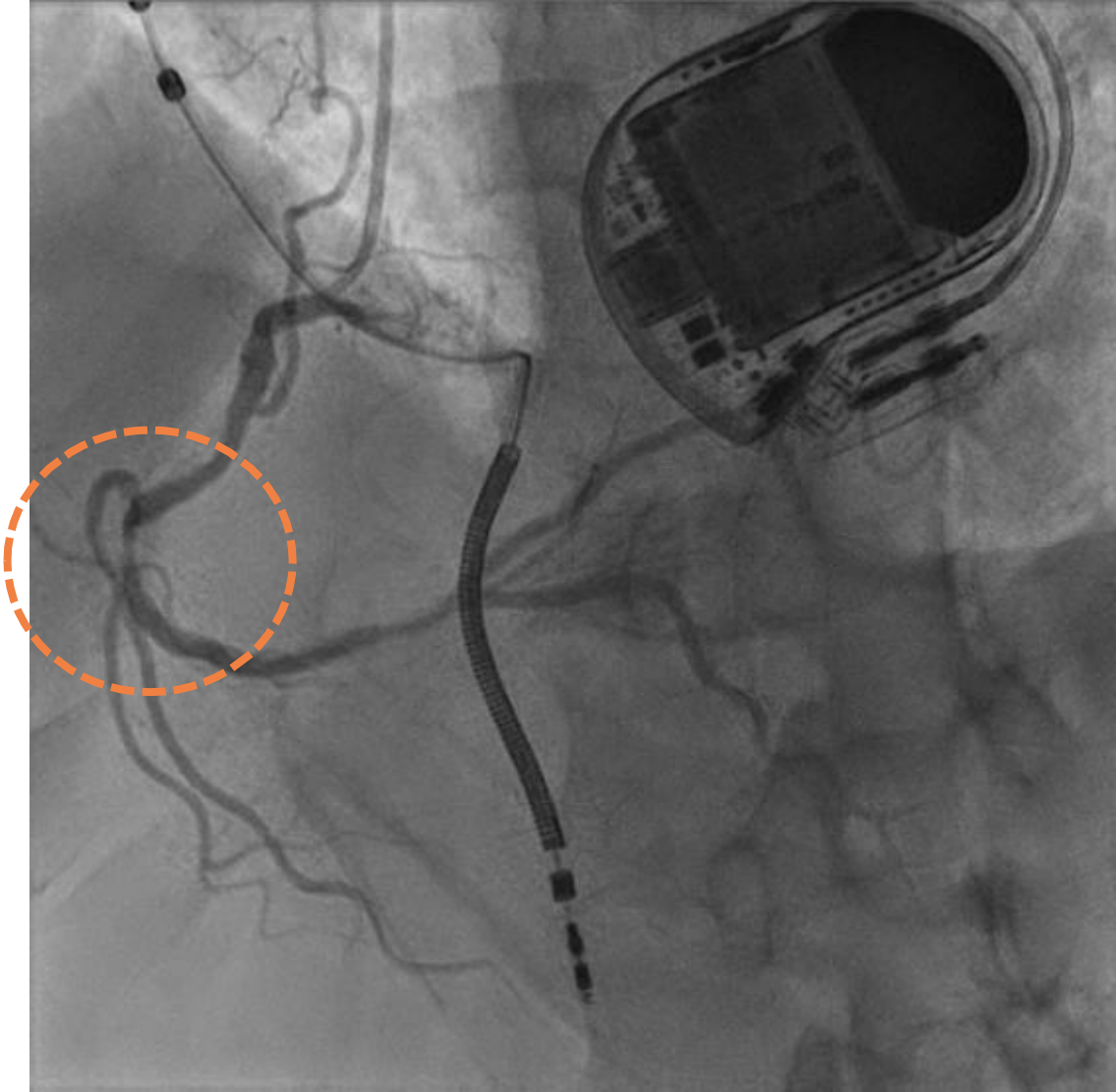
Lab:

- **Creatinine** 176 $\mu\text{mol/l}$ (eGFR 37 ml/min/1.73m²)
- **Hb:** 12,6 gr/dl
- **Nt-pro-BNP** 12248 pg/ml
- **Lactates** : 4 mmol/l

Case Example #1



Case Example #1



Case Example #1 – Heart Failure Team decision

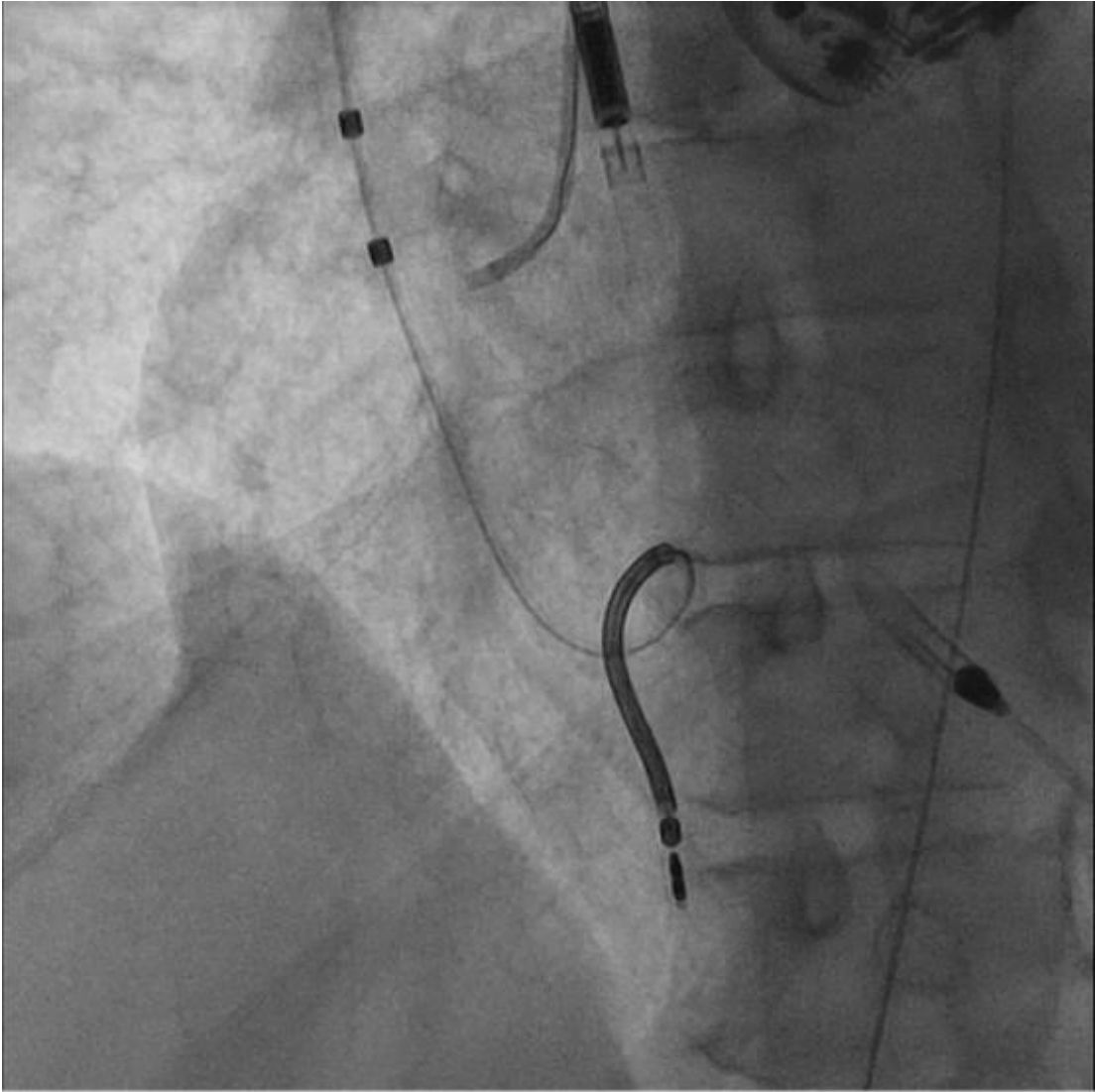


Turned down for CABG, heart transplantation, and long-term LVAD implantation

Decision for **PCI with LV Support (Impella CP)** – Bridge to Recovery

Turned down for rescue AV-ECMO

Case Example #1



Case Example #2

80-year-old

Male



54 Kg - 1m65

Past medical history

- **COPD GOLD III**
- **Rheumatoid arthritis (RA)**

On admission

- **Angina CCS 4**

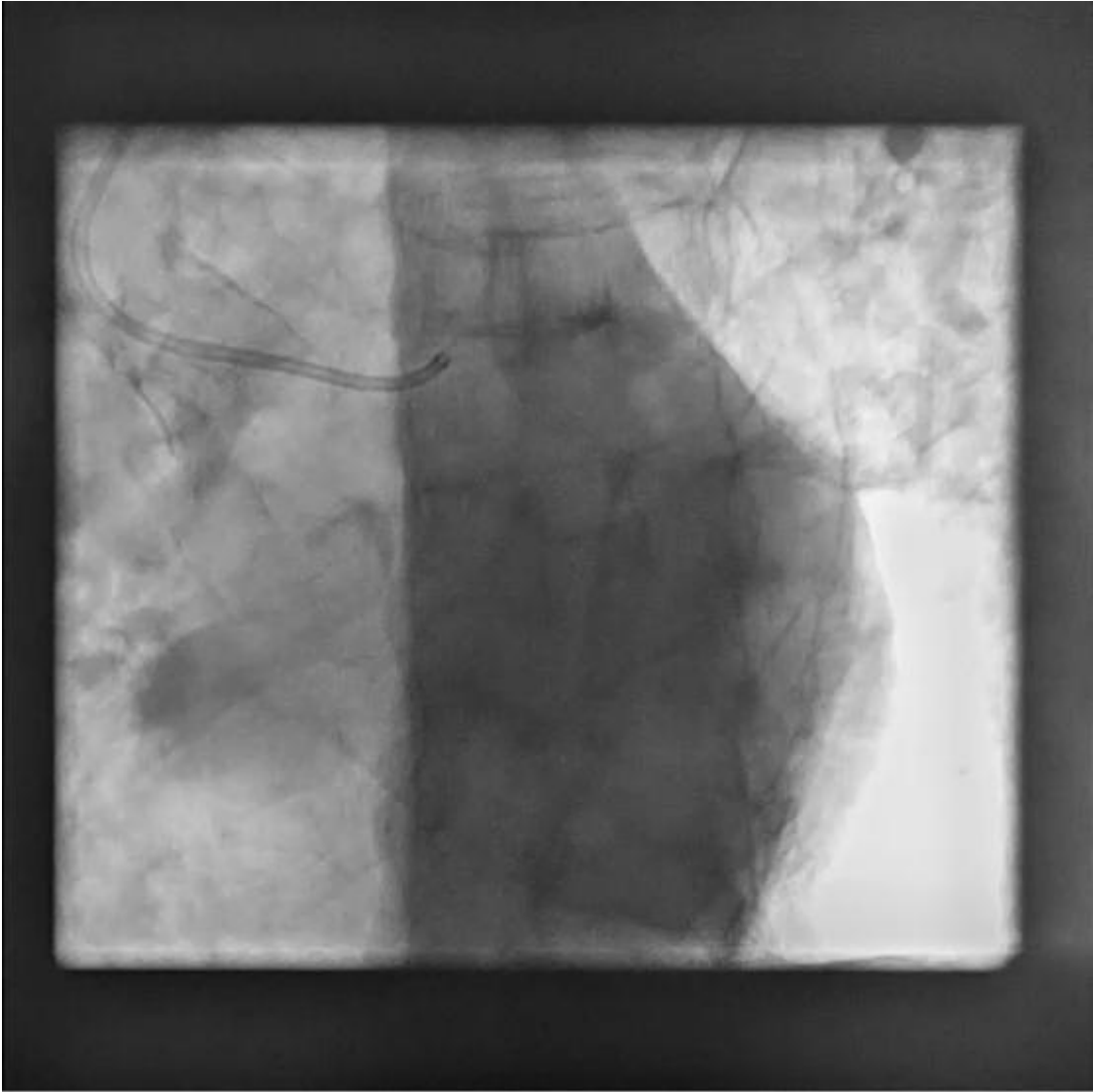
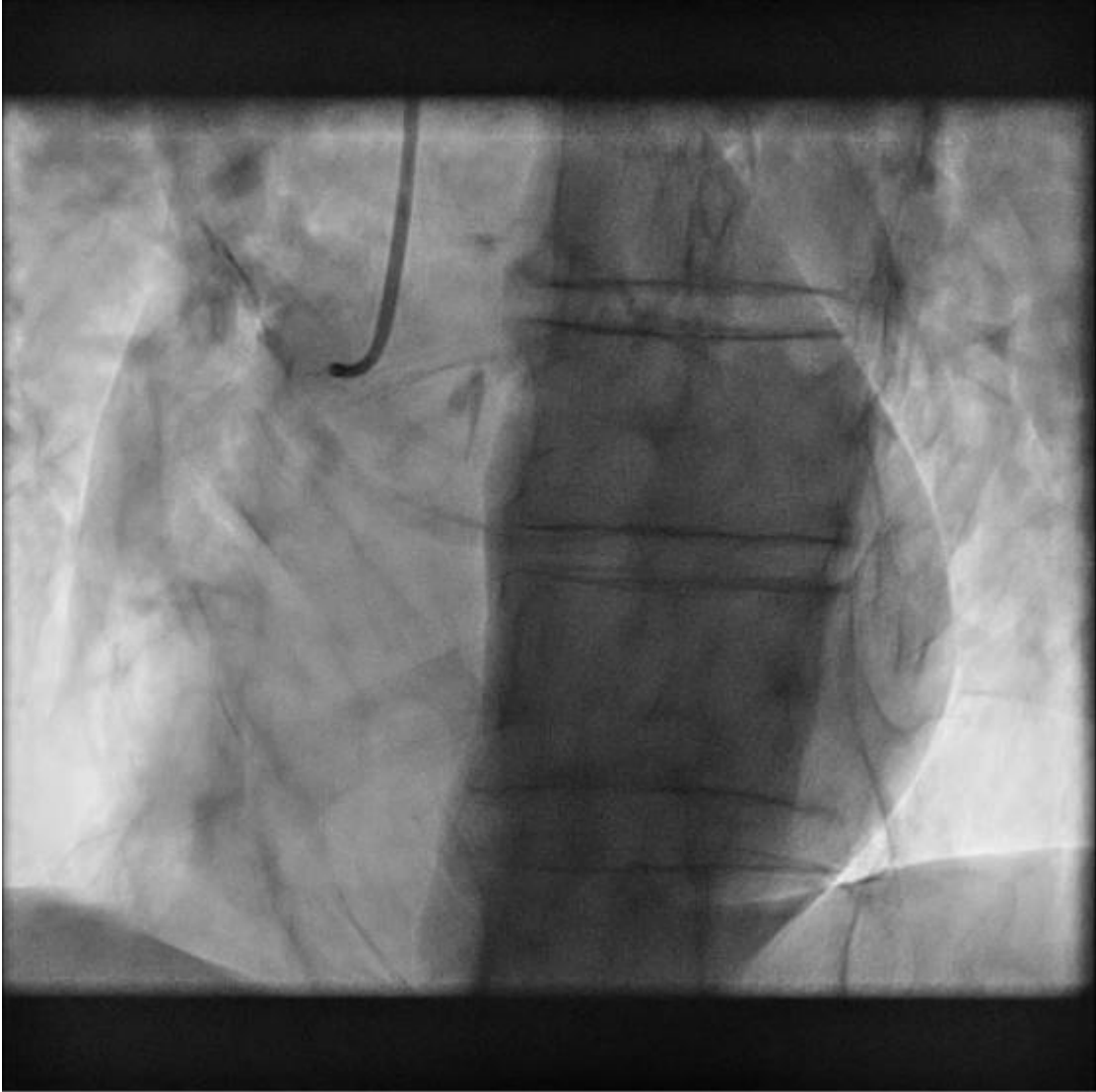
TTE:

- **LVEF: 30%** - global hypokinesia
- **TAPSE 17 mm**
- **Tricuspid annular S' wave 15 cm/s**

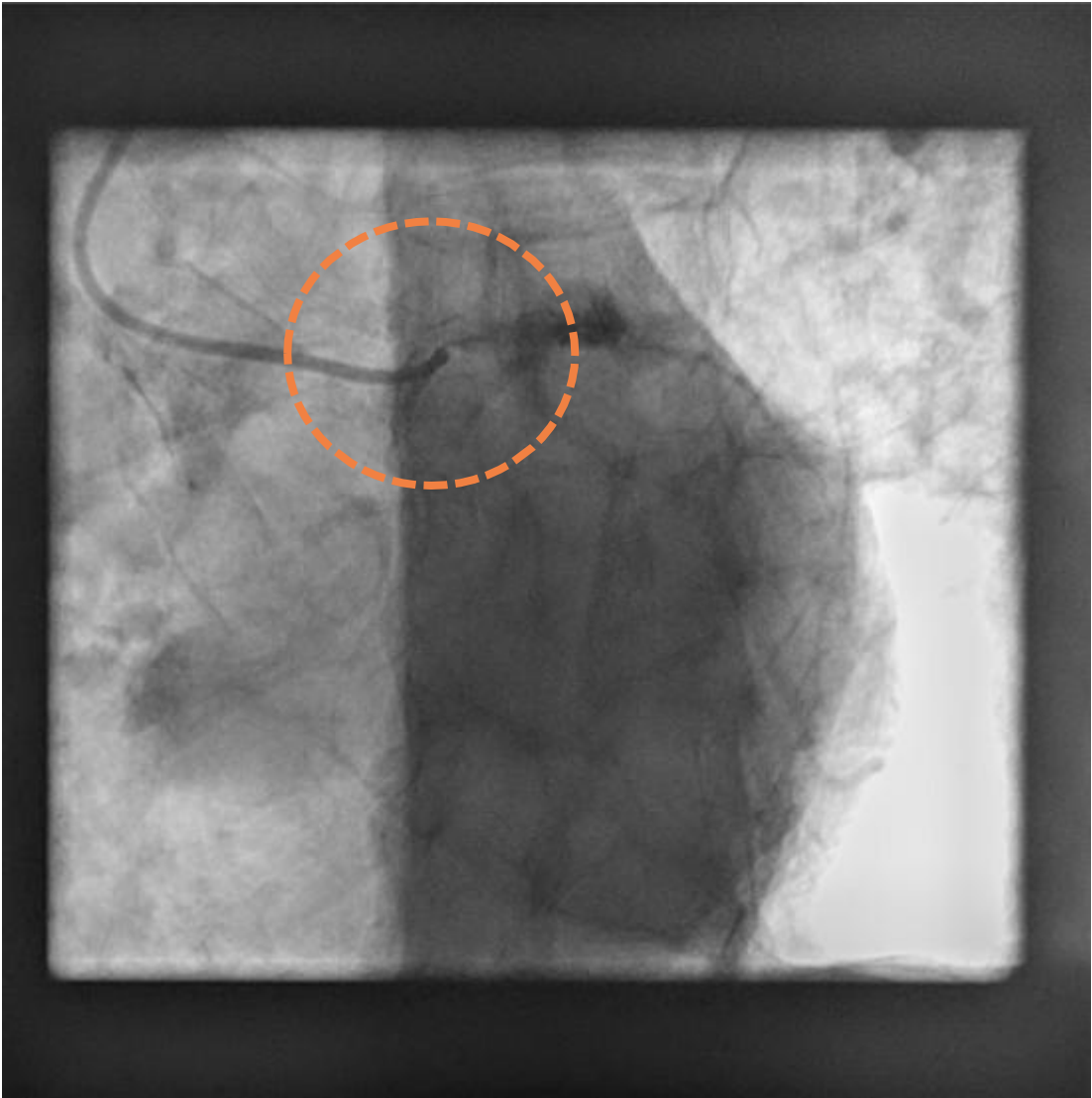
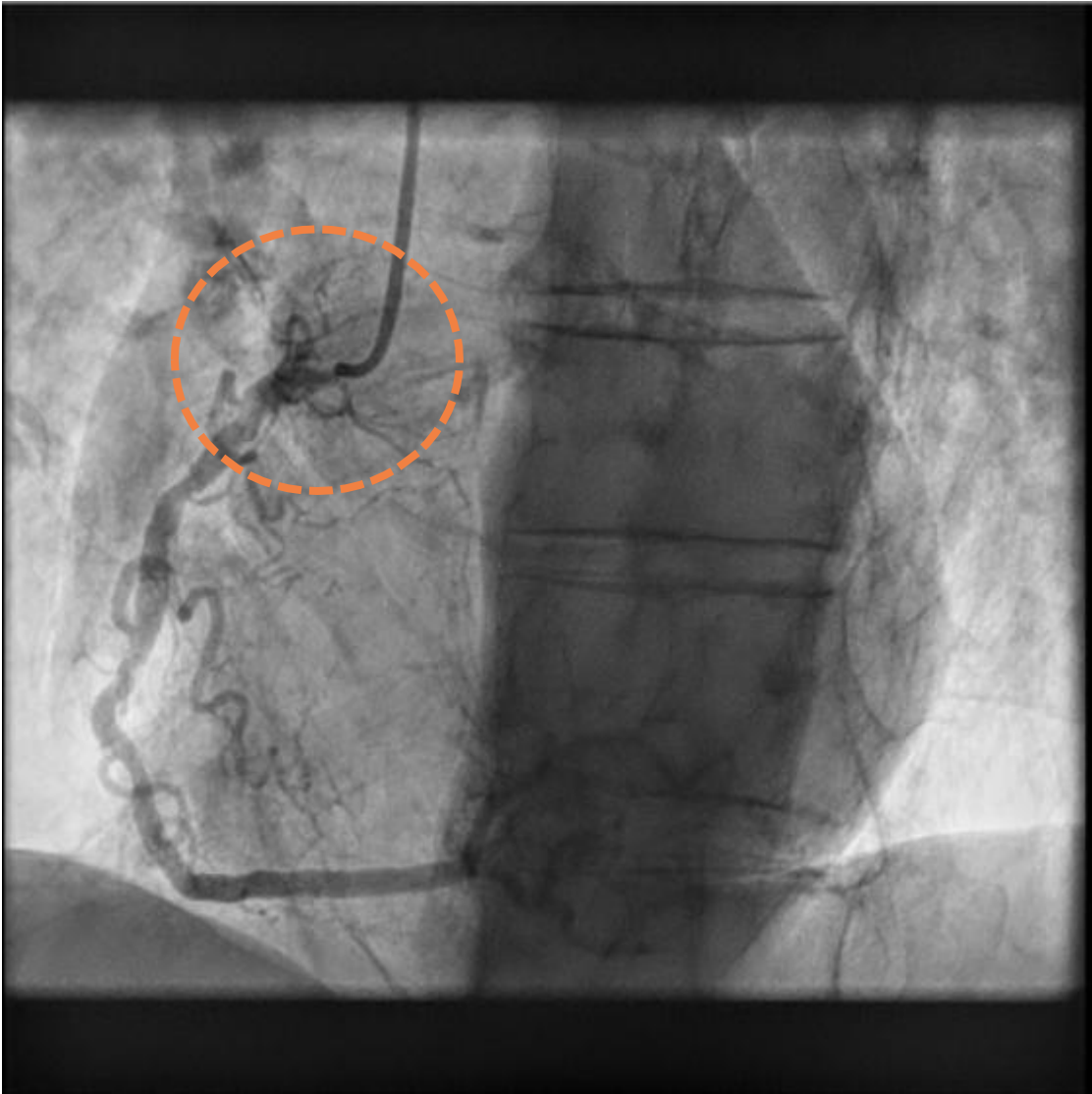
Lab:

- **Creatinine 110 $\mu\text{mol/l}$**
(eGFR 39 ml/min/1.73m²)
- **Hb: 13,7 gr/dl**
- **Nt-pro-BNP : 4291 pg/ml**

Case Example #2



Case Example #2



Case Example #2 – Heart Failure Team decision

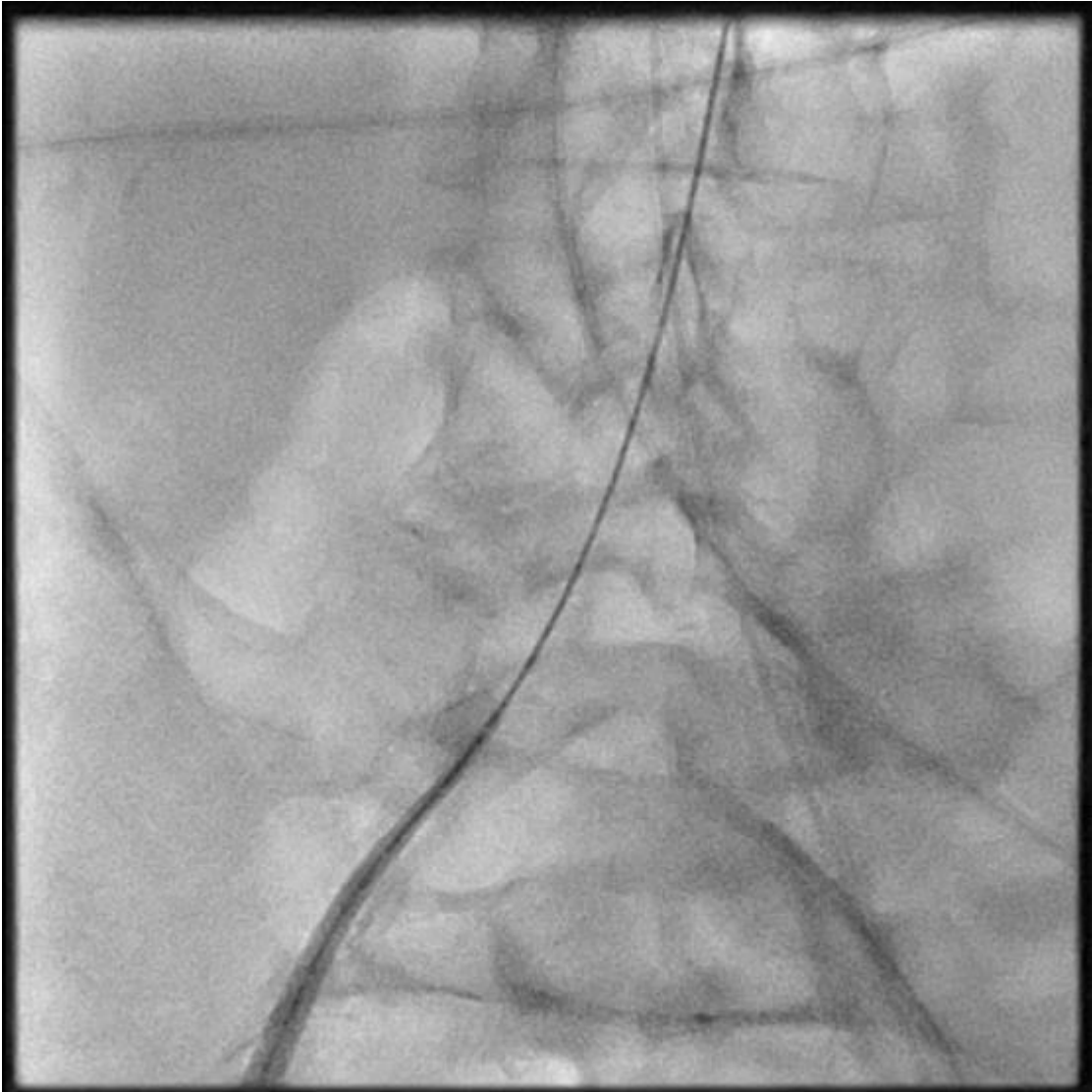
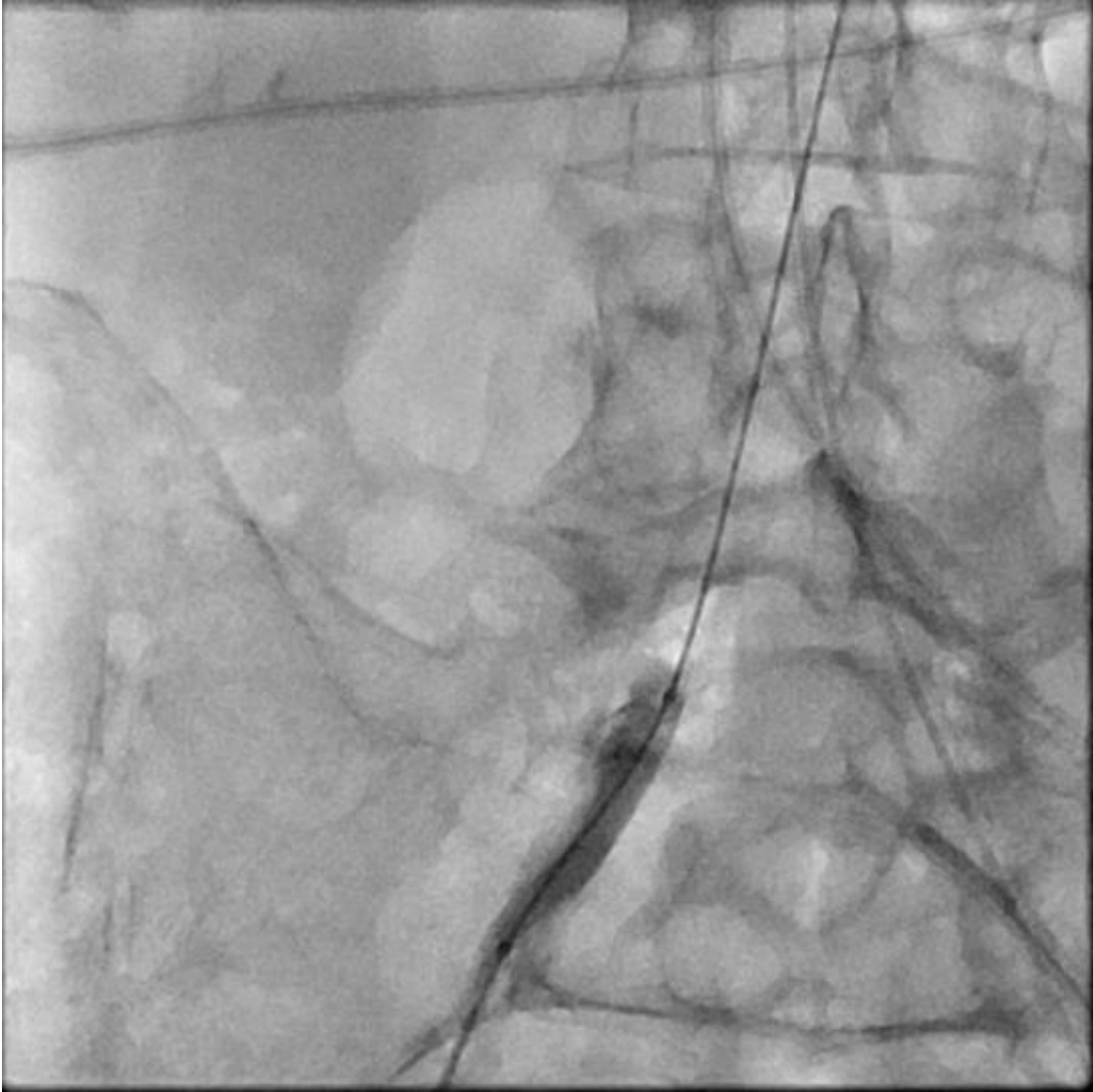


Turned down for CABG surgery

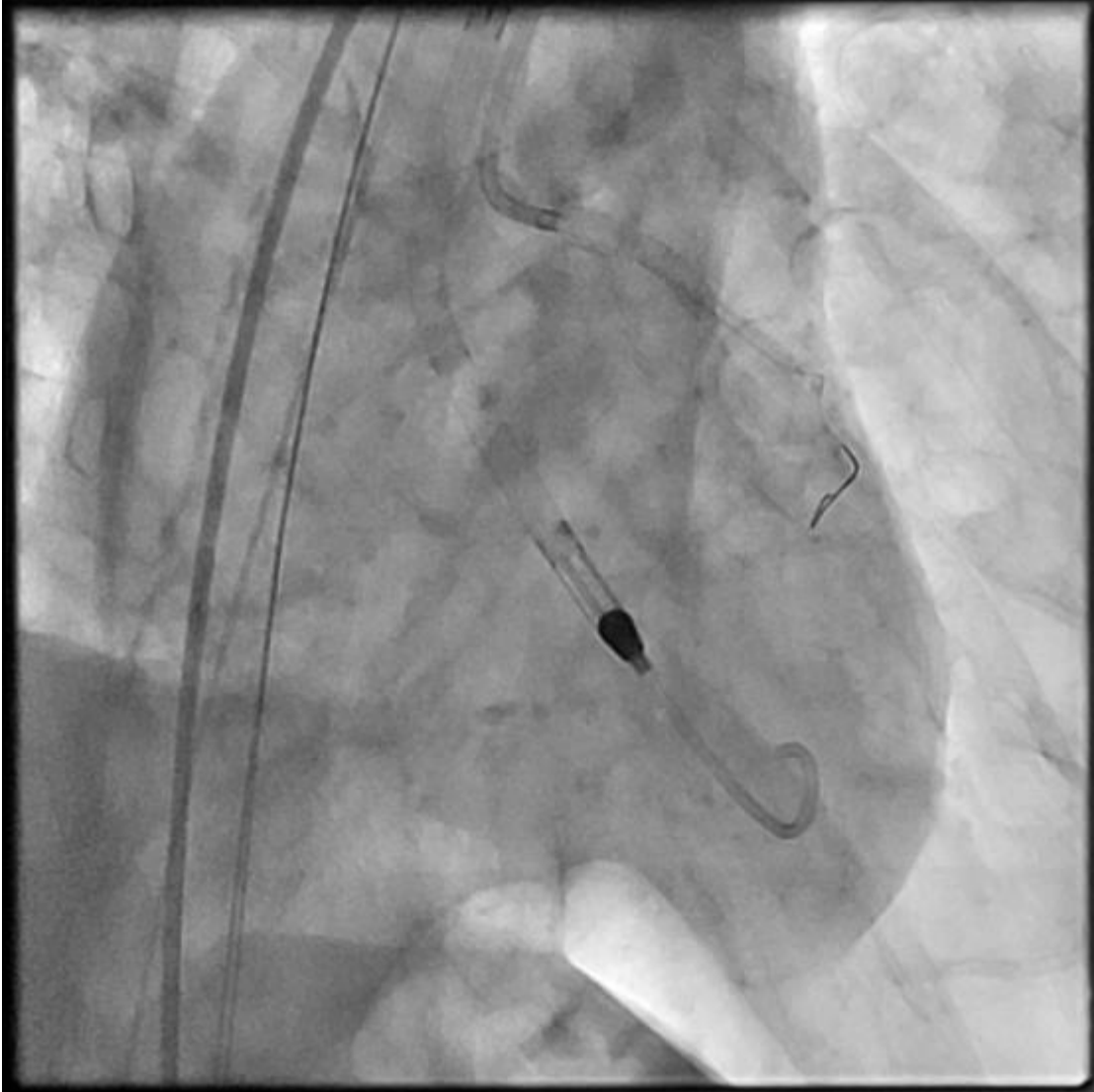
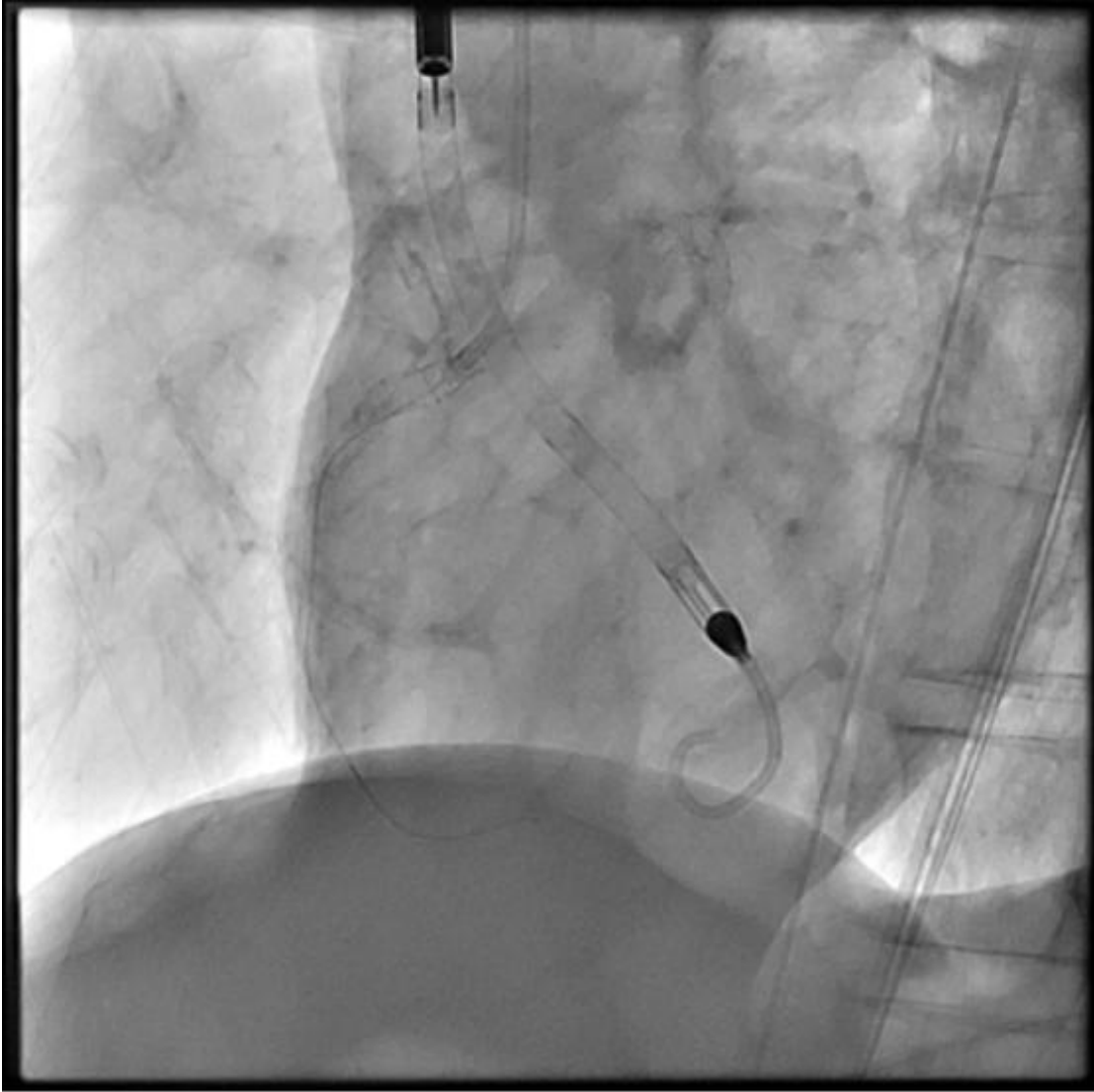
Decision for **PCI with LV Support**
(Impella CP)

Inadequate vascular access for fem-fem AV-ECMO

Case Example #2



Case Example #2



Before stepping in...



Share the decision with the patient and family



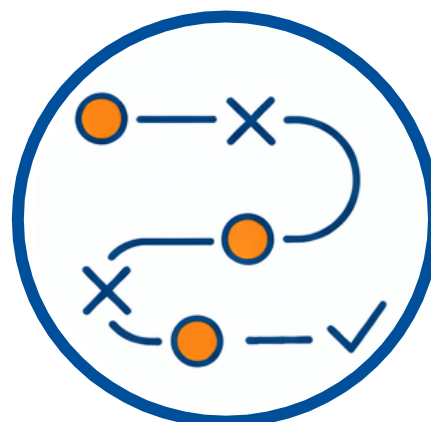
Optimize hemodynamics



Double-check vascular accesses



Have two experienced operators at the table

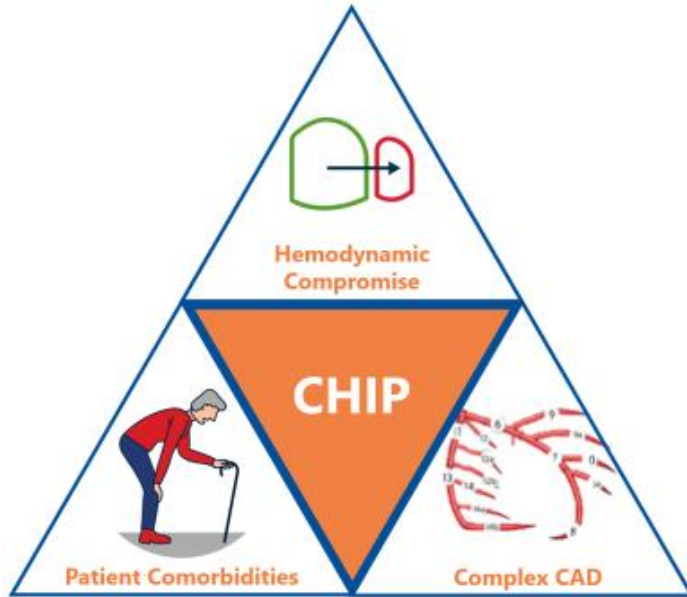


Plan the PCI and brief the team



Define your bailout plan

Conclusion



**CHIP = comorbidities +
poor hemodynamics +
complex anatomy**



**MCS may improve
outcomes in selected
CHIP procedure**

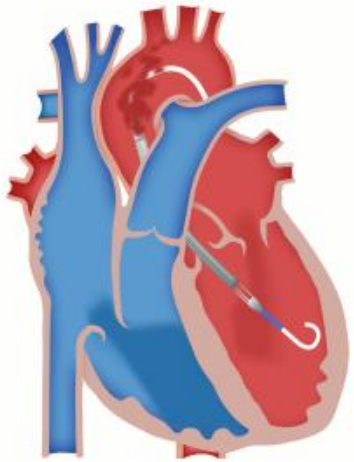


**Protected CHIP requires
thoughtful patient
selection**

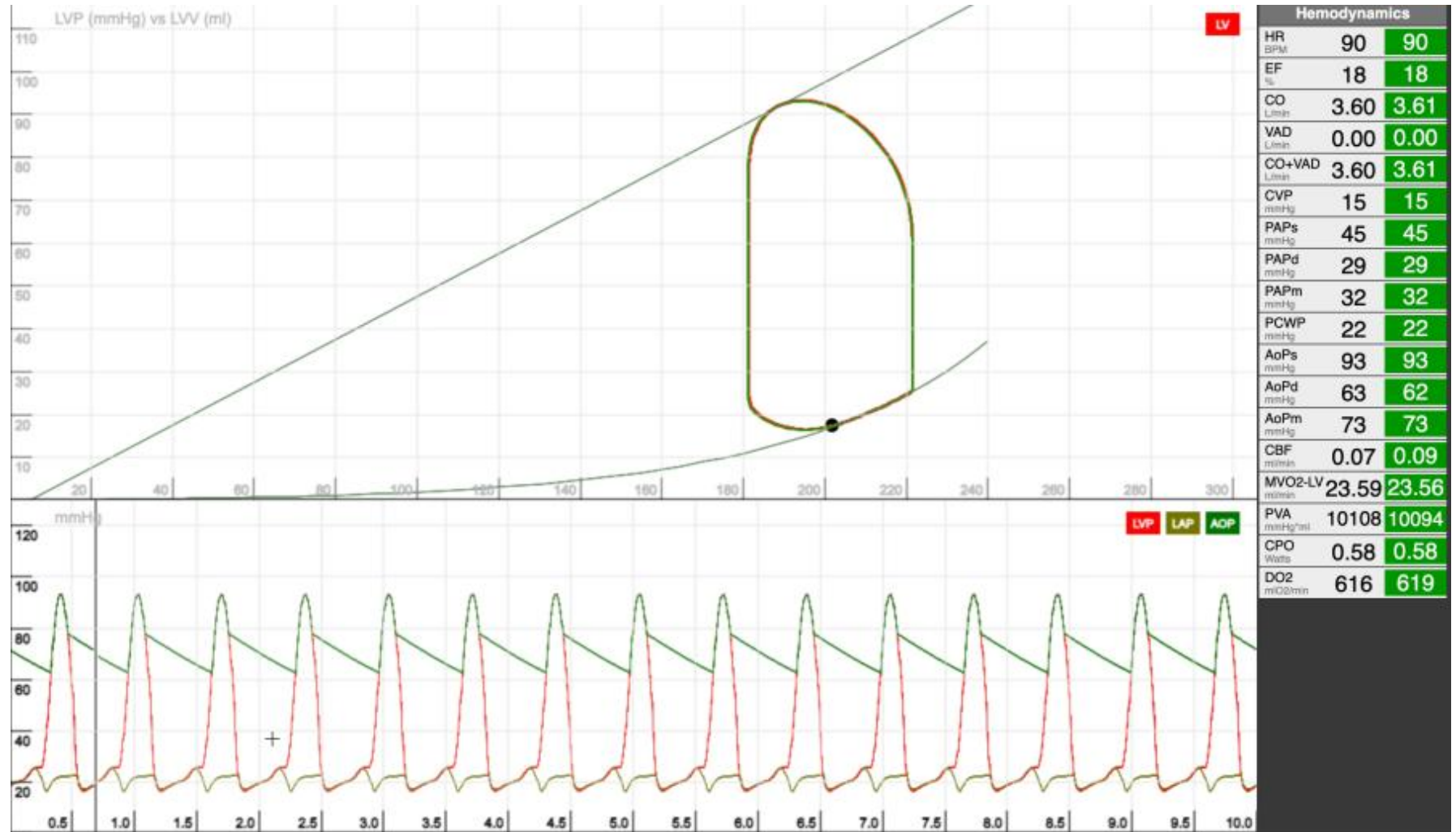
Thanks for your attention!

Back up slides

How does IMPELLA help?



Impella CP



Case Example #3

55-year-old

Male



82 Kg 1m85

Past medical history

- None

On admission

- Progressive dyspnea over the past month

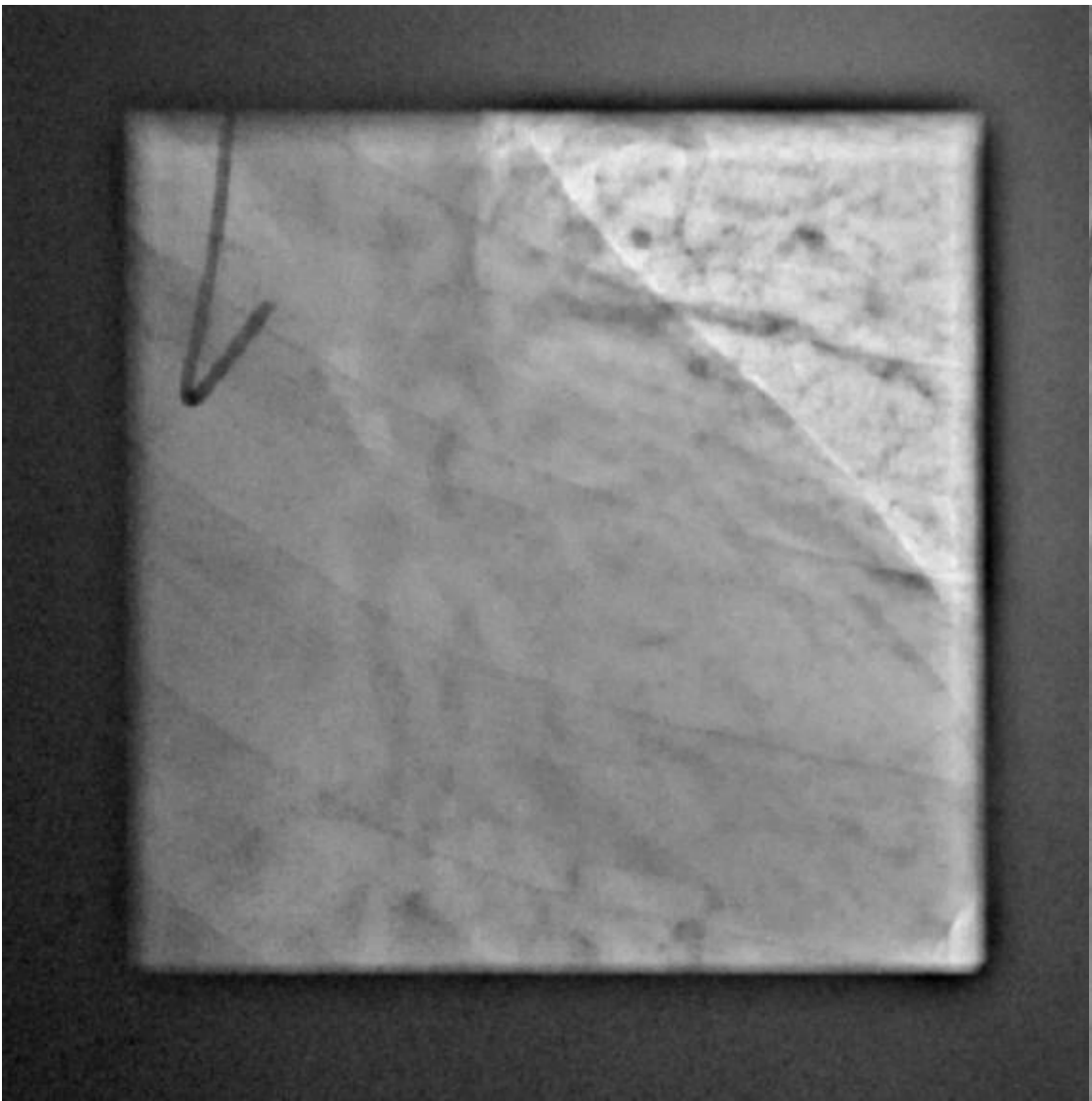
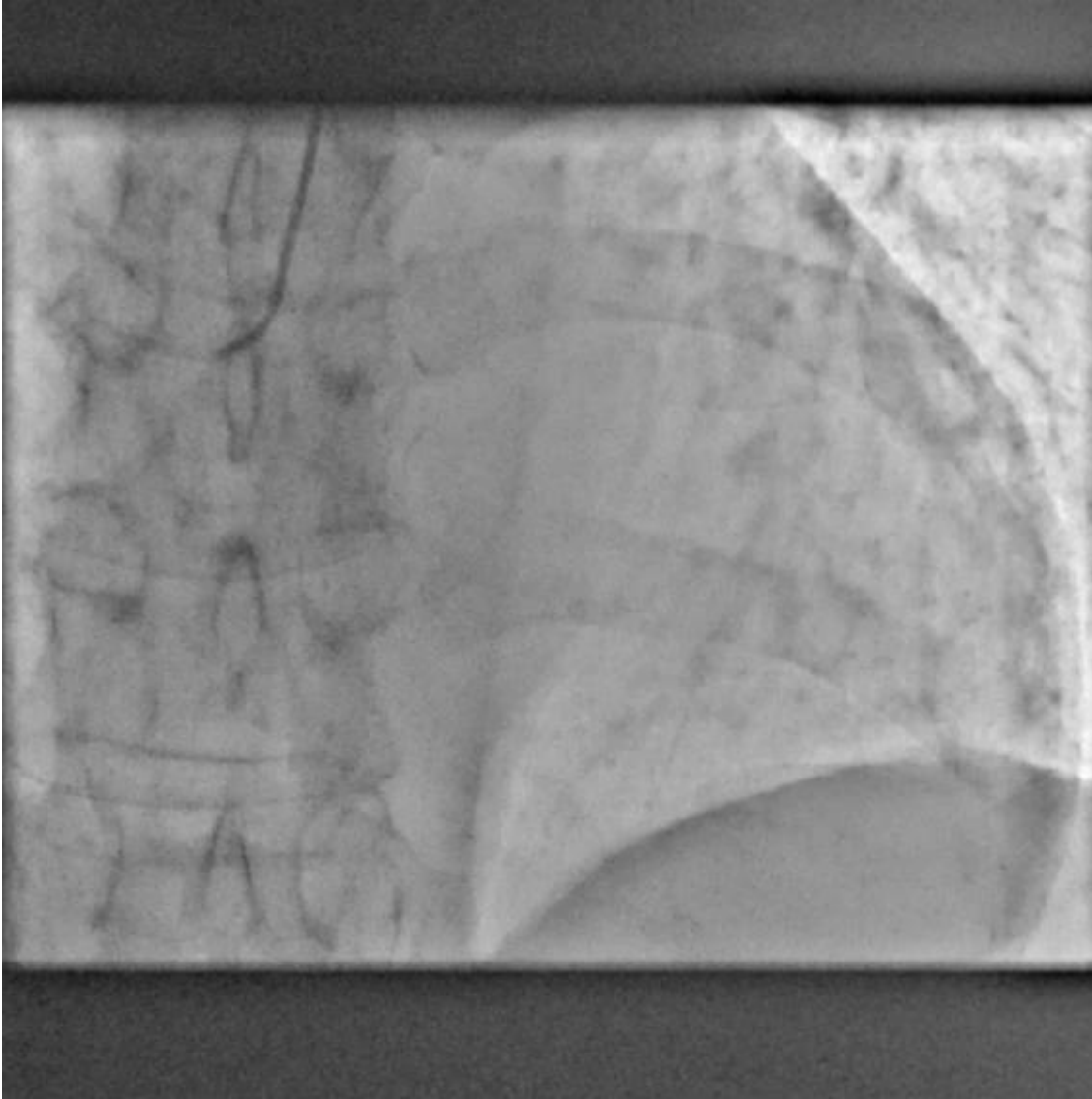
TTE:

- LVEF: 15%
- **LV thrombus**
- TAPSE 21 onde S 10 cm/s

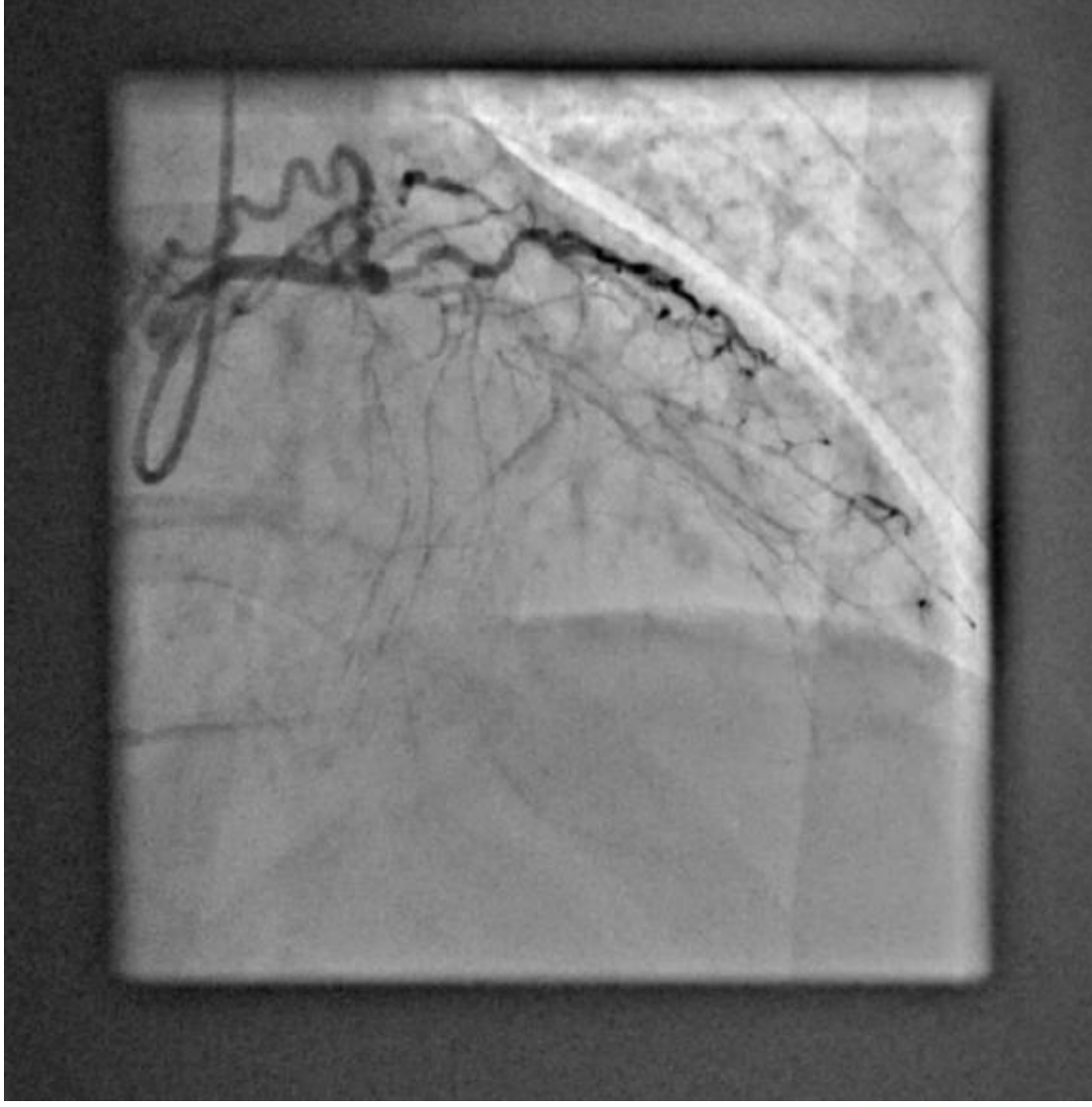
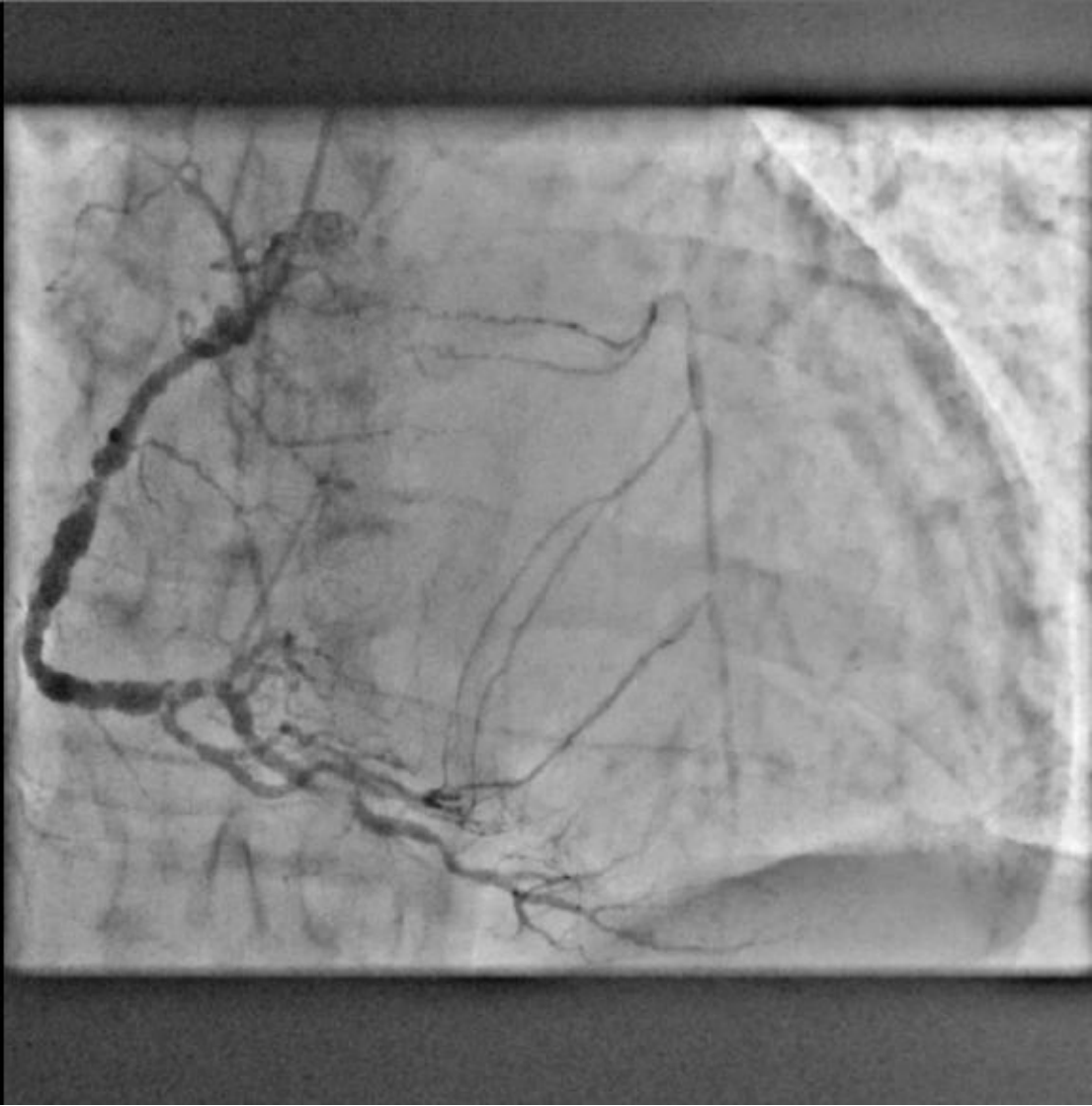
Lab:

- **Creatinine 95 μ mol/l**
(eGFR 78 ml/min/1.73m²)
- **Hb: 11 gr/dl**
- **Nt pro BNP 17986 pg/ml**

Case Example #3



Case Example #3



Case Example #3 – Heart Failure Team decision



Deemed **unsuitable for CABG**; potential candidate for heart transplantation or durable LVAD therapy.

Decision for **PCI with LV Support (IABP – LV thrombus)** to Improve LV Function

Potential candidate for bail-out fem-fem AV-ECMO → heart transplantation or LVAD

Case Example #3

