

**When it rains
It pours:
Having Two Complications at the Same Time**

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Disclosure

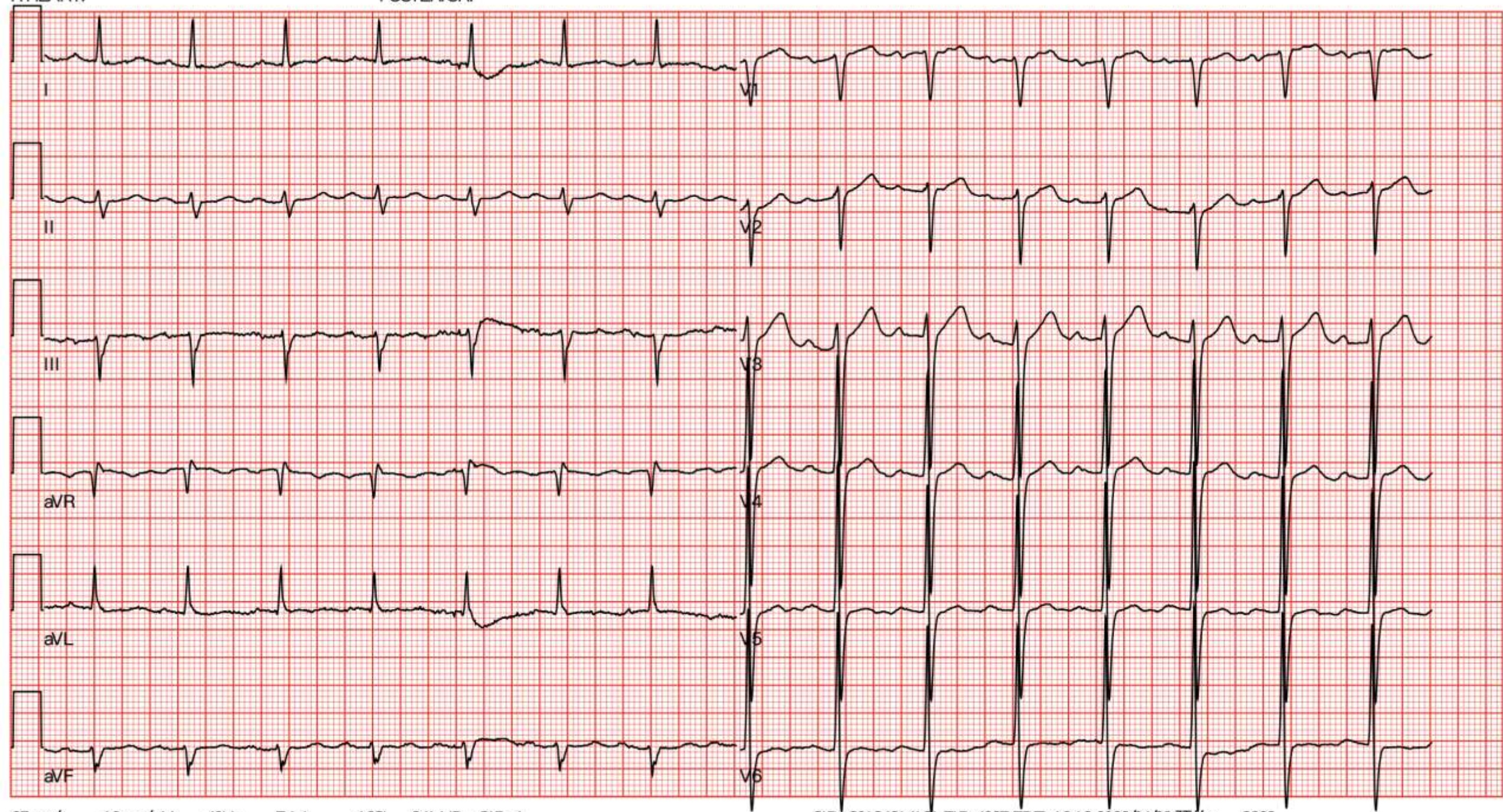
- I have no potential conflicts of interest in relation to this presentation.

Brief History

- 83 y/o man with chest tightness recently
- CAD risk factors:
 - Age (+)
 - Family history (-)
 - Smoking (-)
 - Hypertension (+)
 - Dyslipidemias (+)

R HEART:

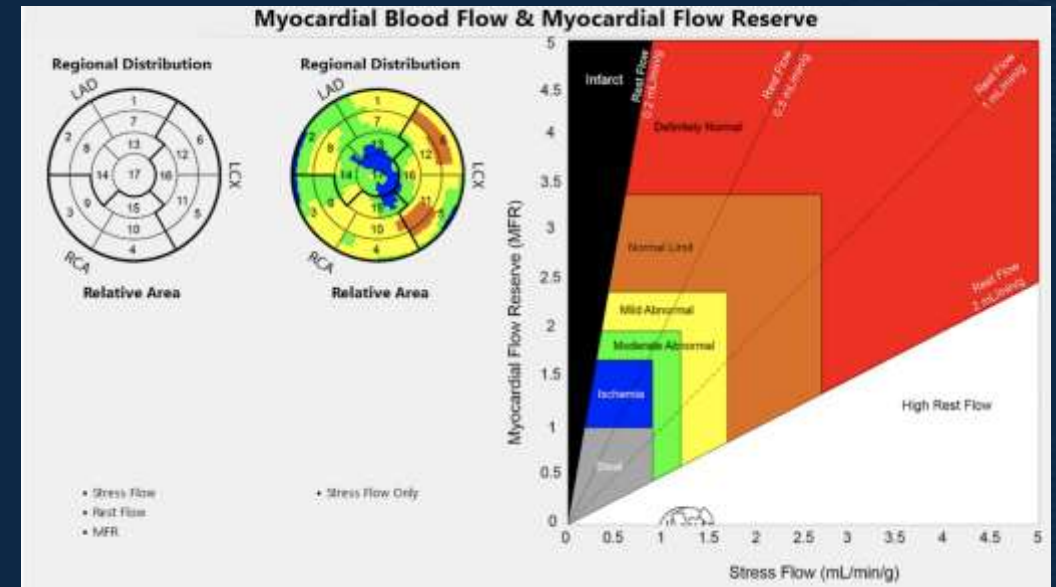
POSTERIOR:



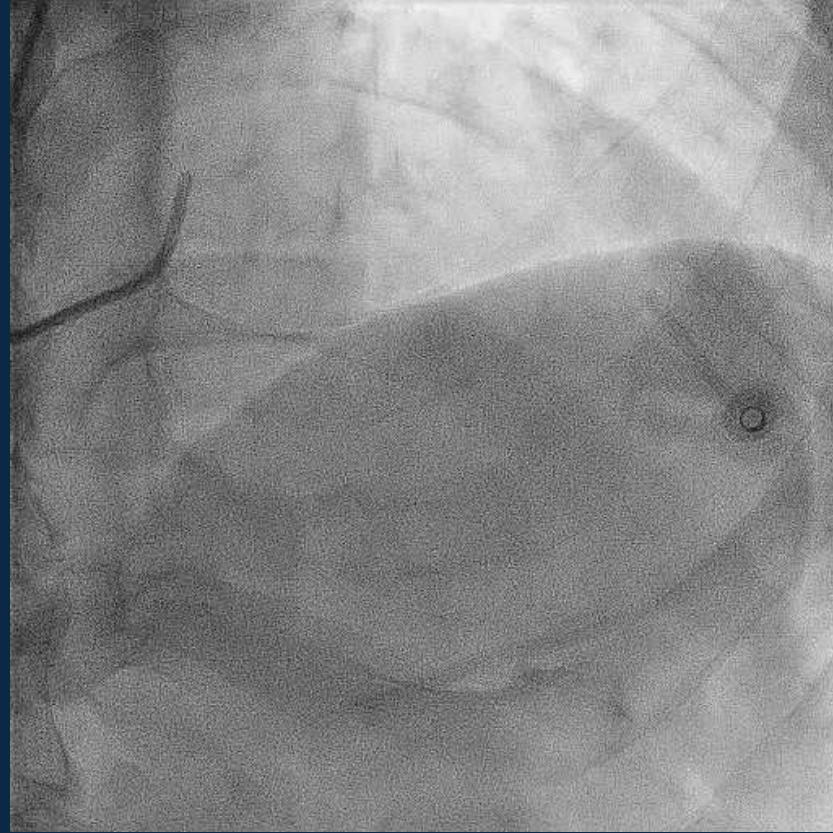
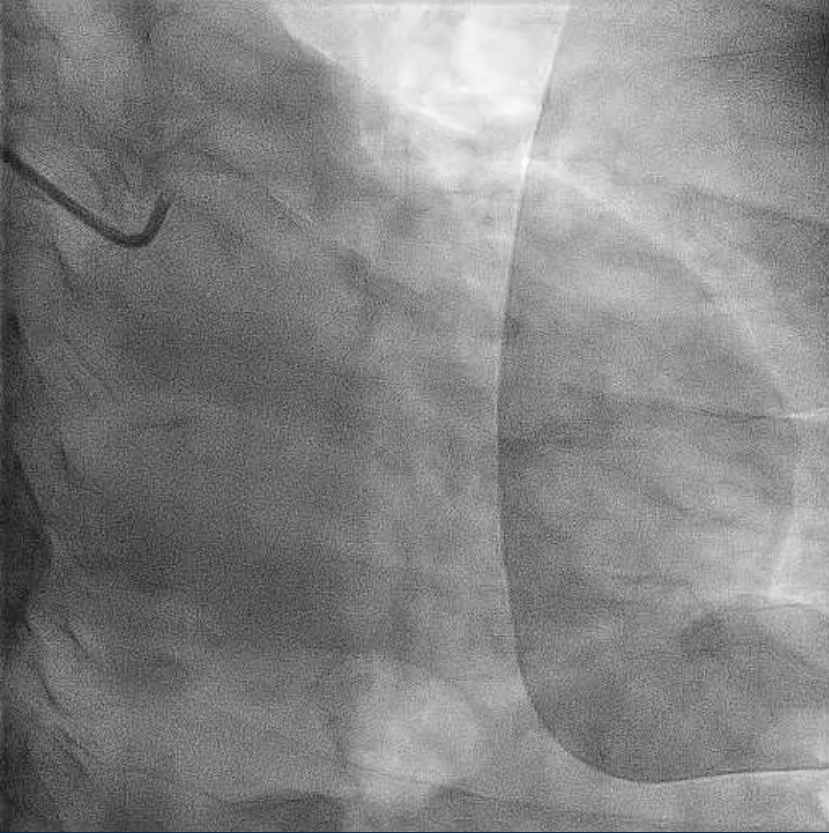
Myocardial Perfusion Scan

The myocardial blood flow quantification (MBFQ) suggests:

- 1) ischemia in 13.2% of LAD territory
- 2) ischemia in 2.5% of LCX territory
- 3) ischemia in 4.7% of RCA territory
- 4) moderate ischemia of left ventricle, extent: 7.5% (3% \leq extent $<$ 8%)



Angiographic Findings

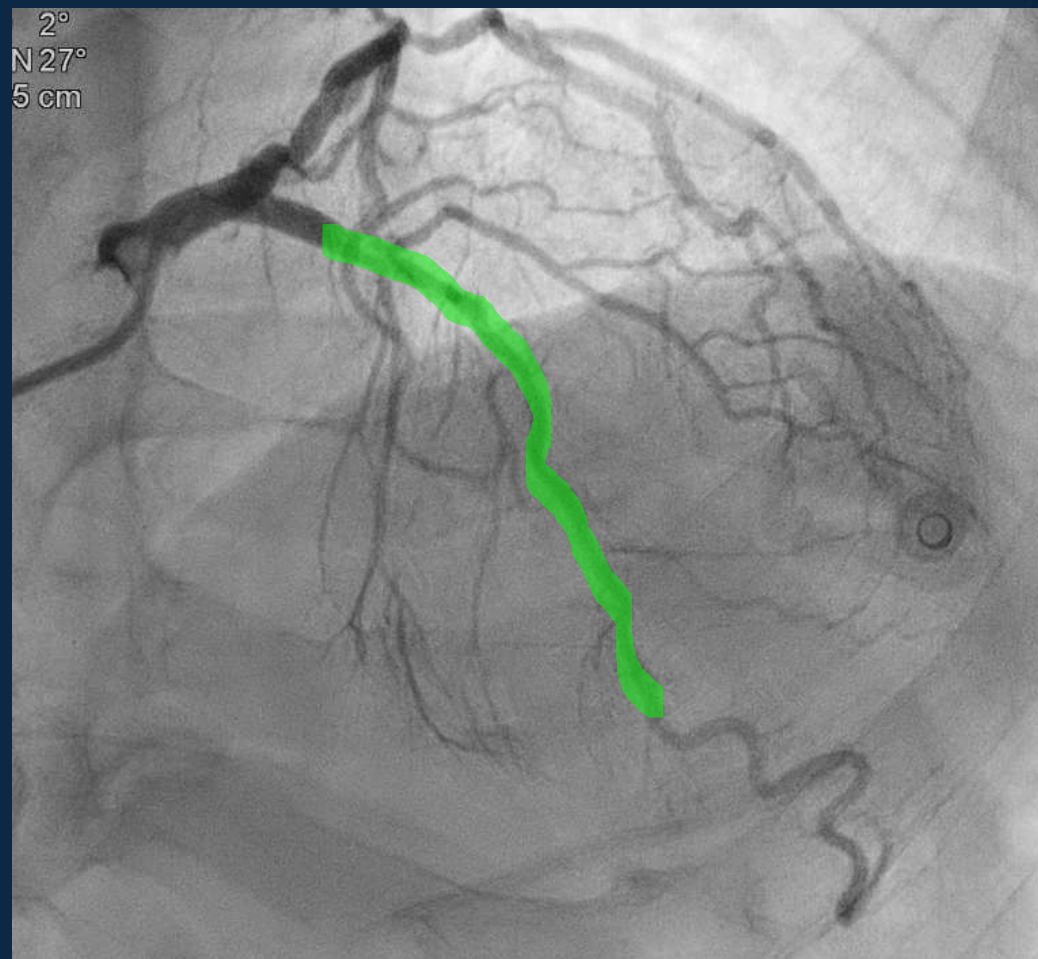
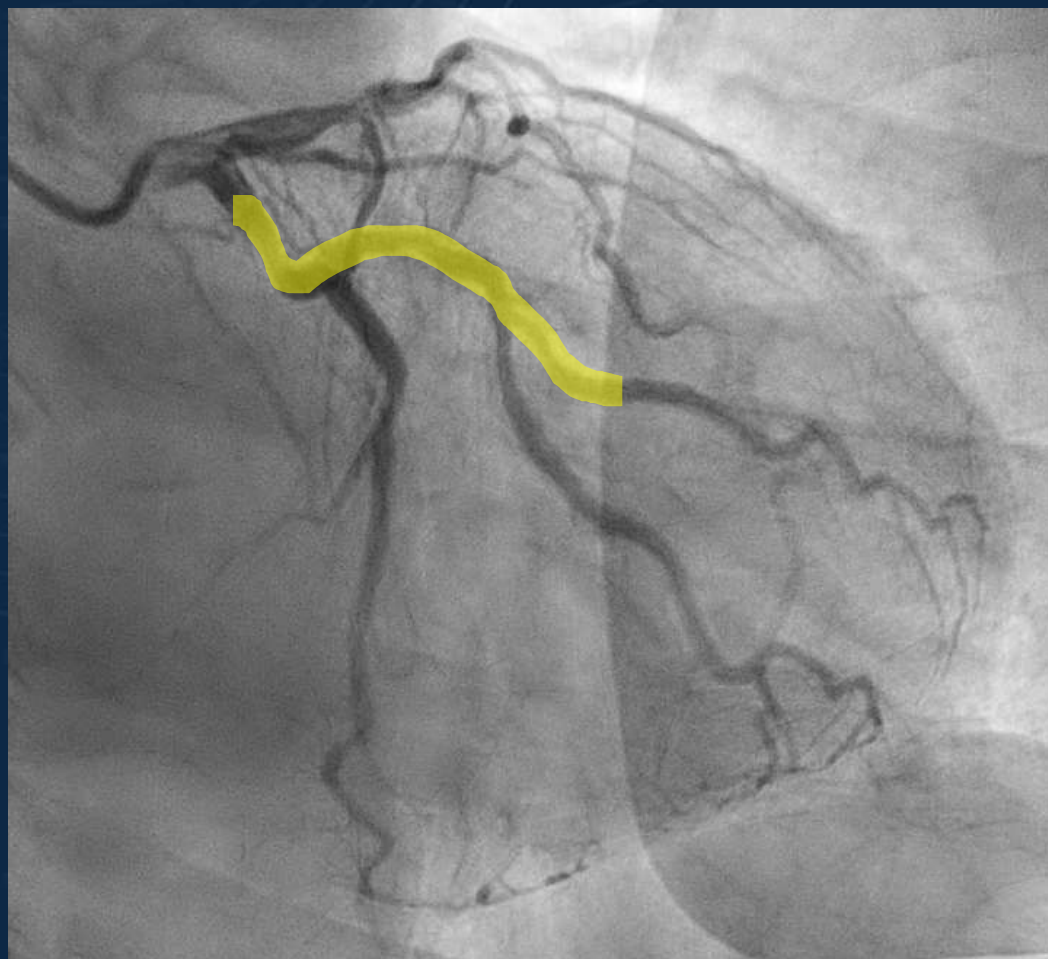


Angiographic Findings

- CAD, 3-V-D
 - LAD-P to D diffuse stenosis
 - LCX-P and D stenosis, OM-1 stenosis
 - RCA-P and M stenosis
- SYNTAX score > 33
 - PCI vs. CABG

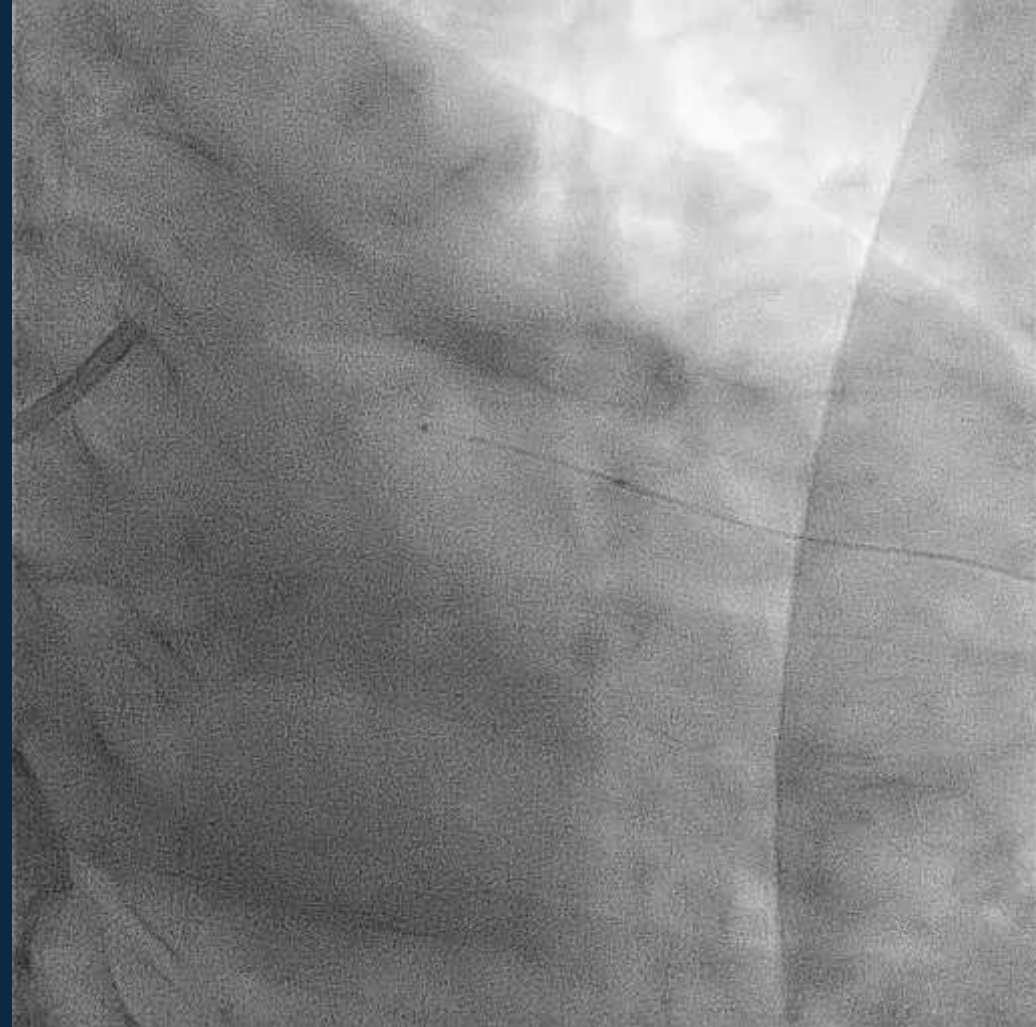
Intervention Strategy

Complete Revascularization



PCI for LCX

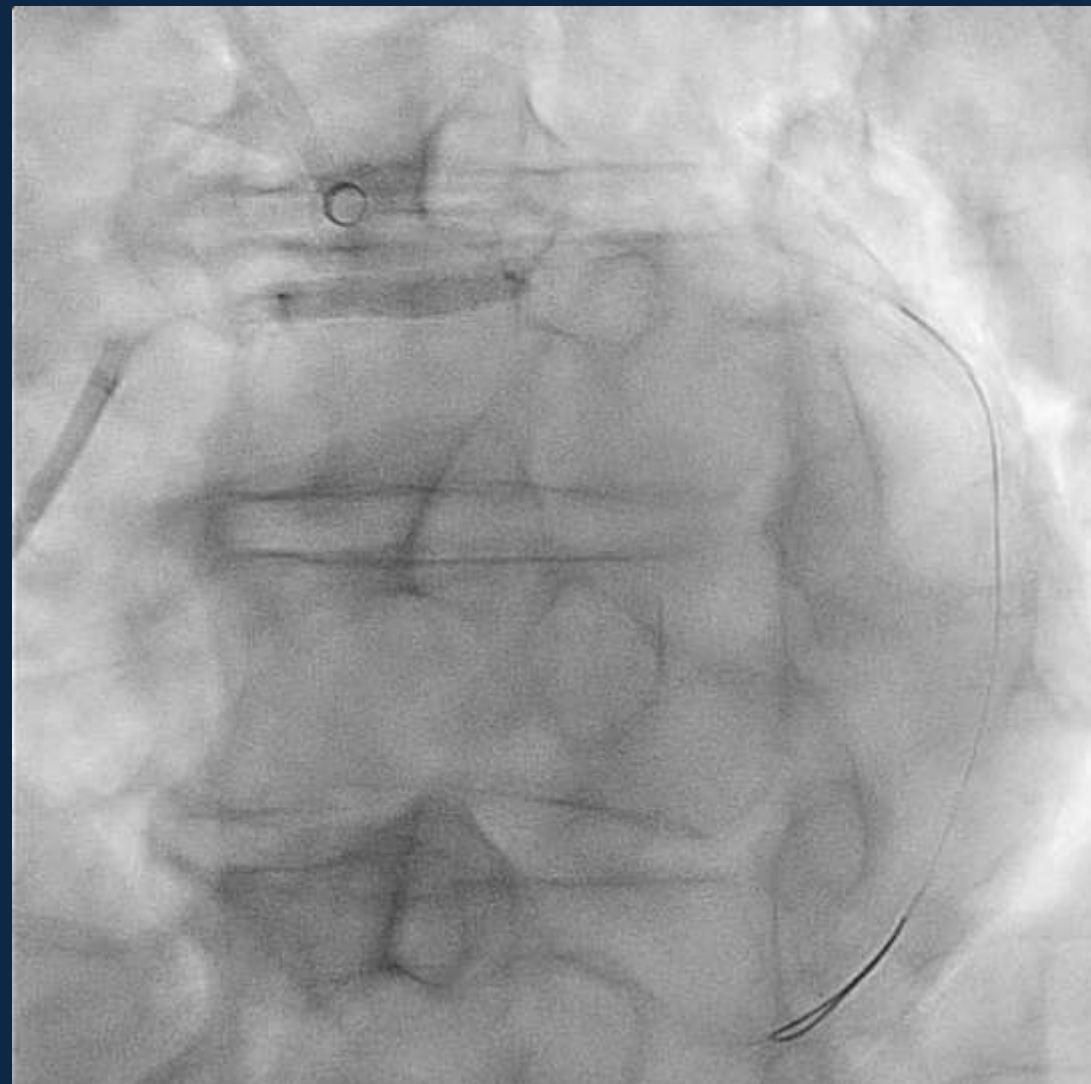
- Guiding catheter: 6 Fr EBU 3.5
- Wire: Runthrough NS
- Balloon: NC 3.0 x 20 mm



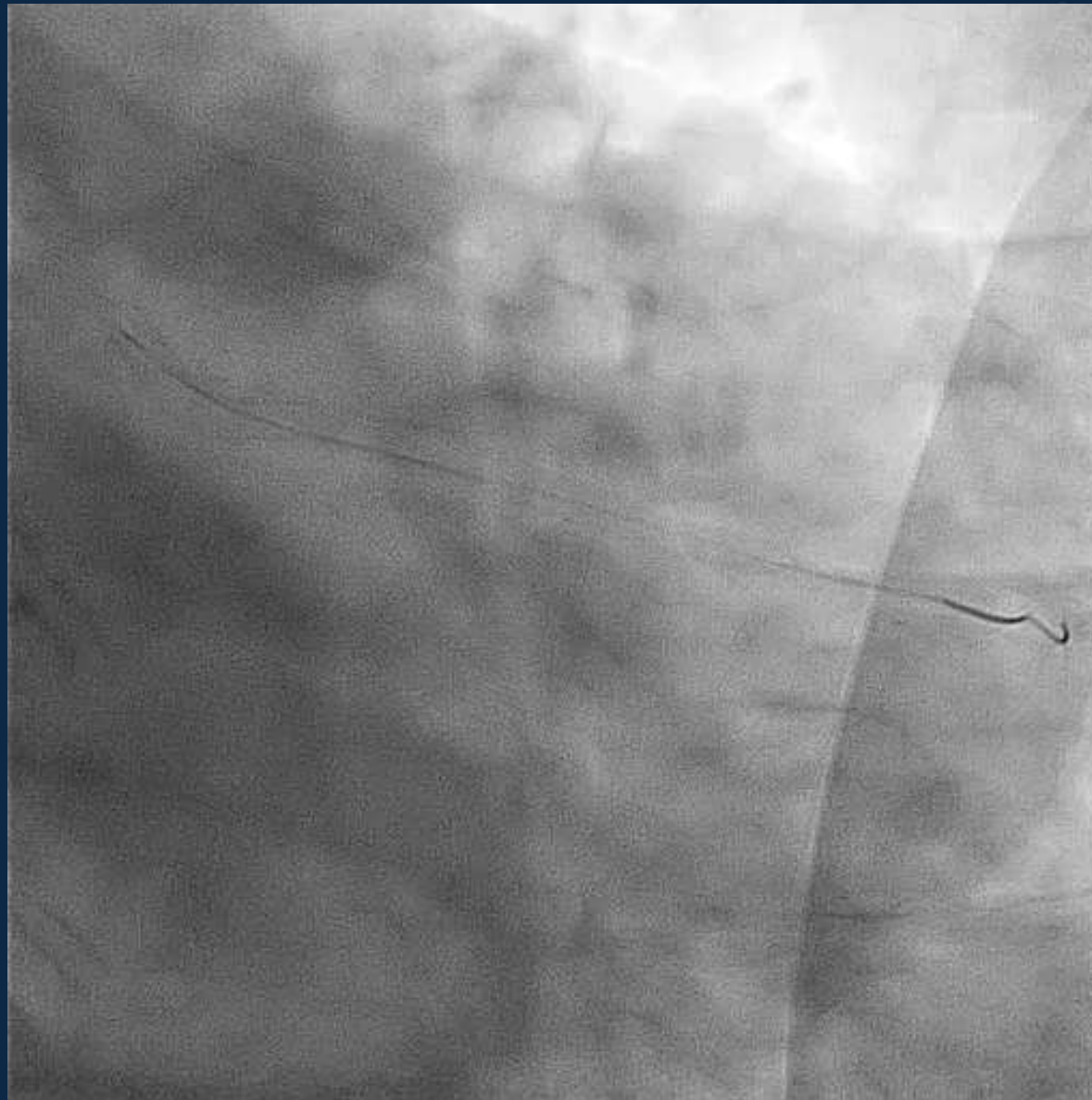
DES 2.75 x 48 mm



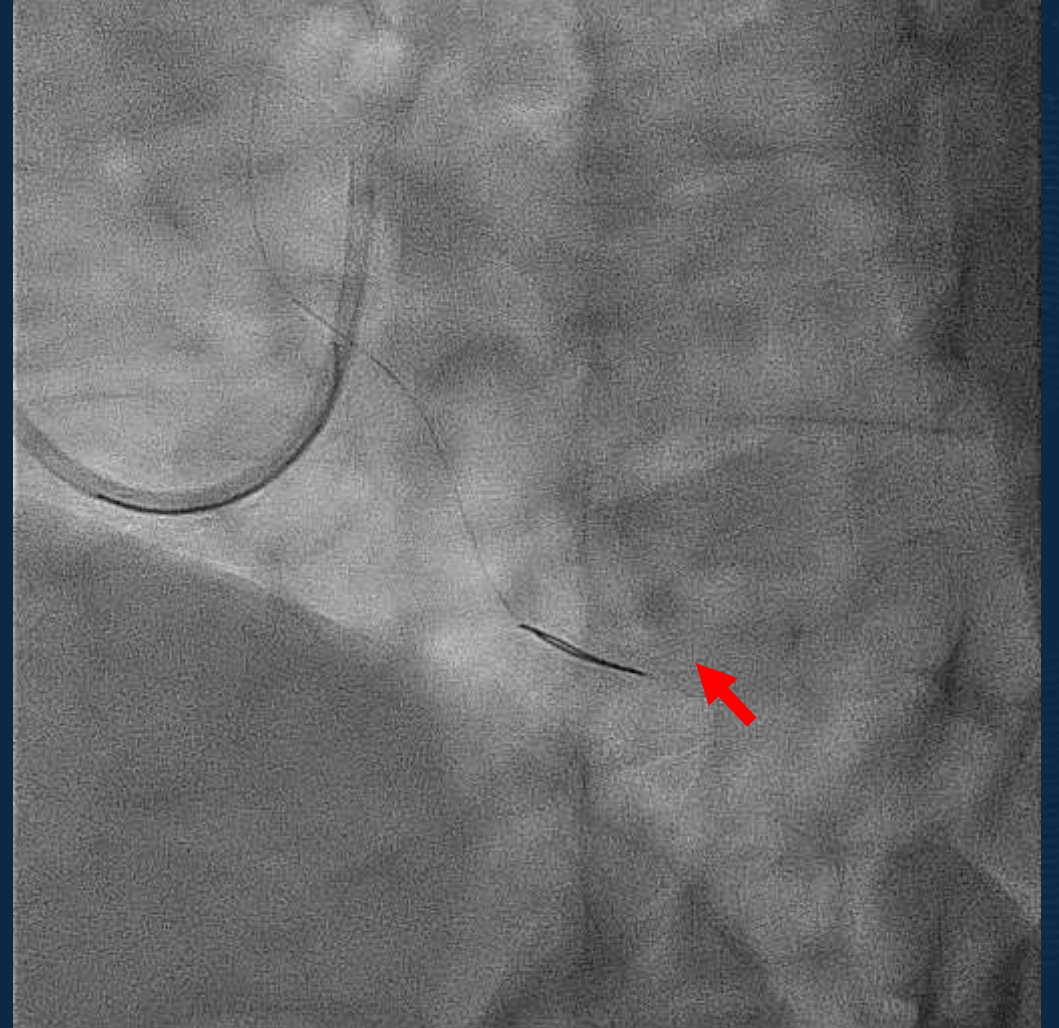
DES 3.5 x 18 mm



NC Balloon 3.0 x 20 mm, 20 ATM



PCI for LAD

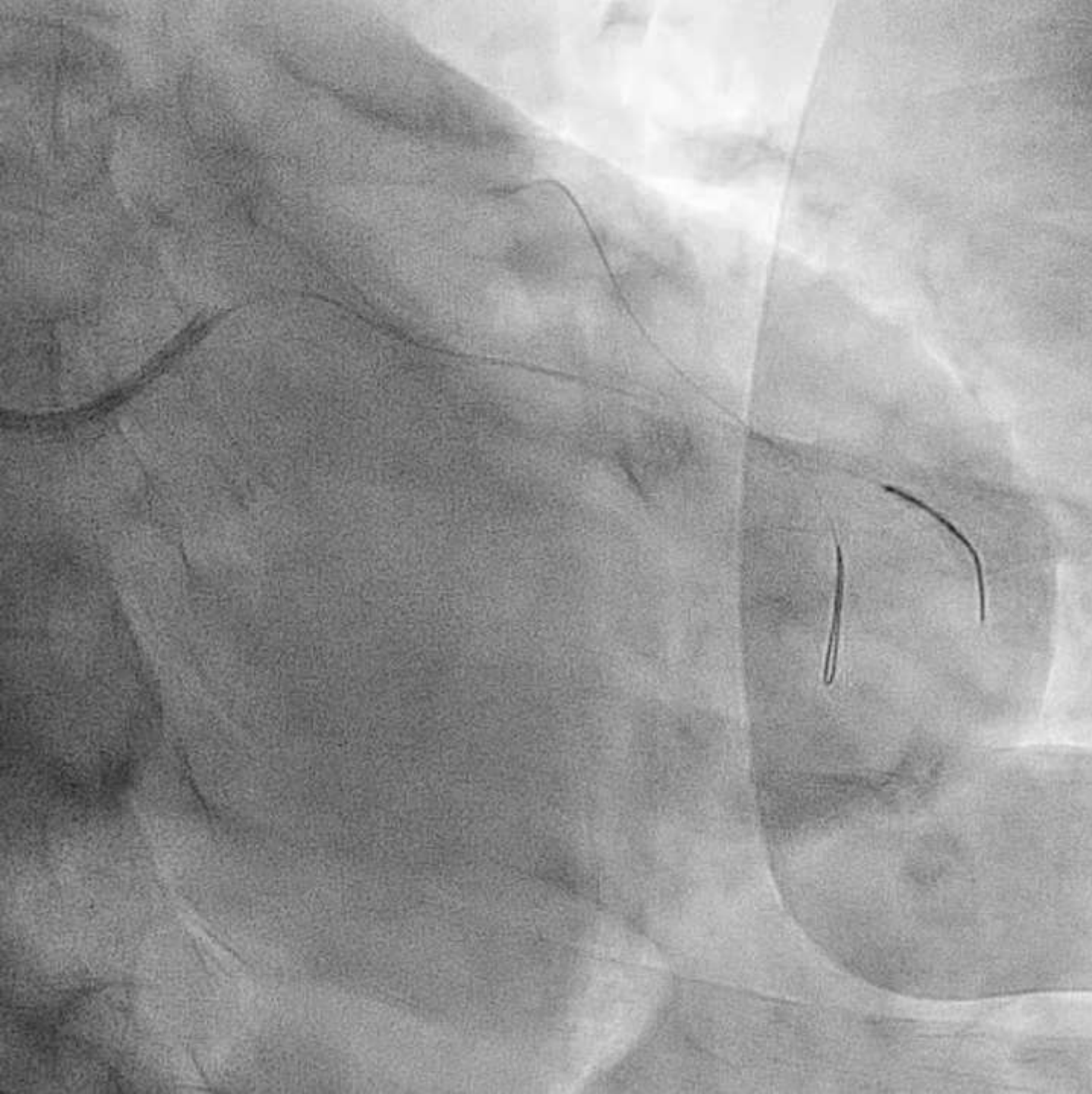




Observe & Complete PCI

OR

Immediately terminate



Wire: Runthrough NS

Balloon inflation?

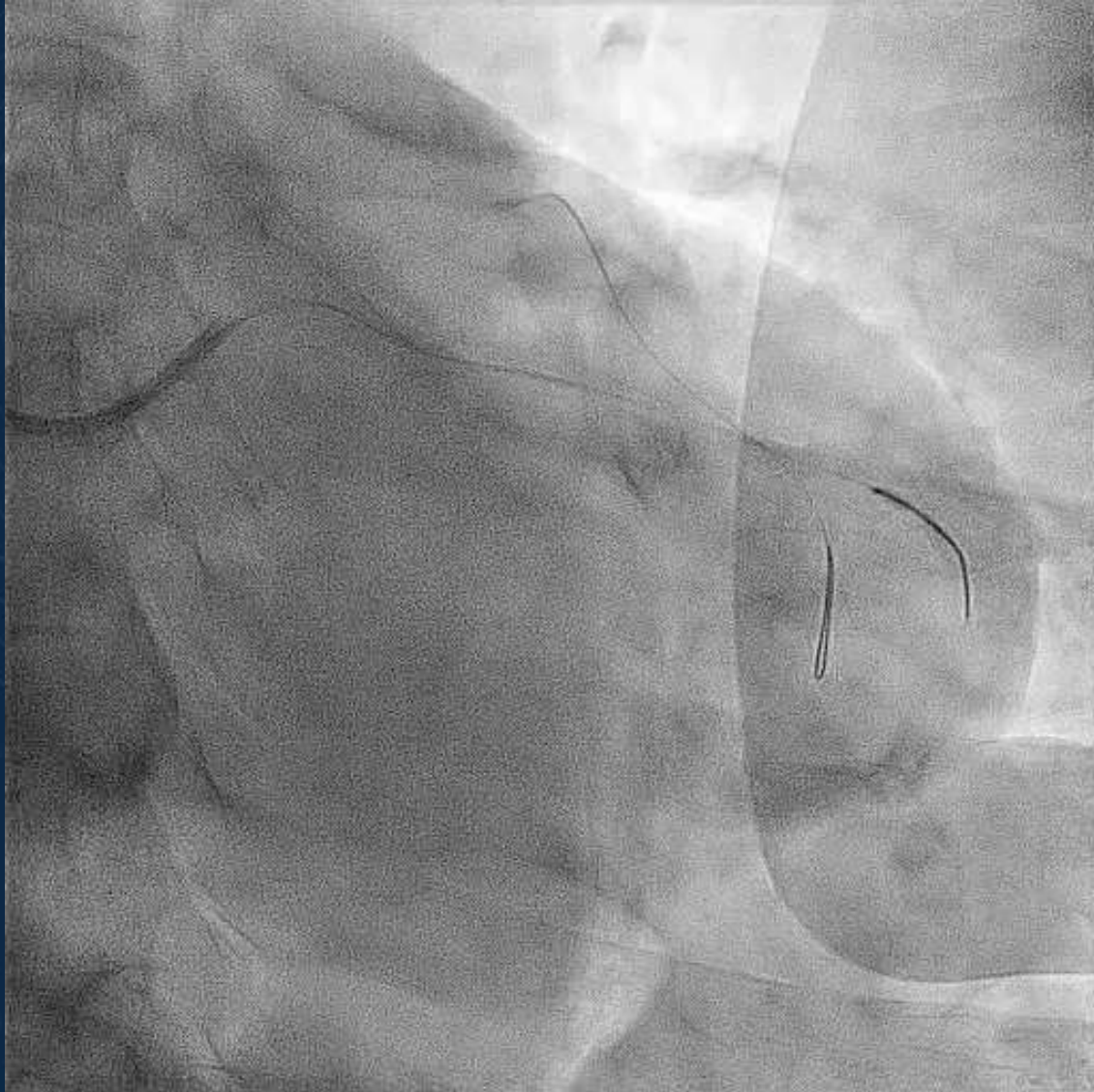
Embolization?

- Coil
- Gel foam
- Clotted blood
- Subcutaneous fat
- Microsphere
- Thrombin

Reversal of anticoagulation?

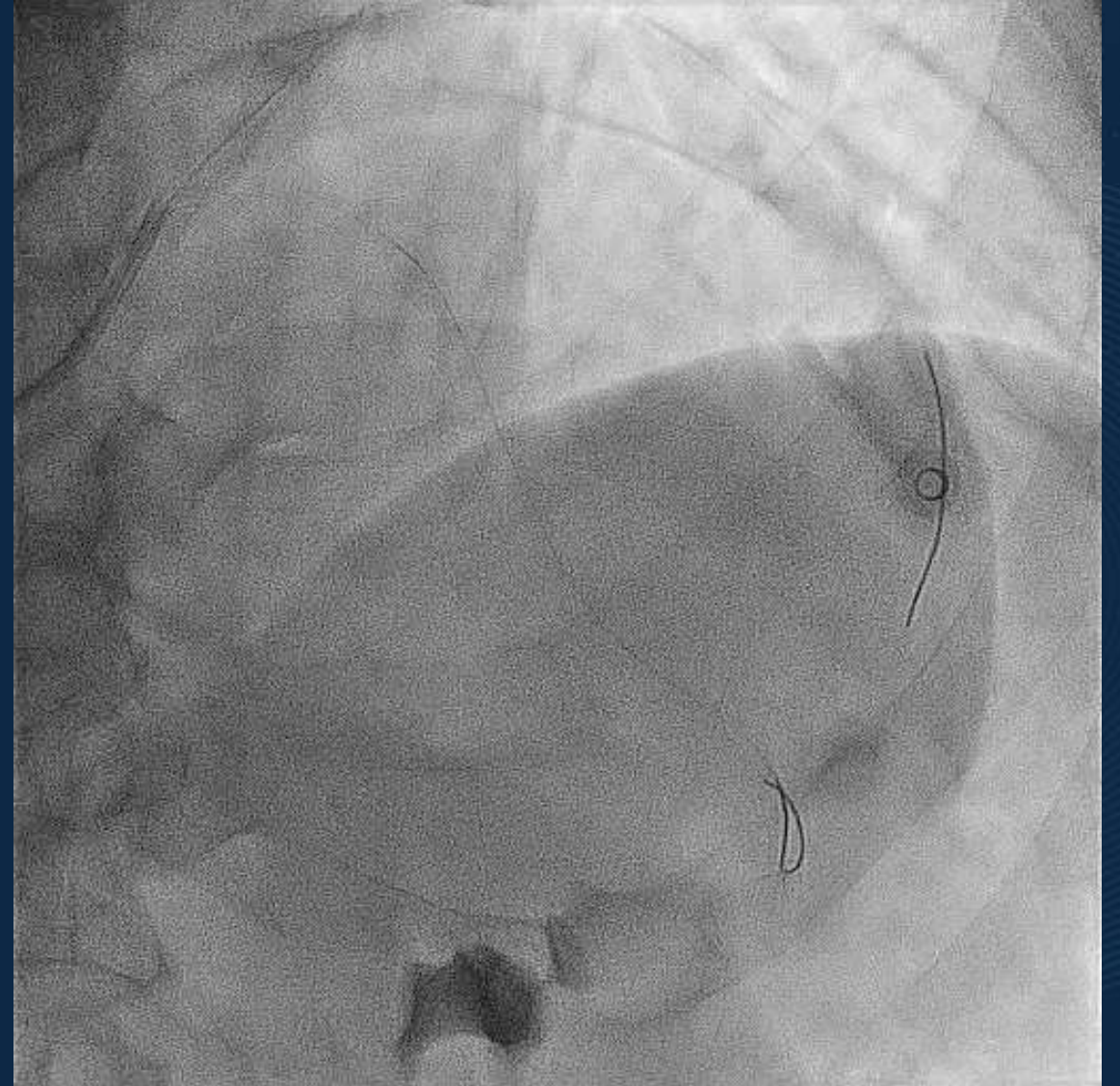
Balloon inflation

2.0 x 15 mm for 5 minutes x 2 times



Heparin not reversed

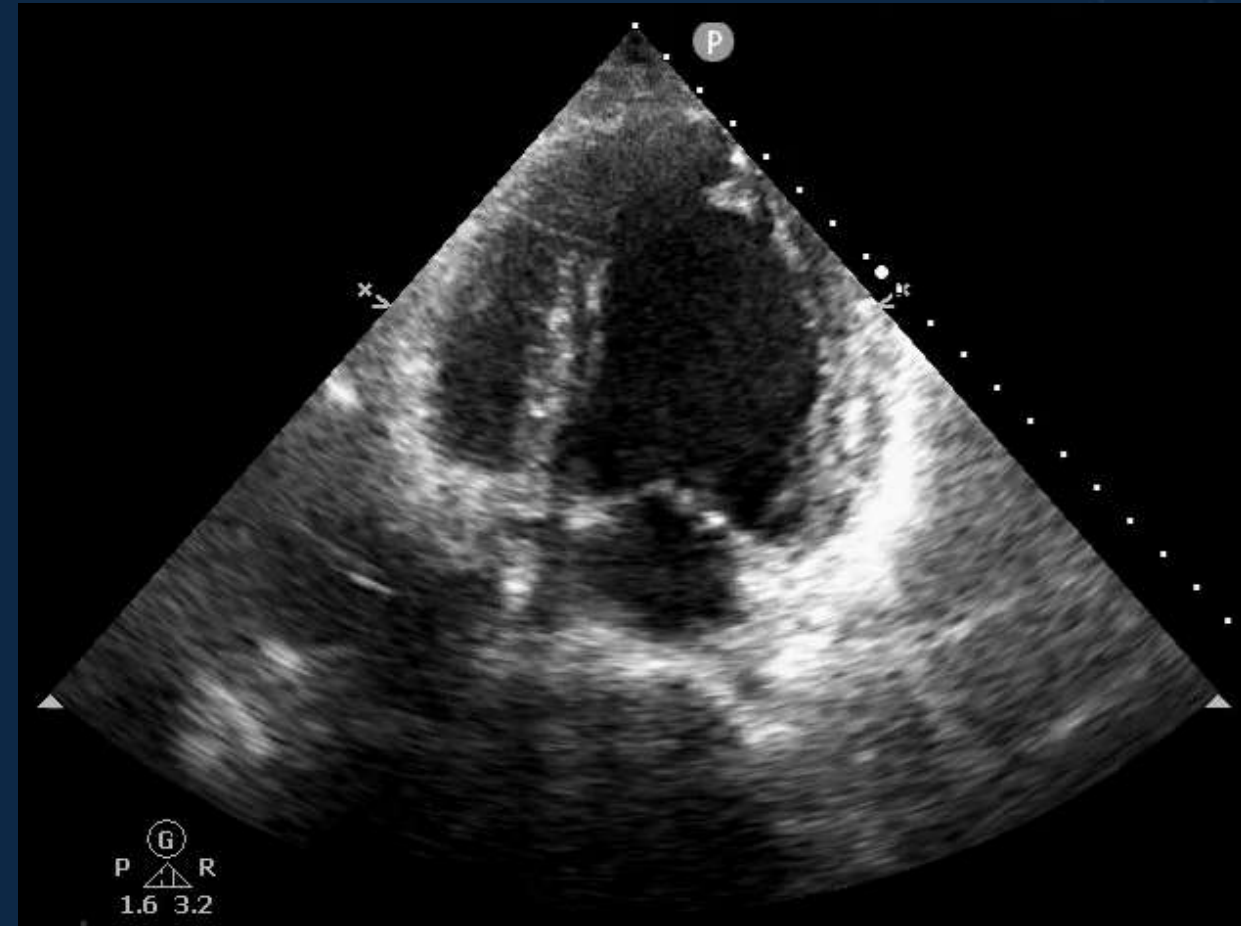
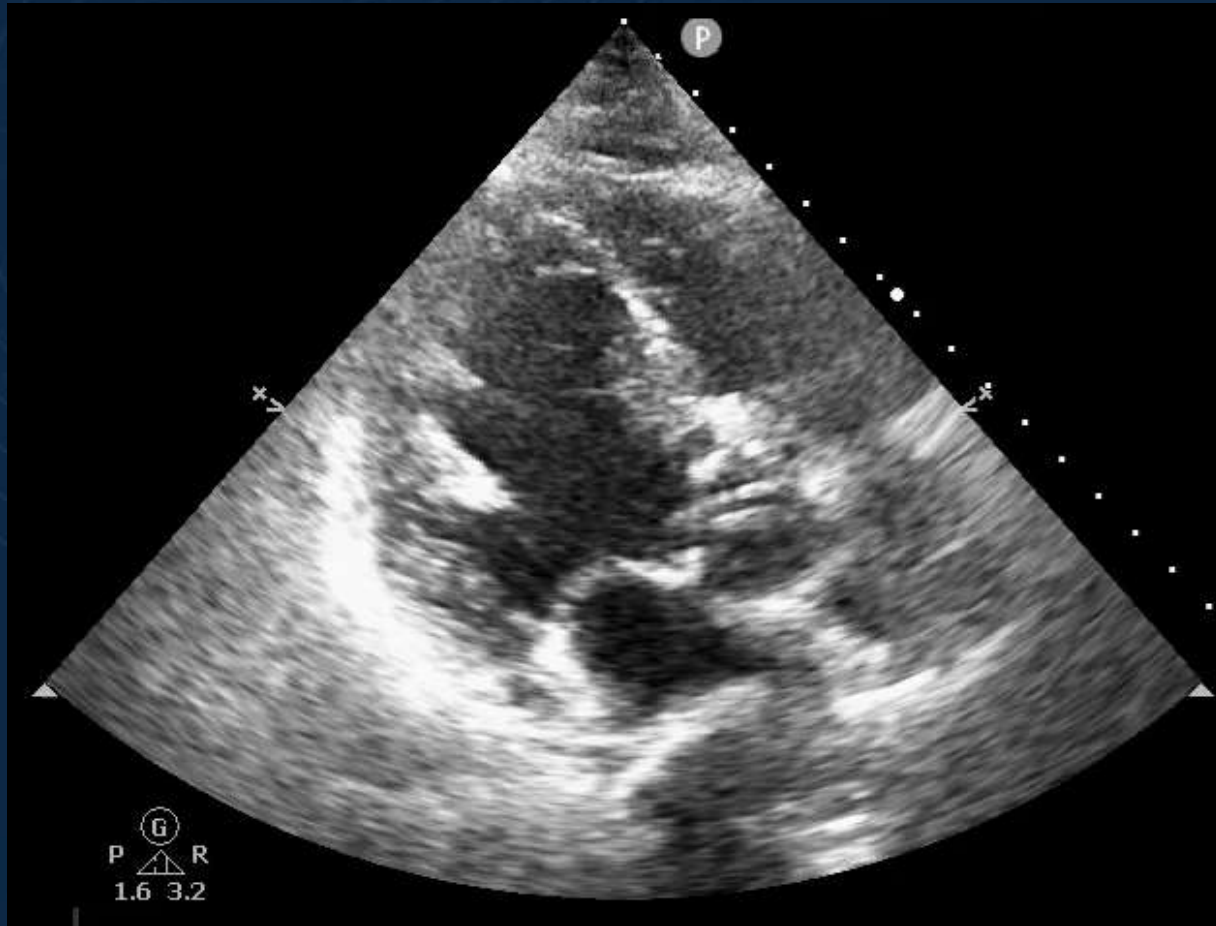
ACT 300~400



Sudden Hemodynamic Change

- The patient complained of chest pain
- SBP: 110~150 dropped to 80~90
- HR: 90~100 dropped to 50~70

Bedside Echocardiography



Perforation management

1. Inflate balloon to occlude vessel
2. Intravenous fluids / pressors
3. Pericardiocentesis if hypotension
– ? autotransfusion
4. Notify surgeons

**“Universal” Algorithm for
Coronary Perforations**

Persistent extravasation?

no

Monitor pt

yes

Treat the cause

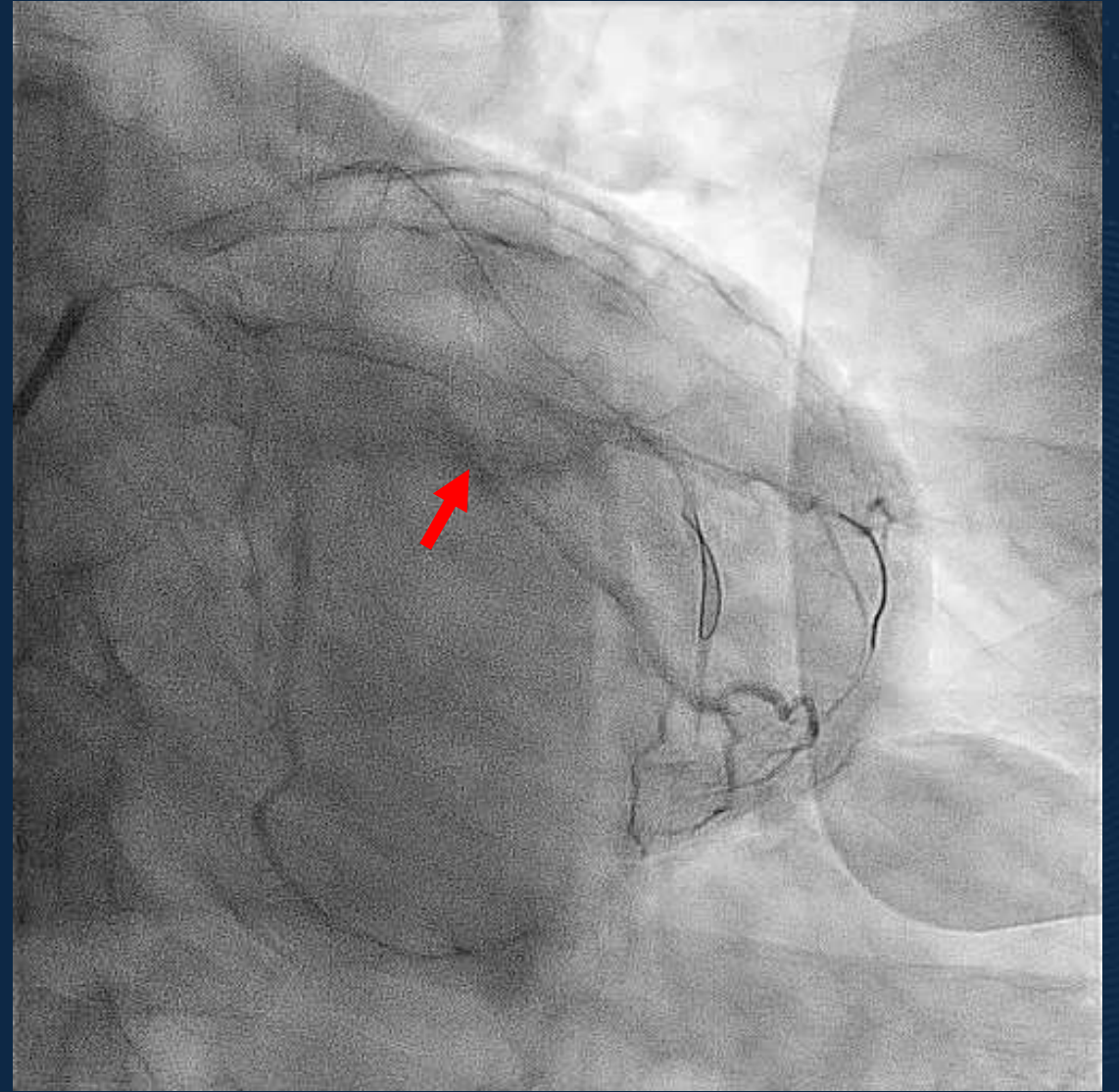
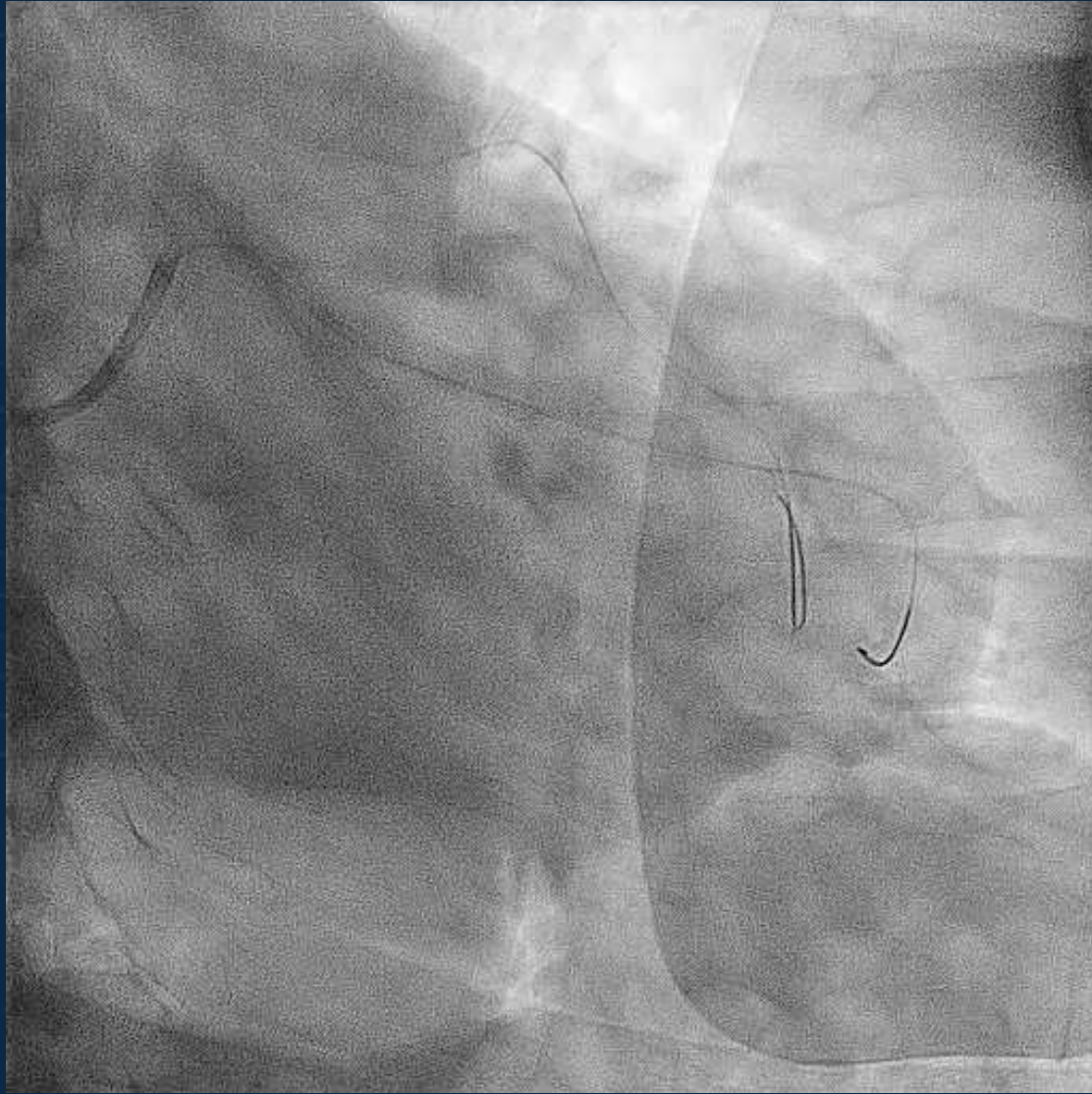
Large vessel perforation
1. Covered stent
2. Prolonged balloon
inflations

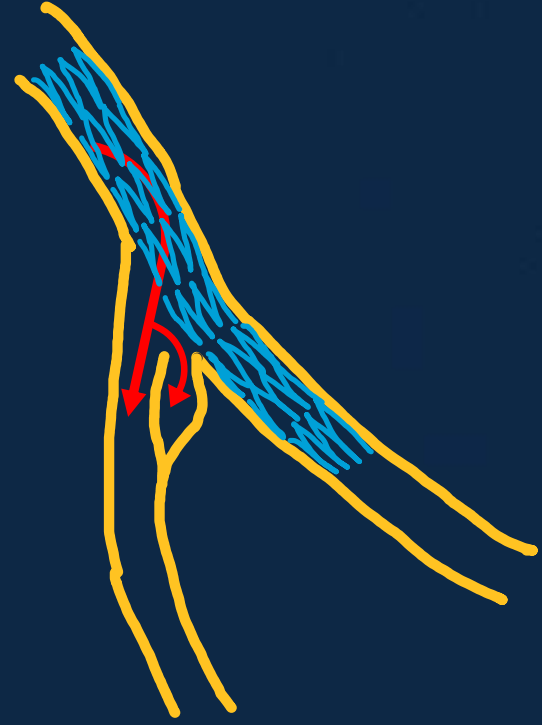
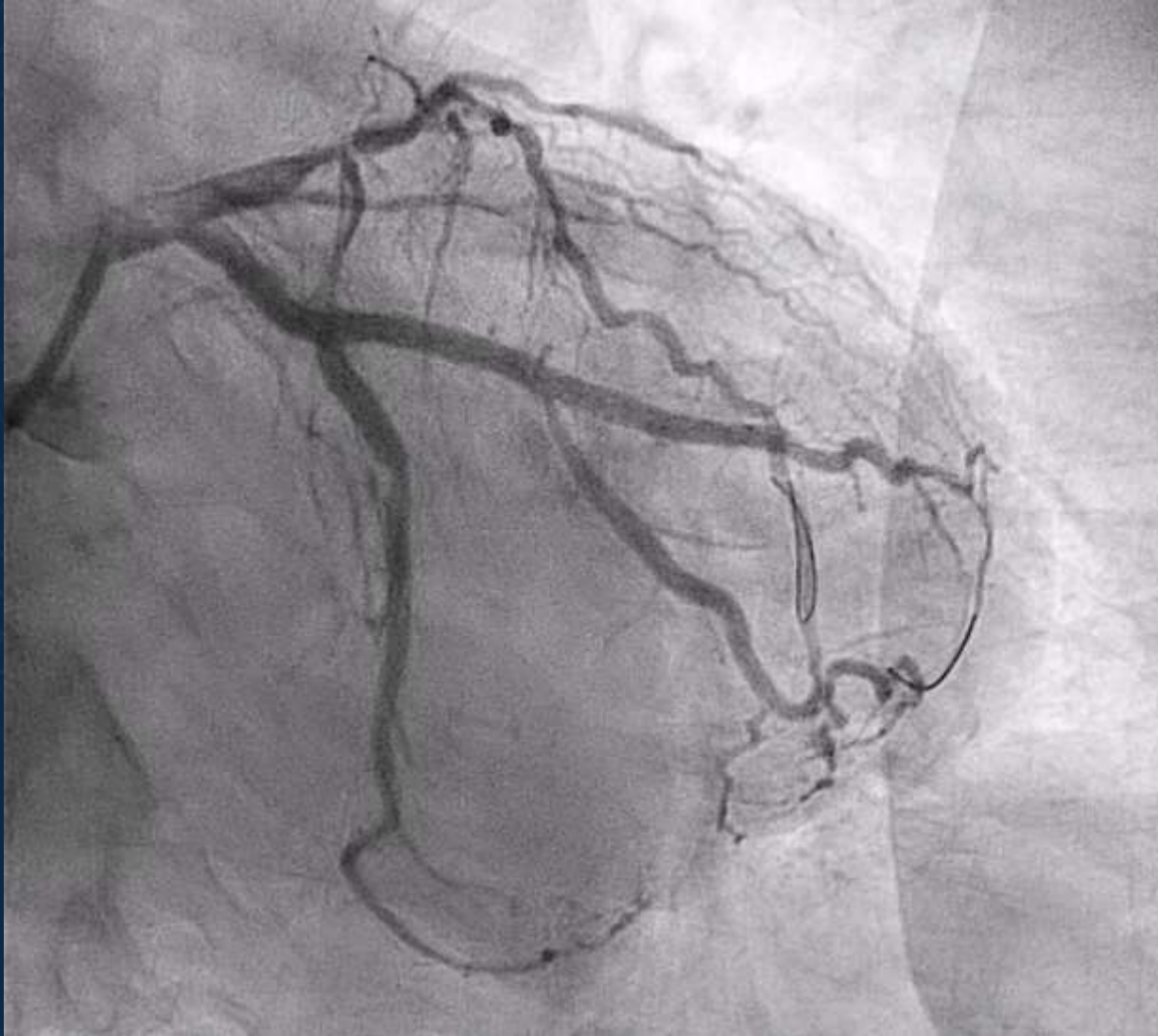
Distal vessel perforation
1. embolization (fat, coil,
thrombin, etc)
2. Covered stent over
perforated branch origin

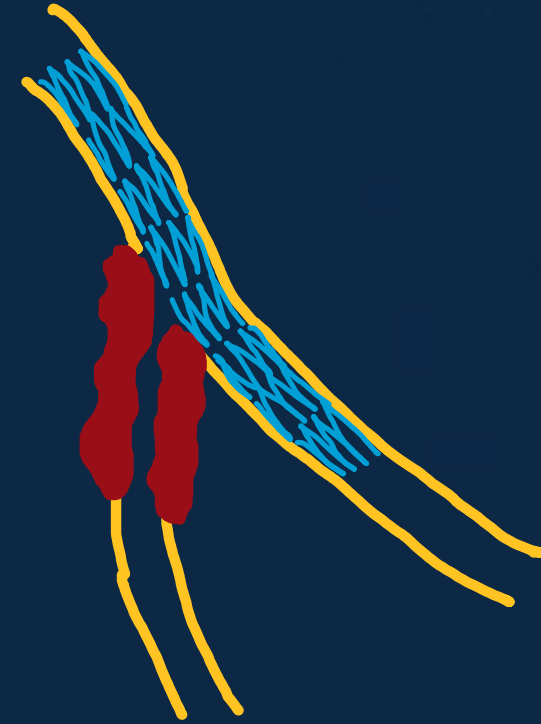
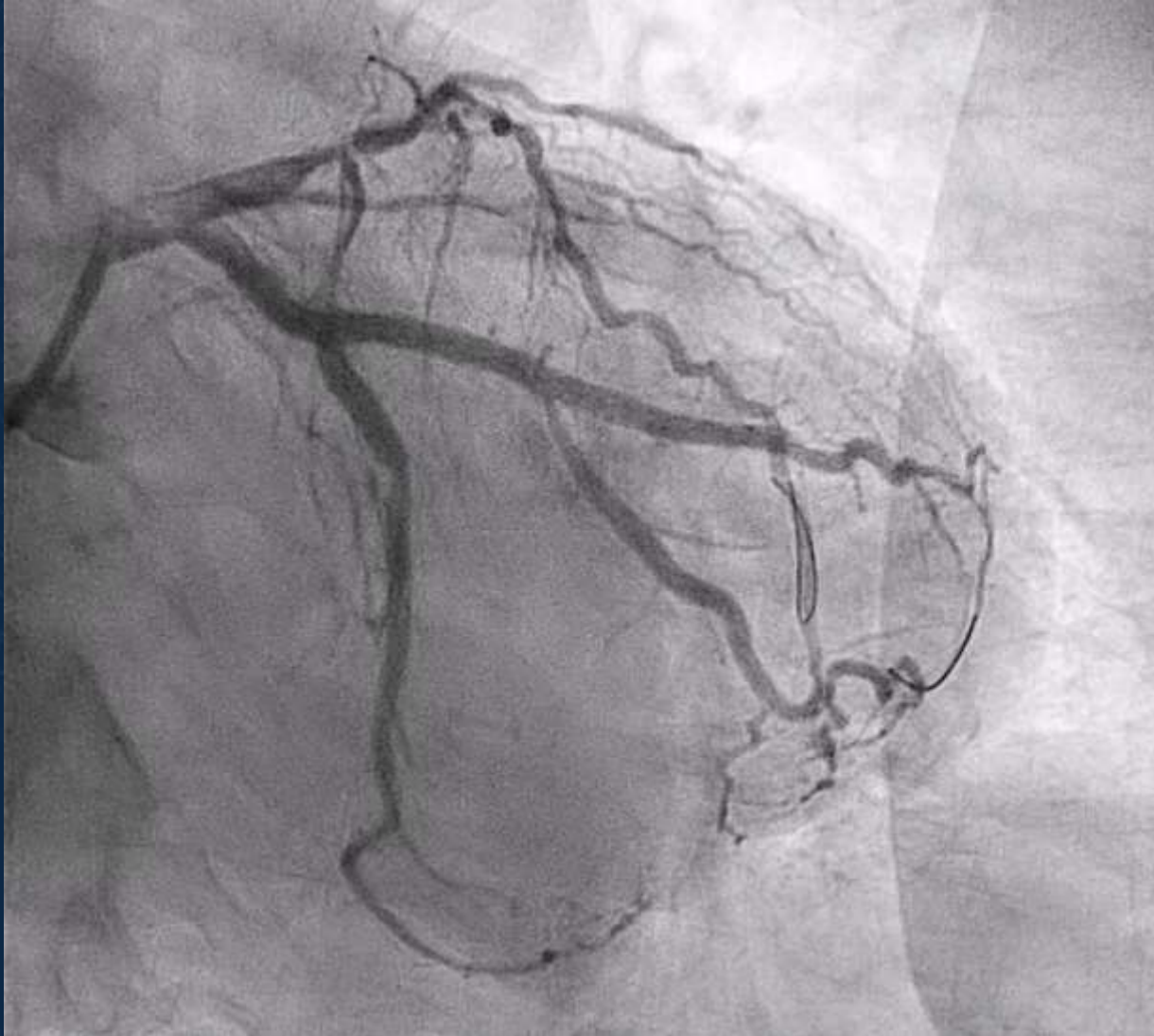
**Type-specific
Treatment**

continued extravasation?

Reverse anticoagulation



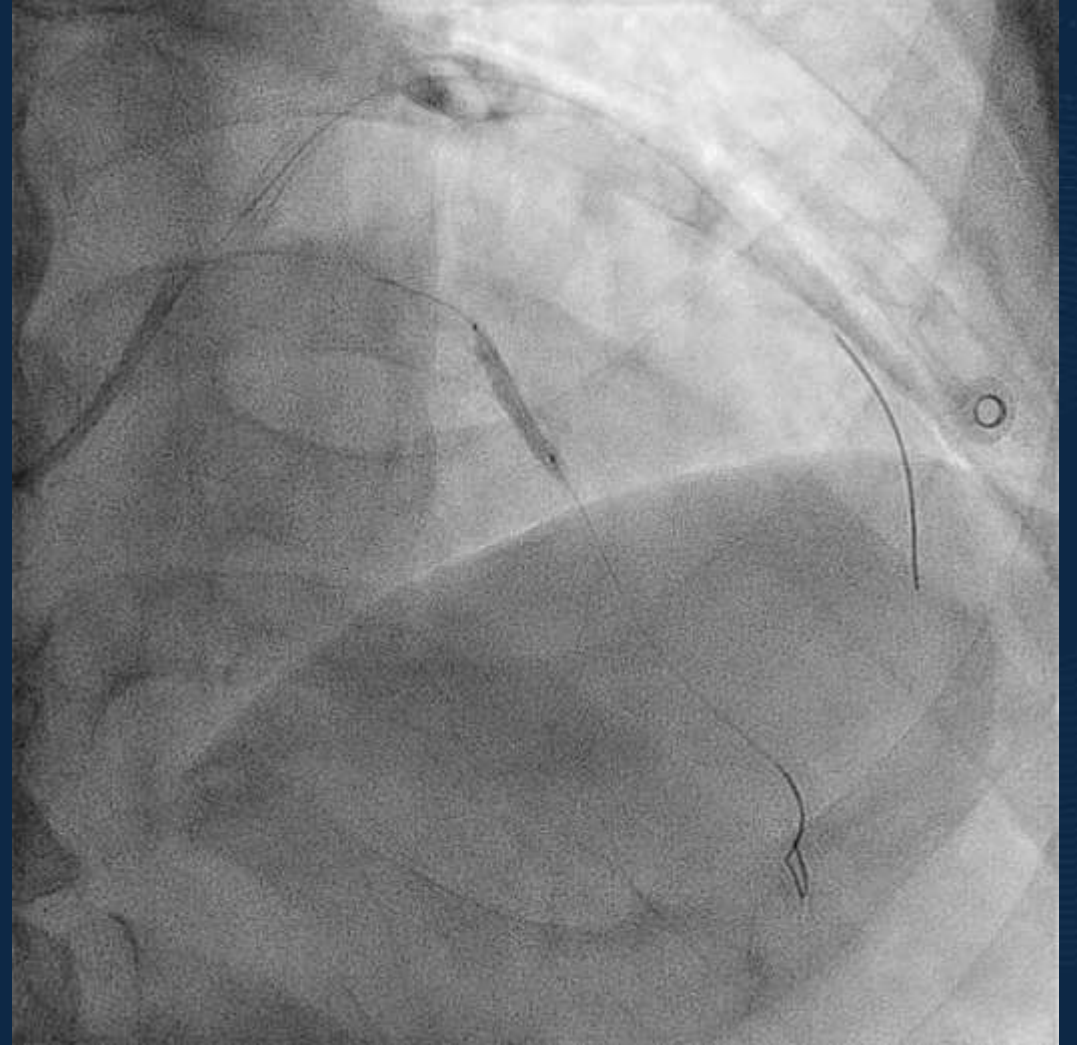
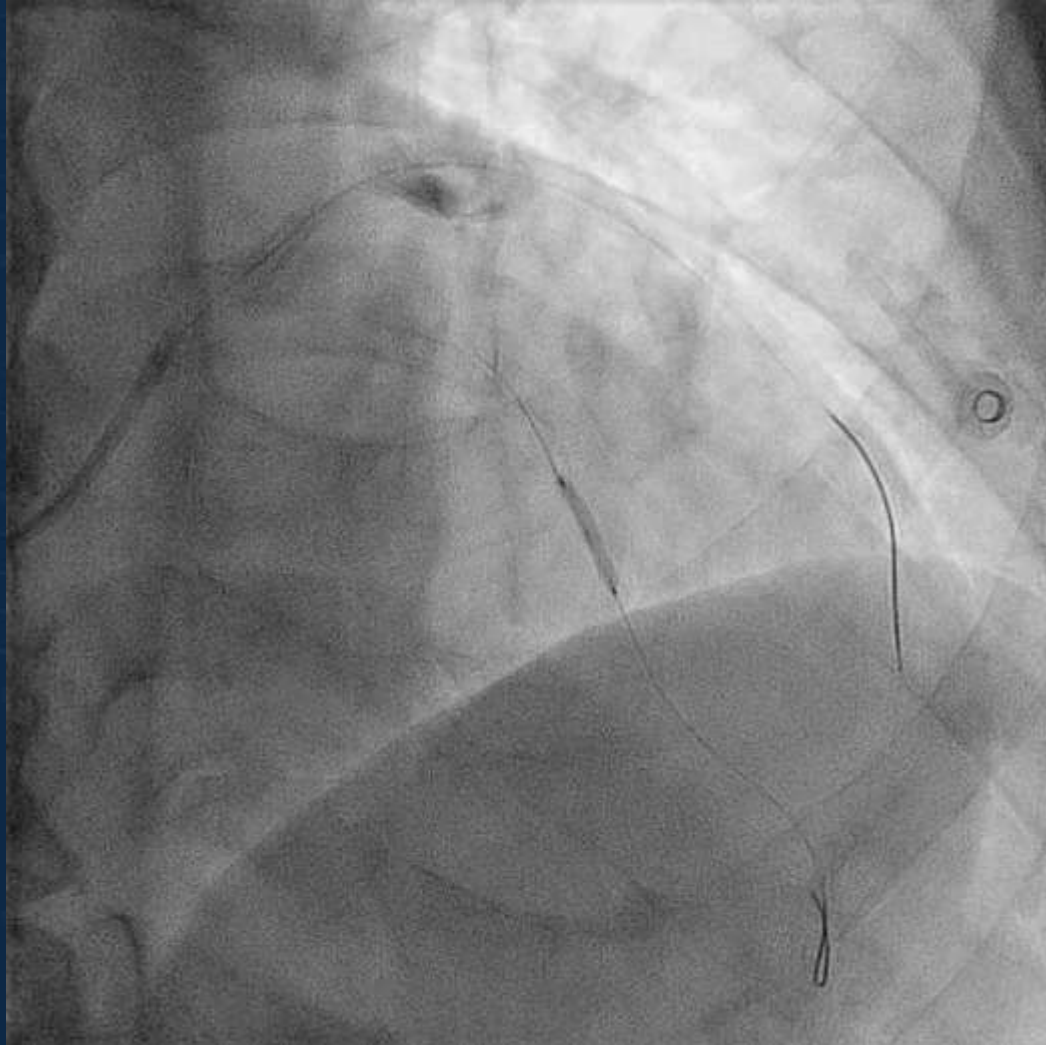




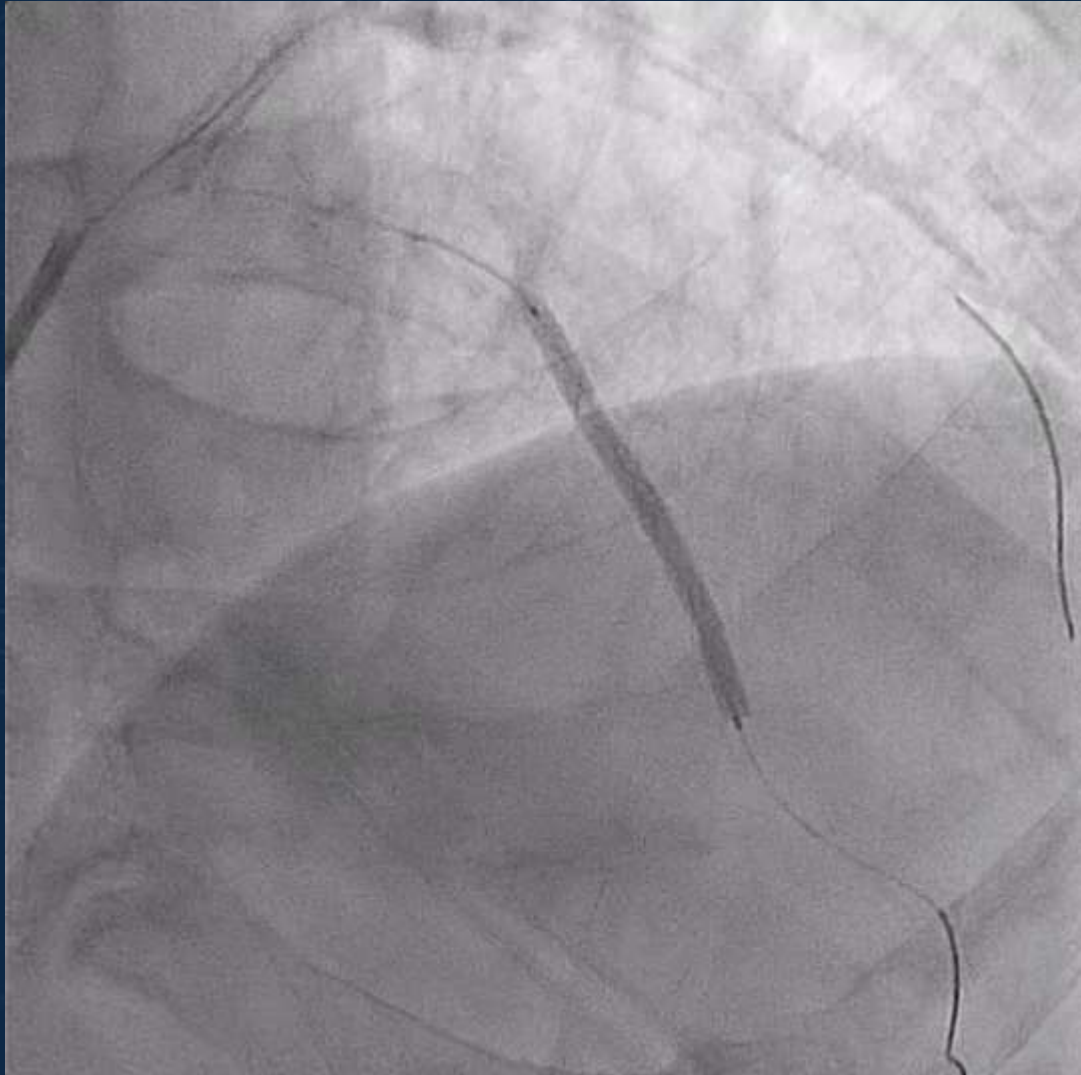
Intramural hematoma

Wait & See?

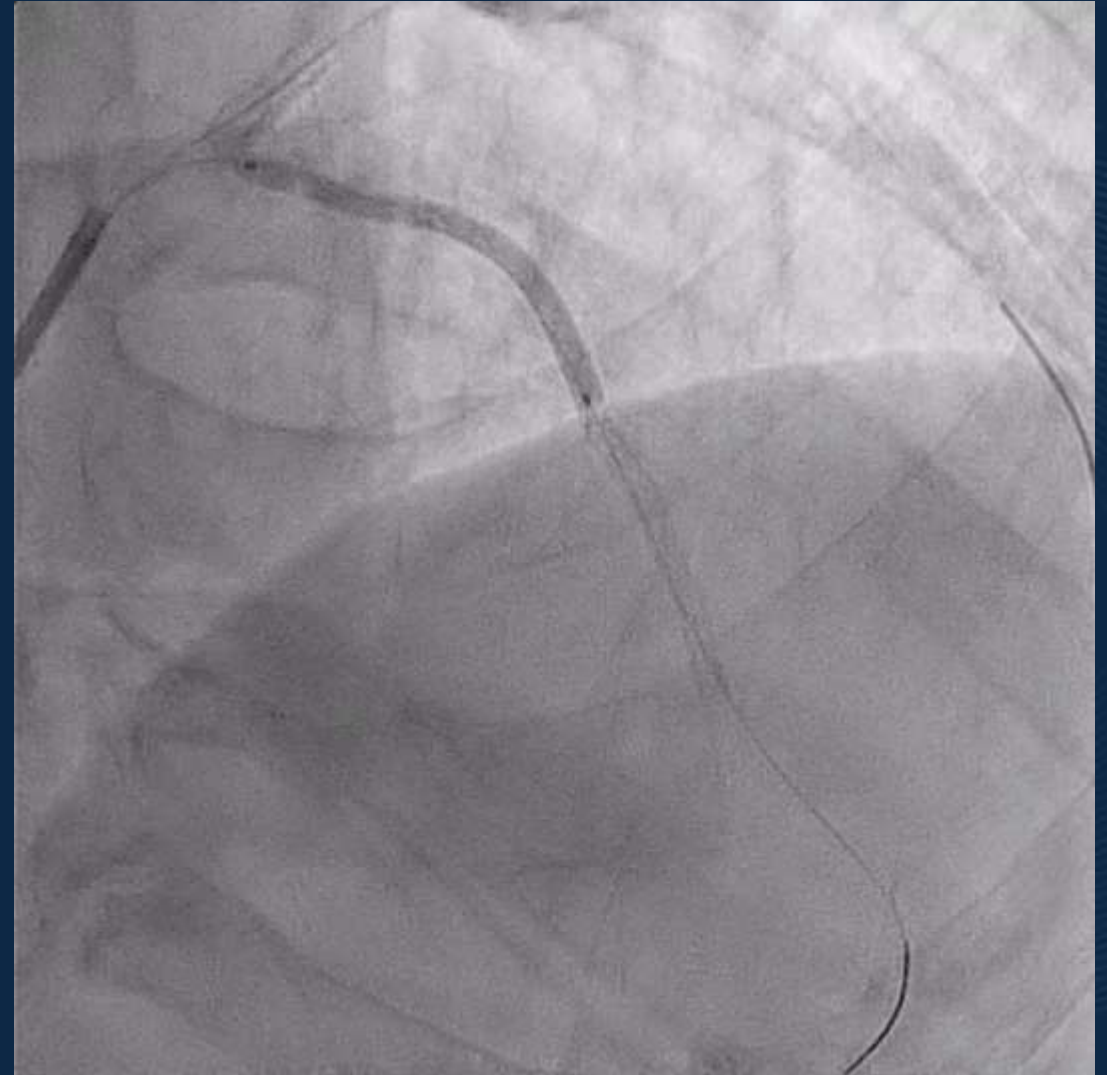
Back to LAD



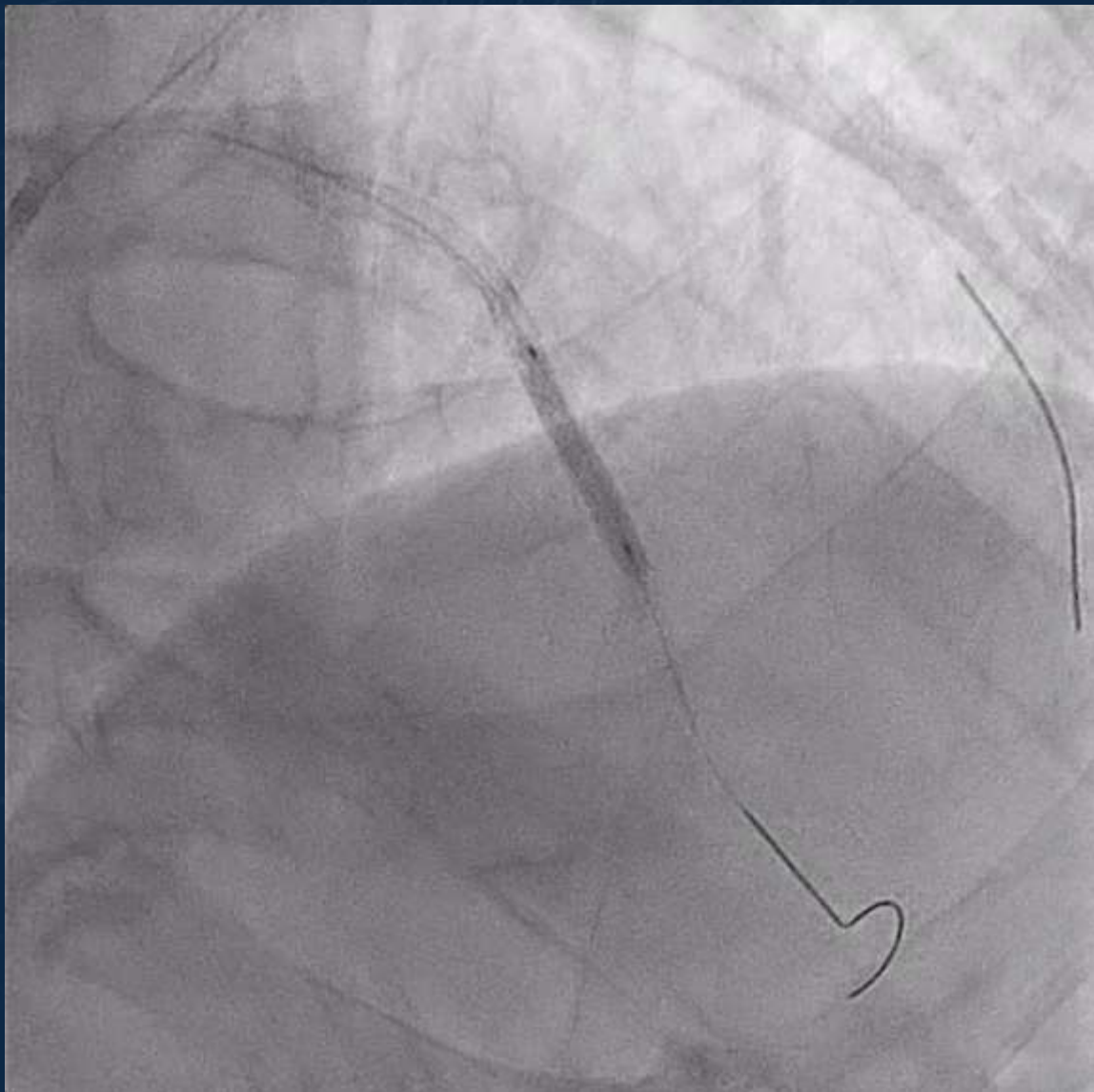
DES 2.25 x 38 mm, 12 ATM



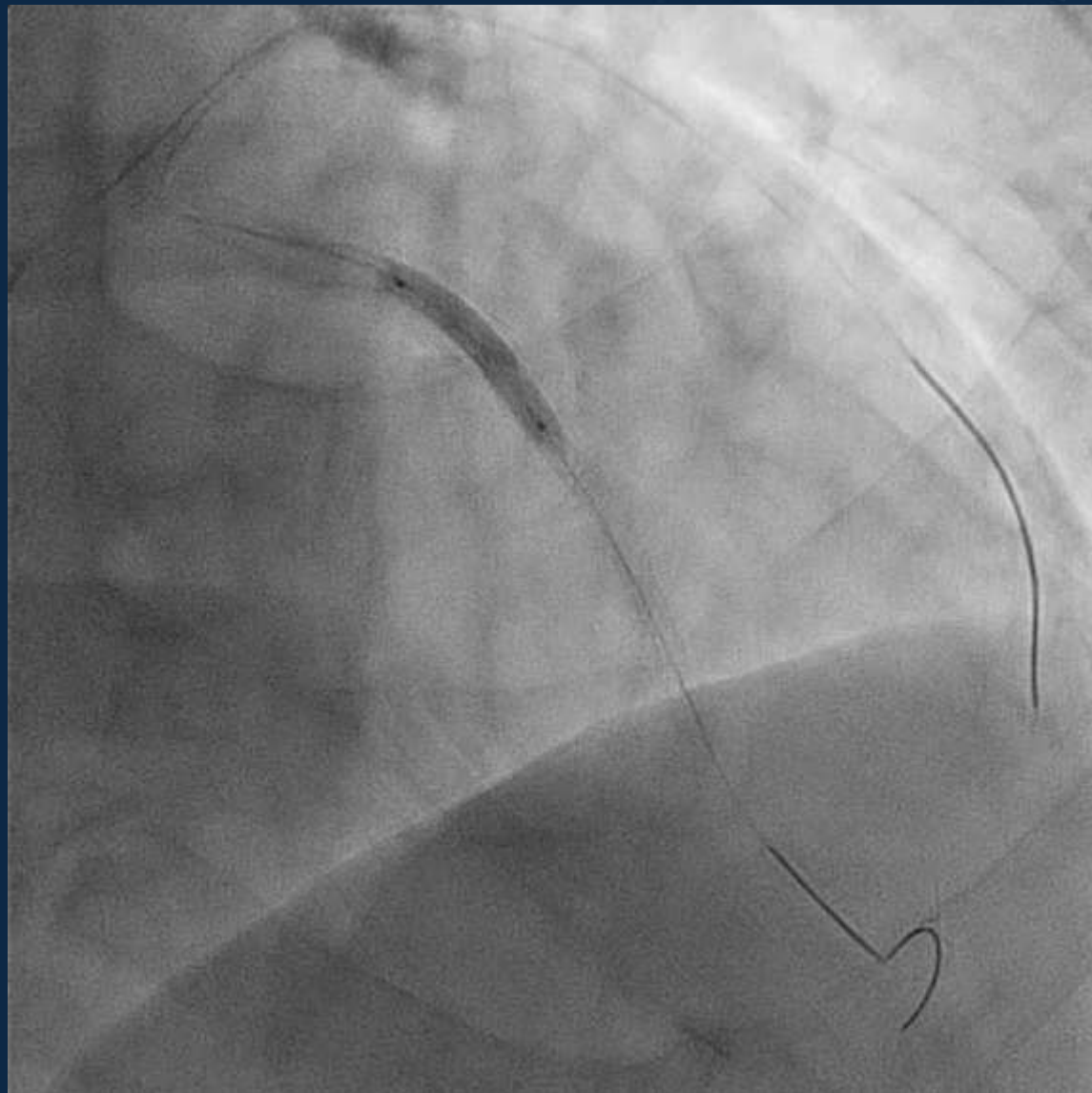
DES 3.5 x 34 mm, 12 ATM

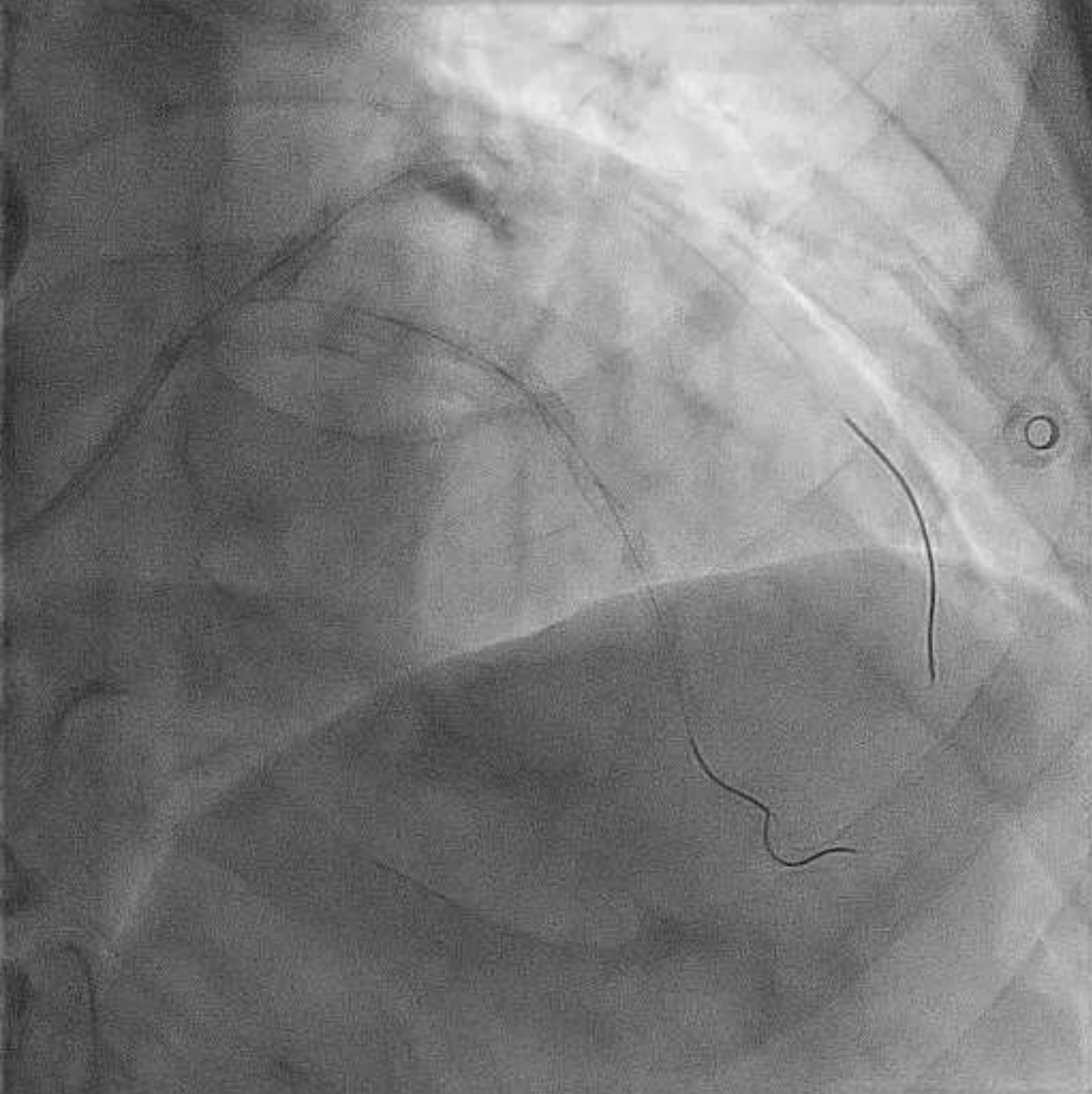


NC Balloon 3.0 x 20 mm, 10 ATM

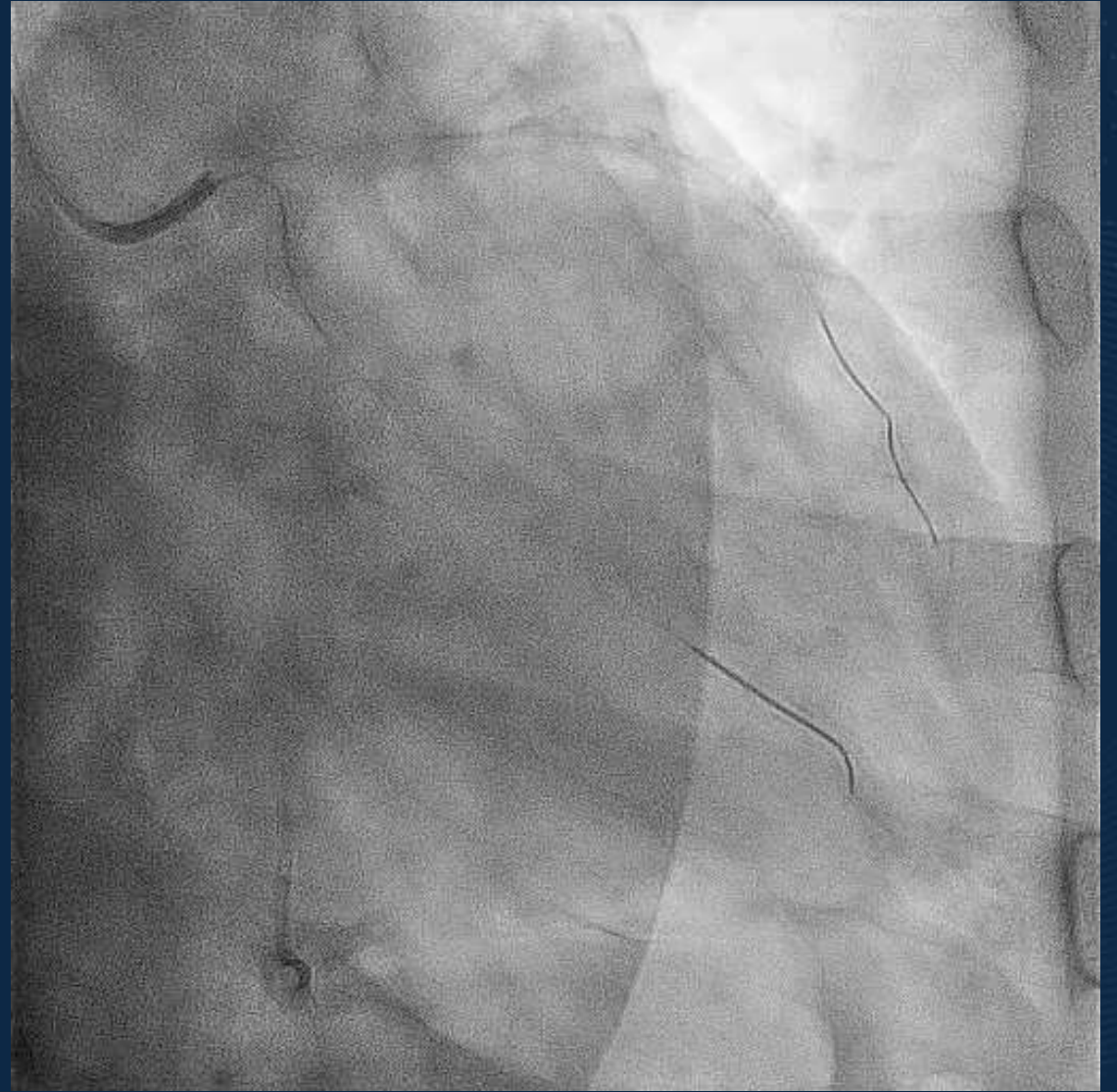
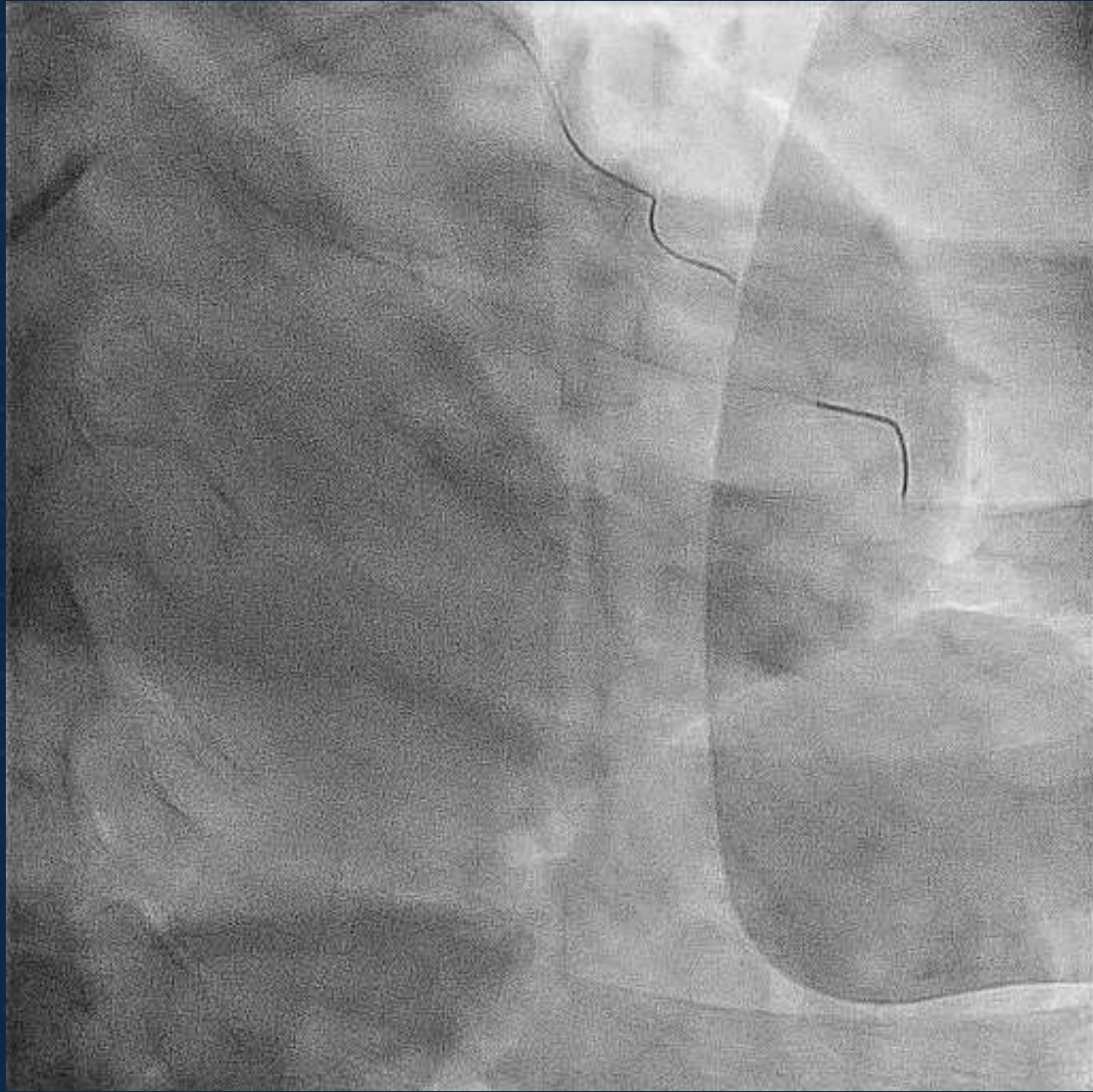


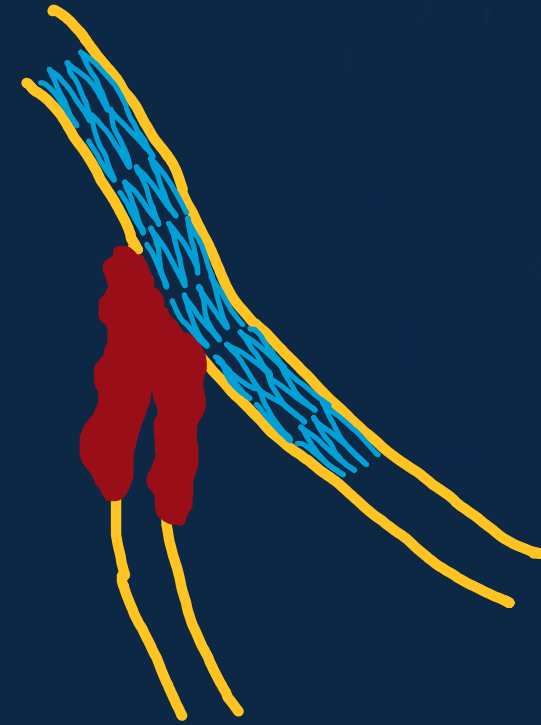
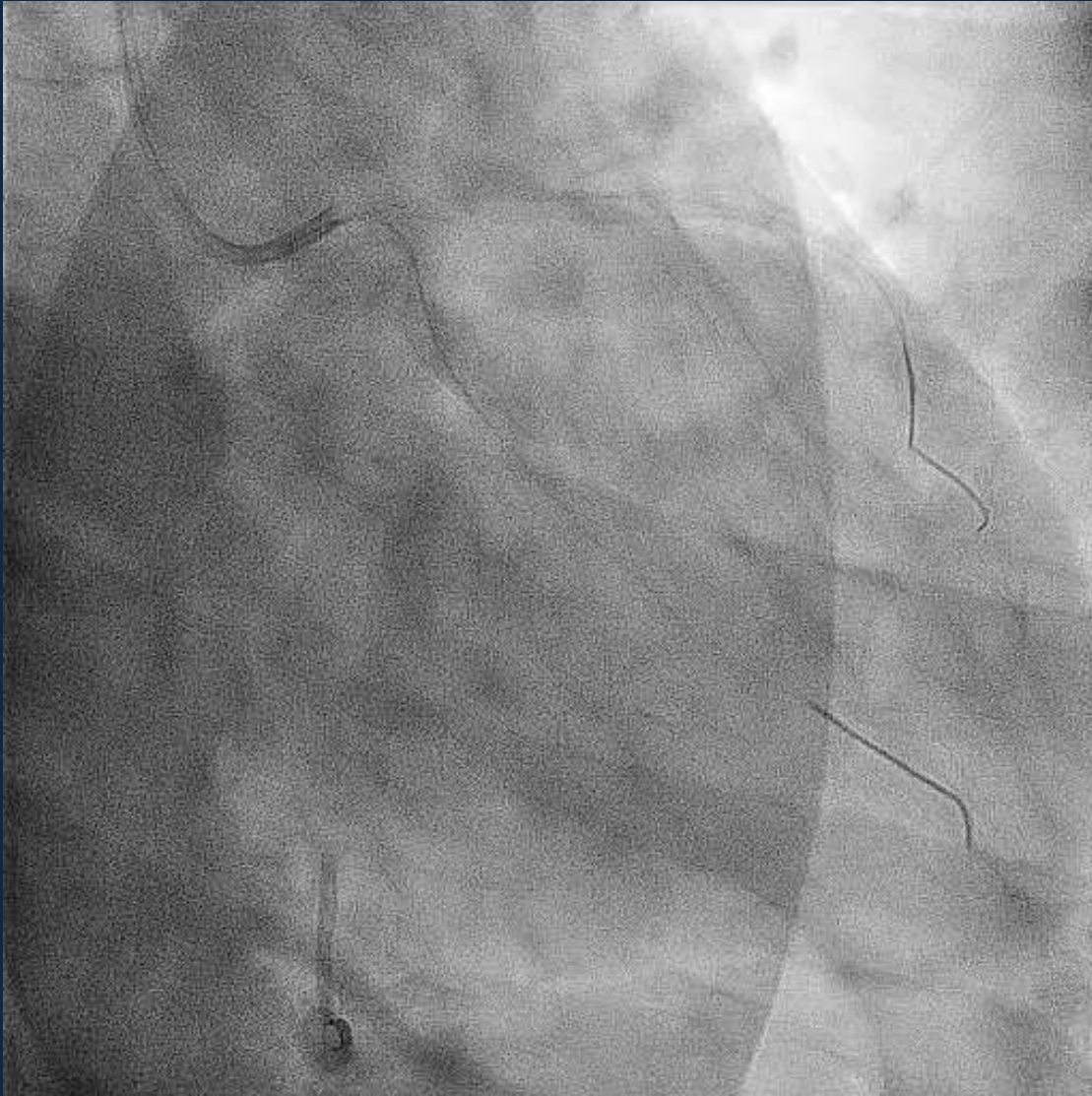
NC Balloon 3.0 x 20 mm, 10 ATM



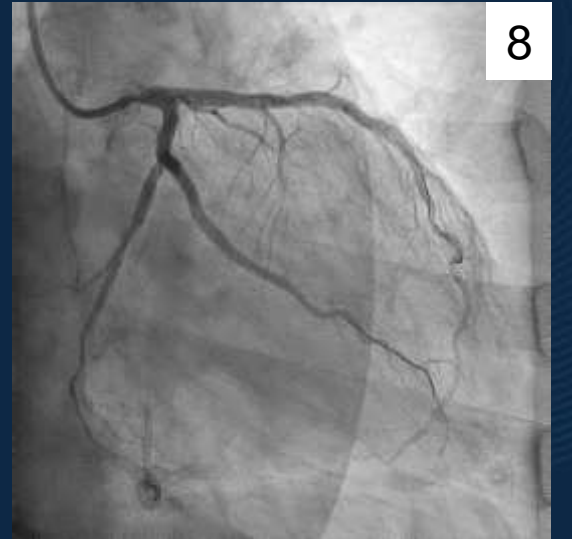
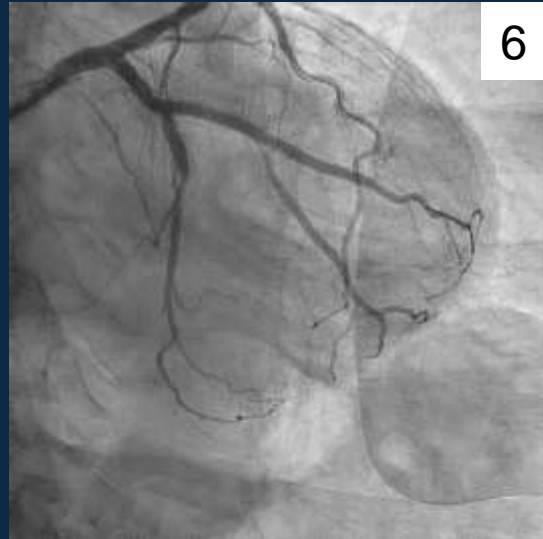
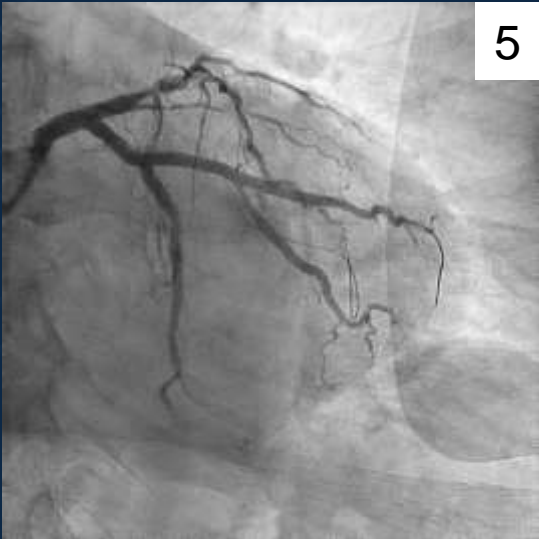
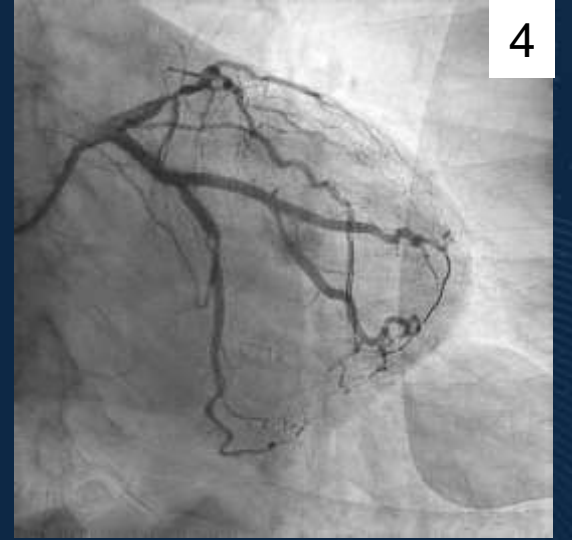
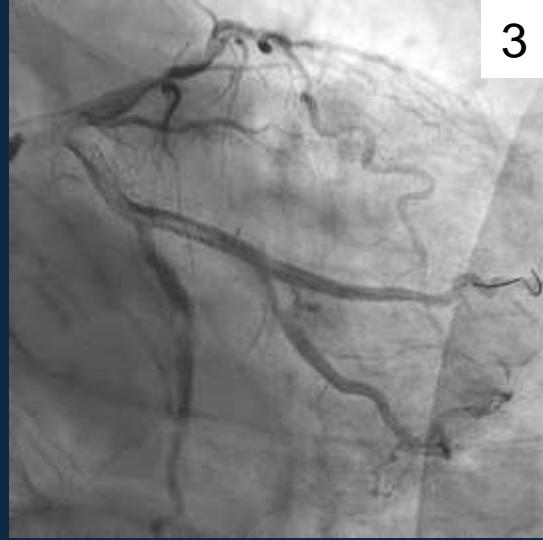
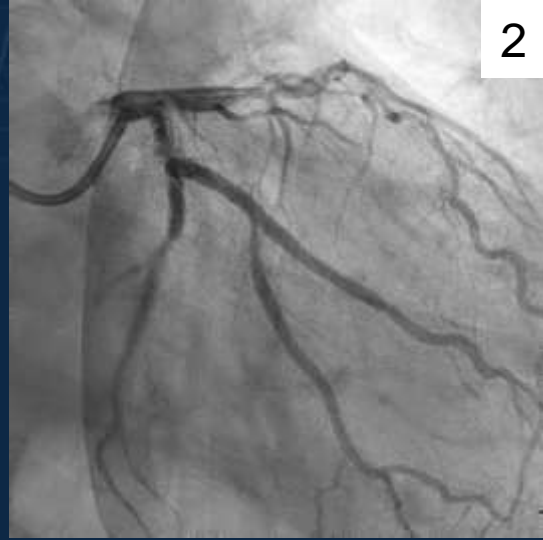
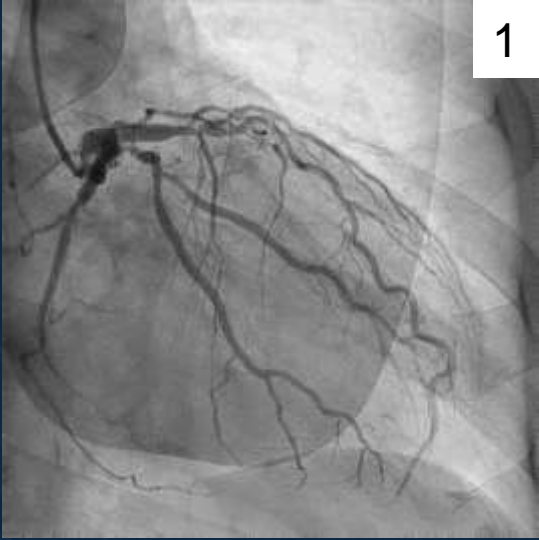


Final LAD





Total occlusion



Stent or Balloon or Wire

Stent



Culotte

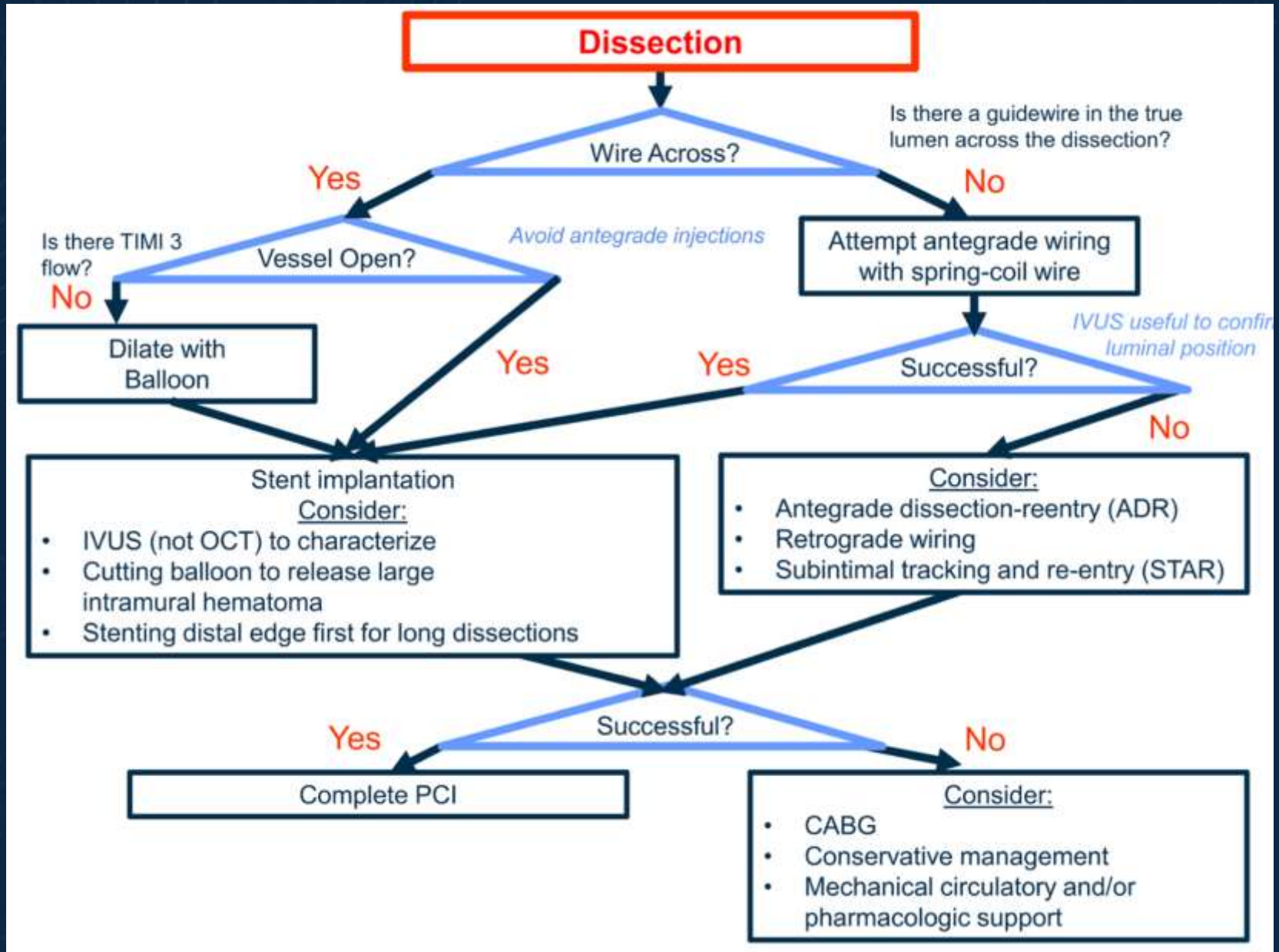
T stent

Balloon

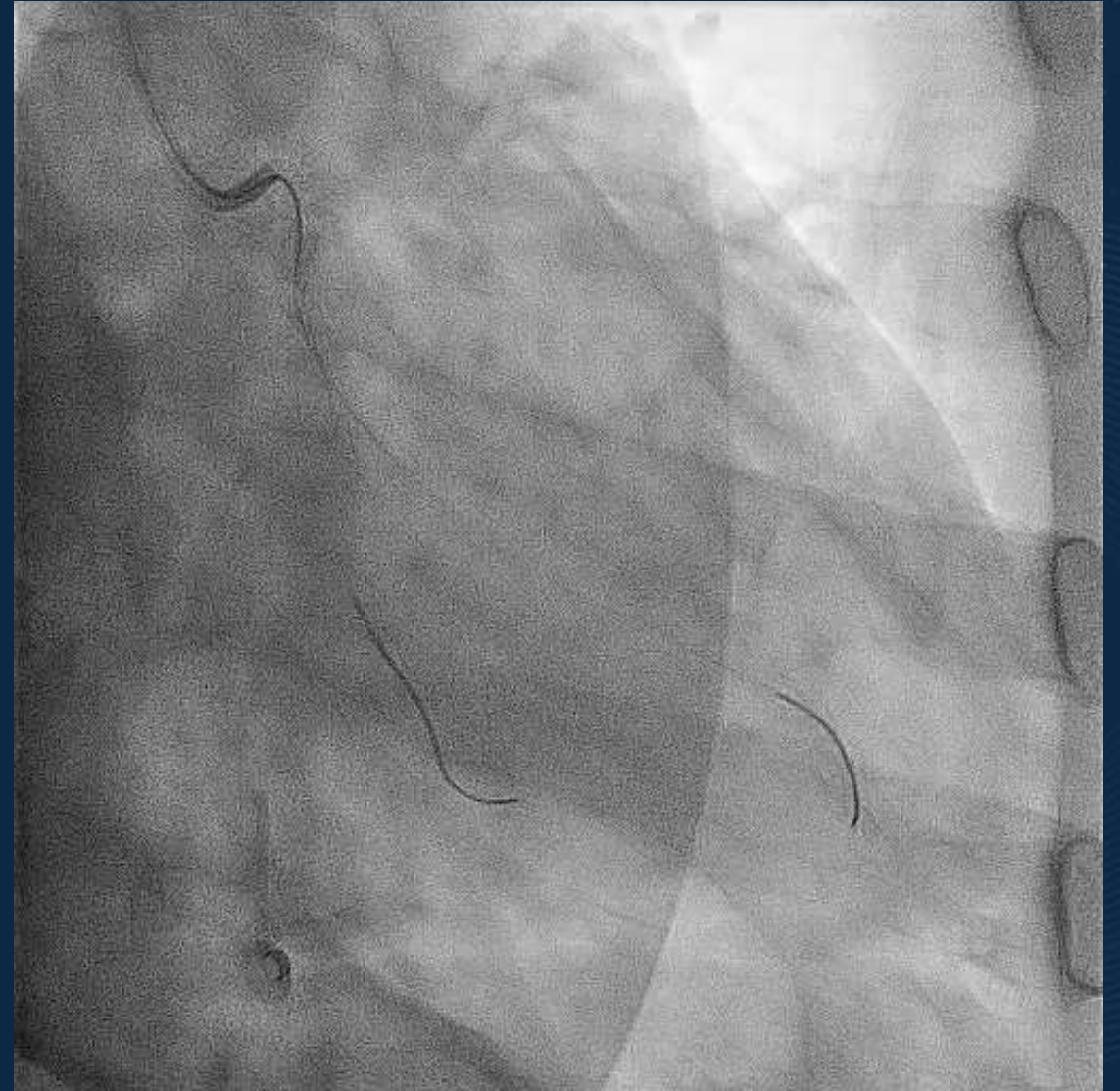
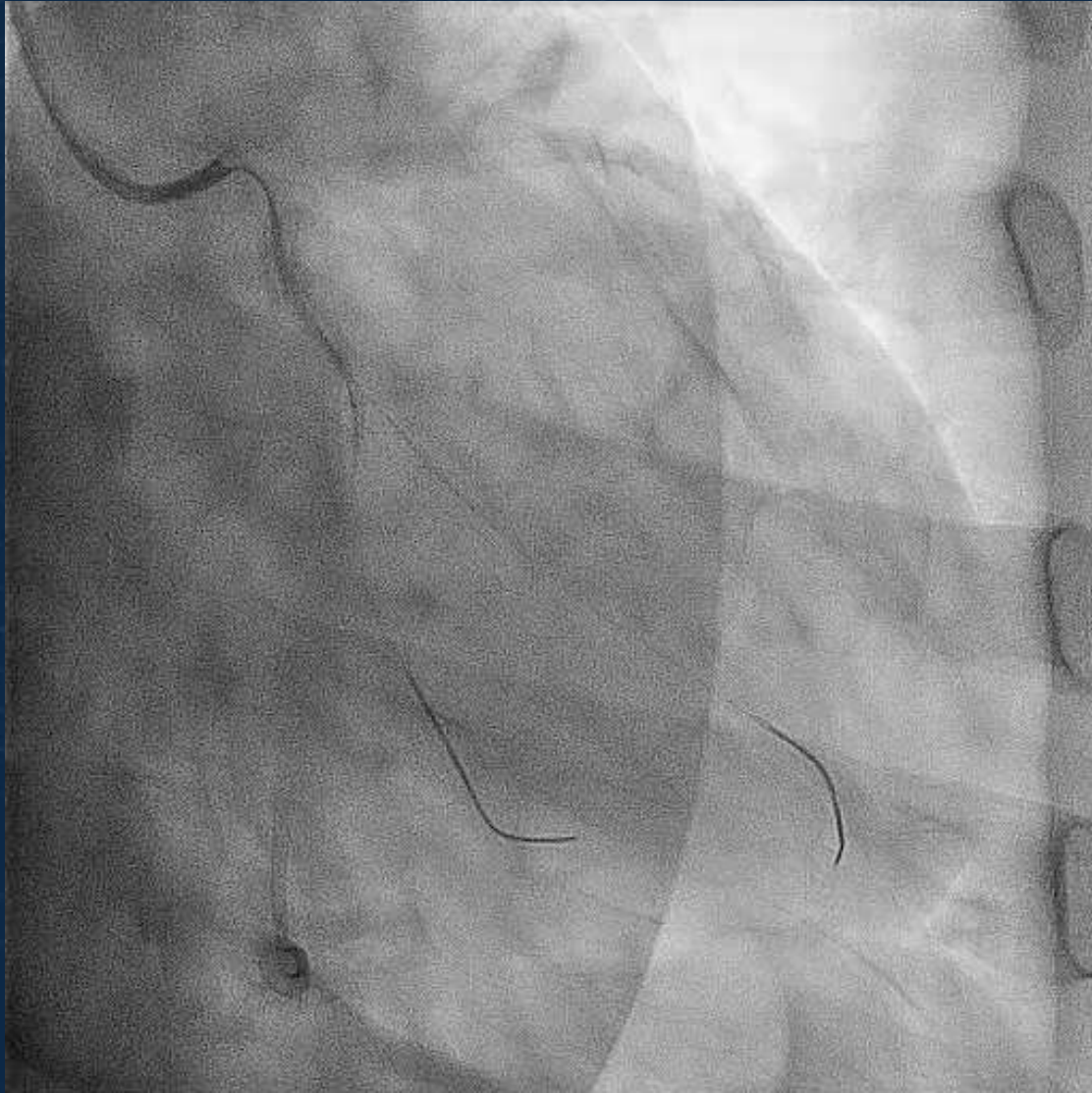


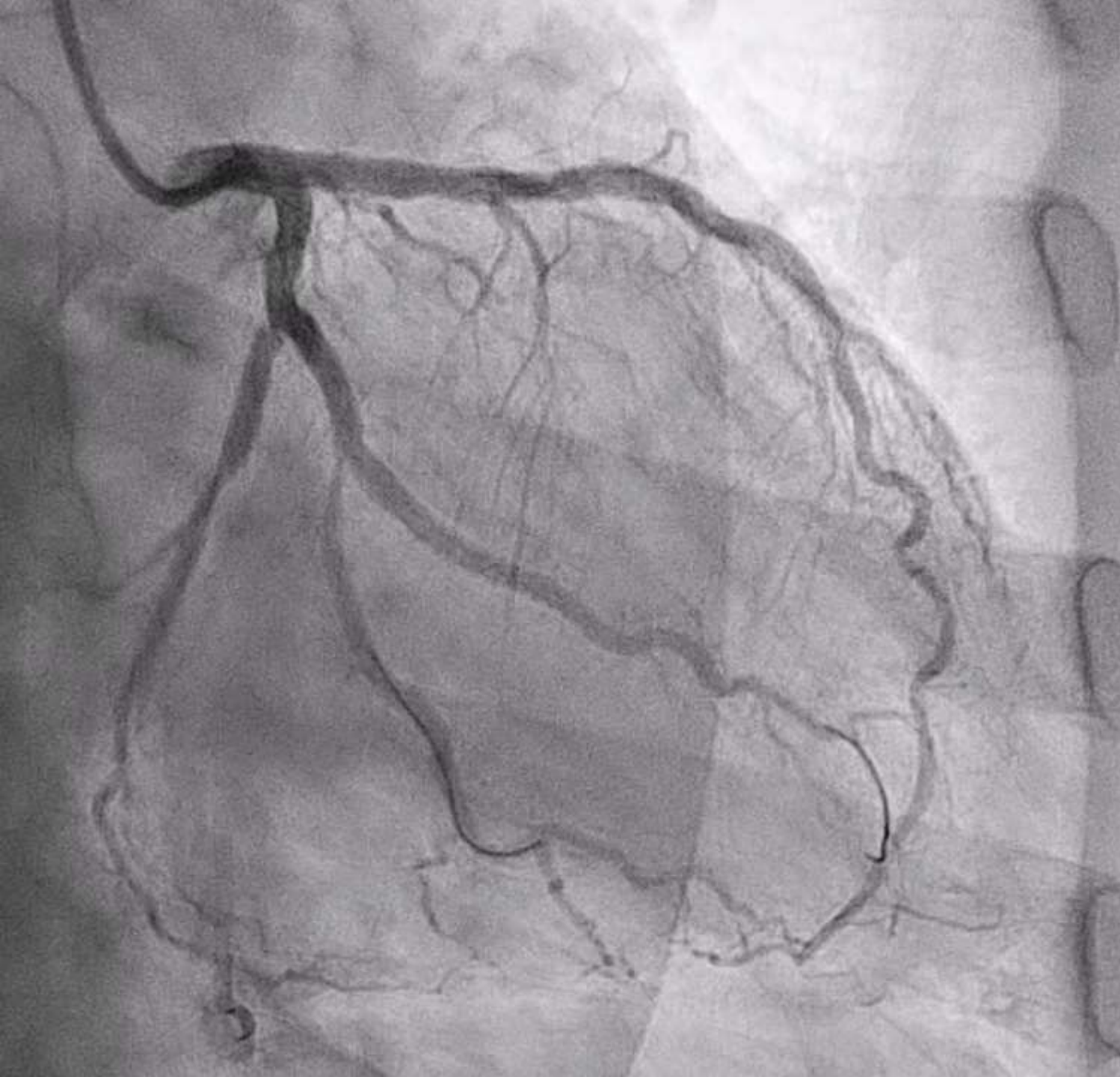
Kissing

Non-kissing



Balloon 1.5 x 1.5

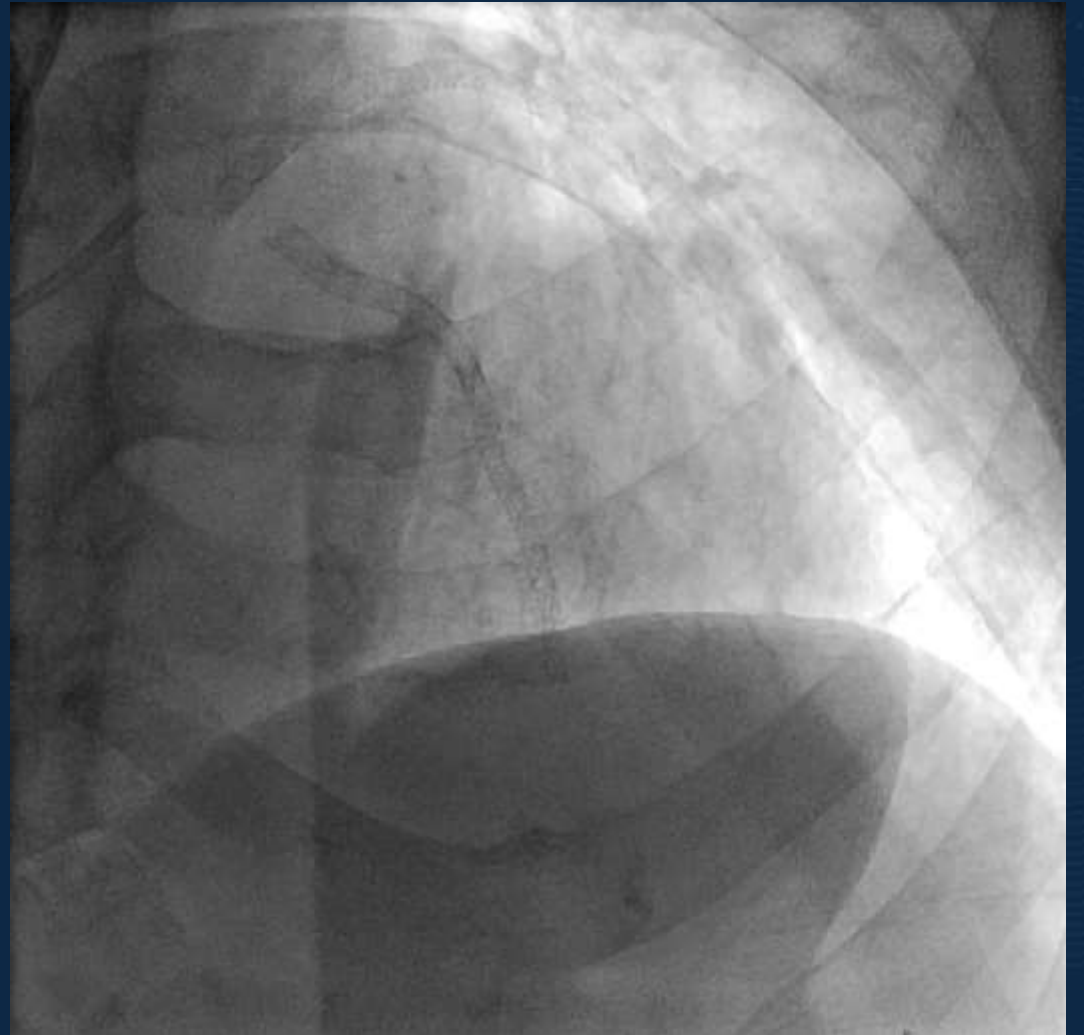
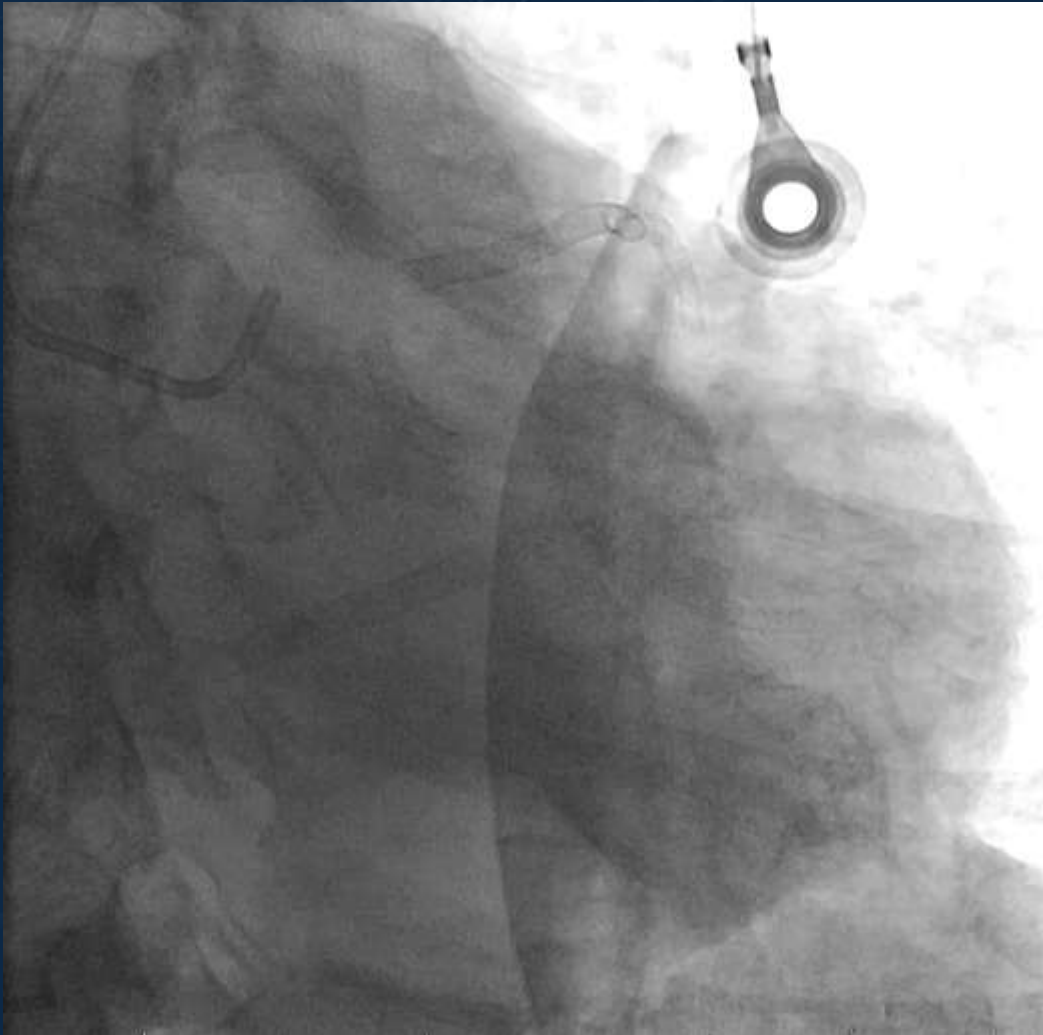


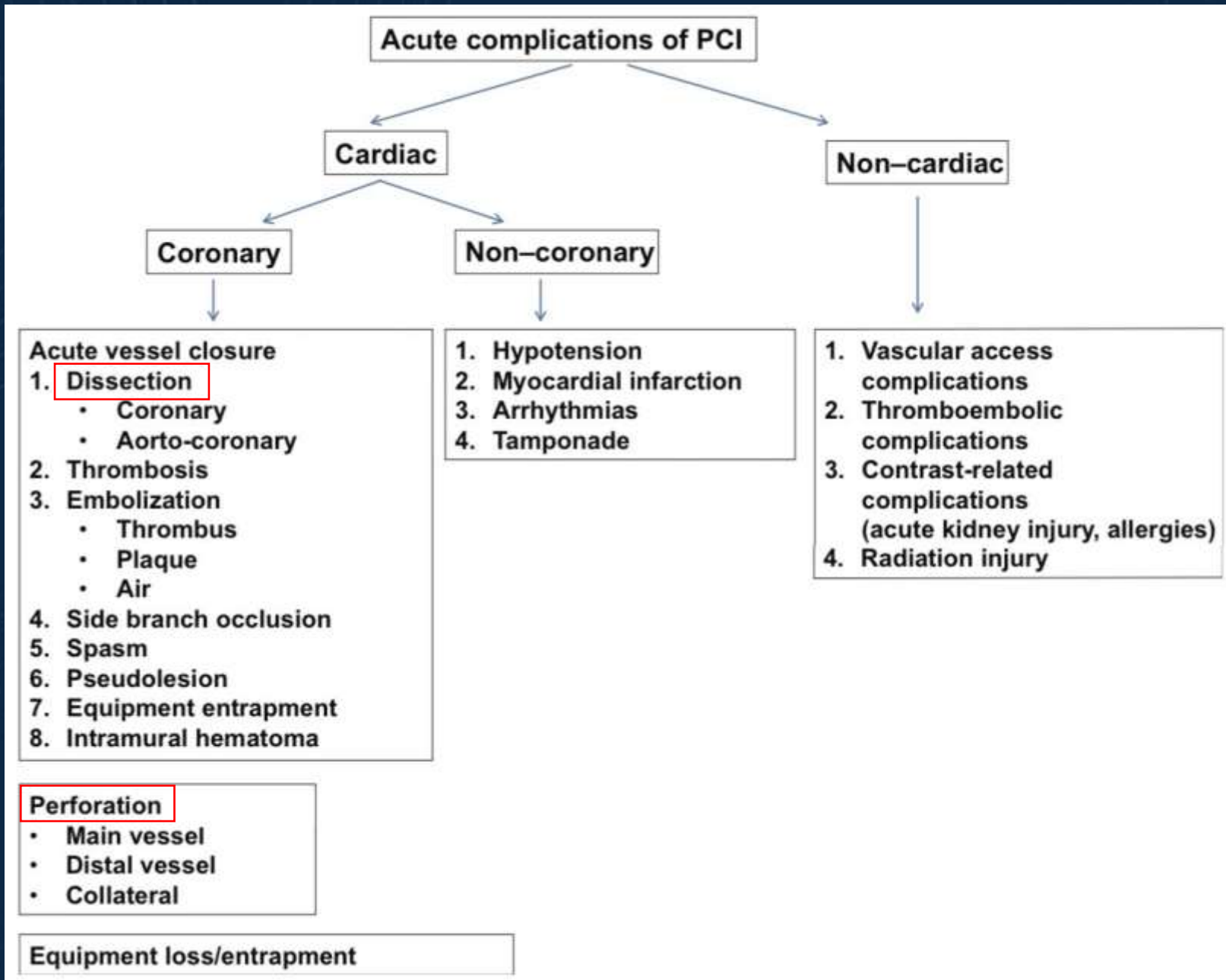


Removal of all the equipment

Protamine 30mg for partial reversal of heparin anticoagulation

3 Weeks Later





Discussion Points

- The decision to **complete versus immediately terminate** a planned PCI procedure
- Methods of management of perforation and dissection
- Timing and dosing of administration of protamine

Conclusions

- **When we run into trouble**
 - Early identification
 - Serial echocardiography
 - Hemodynamic monitoring
- **The decision must be based on the relative risks of each option to the patient**
 - Distal perforation can be managed with prolonged balloon occlusion
 - Simple balloon dilatation without bail-out stenting may be effective for type C dissection
 - Prepare the knowledge of effective techniques