

Clinical experience of Impella

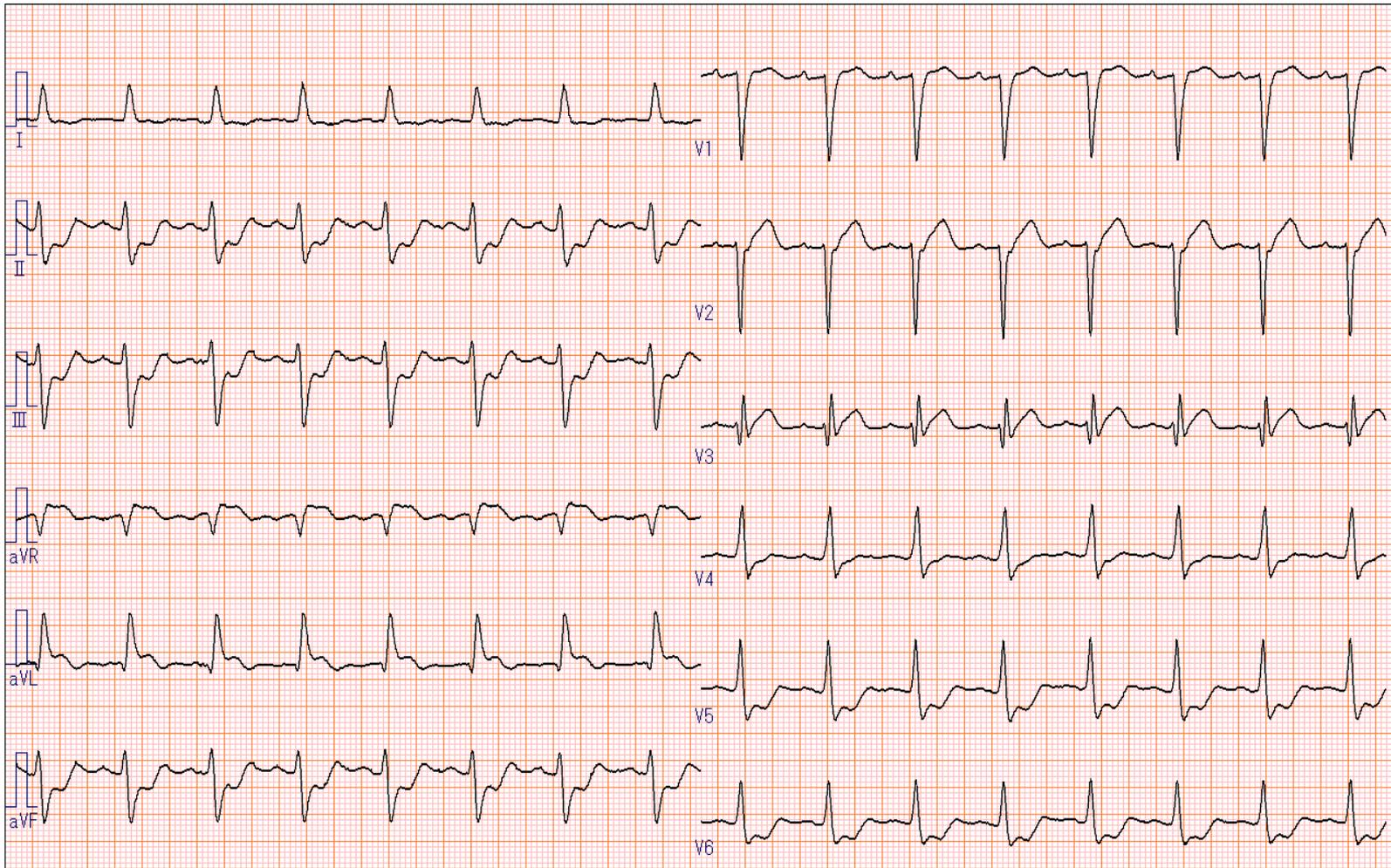
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Hospital
Hyogo, Japan**

Case1: Non-STEMI

- ◆ A 66-year old Japanese woman presented to the emergency department with chest pain.
- ◆ Coronary risk factors
 - Hypertension, Diabetes mellitus
- ◆ Renal function
 - Chronic kidney disease stage 5, undergoing kidney dialysis
- ◆ Transthoracic echocardiogram
 - Ejection fraction 49%
 - Dyskinetic anterior-septal-apical wall of the left ventricle
- ◆ Blood pressure: 86/64 mmHg

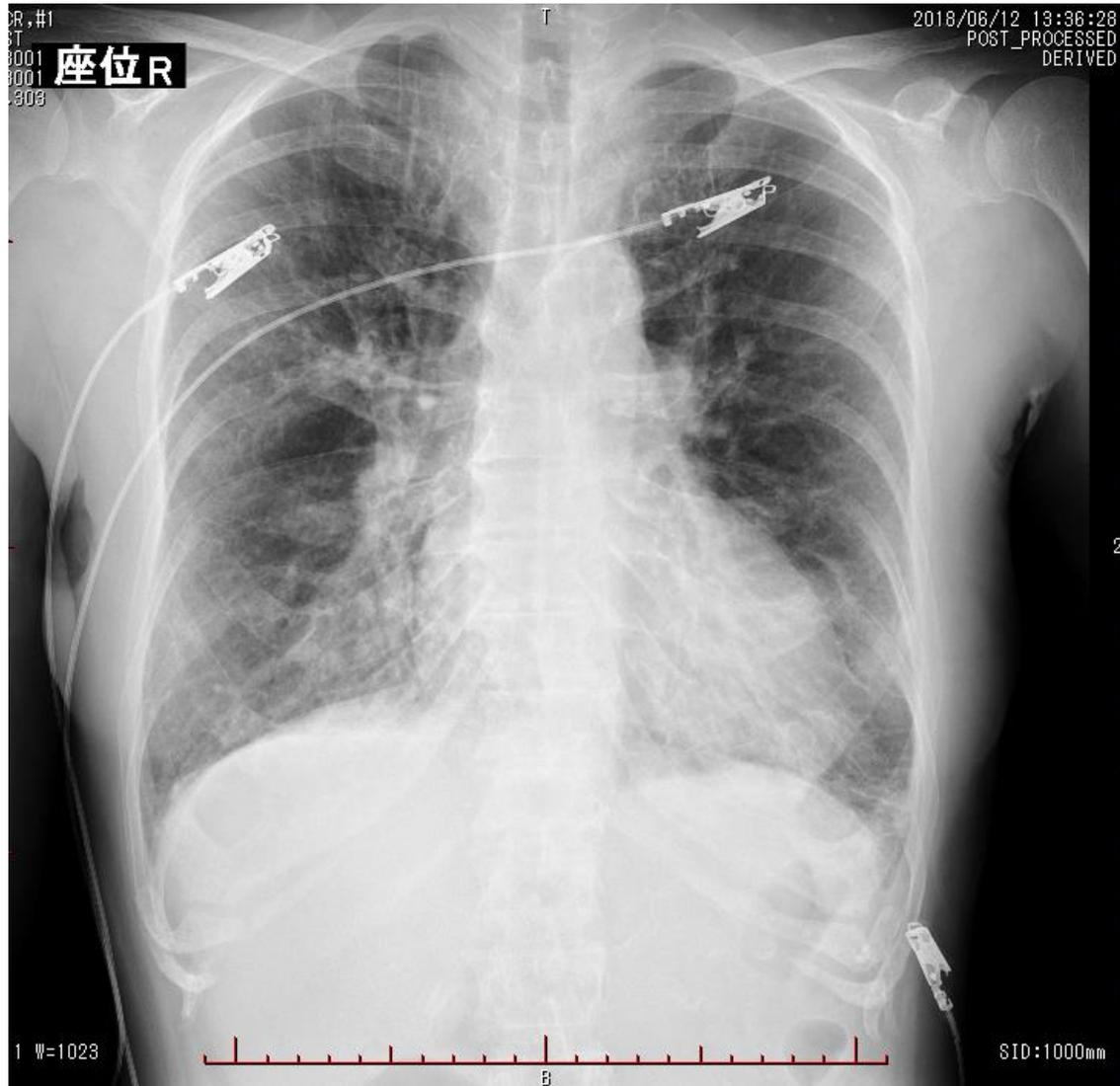
ECG

ST depression in the inferior, lateral leads with ST elevation in the lead aVR



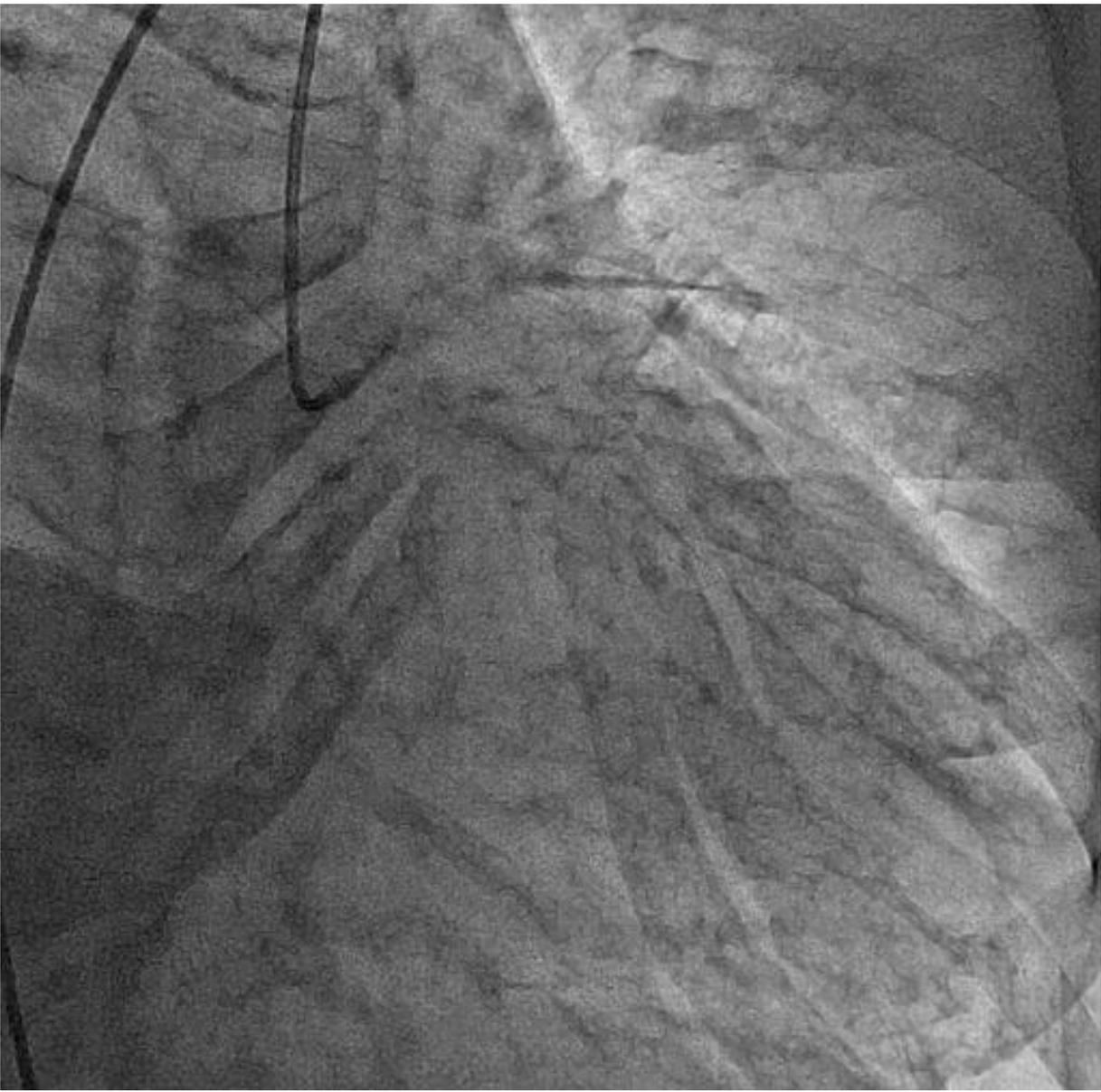
Chest X-ray

Pulmonary congestion and cardiomegaly



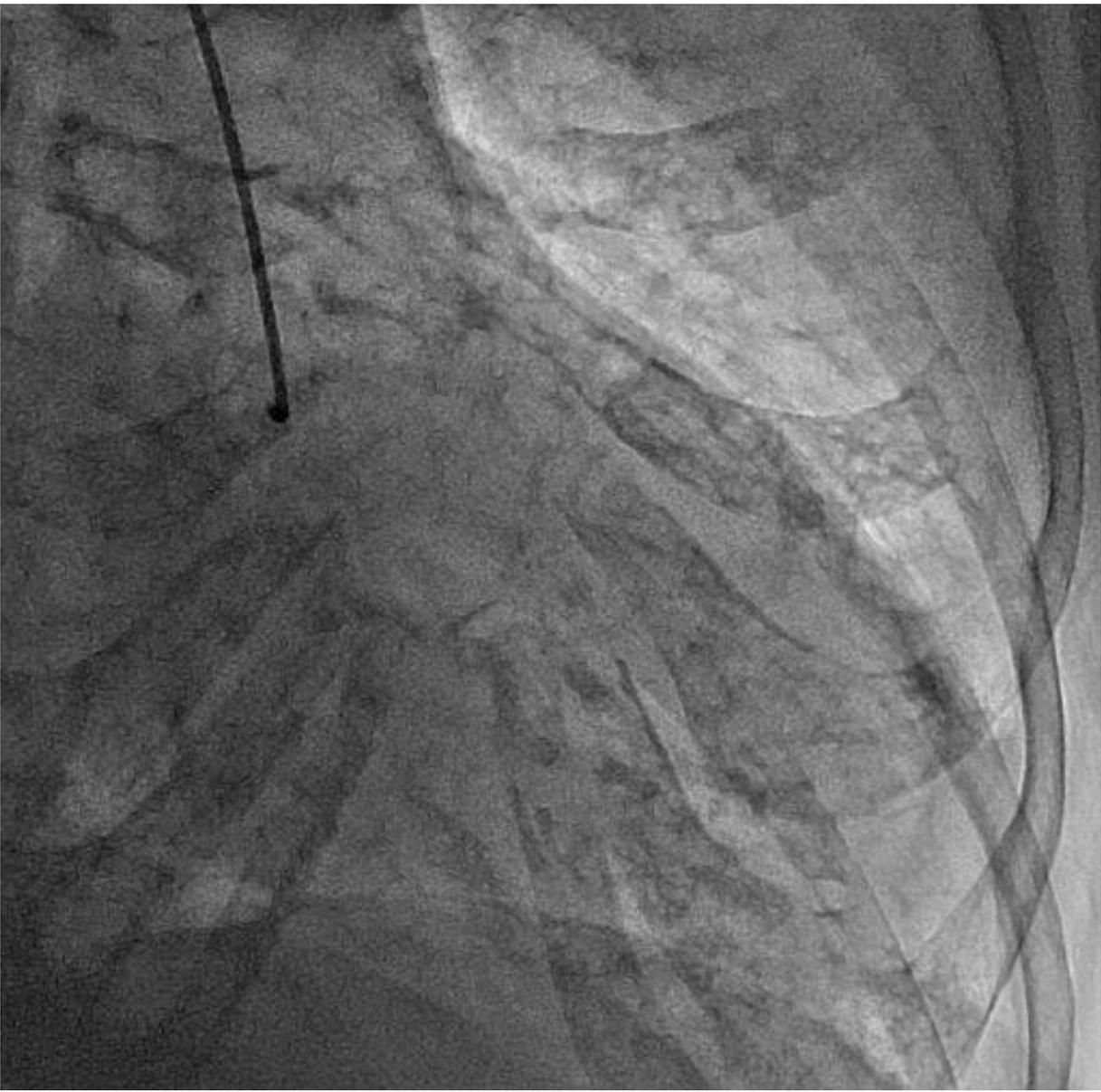
Emergent coronary angiography

LCA
RAO30°
CAU25°

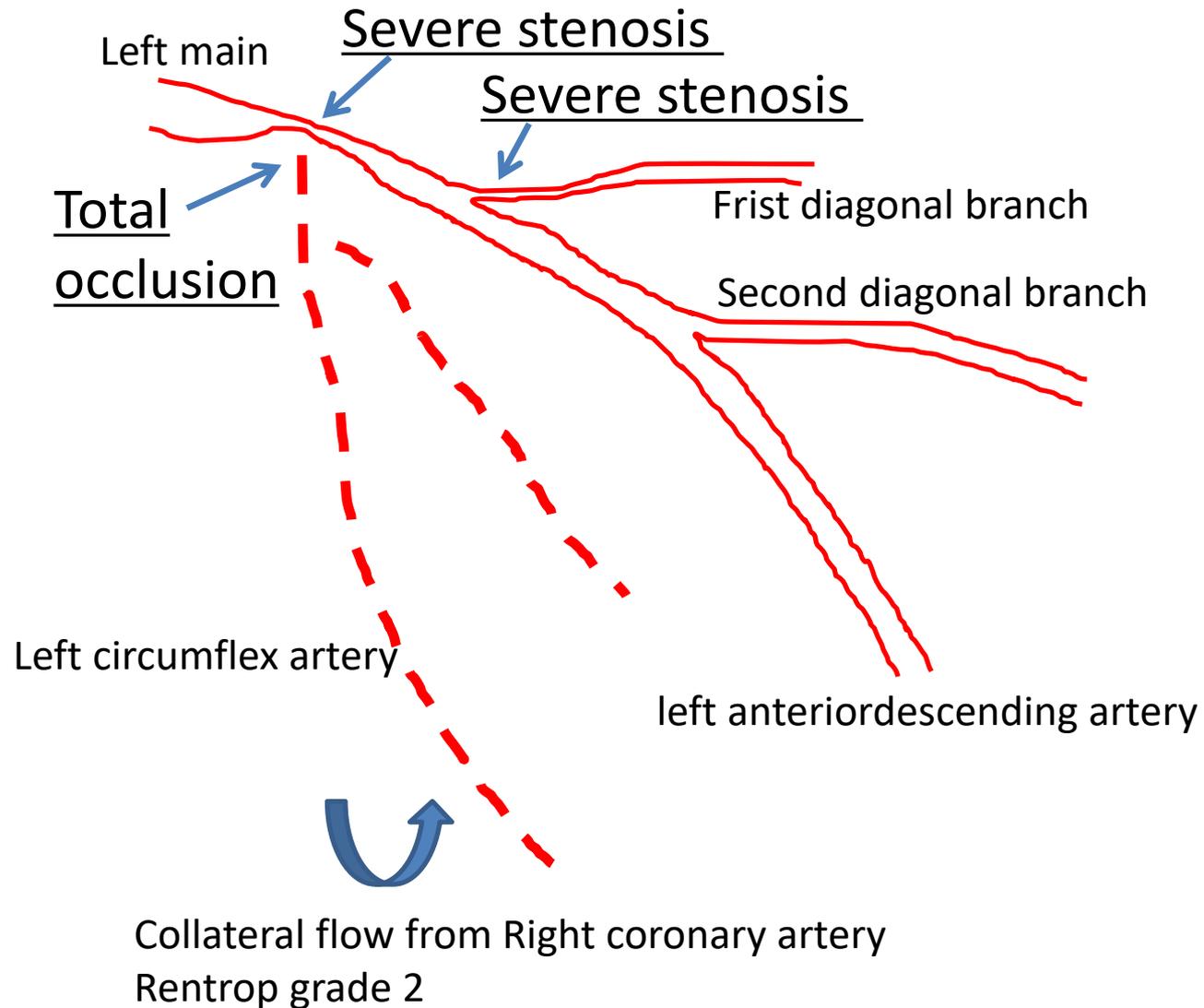


Emergent coronary angiography

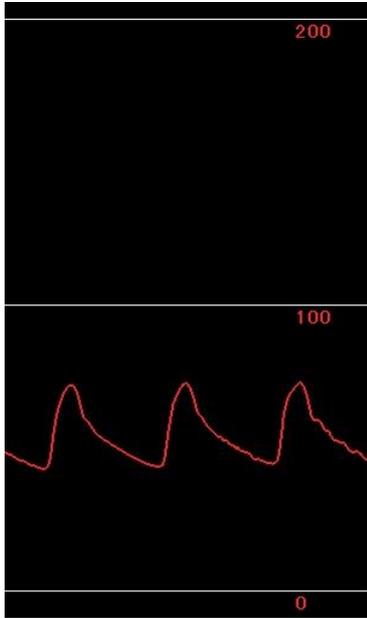
RCA
RAO30°



Schema of left coronary artery



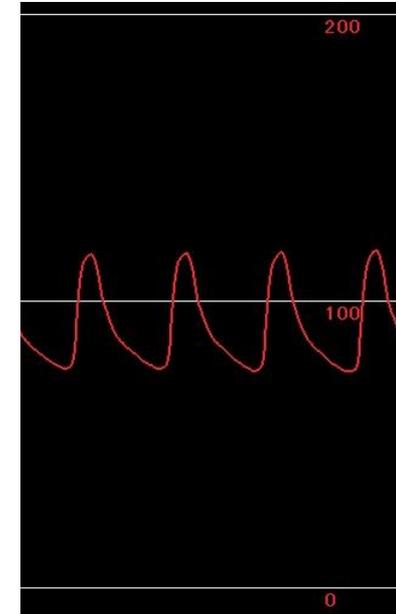
Cardiac shock with low blood pressure



72/42(52)mmHg
NAd0.3 μ g + NAd iv



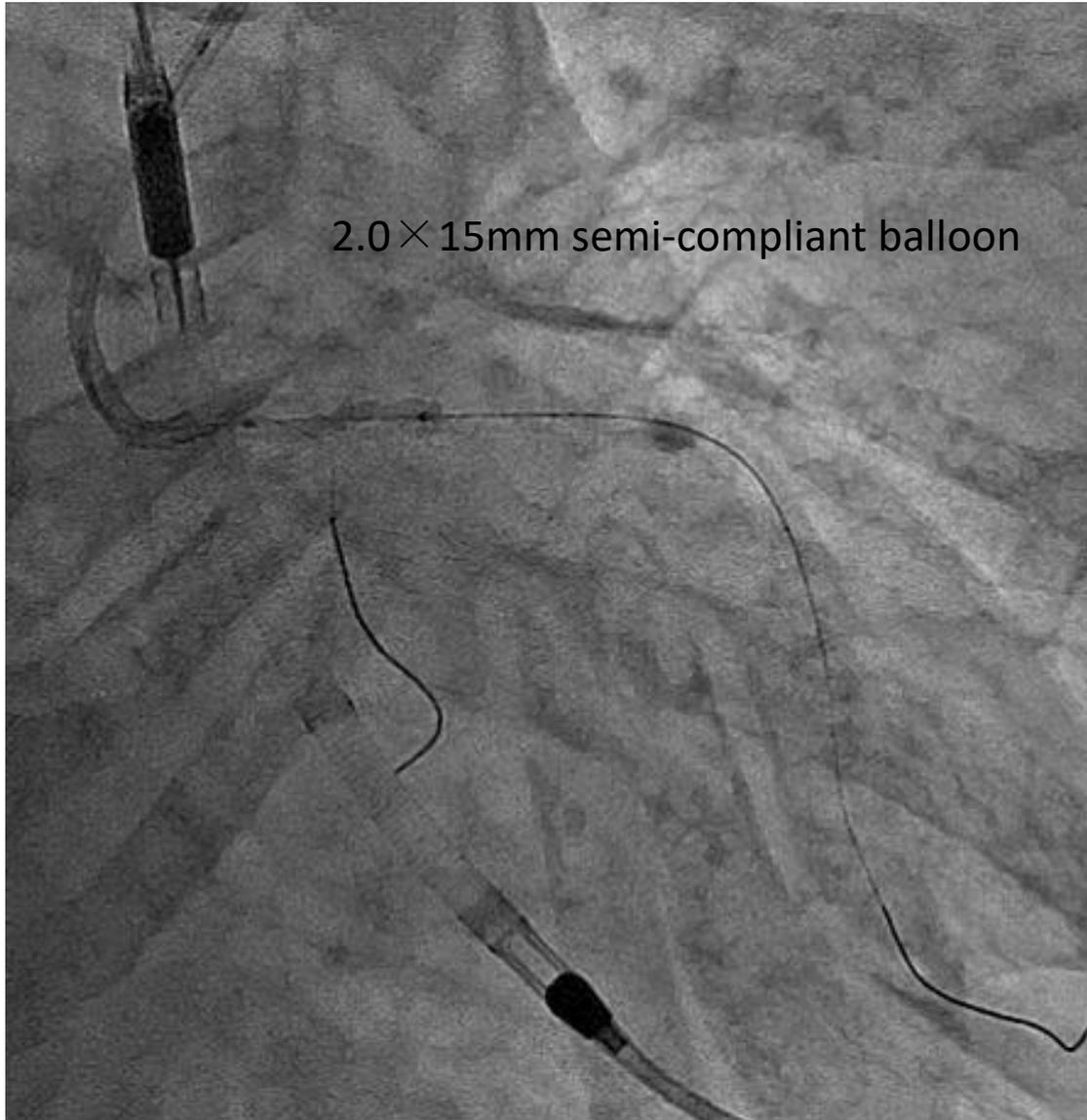
IMPELLA 2.5



116/76(89)mmHg
NAd0.3 μ g

In light of the sustained hemodynamic compromise in spite of using noradrenaline, An Impella 2.5 device was inserted via the left femoral artery, to support cardiac out put.

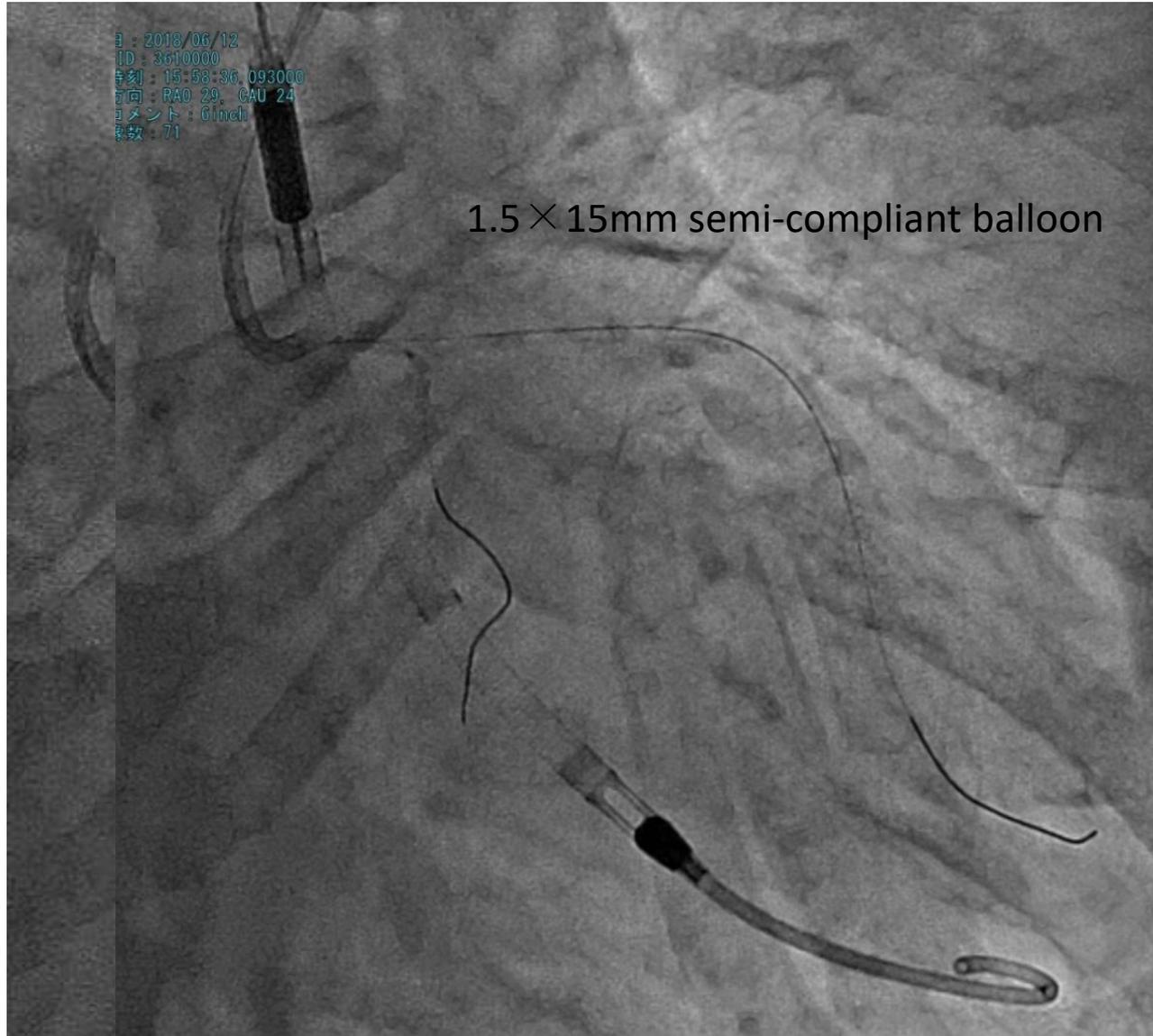
PCI



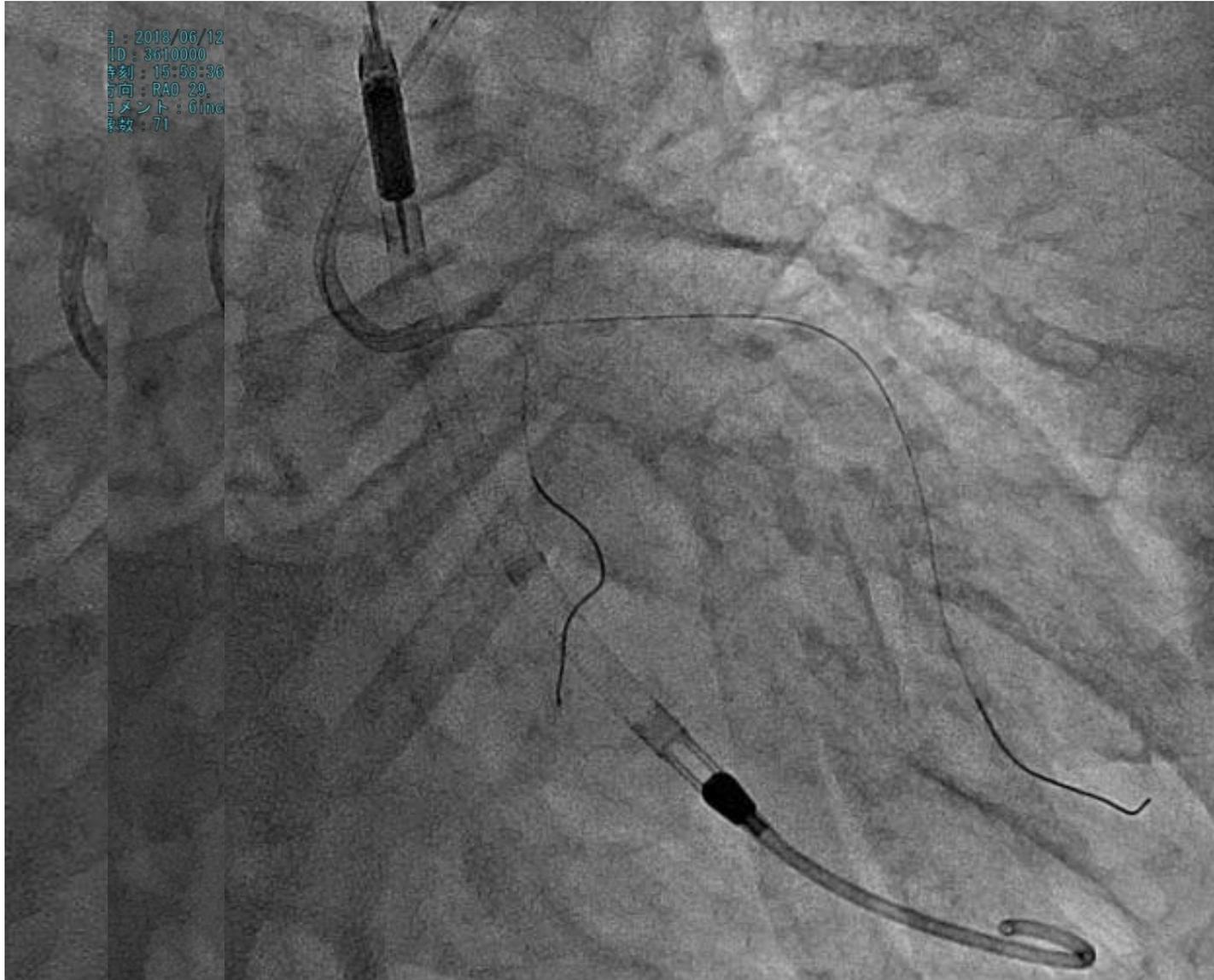
2.0 × 15mm semi-compliant balloon

- ◆ Right femoral artery approach
- ◆ 7-Fr SL3.5 SH guiding catheter

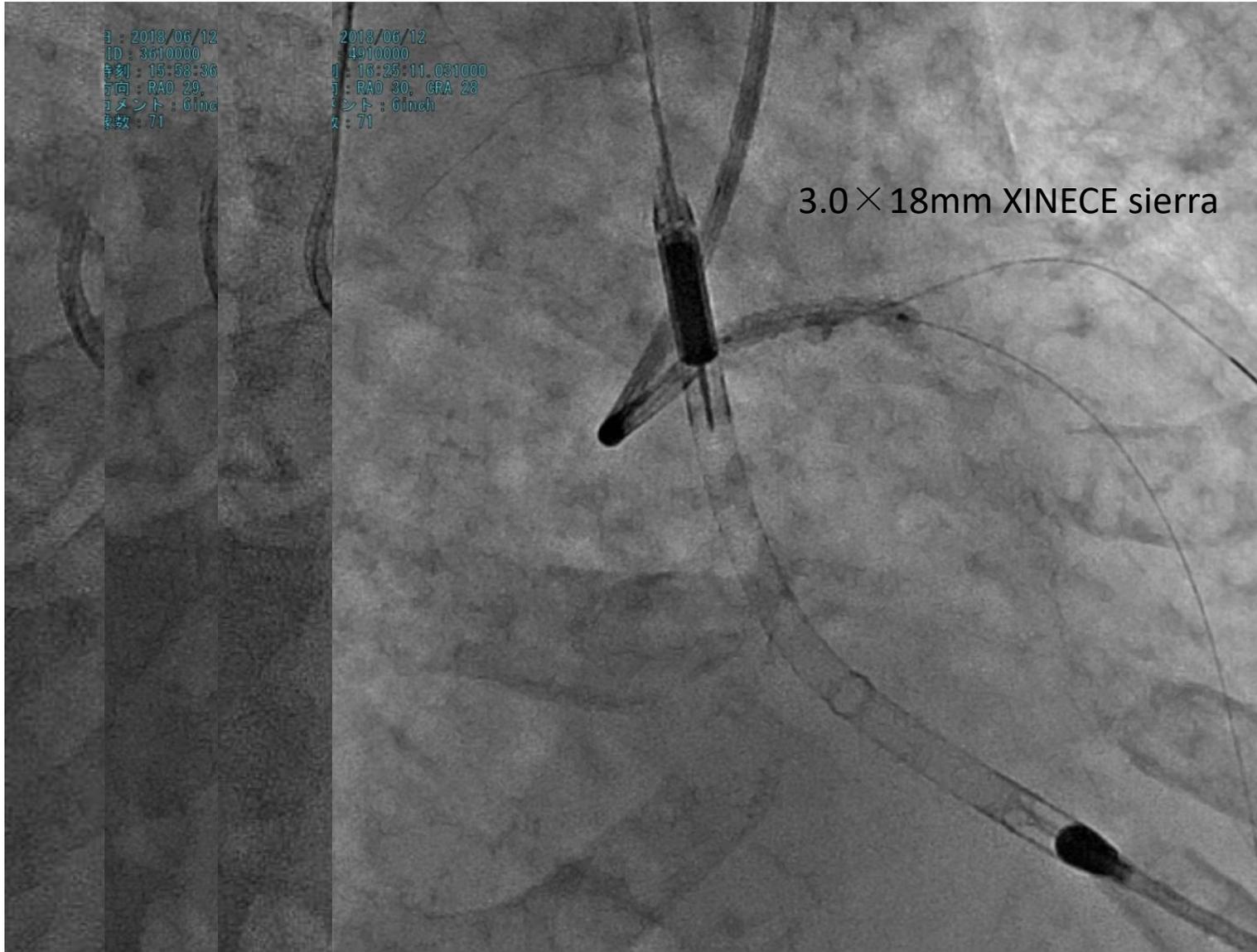
PCI



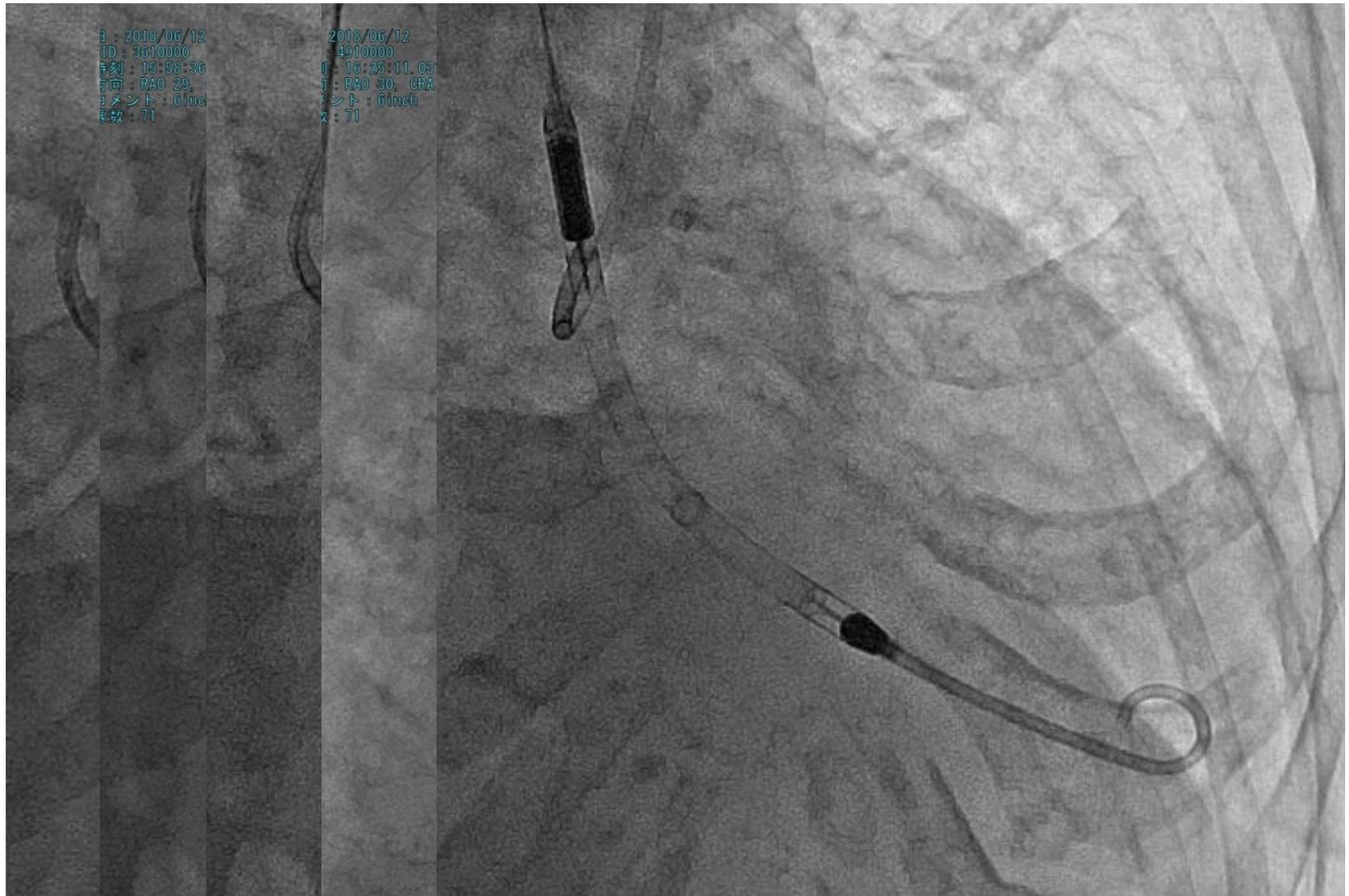
PCI



PCI



PCI



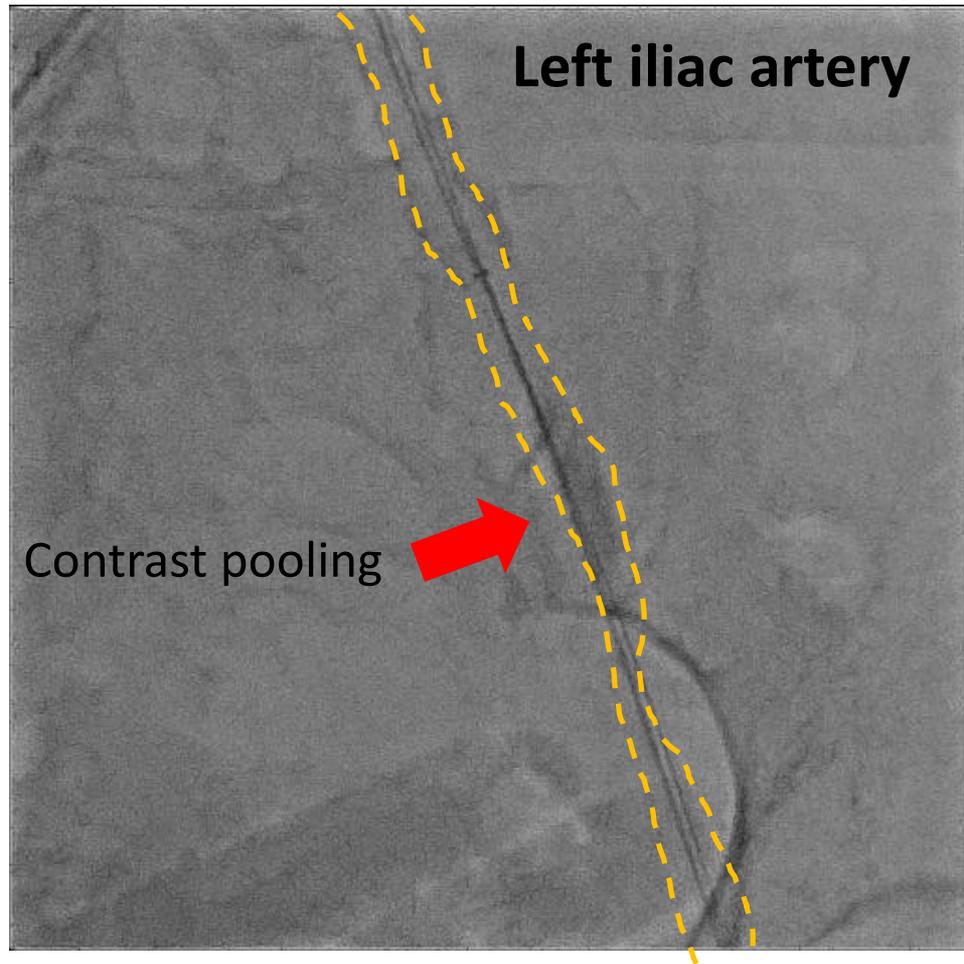
Follow-up

- IMPELLA 2.5 was set at P7 with out put of 2.0-3.0 L/min.
- The device was removed 2 days later in the cardiac intensive care unit.

◇ Complications Due to Impella 2.5 Device in this patient.

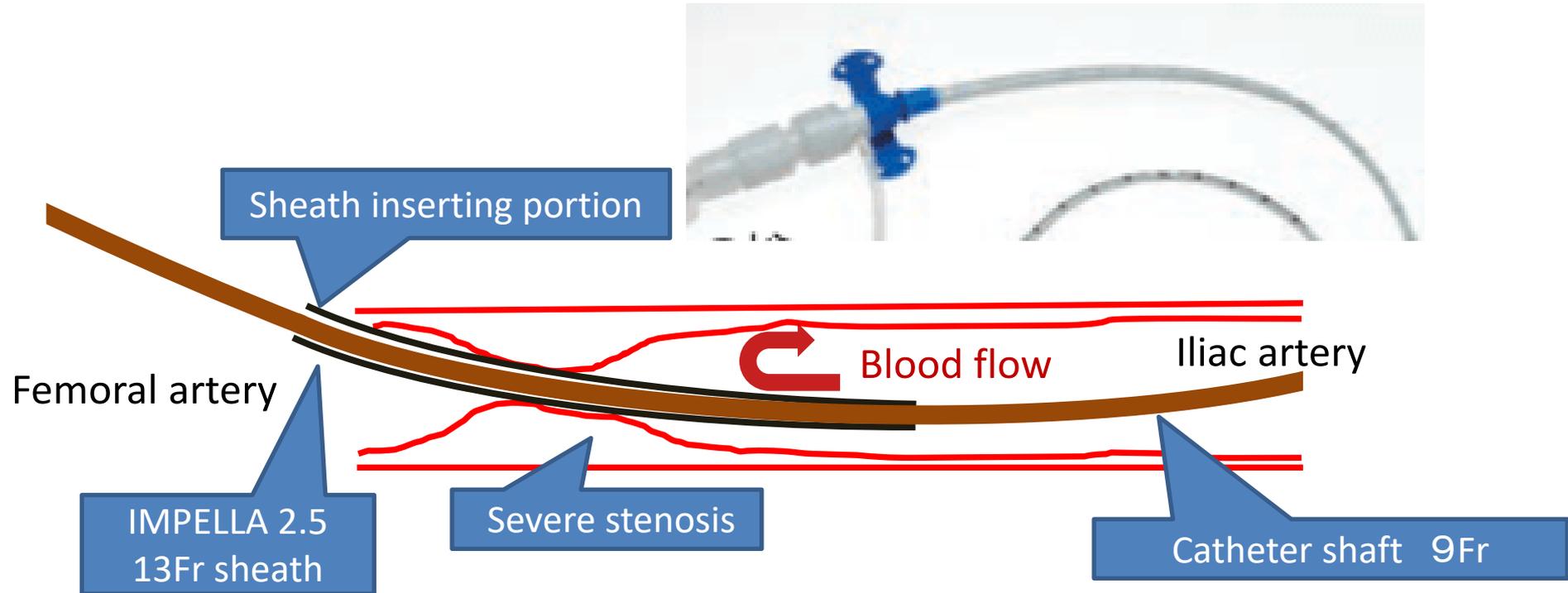
1. Lower limb ischemia
2. Pump displacement
3. Hemolysis

Lower limb ischemia



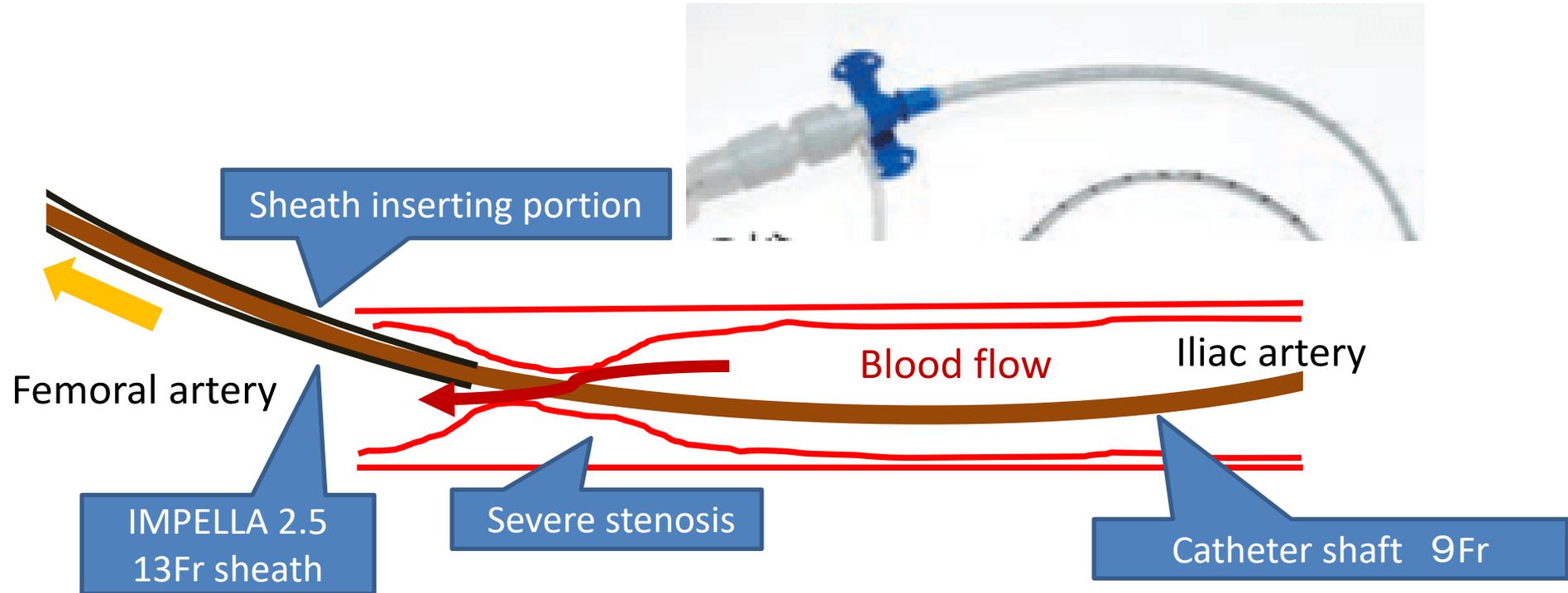
It is thought that due to use a larger sheath (13Fr) in a patient with stenosis of the iliac artery, lower limb ischemia was occurred.

Recovery of blood flow



Recovery of blood flow was achieved by pulling back the sheath.

Recovery of blood flow



Recovery of blood flow was achieved by pulling back the sheath.

Recovery of blood flow

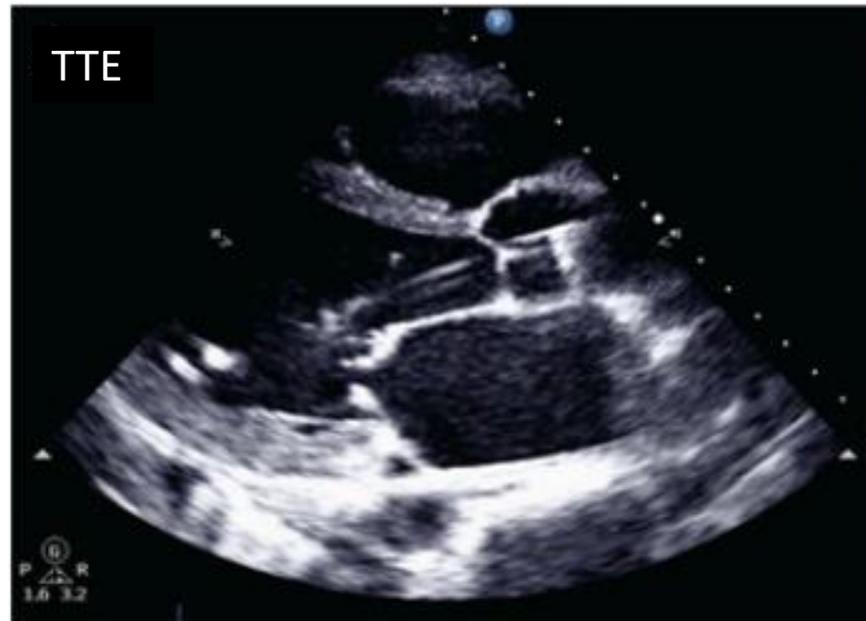


Pump displacement

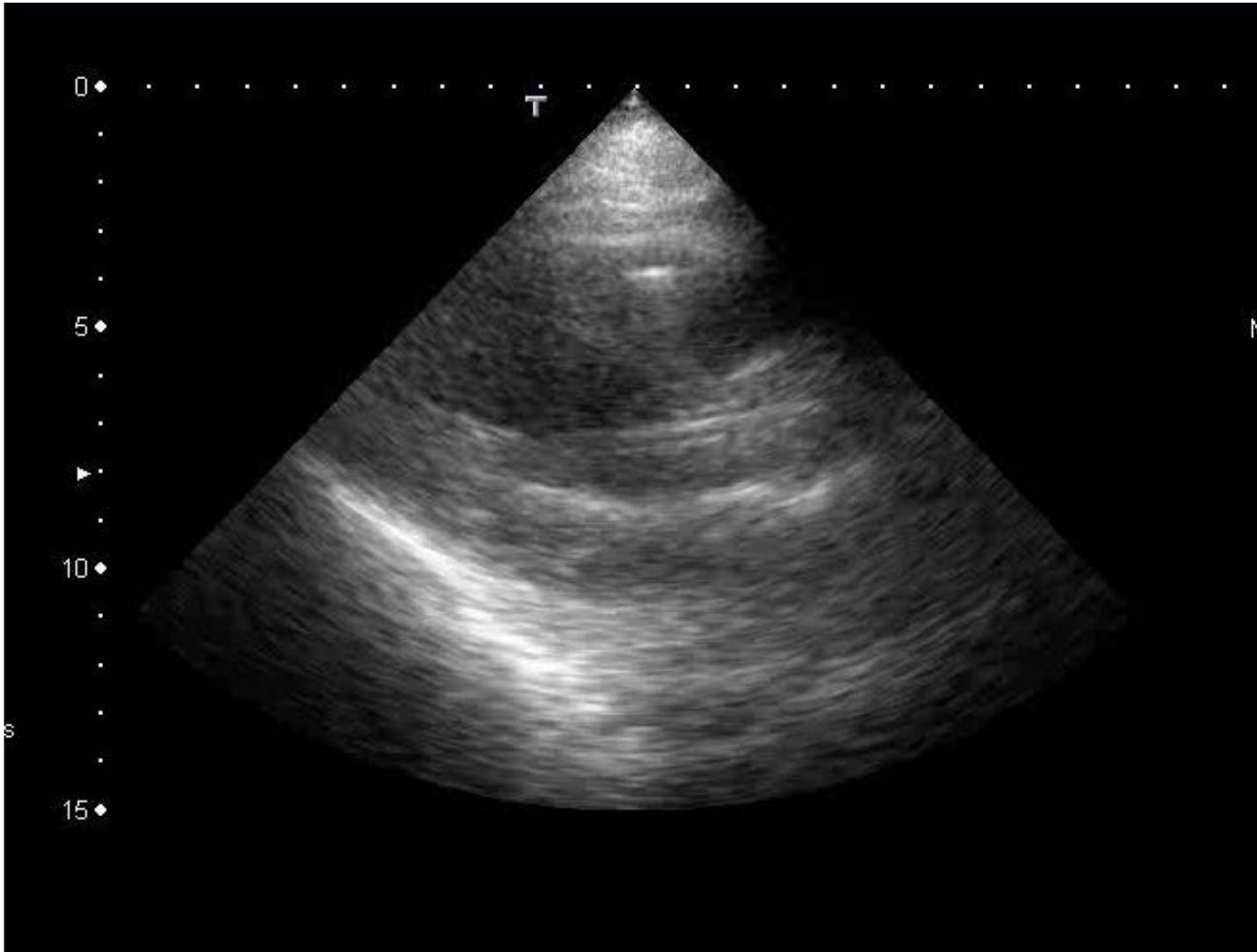
In this case, the pump displacement led to shock due to a movement of the patient.

◆ Correct IMPELLA catheter position

- Catheter inlet area 3.5cm below the aortic valve



Transthoracic echocardiogram in this case



Pump displacement

If the patient move one's own body , pump displacement could easily occur.

➡ We putted the patient under sedation. After that, pump displacement didn't happen.

It is thought that sedation is requisite for use of the IMPELLA.

Hemolysis

The blood cells may be damaged by mechanical force of the IMPELLA.

【The main causes of hemolysis】

- Wrong pump position
- Inadequate filling volume
- Higher than needed flow setting

👉 In this case

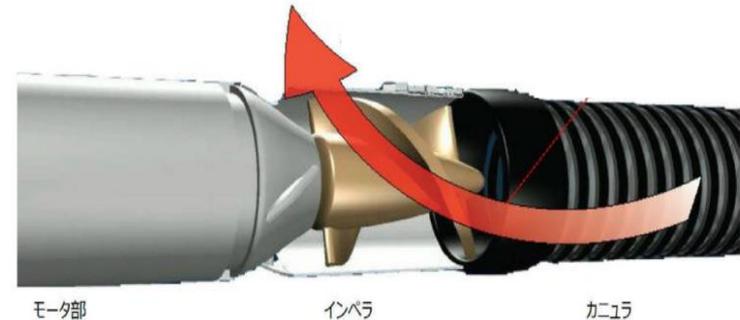
◇ Dialyze wastewater by continuous hemofiltration

➡ Transparent pale pink

➡ Reduce P-level from P8 to P7

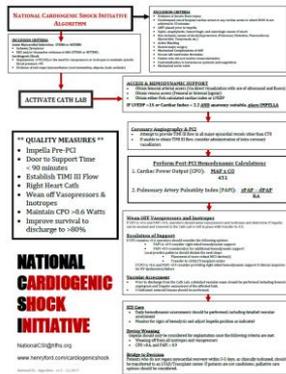
➡ Color transparent

👉 At an early stage, we eliminated the cause of the hemolysis.



National Cardiogenic Shock Initiative* Algorithm

AHF or Cardiogenic shock due to AMI



www.henryford.com/cardiogenicshock

Prompt diagnosis of cardiogenic shock

- ❑ Sustained Hypotension
 - SBP < 90 mmHg
 - SBP > 90 mmHg maintained with inotropes
- ❑ Hypoperfusion of end organs
 - Cold sweating oliguria or aguria, lactate

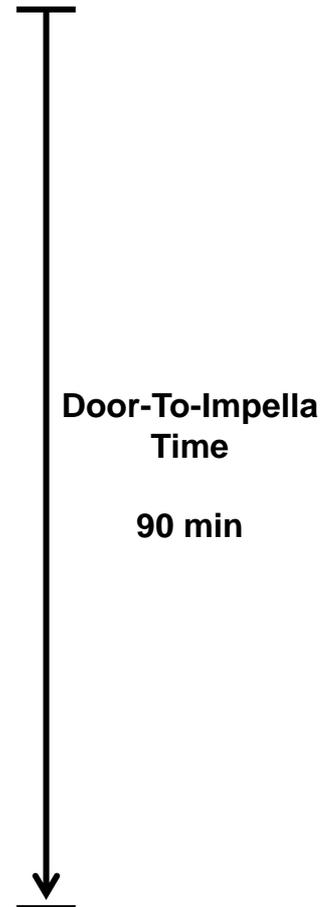
Cath lab, shock team

Femoral access

- FA, FV or IC
- LVEDP or CI by RHC

LVEDP > 15 mmHg or CI < 2.2

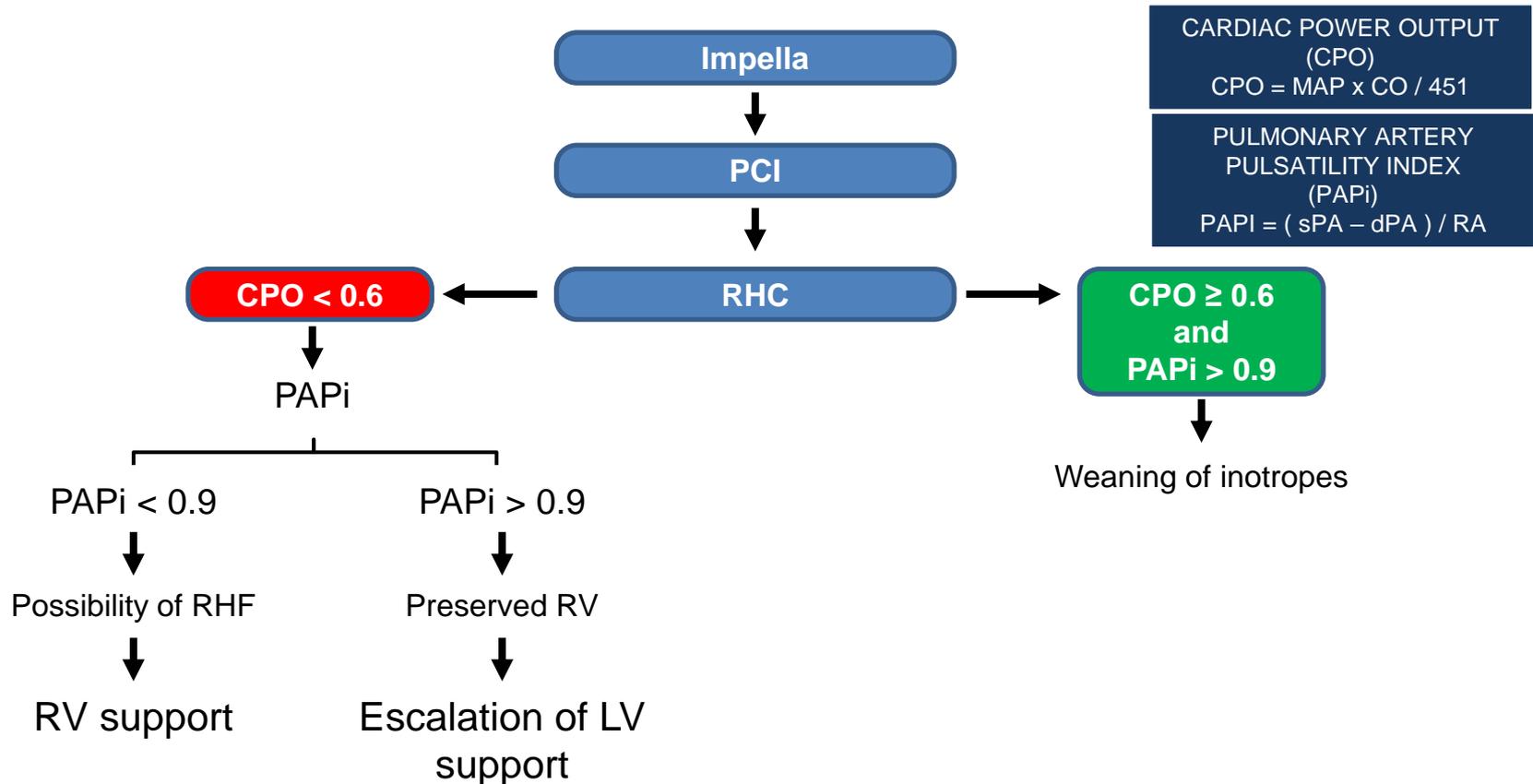
Impella



* Basir, Catheter Cardiovasc Interv. 2019 Jun 1;93(7):1173-1183.
O'Neill, SCAI 2019

National Cardiogenic Shock Initiative*

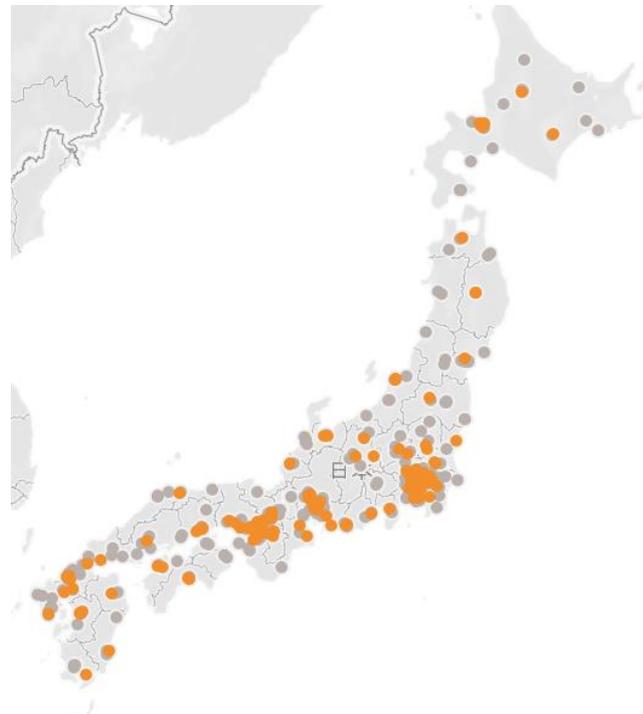
Algorithm



* Basir, Catheter Cardiovasc Interv. 2019 Jun 1;93(7):1173-1183.
 O'Neill, SCAI 2019

Institute that IMPELLA is approved

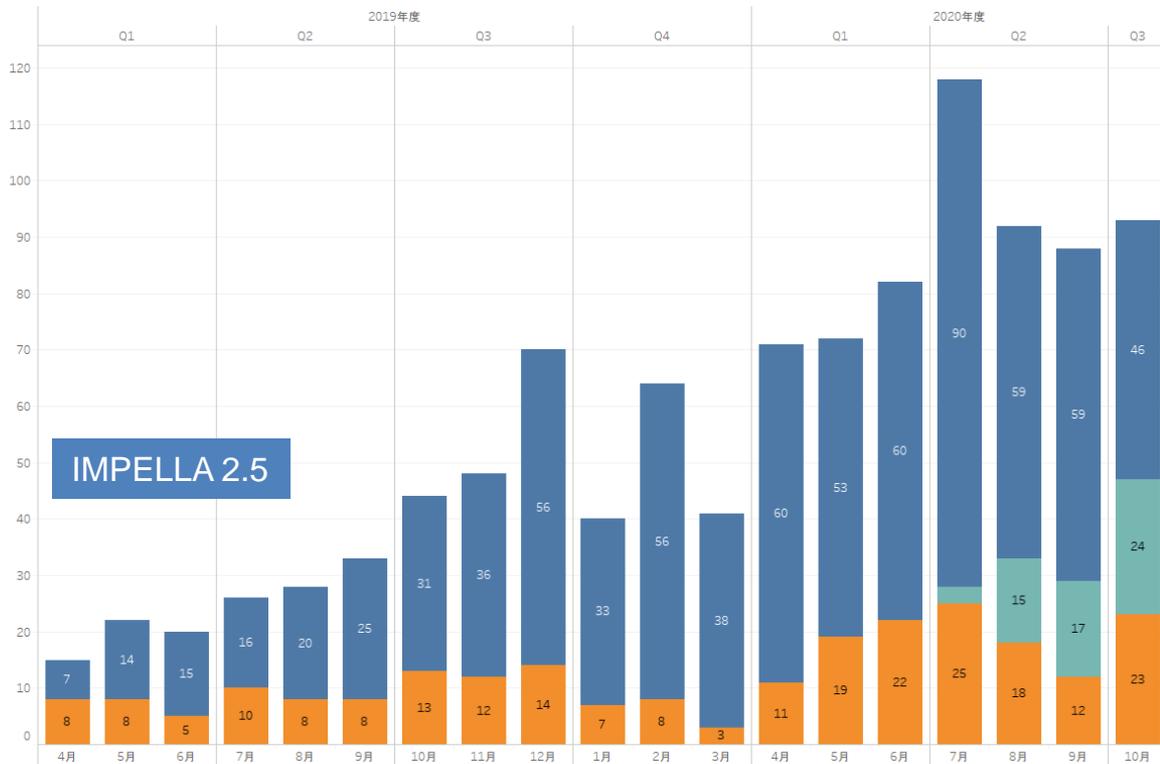
	number	Hokkaido	Tohoku	Kanto	Tokai	Kinki	Chugoku	Shikoku	Kyushu
Institute	133	7	5	46	22	28	6	4	14



At 2019/10/31

STATUS OF USE: IMPELLA

2019/10/31



IMPELLA 5.0

IMPELLA CP

Cumulative number 1114

IMPELLA 2.5: 798

IMPELLA CP: 59

IMPELLA 5.0: 257

Ratio of October

IMPELLA 2.5: 49%

IMPELLA CP: 26%

IMPELLA 5.0: 25%

Average date

IMPELLA 2.5: 4.4 days

IMPELLA CP: 6.6 days

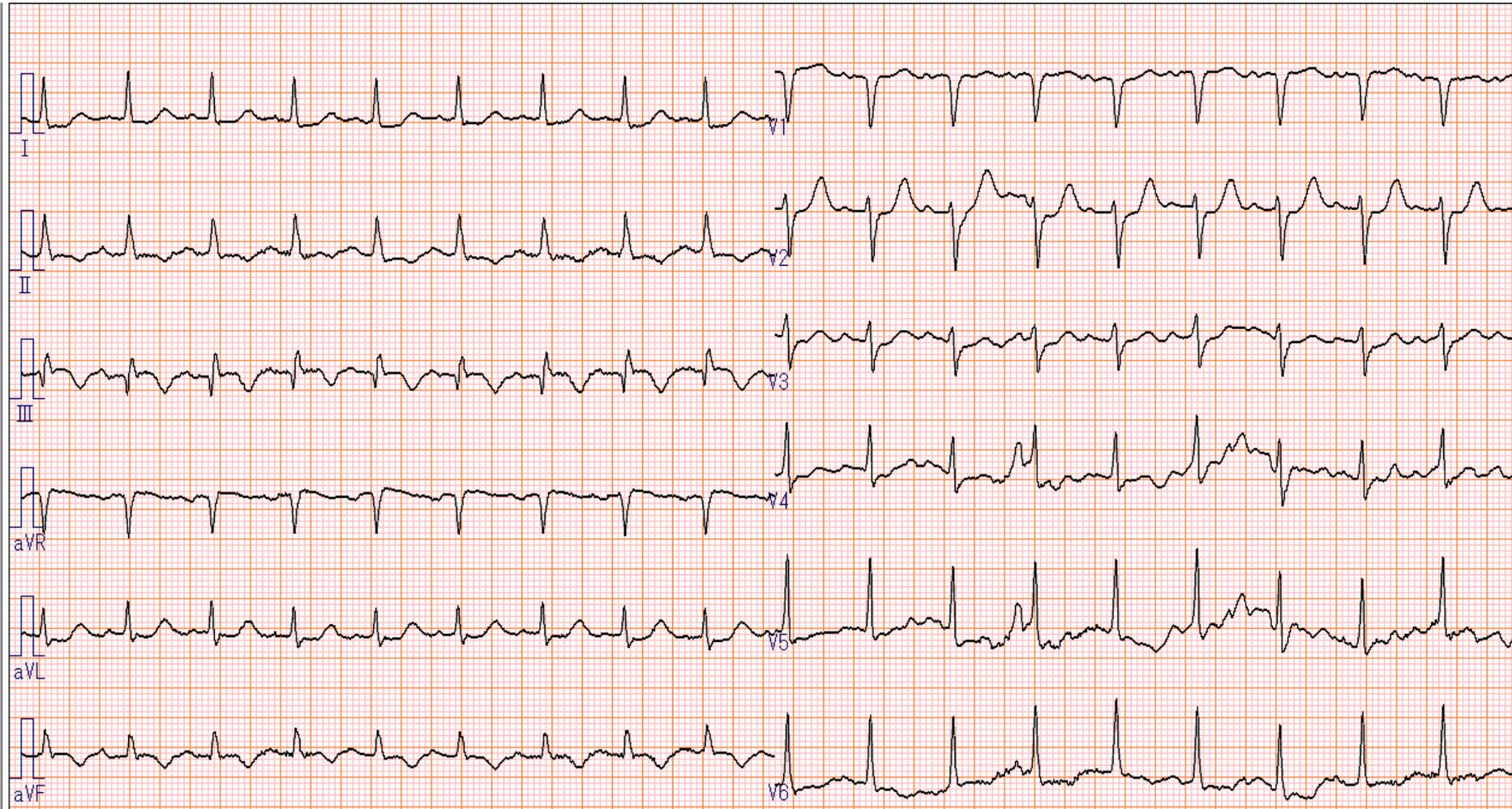
IMPELLA 5.0: 13.0 days

Case2: Non-STEMI

- ◆ A 83-year old Japanese woman presented to the emergency department with dyspnea.
- ◆ Coronary risk factor: Hypertension
- ◆ Transthoracic echocardiogram
 - Ejection fraction 48%
 - Dyskinetic inferior-posterior wall of the left ventricle

ECG

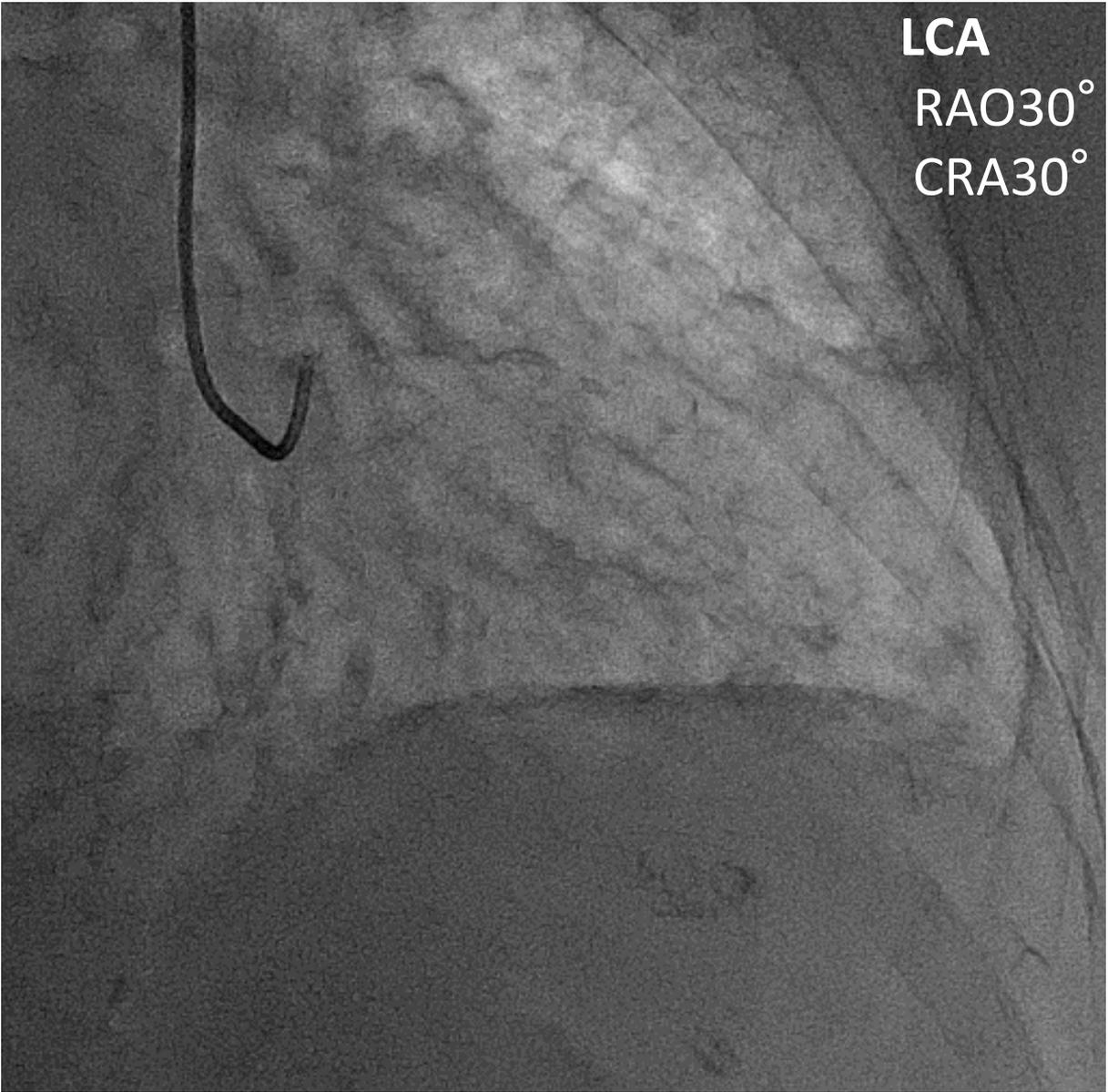
Negative T wave in the inferior, lateral leads



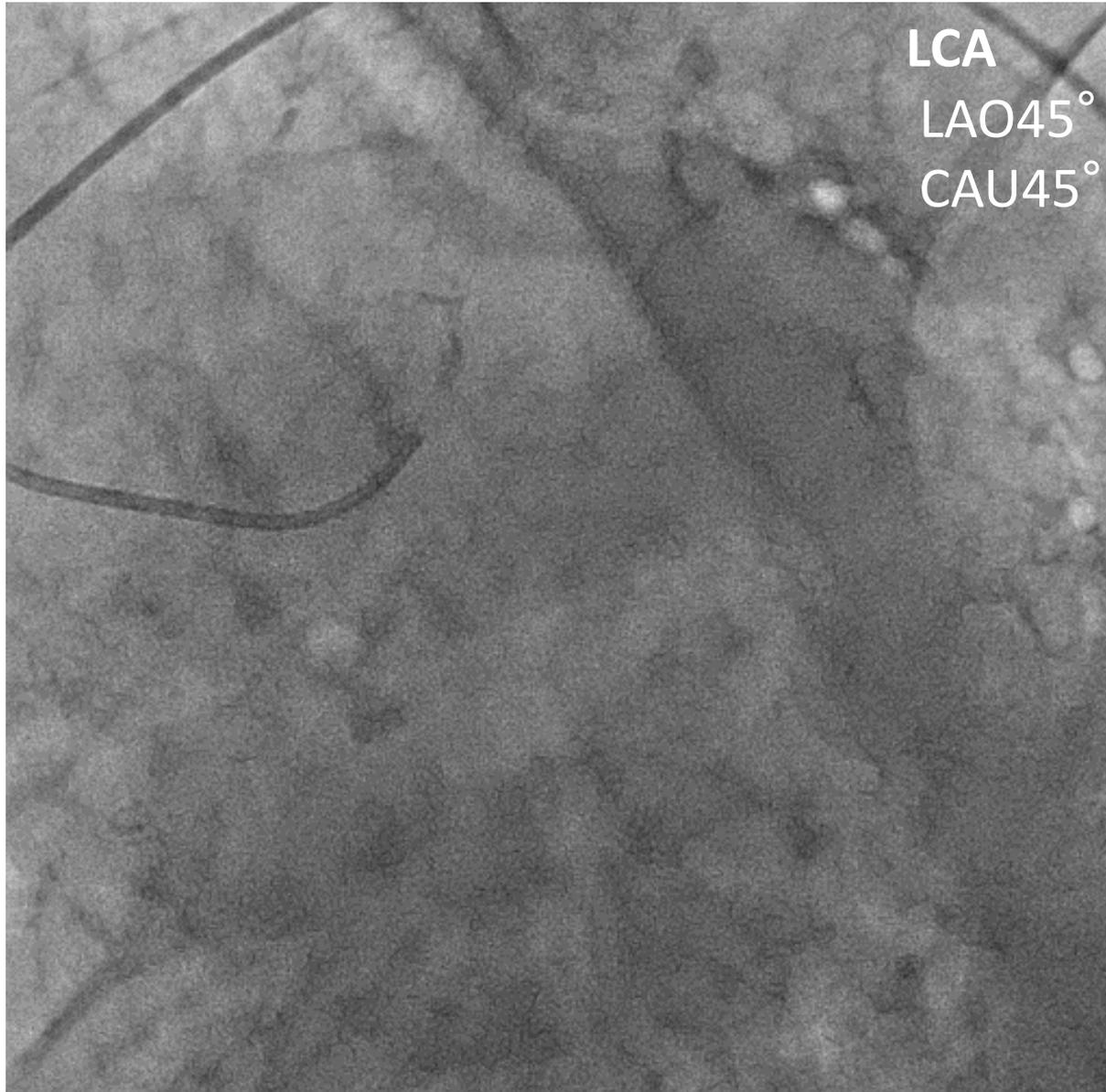
Emergent coronary angiography



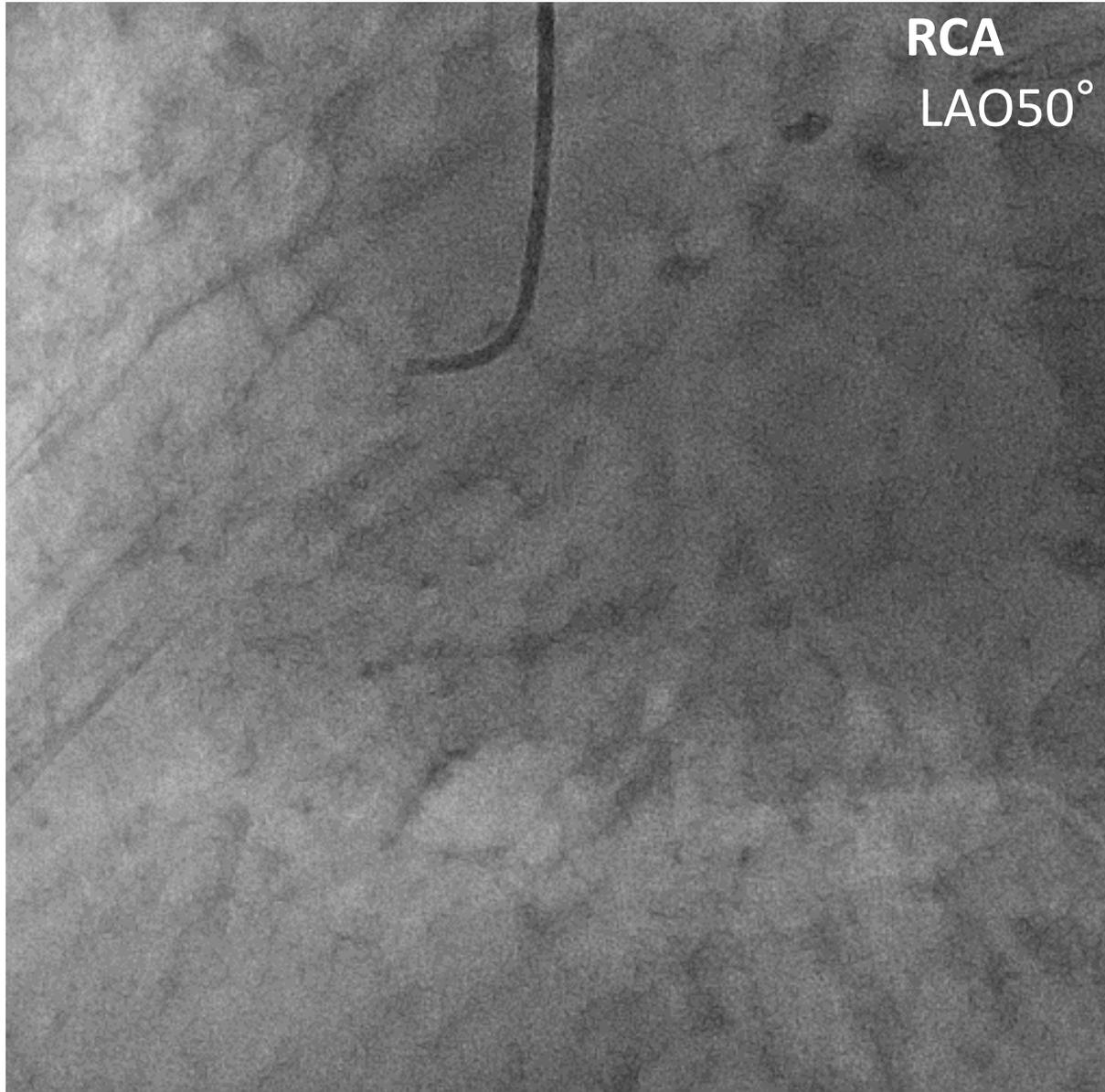
Emergent coronary angiography



Emergent coronary angiography



Emergent coronary angiography



Schema of left coronary artery

Right coronary artery

Left coronary artery

Severe stenosis

Moderate stenosis

First diagonal branch

Severe stenosis

A high risk PCI

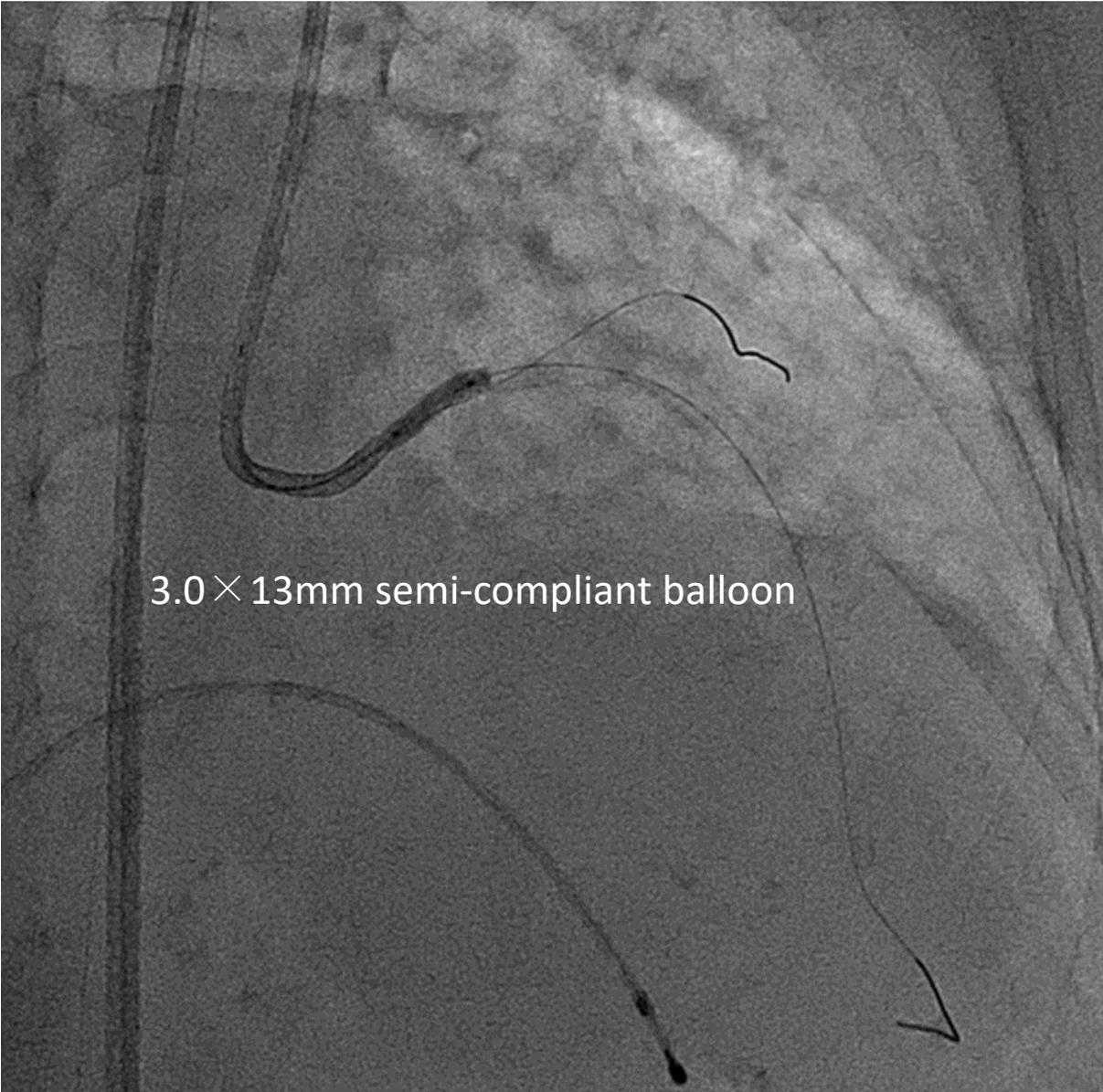
**A multi-vessel disease of Left main into LAD
with CTO at proximal RCA**



**In Japan, the Impella device is not available for a high risk
PCI without cardiac shock.**

**The Intra-Aortic Balloon Pumping was chosen for
circulatory support during this high risk procedure.**

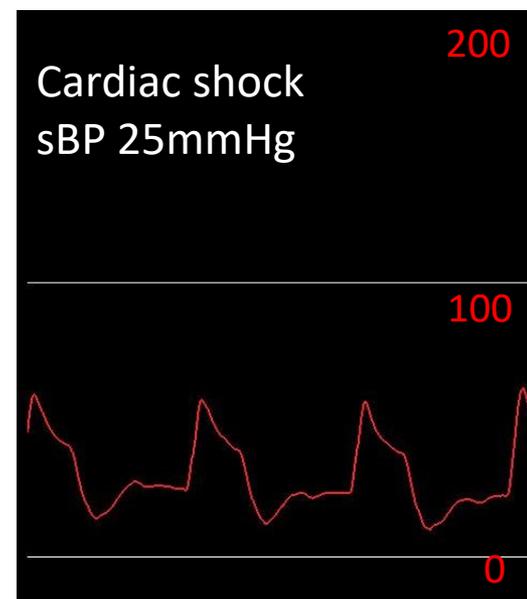
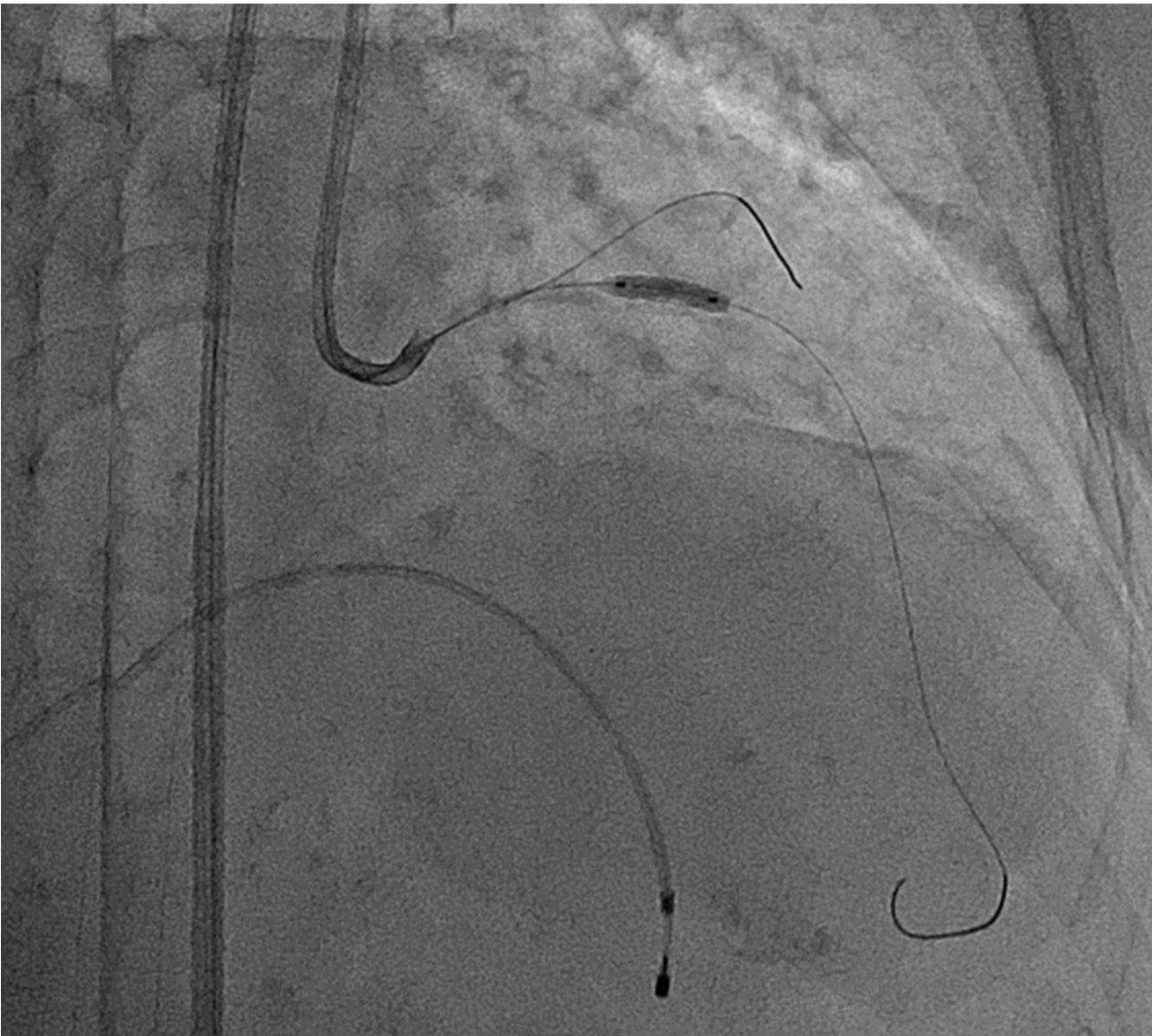
PCI



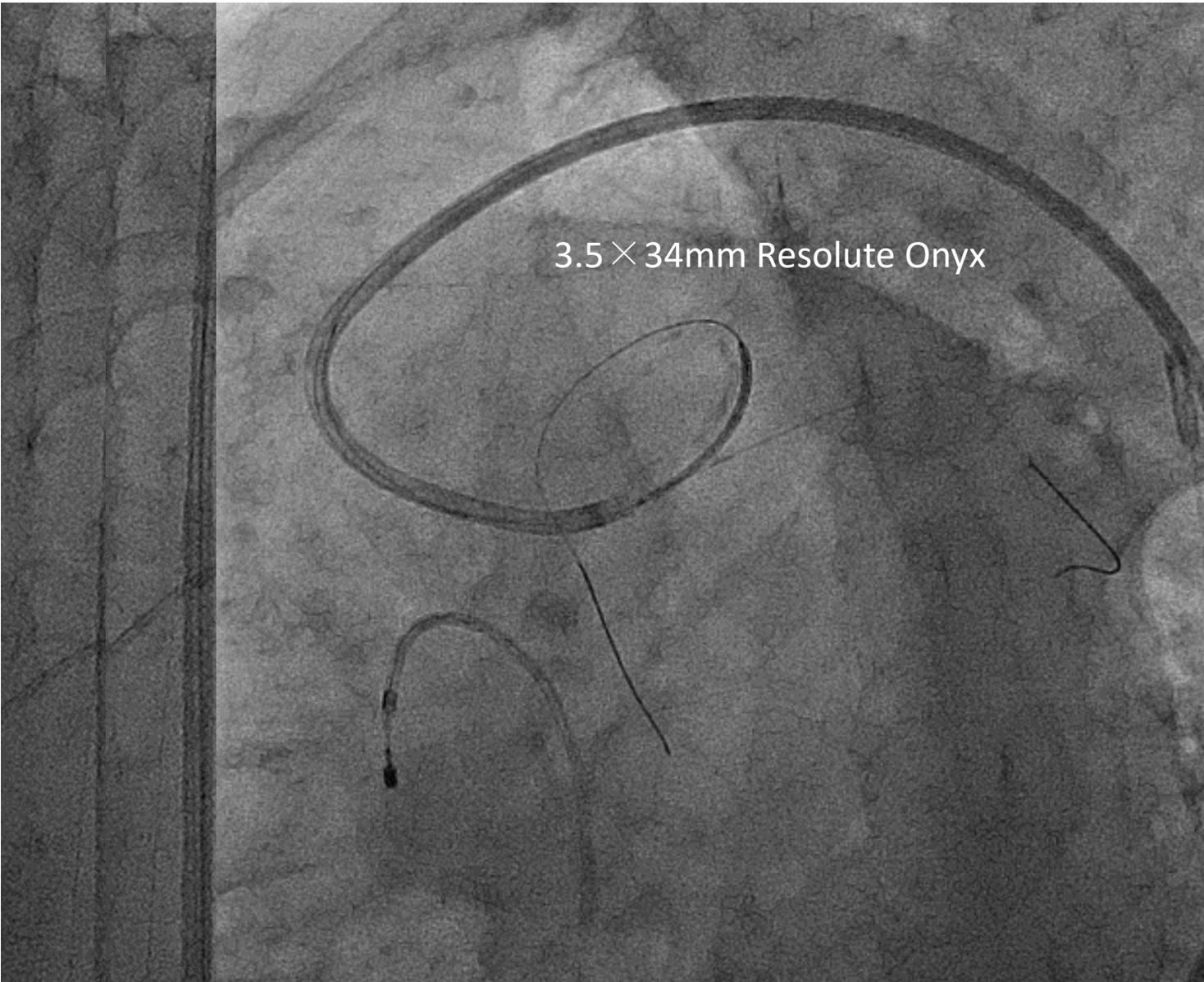
3.0 × 13mm semi-compliant balloon

- ◆ Right femoral artery approach
- ◆ 8-Fr SL3.5 SH guiding catheter

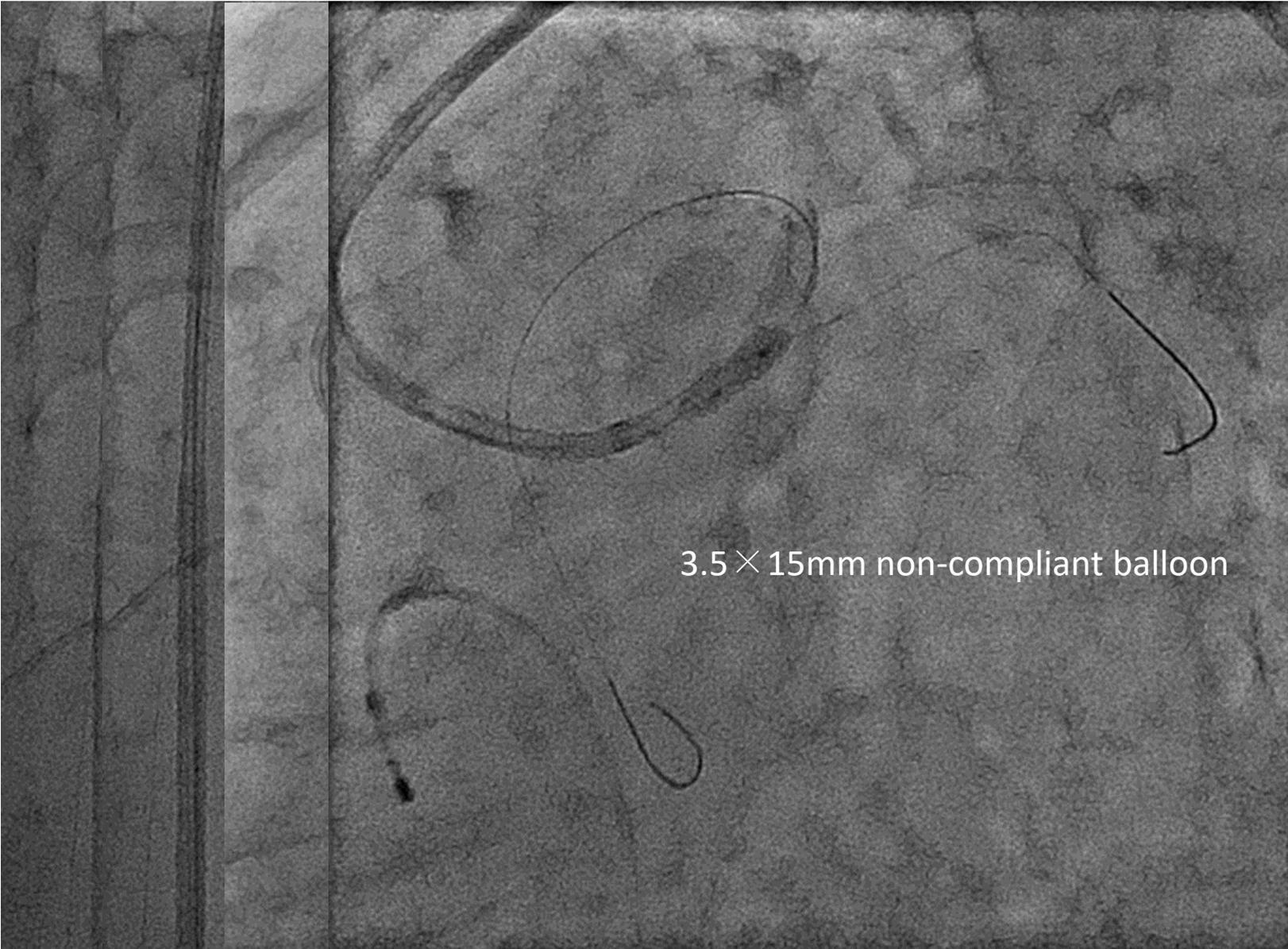
PCI



PCI

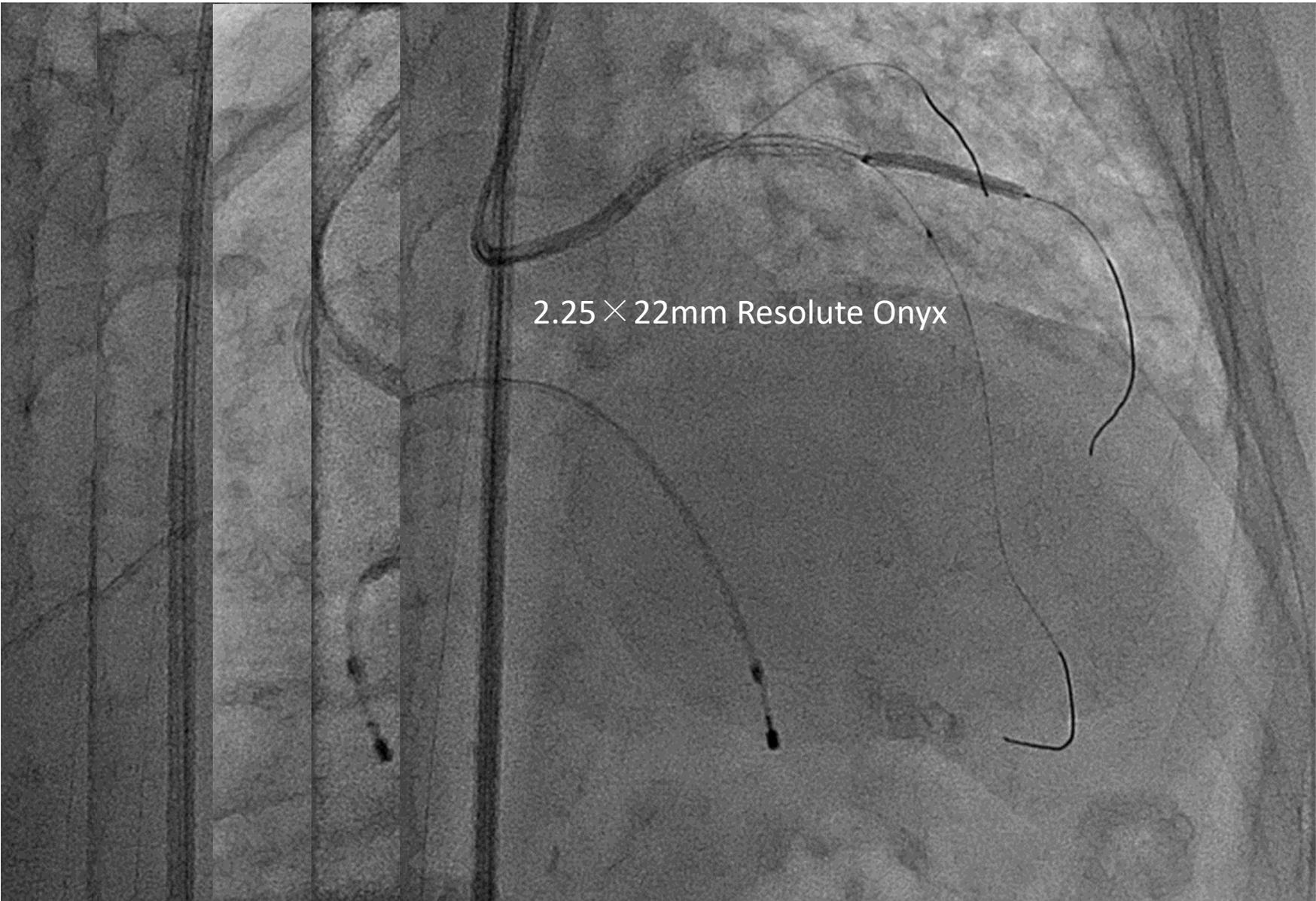


PCI



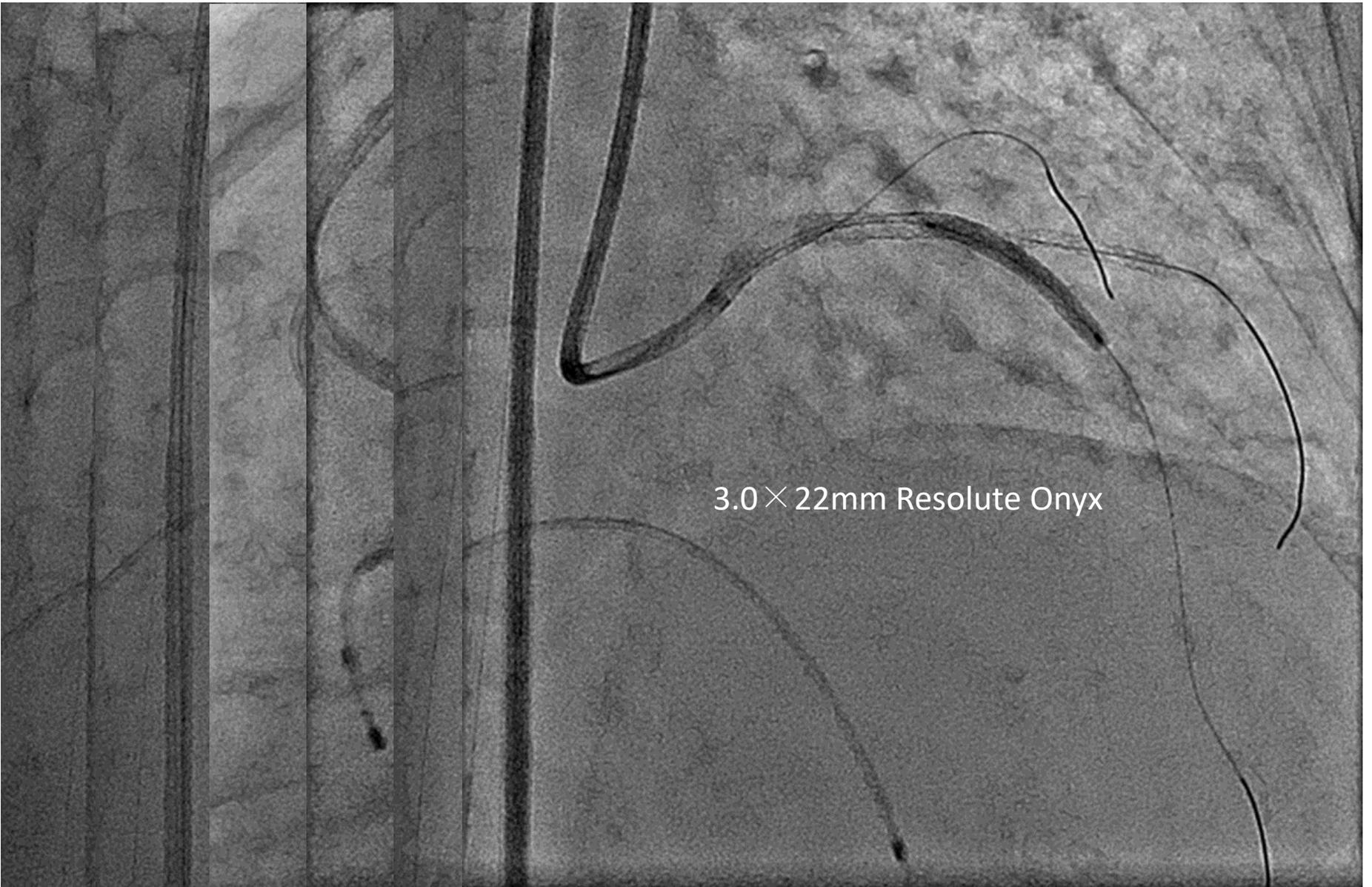
3.5 × 15mm non-compliant balloon

PCI



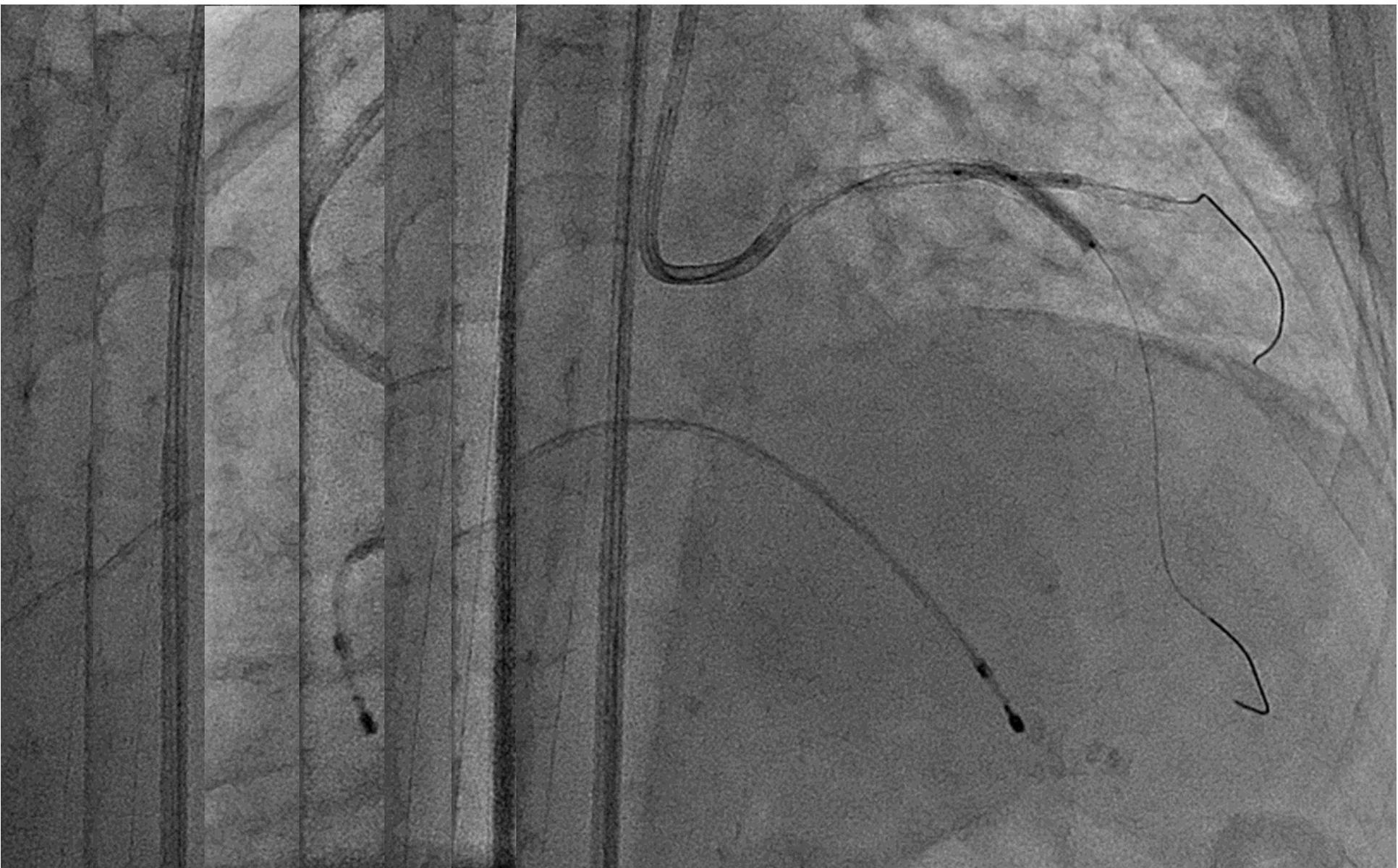
2.25 × 22mm Resolute Onyx

PCI



3.0 × 22mm Resolute Onyx

PCI



Final angiography



➡ The IABP was removed After PCI in the cardiac intensive care unit.

Summary

◆Case ①

- A high risk PCI of Left main into LAD with cardiac shock
- The procedure supported by the Impella device was successful
- We experienced several complications associated with the Impella
 - 1. Lower limb ischemia 2. Pump displacement 3. Hemolysis*

◆Case ②

- A high risk PCI of multi-vessel disease of Left main into LAD with CTO at proximal RCA
- Cardiac shock occurred during the procedure with intra-aortic balloon pumping
- We had no choice but to use the intra-aortic balloon pumping in this patient