

Complications in CTO procedure

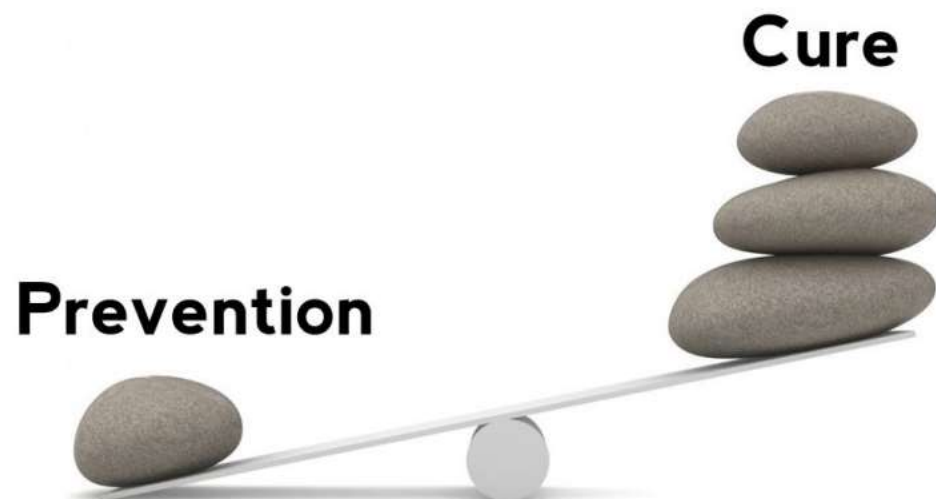
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An Ounce of Prevention is Worth a Pound of Cure



Hope is not a substitute for preparation

Trouble often happens lack of recognition in case planning

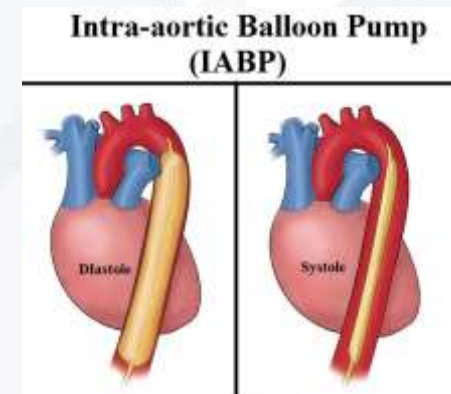
When Bad Things Happen

- Preparation is critical because complications are rare
 - my algorithm for “xx” complication is
 - trouble shooting resource
 - phone a friend

- Assemble resources – Help



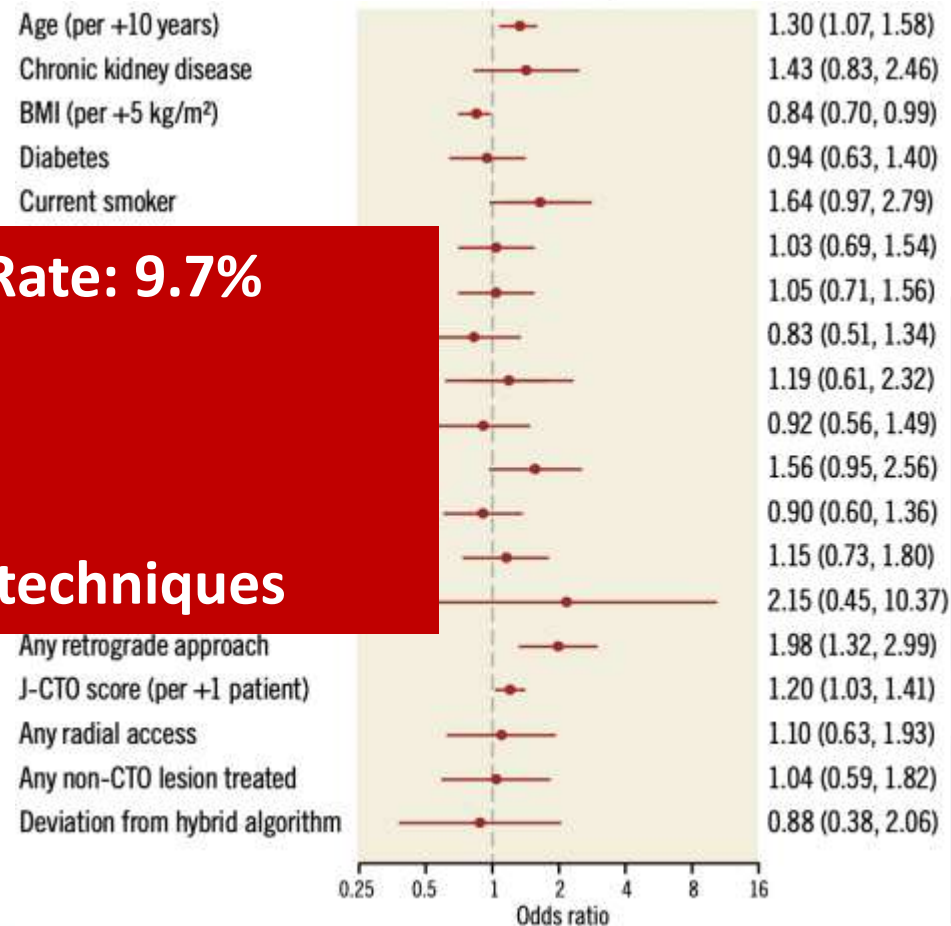
- ***Take a deep breath – remain calm***



What do we know?

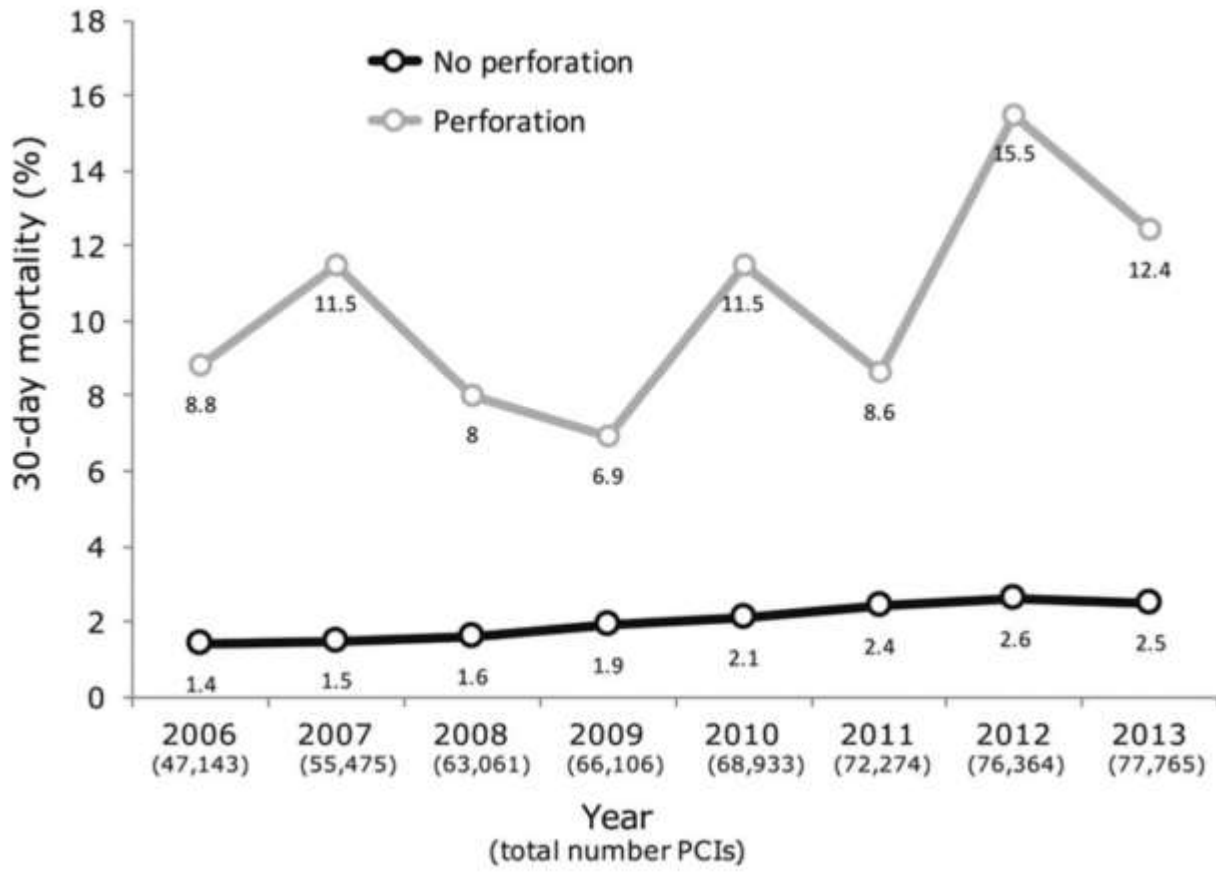
Complication	n=1,000
Any complication	97 (9.7%)
All-cause death	9 (0.9%)
Post-PCI myocardial infarction	26 (2.6%)
Need for emergency surgery	
Stroke	
Major bleeding	
Contrast-induced nephropathy	
Cardiogenic shock	
Donor vessel thrombosis	
Arrhythmia requiring treatment	
Coronary perforation (core lab)	88 (8.8%)
Ellis grade I	11 (12.5%)
Ellis grade II	44 (50%)
Ellis grade III	28 (31.8%)
Ellis grade III (cavity spilling)	5 (5.7%)

- Overall Complication Rate: 9.7%
- Predictors include:
 - Advanced age
 - J-CTO Score
 - Use of retrograde techniques

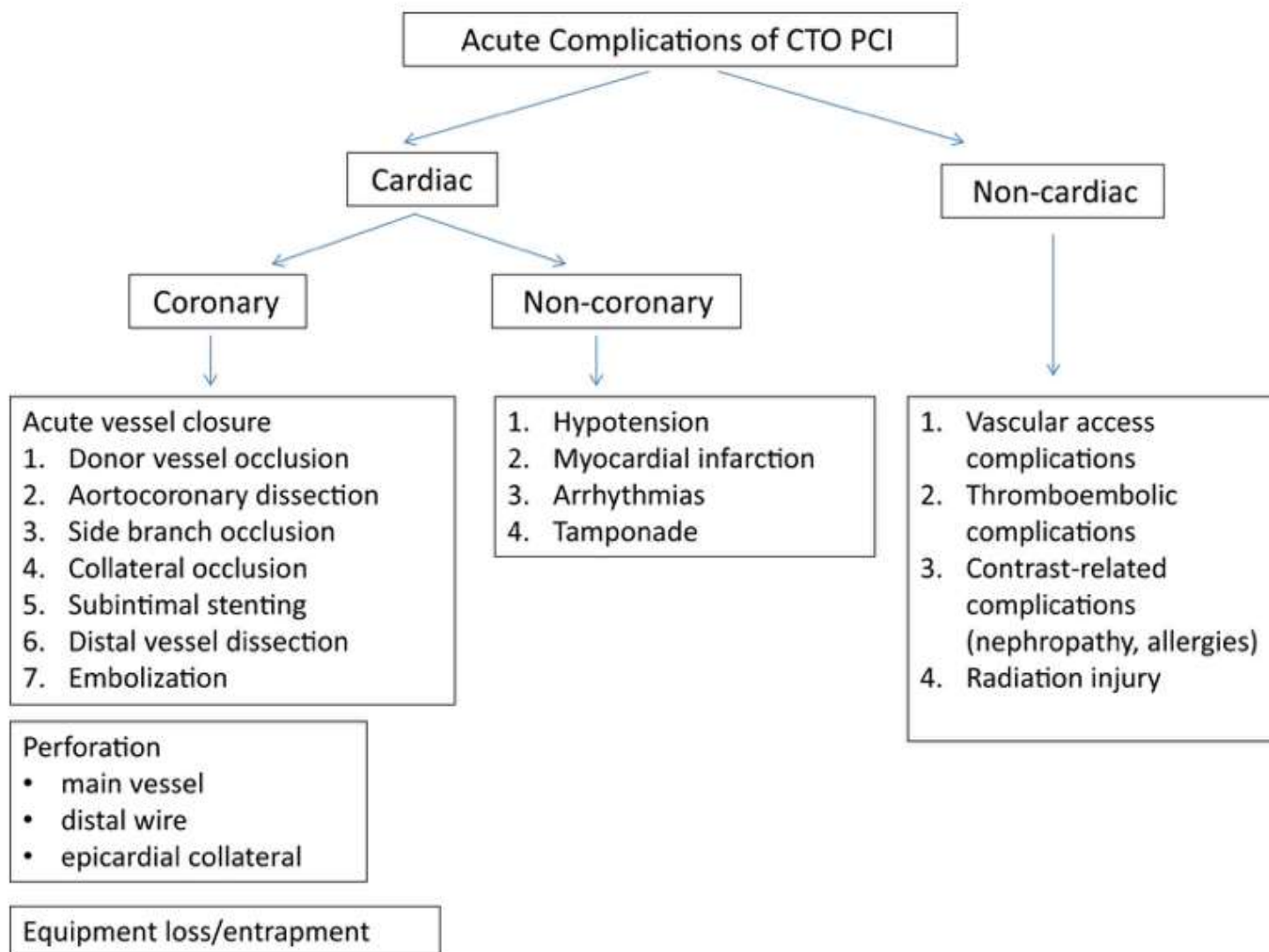


What do we know?

Months	All-cause mortality		p-value
	Complication	No complication	
0	4.1±2.0%	0.0±0.0%	<0.001
1	11.3±3.2%	0.2±0.2%	
6	11.3±3.2%	2.0±0.5%	
12	12.4±3.3%	3.1±0.6%	
Reported as percentages±standard error.			



What can go wrong?



Complications in CTO PCI

- P:** Predictability of the complication in the context of the case
- E:** Event prior to the complication
- T:** Treatment employed and outcome achieved
- A:** Advice for next time (lessons learned)



62 yo; MALE

CRF:

- HTN
- OMT
- DISLIPIDEMIA



CCS 2-3 angina

TTE:

- LVEF: 65%
- Mild anterior hypokinesia
- No valves disease

SPECT:

- Anterior ischemia 18%

Proximal Cap: ambiguity

Lenth: ~ 25 mm

Target vessel: Good landing zone

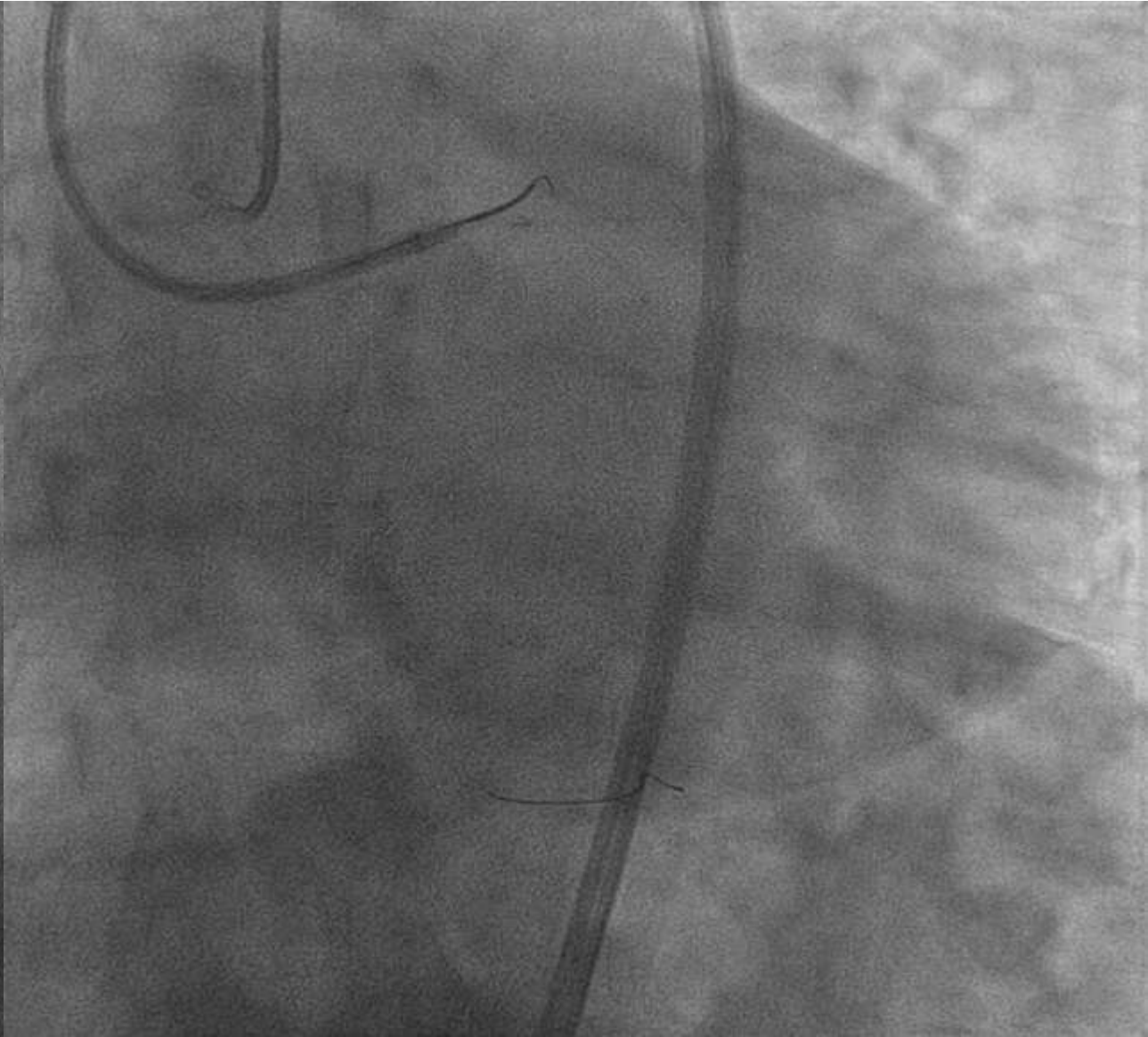
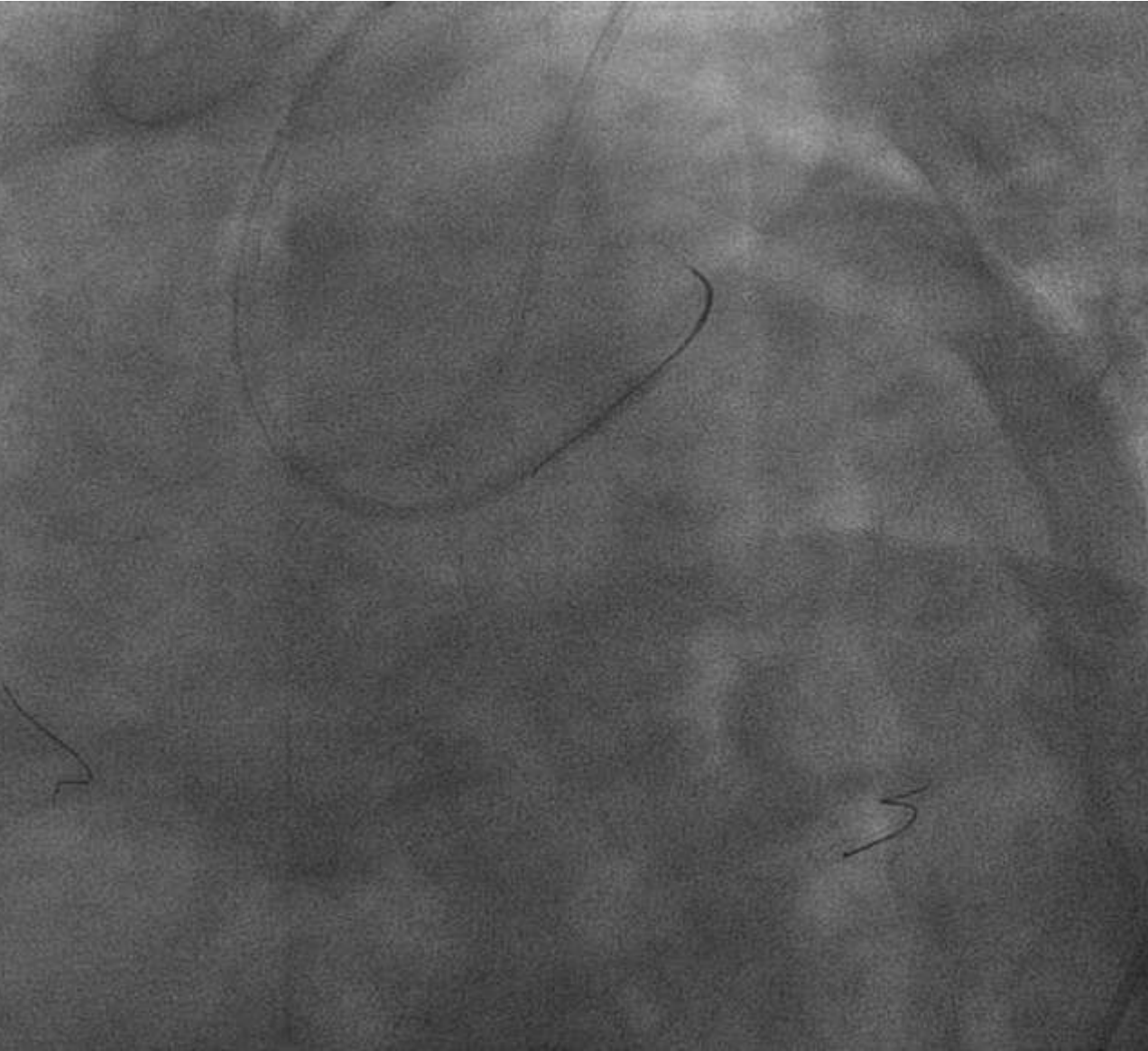
Collaterals: epic. Tort. poor

Plan:

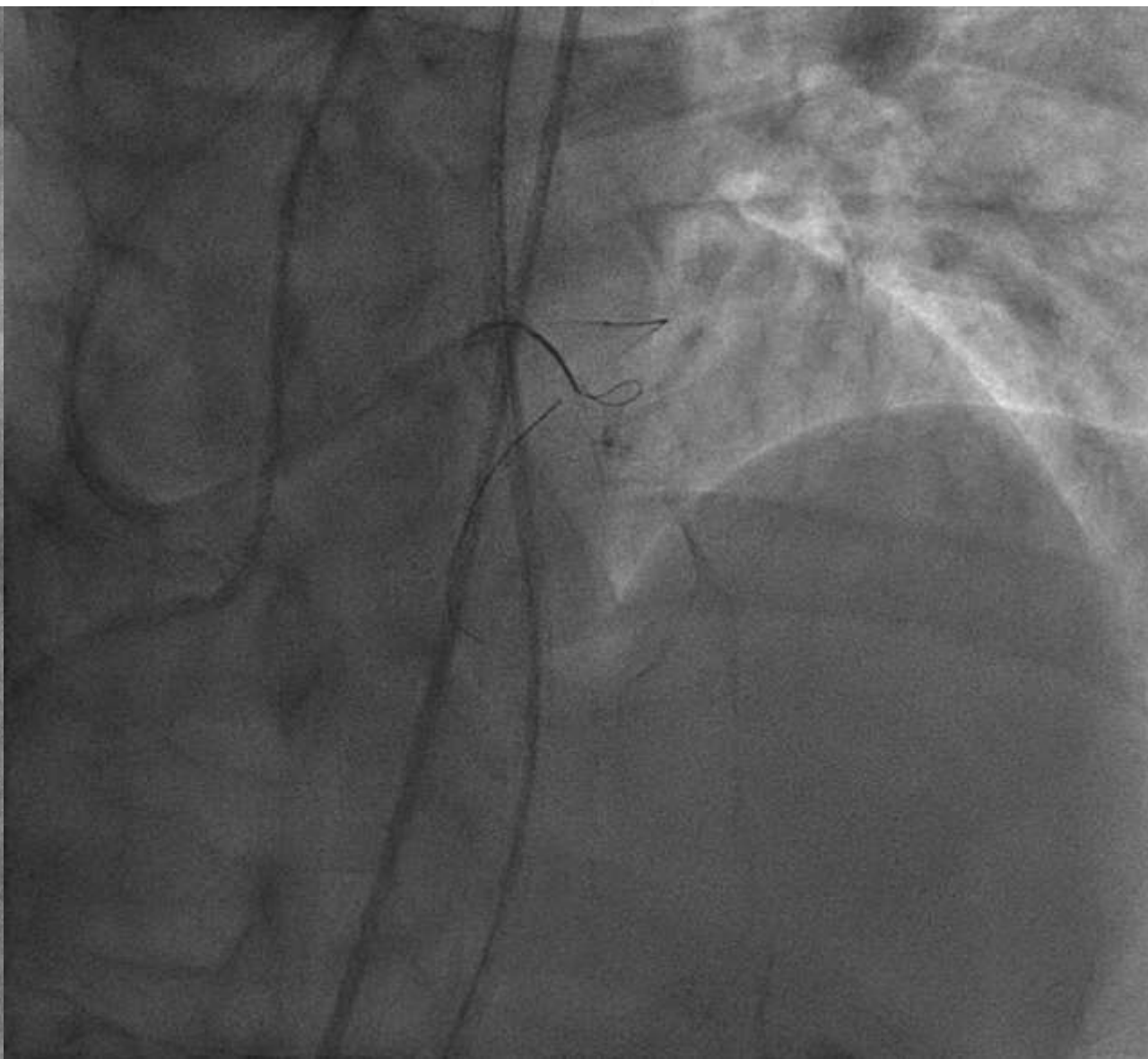
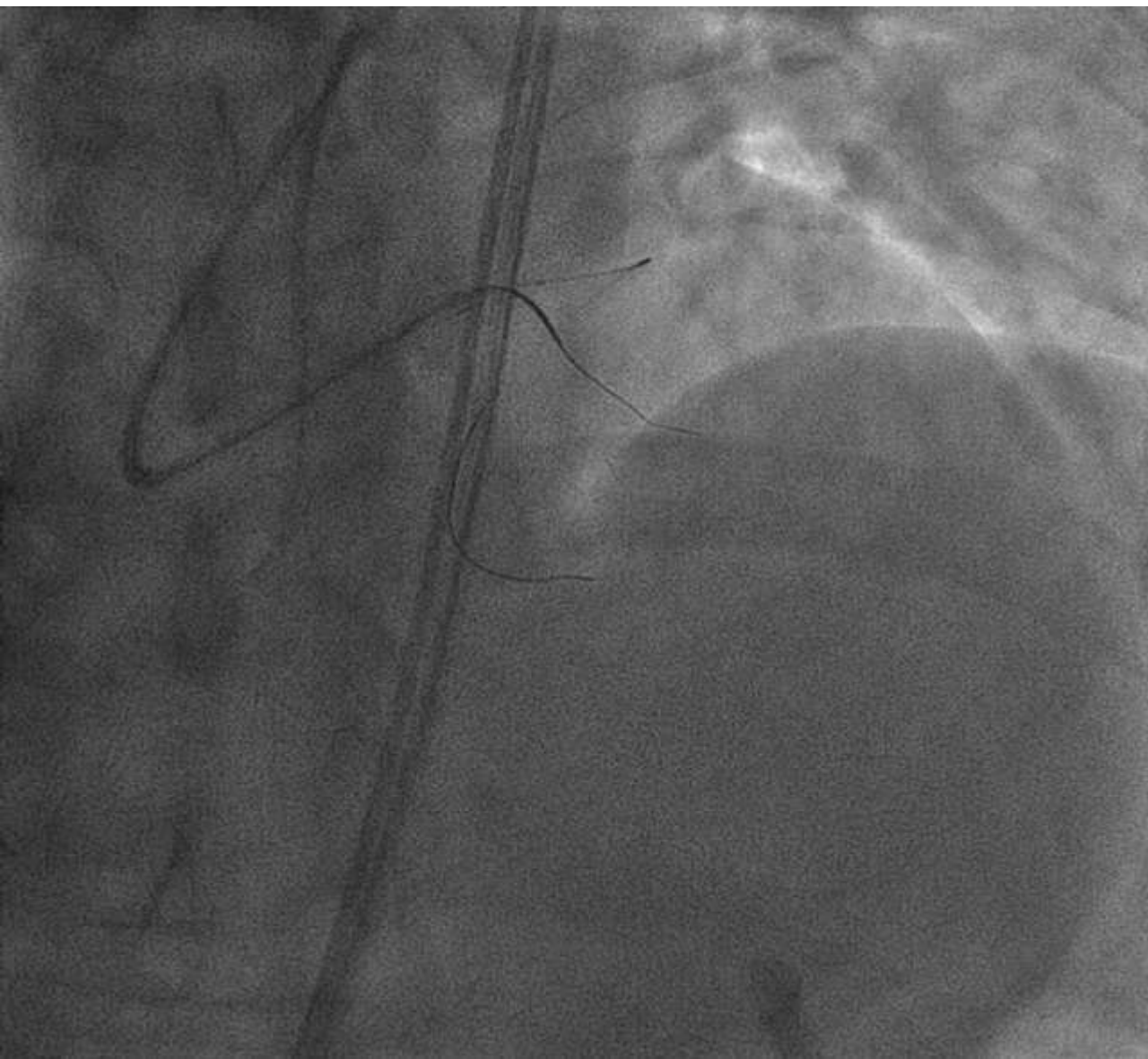
AW (IVUS GUIDED)
ADR



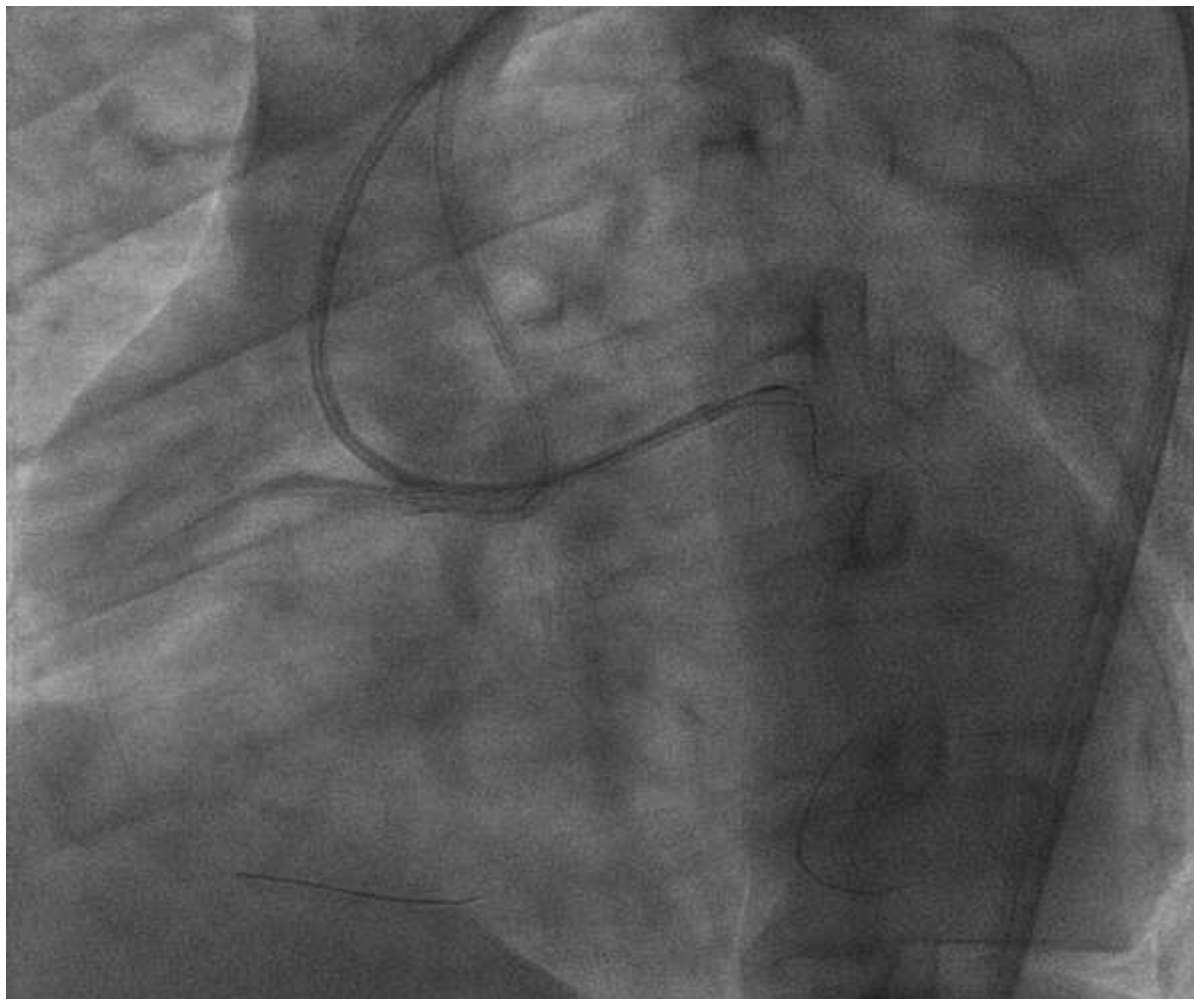
PUNCTURE GUIDED BY IVUS+TURNPIKE+CONFIANZA PRO 12

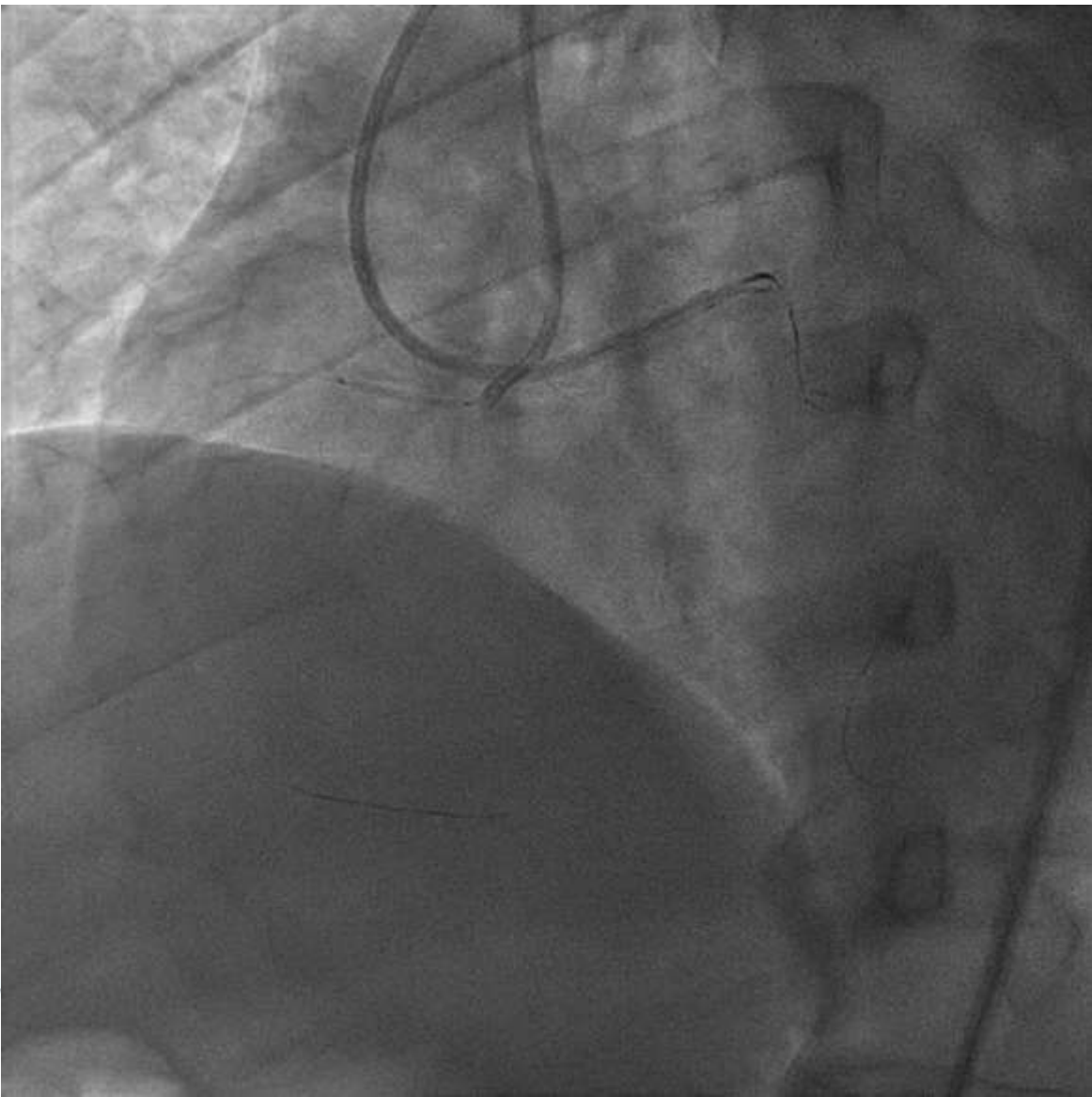


REDIRECT WITH KNUCKLE



“Patient complains chest pain”





CHEST PAIN

FIXING THE DONOR VESSEL NO DOMINANT RCA

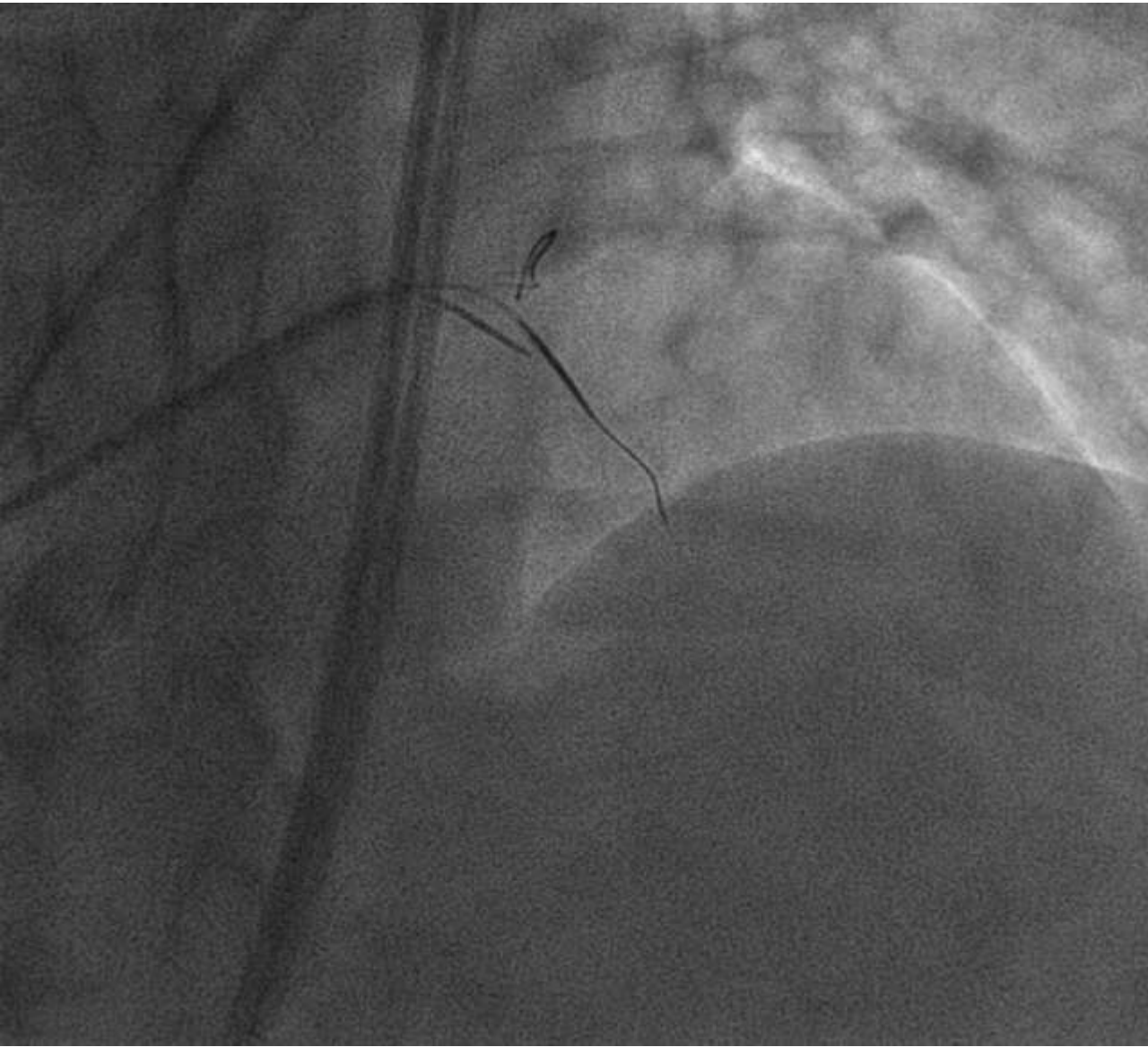
Donor vessel injury

Incidence: 2% during retrograde CTO PCI

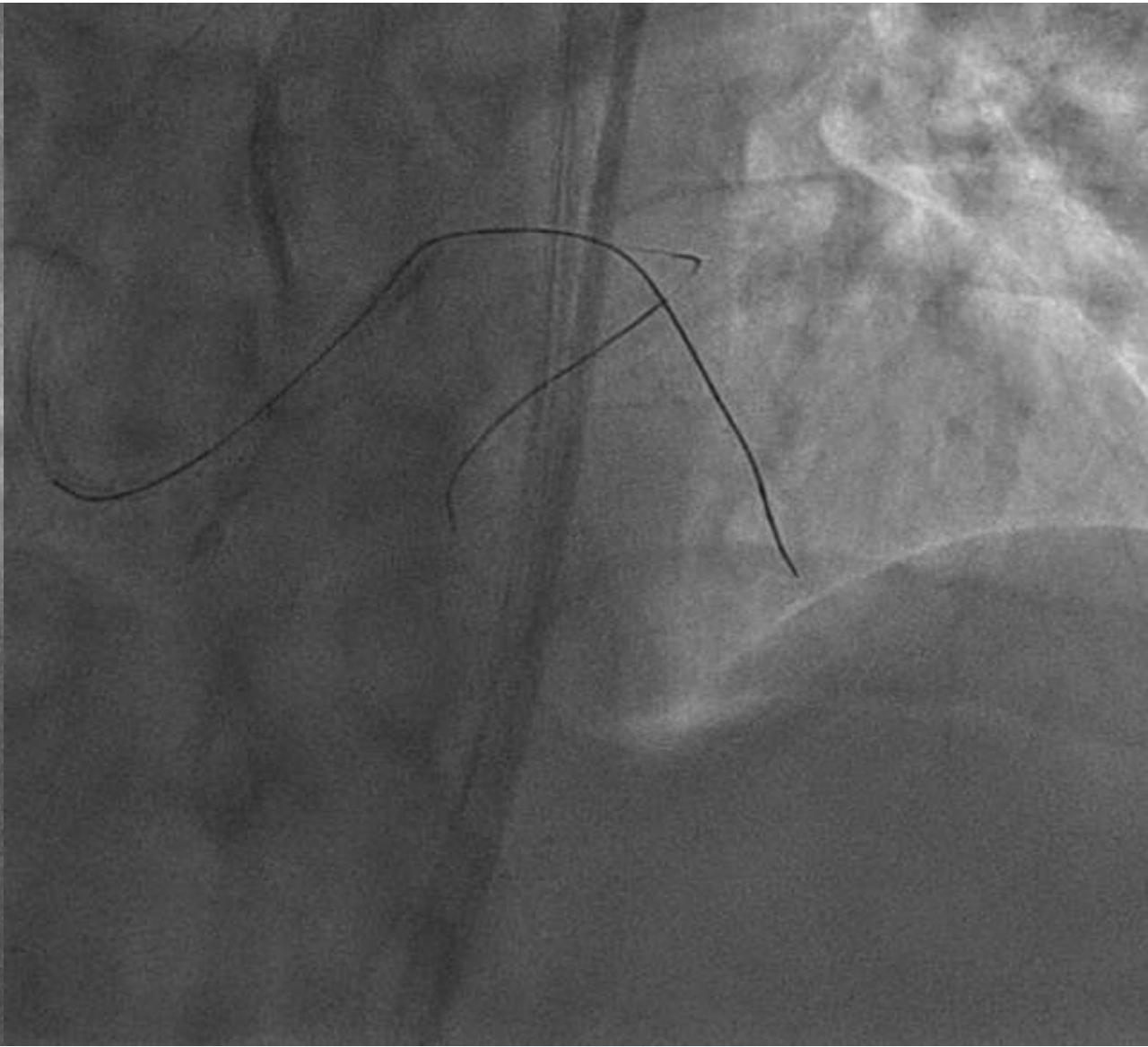
- Dissection, plaque disruption, thrombolysis, embolism
- Large territory at risk
- Extensive ischemia
- Haemodynamic compromise
- Immediate intervention required

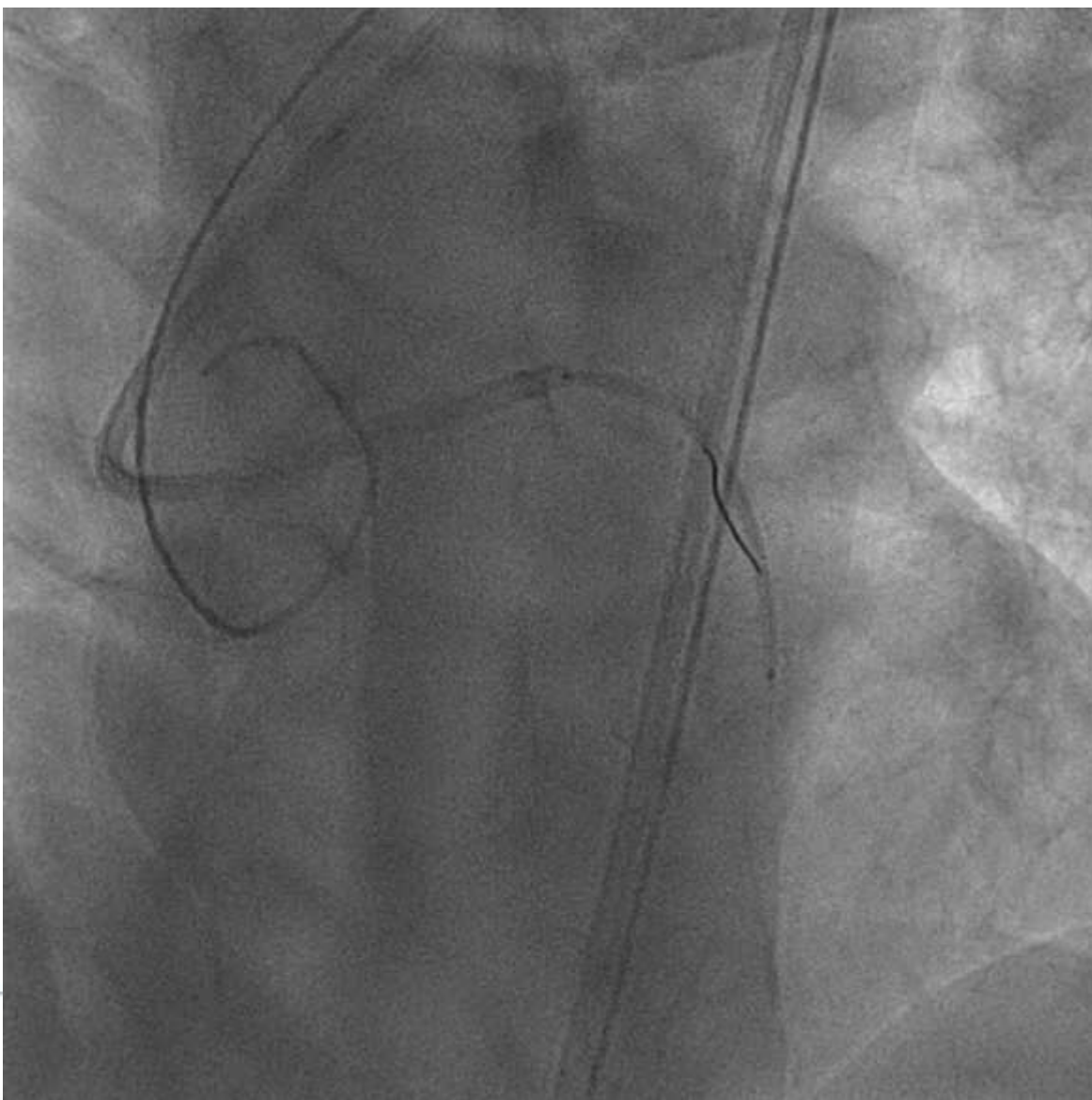
Act quickly!

PARALLEL MICRO CATHETER



MIRACLE 12 + STINGRAY

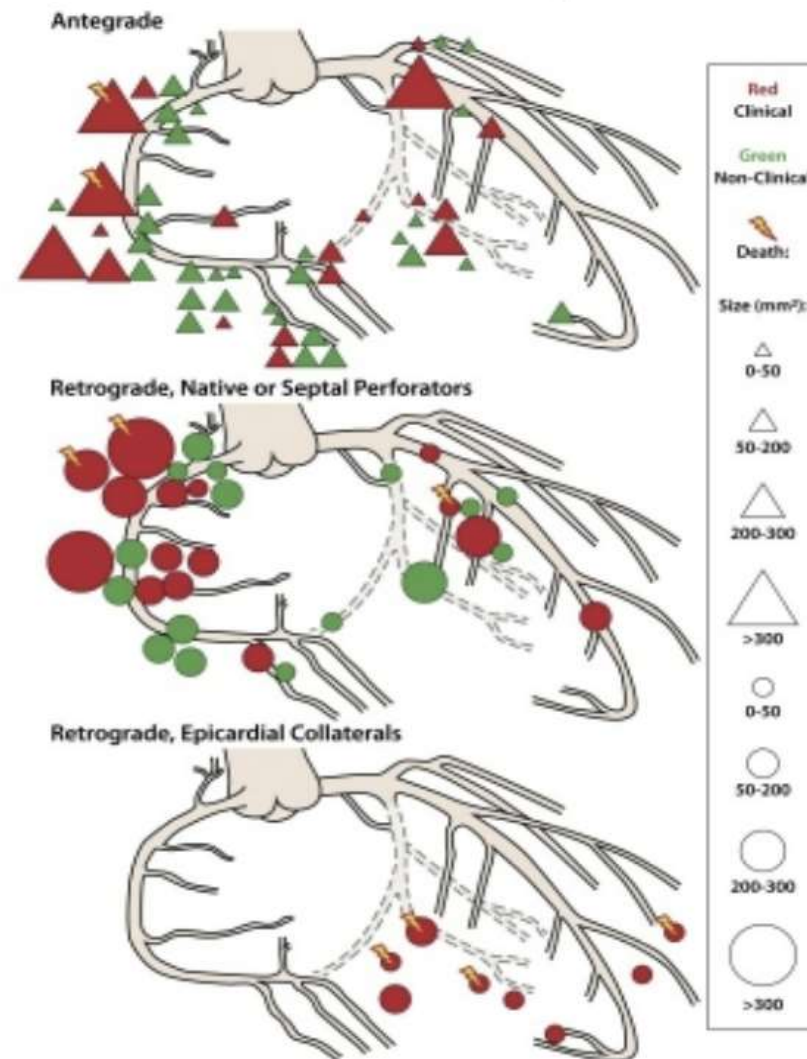
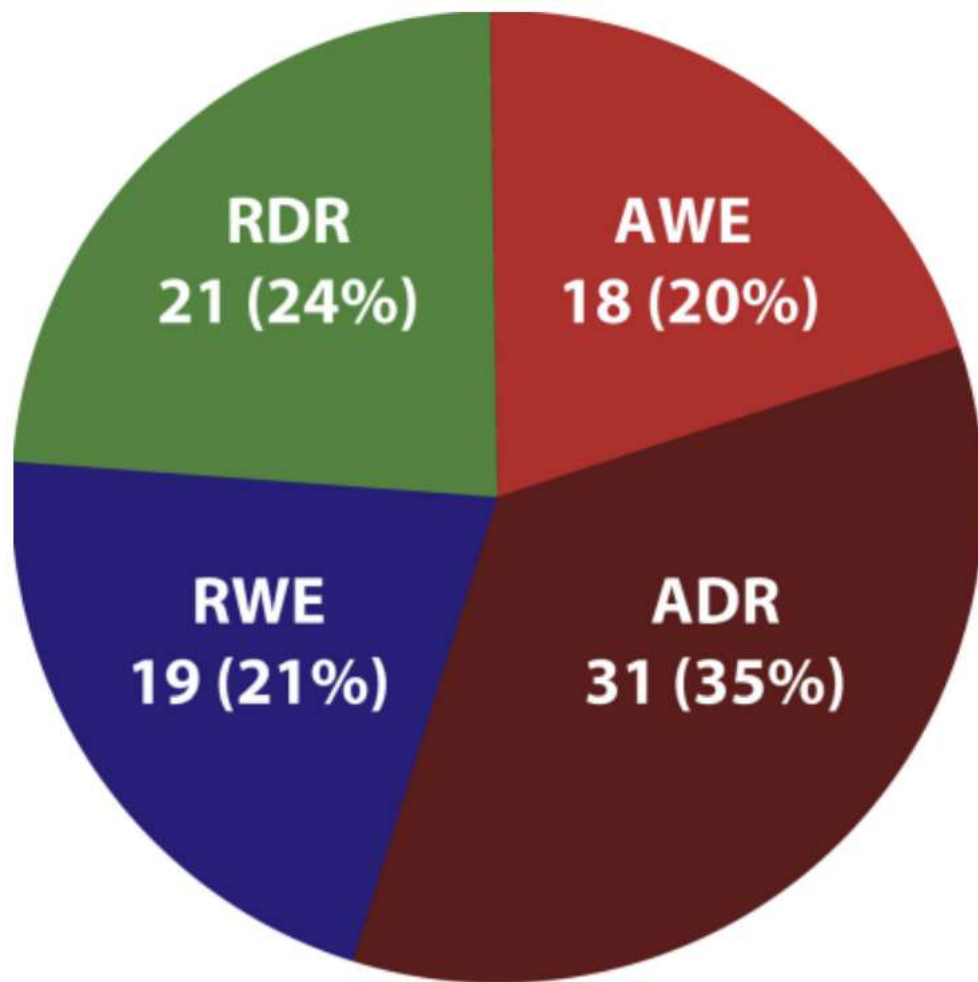




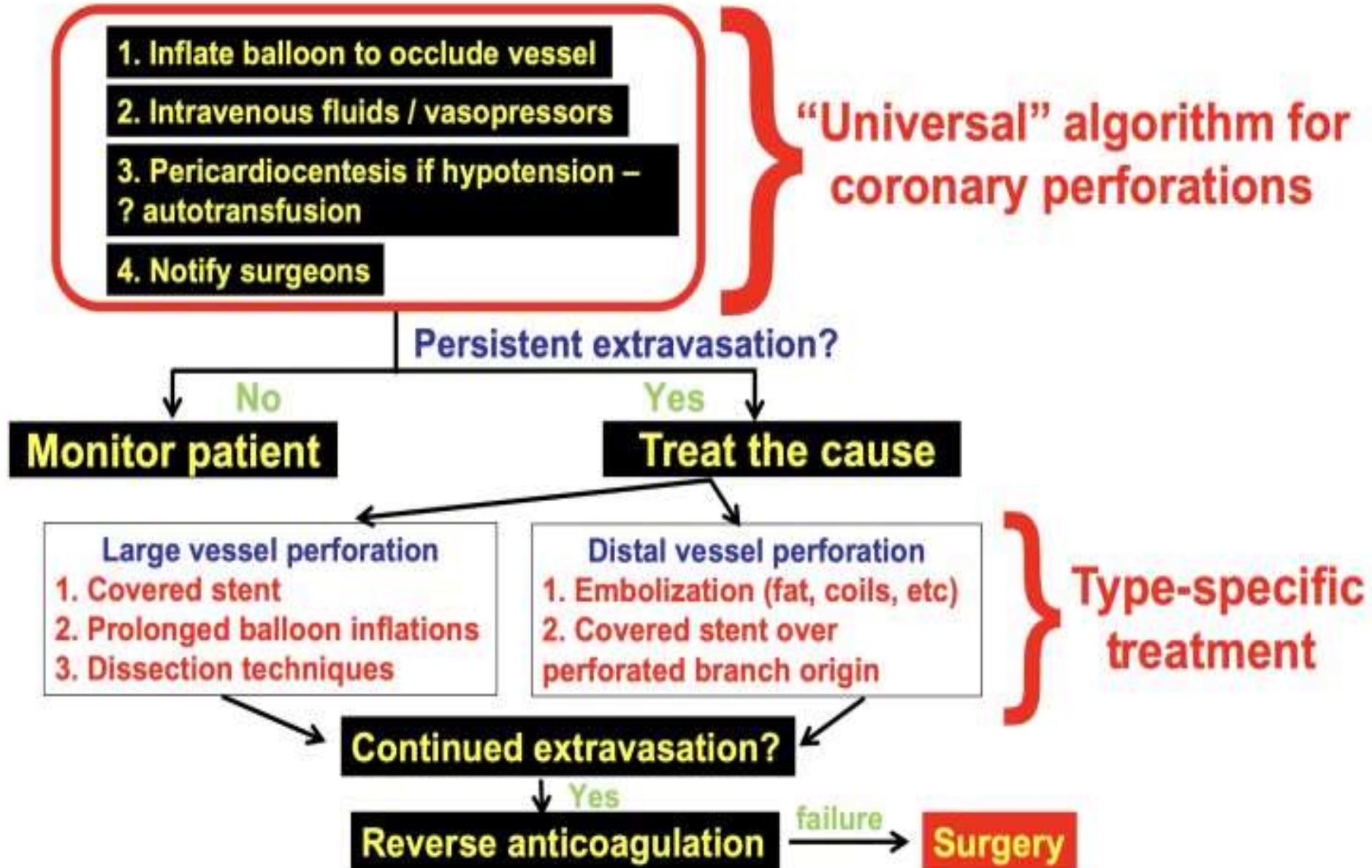
LM-LAD stenting

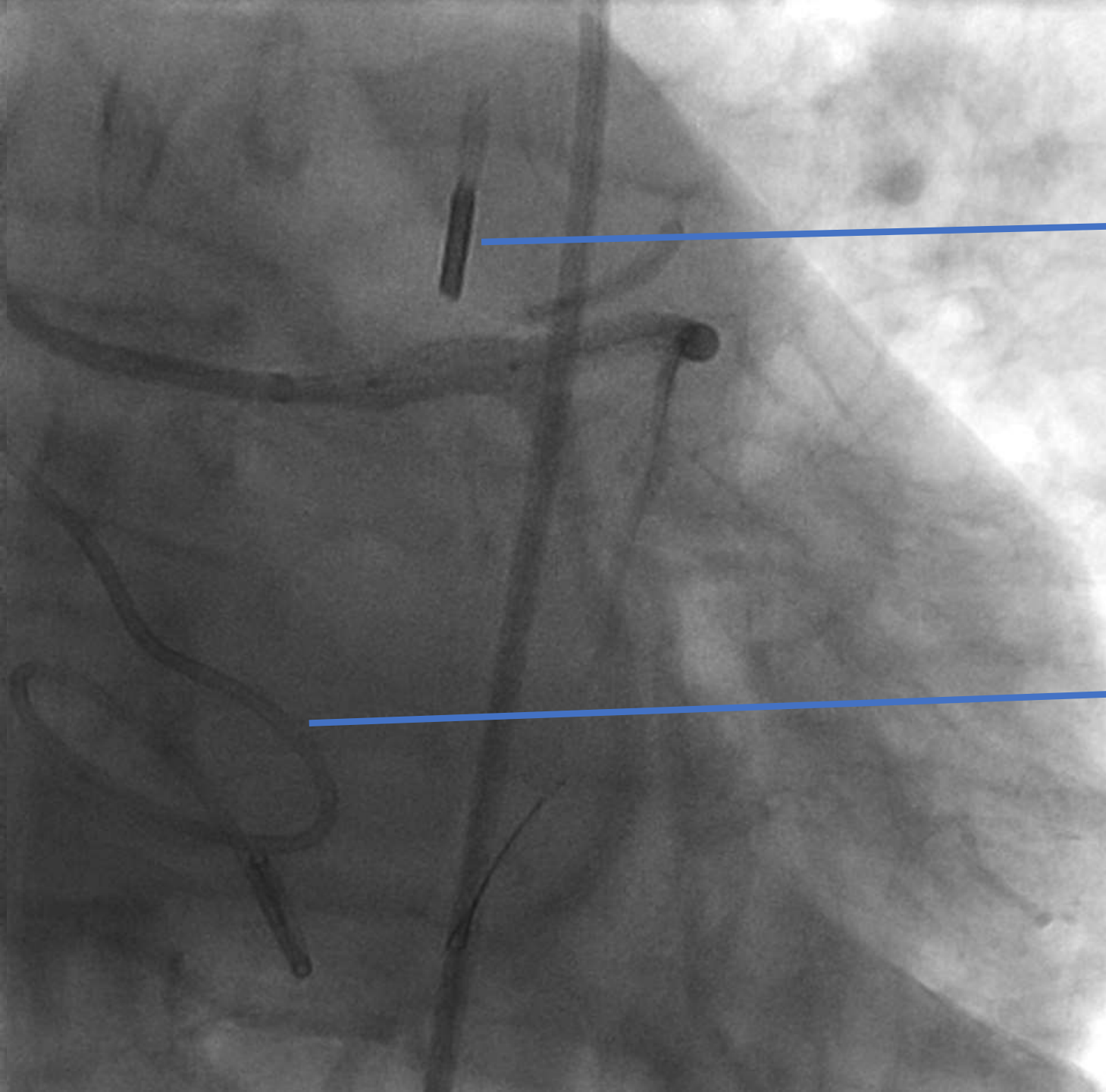
Suddenly...
Hypotension and SOB

Predictors of perforations in CTO PCI



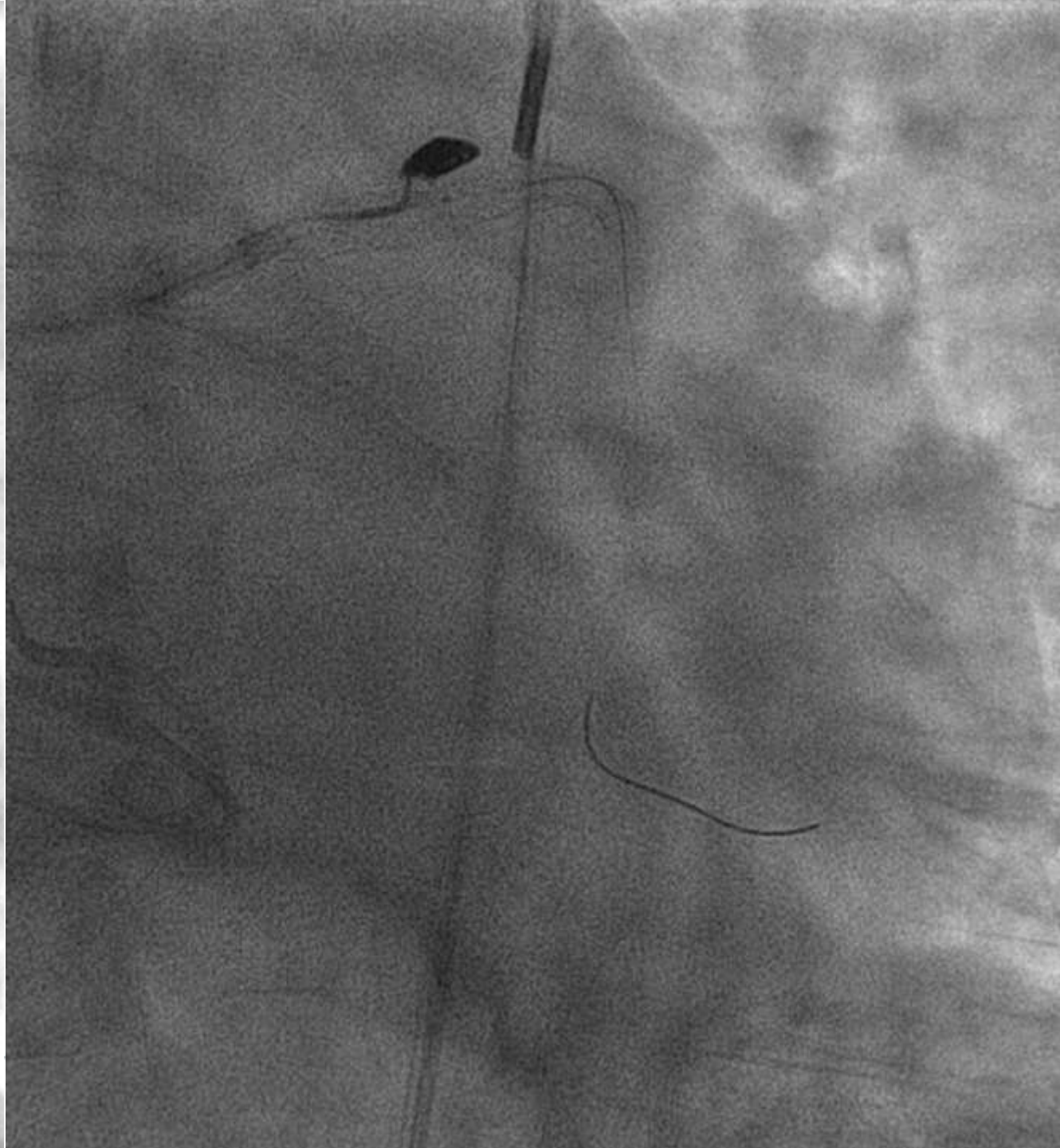
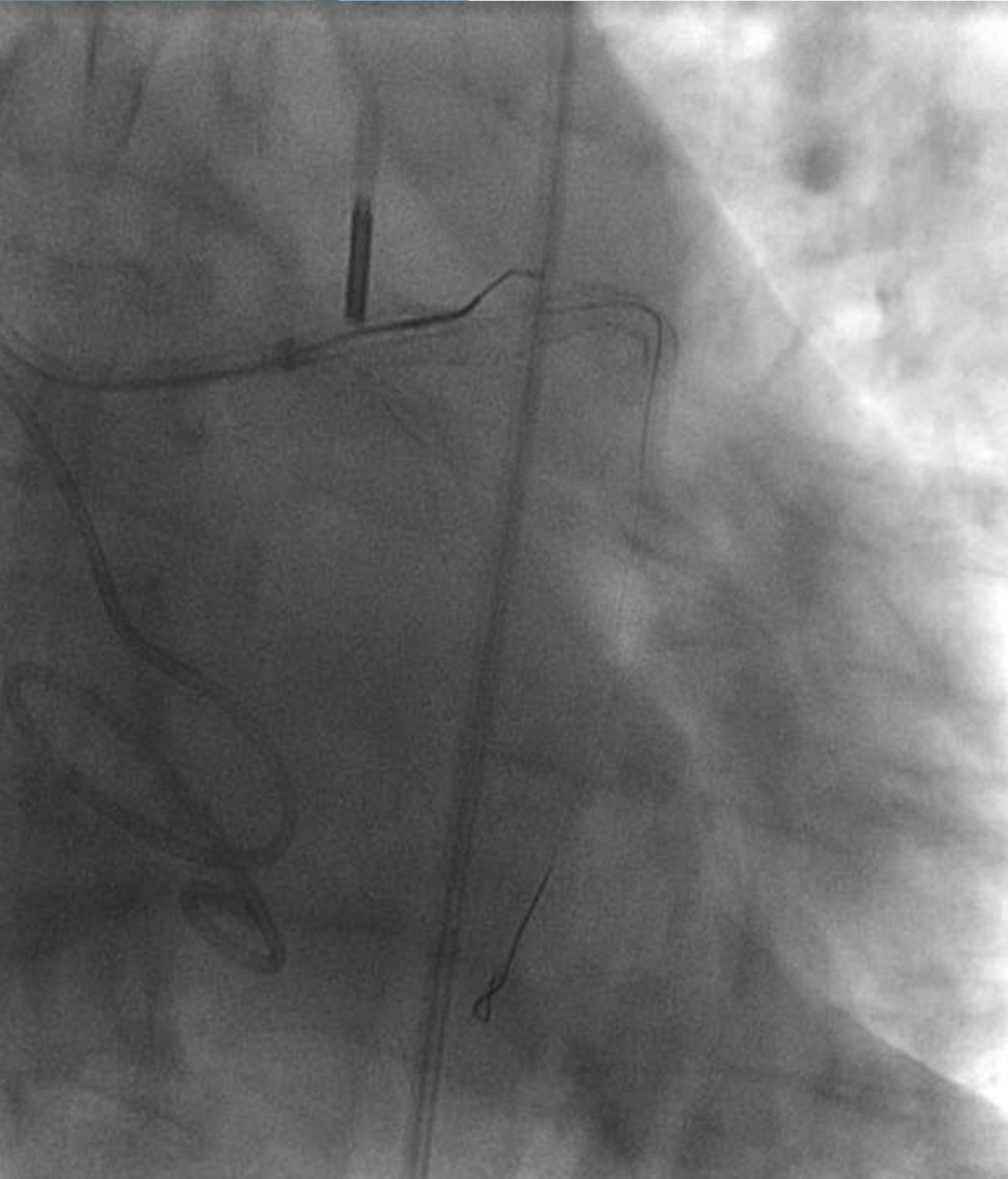
Perforation Algorithm



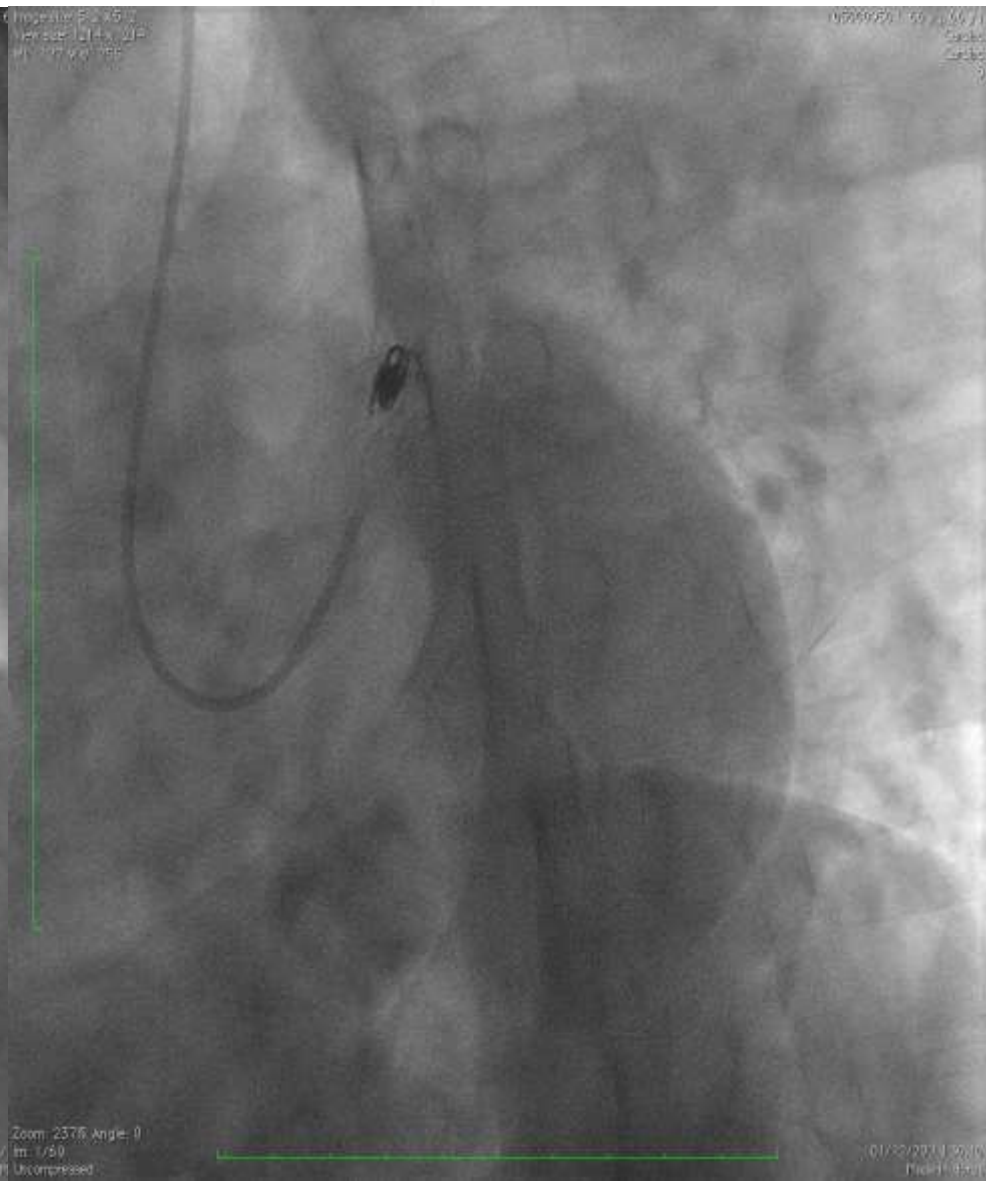
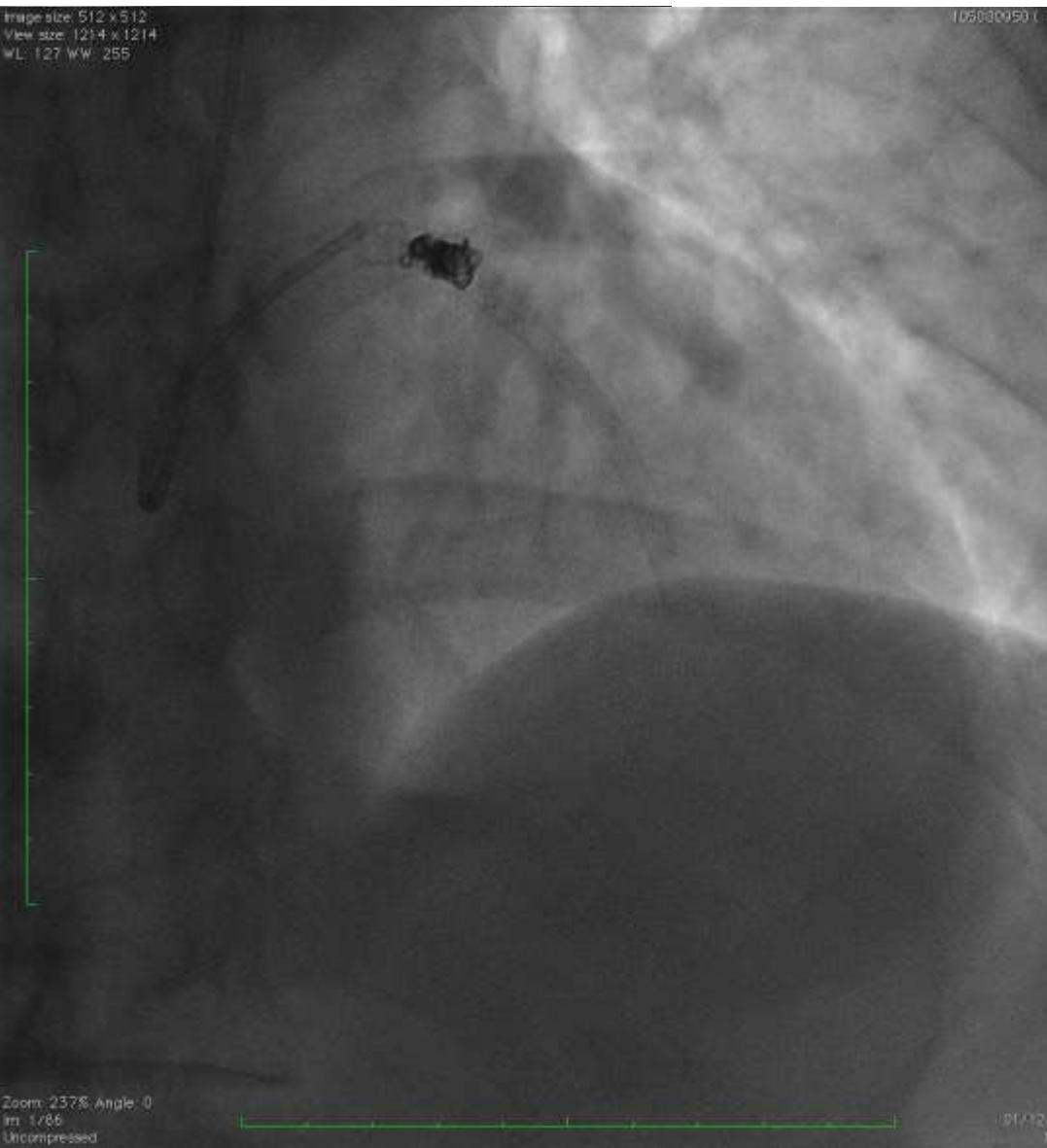
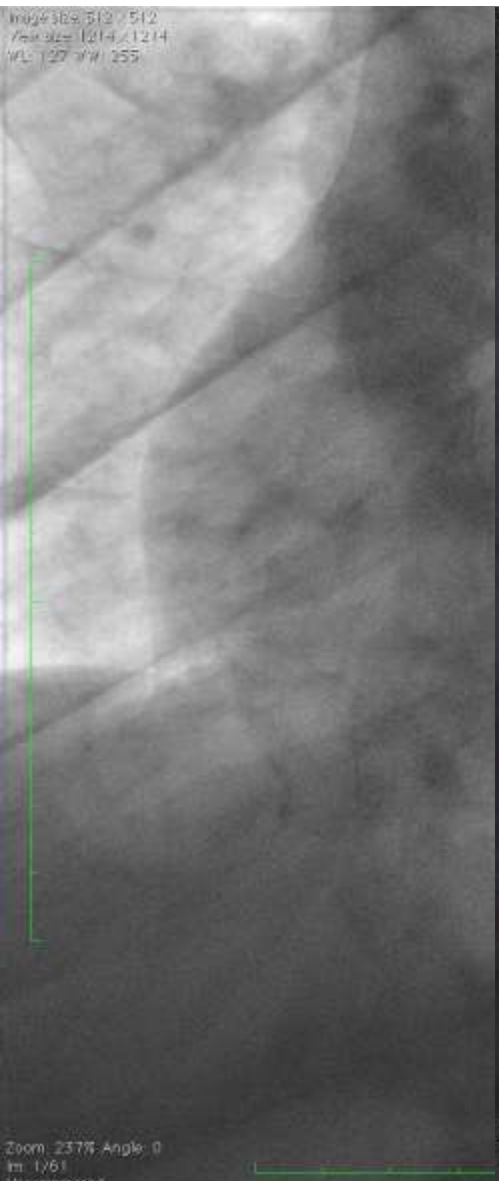


IABP

Pericardial Drainage



Final Results



Complications Cart

- **Pericardiocentesis Kit**
- **Covered Stents**
- **Embolization tools**
 - § Coils
 - § Fat
 - § Micro Spheres
 - § Thrombin
- **Equipment Retrieval**
 - § Snares
- **Hemodynamic Support Devices**
 - § IABP
 - § ECMO
 - § Impella CP
- **Vascular Access Management**

Take Home Messages

- « Chance favors the prepared mind » - Louis Pasteur
- Have a complication cart at the ready in your lab
- Can use the PETA approach to organize experience and lessons learned for easy recall
- Always **stay calm and composed** and **learn** the complications algorithms

THANKS!

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