

Troubles Beyond Sight

The Impact of an Unrecognized Critical Complication

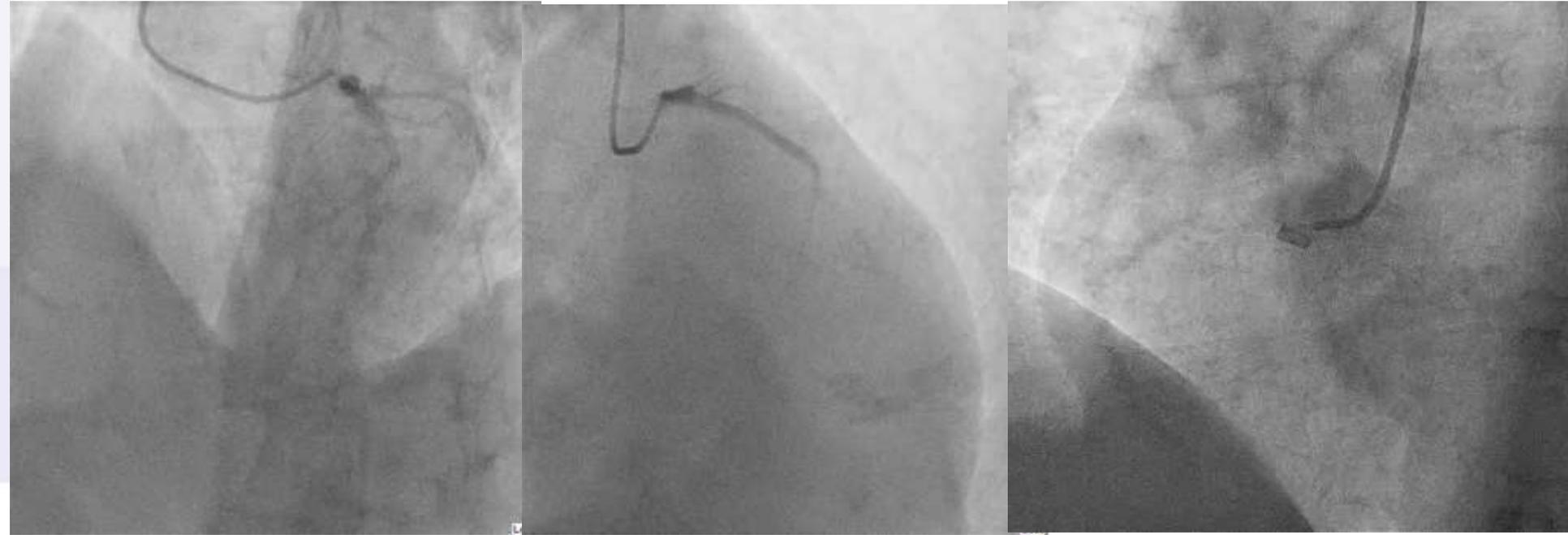
Ilya Litovchik
CTO Program Head
Shamir Medical Center Israel



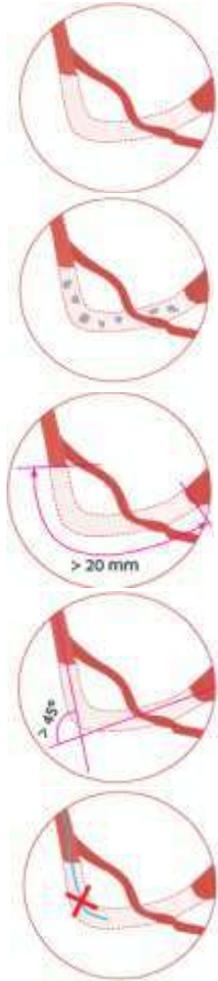
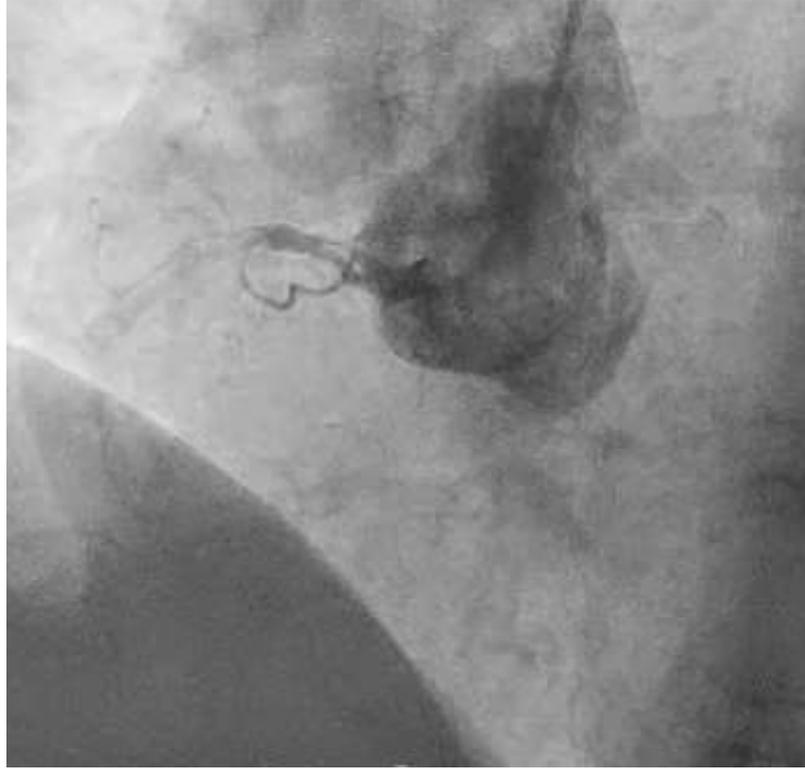
Patient's details

- 75 y.o Female
- DM; HTN; Dyslipidemia; Former smoker; Active
- UAP 6 month ago: CAG 2 VCAD DES to LCX and CTO Prox RCA
- Stable AP CCS3
- EF 60%
- Dipyridamole SPECT significant inferior and posterior ischemia

Previous CAG



JCTO Score 3/4 Strategy: Retro



Stable Hemodynamics

12/01/2023
09:51:32

SPO2: 99

RSP: 33

HR 57



AO

136

59

(94)

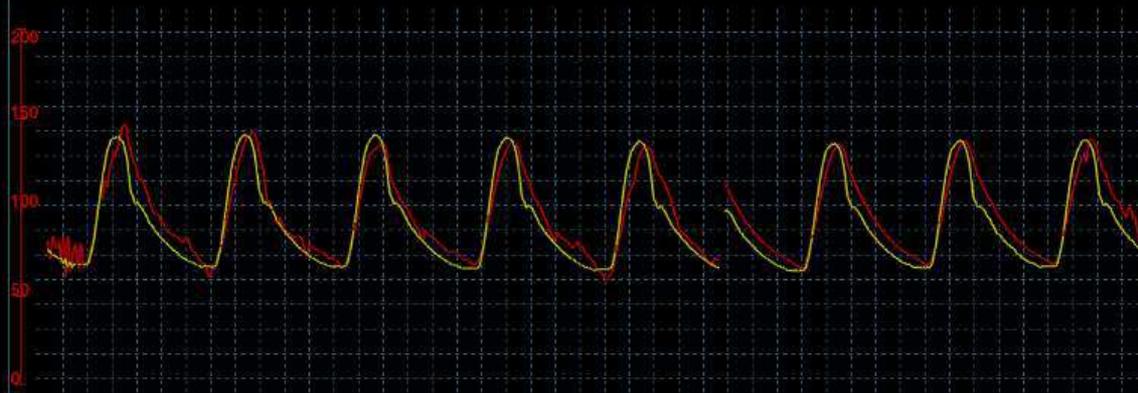


BP2

139

64

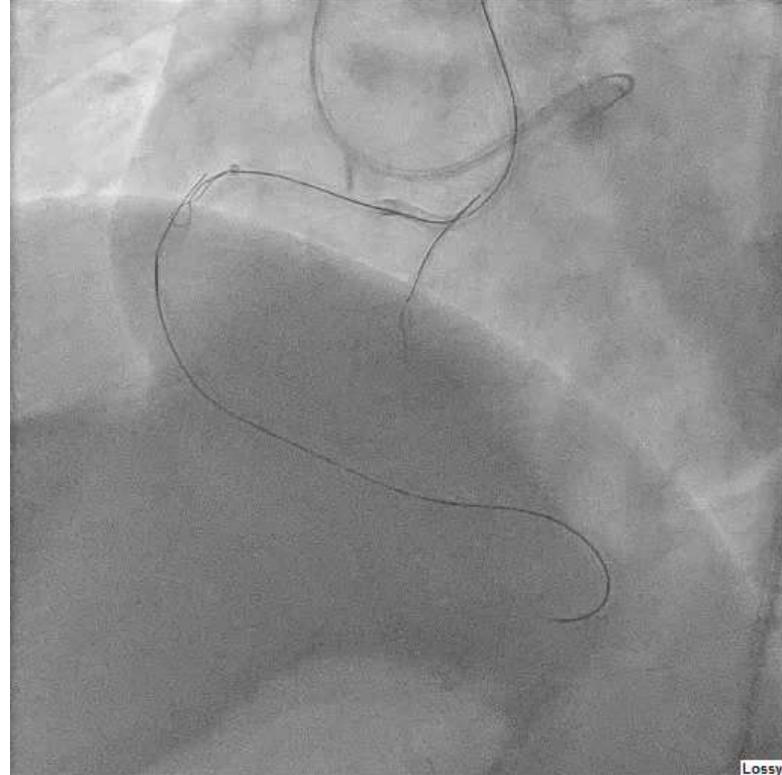
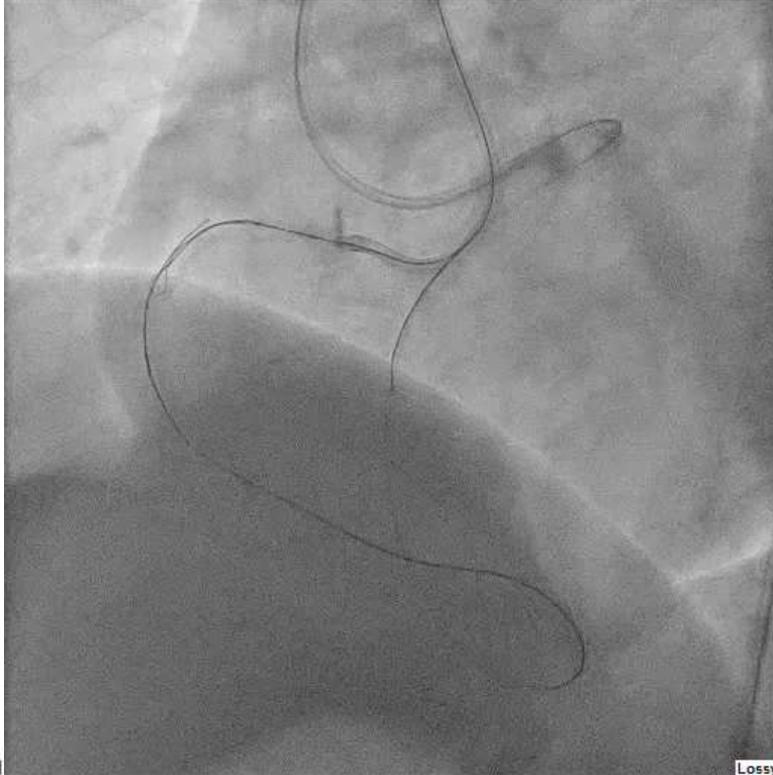
(91)



25 mm/sec

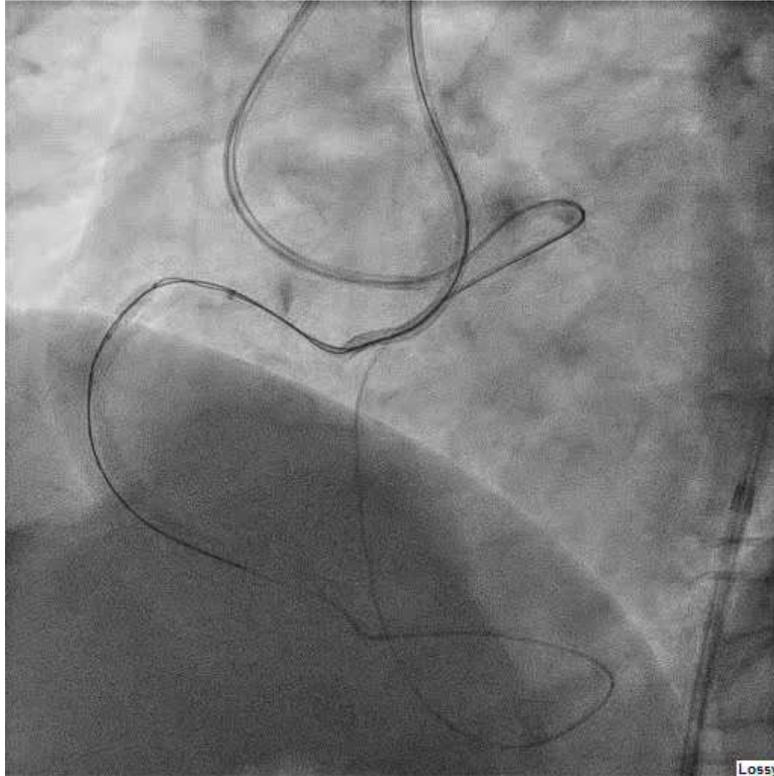
Monitor

Anterograde Gear: AL0.75 7Fr + Gudeler; Fielder XTa
Retrograde Gear: EBU 3.5 6Fr; Crossing via apical collateral
Caravel Gaia-2. GL wiring

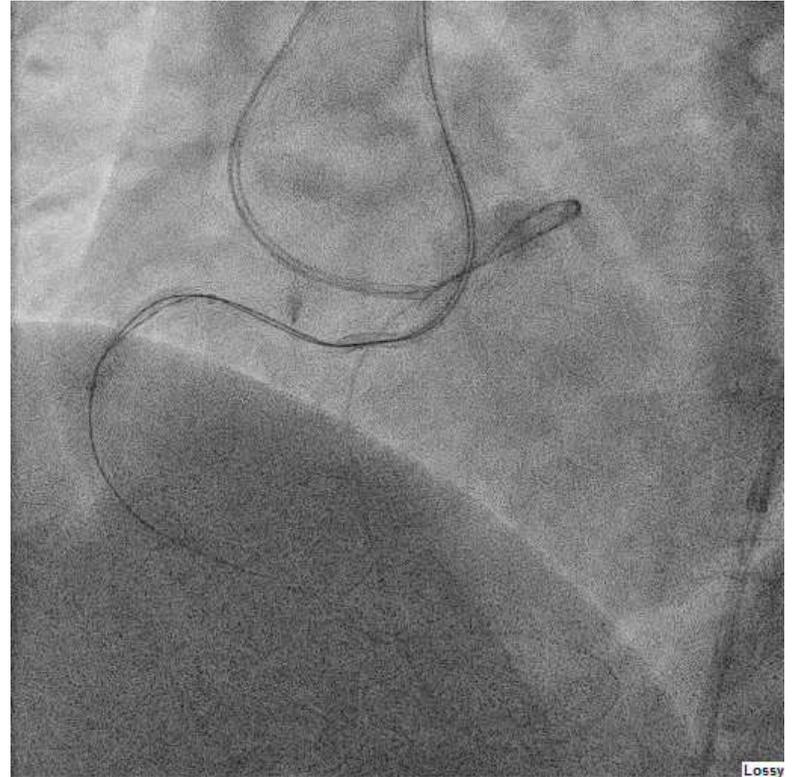


MC stuck in calcium.

Multiple NC ballooning to create anterograde dissections trying to release the tip.

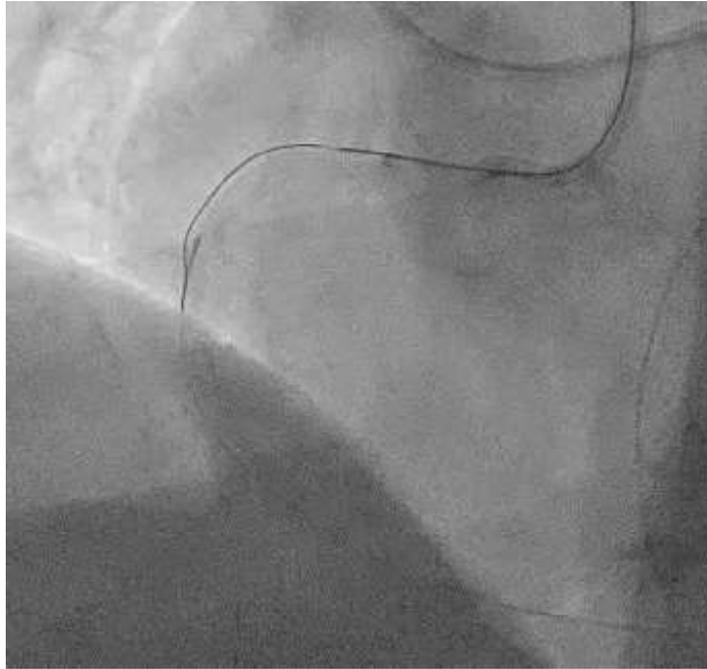
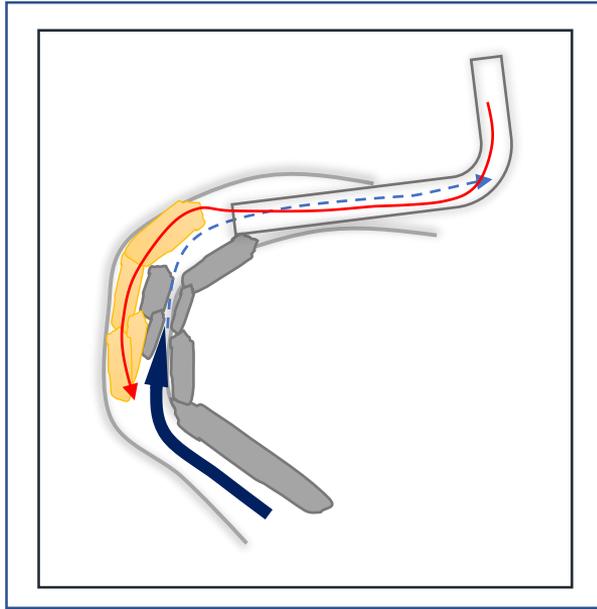


Lossy

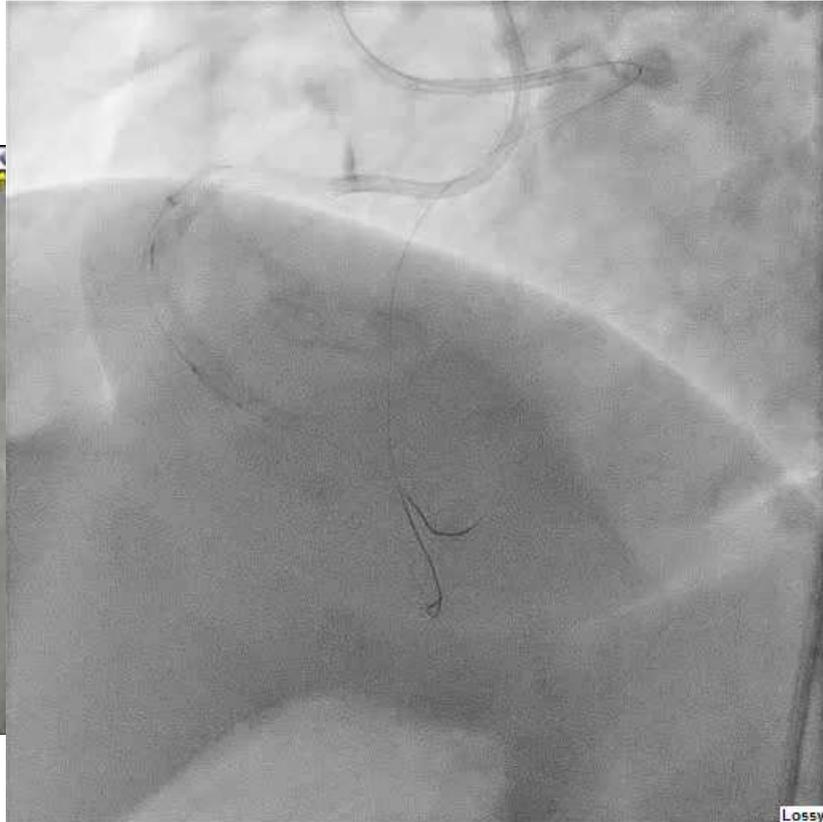


Lossy

After predilatation, anterograde wiring succeeded with Gladius, via different path

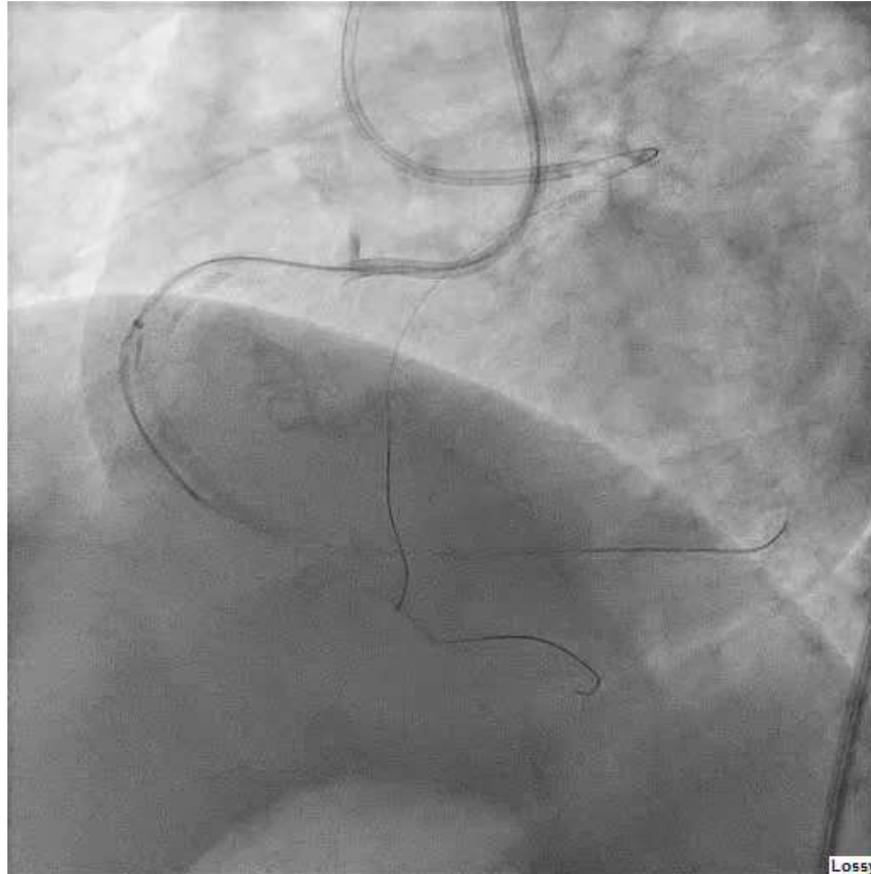


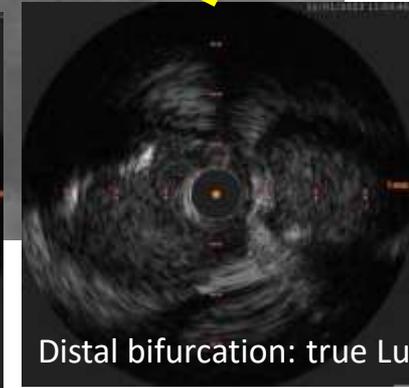
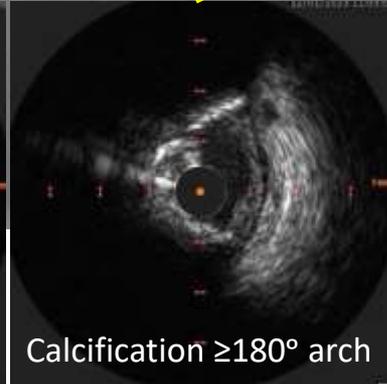
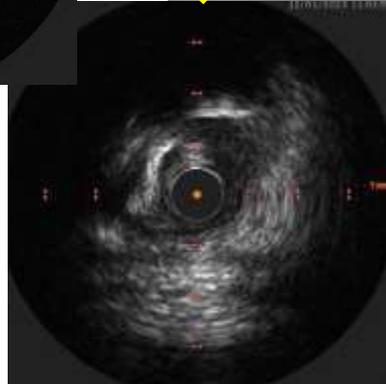
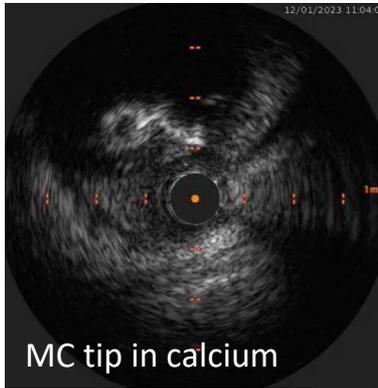
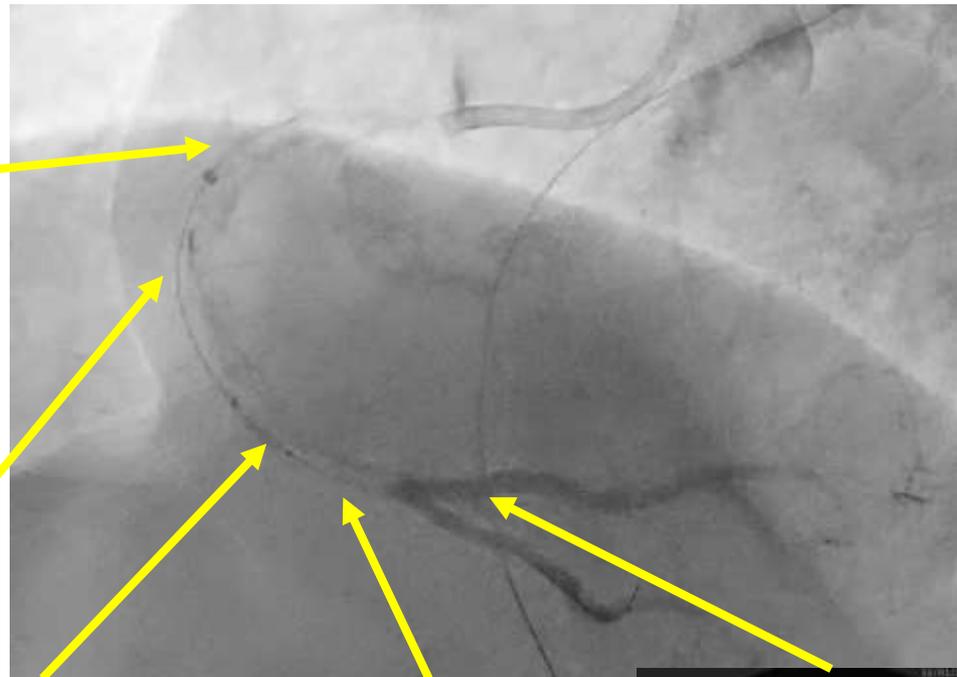
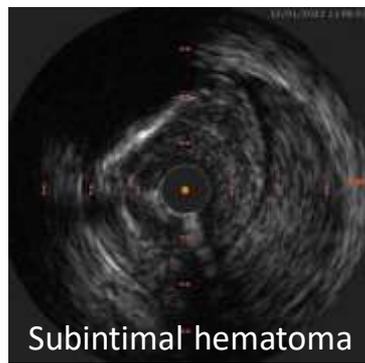
**Inability to pull out the over-the-apex microcatheter.
Caravel was over twisted, tip detached and remained behind,
stuck in calcium.**



Is anterograde wire in true lumen?

Calcium shadow is very misleading → IVUS

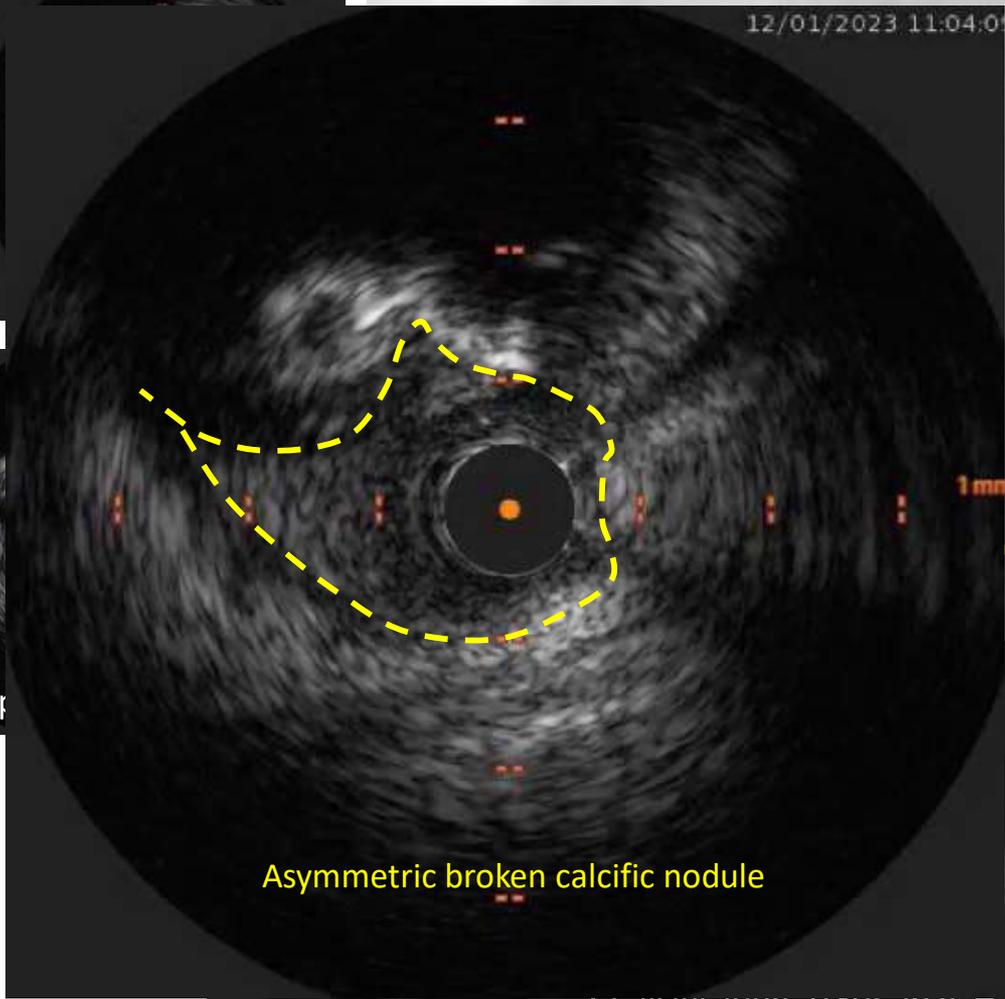




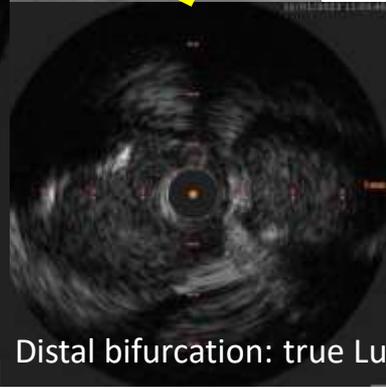
12/01/2023 11:04:00



MC tip



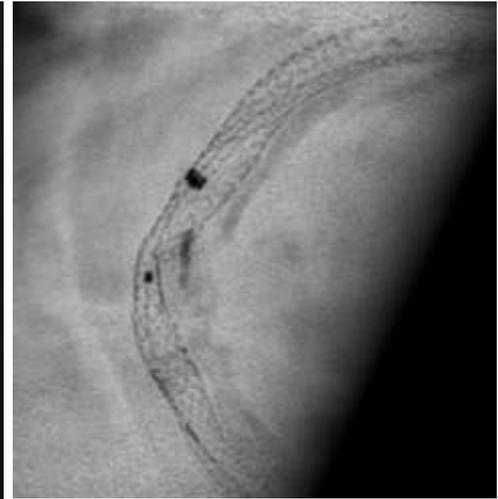
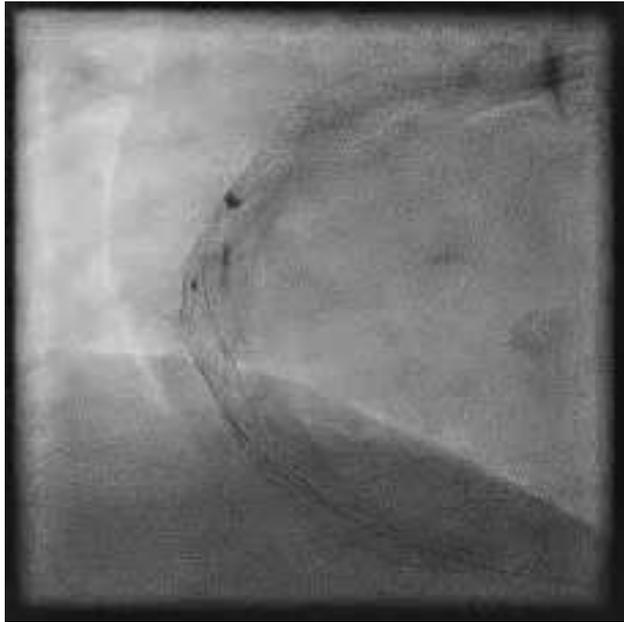
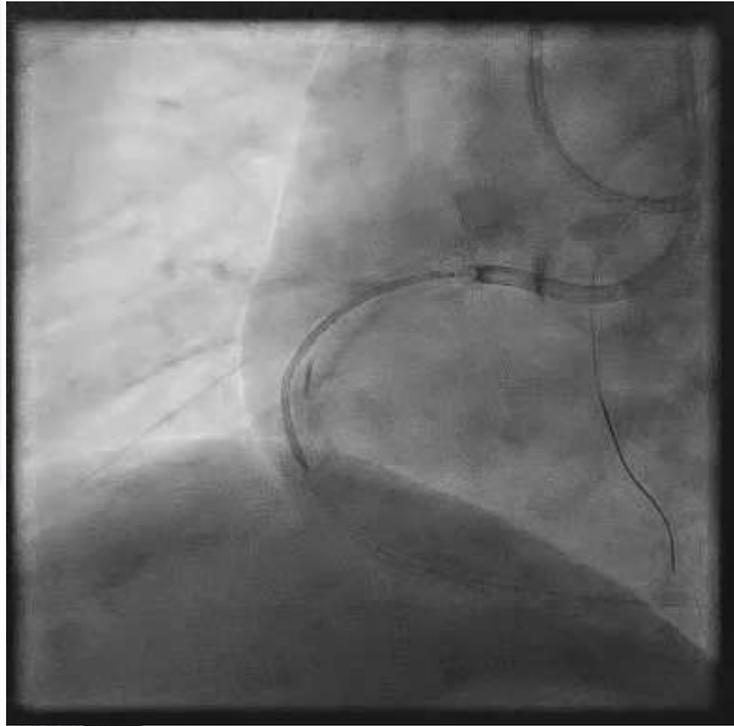
Asymmetric broken calcific nodule



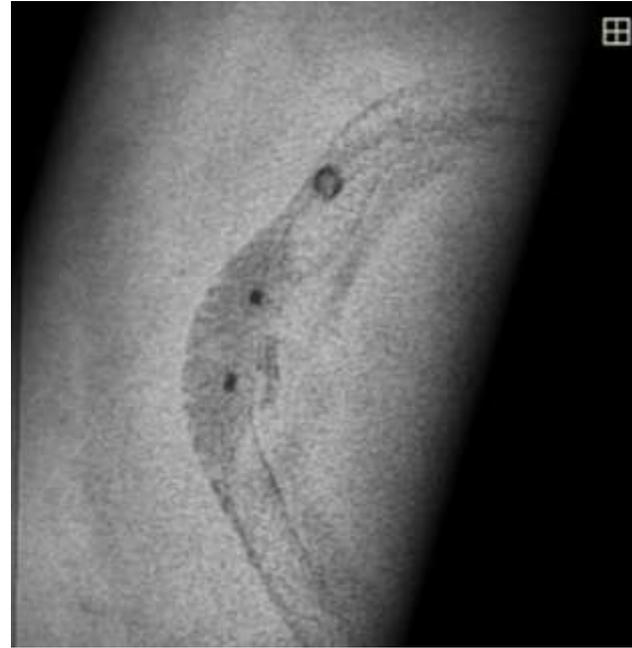
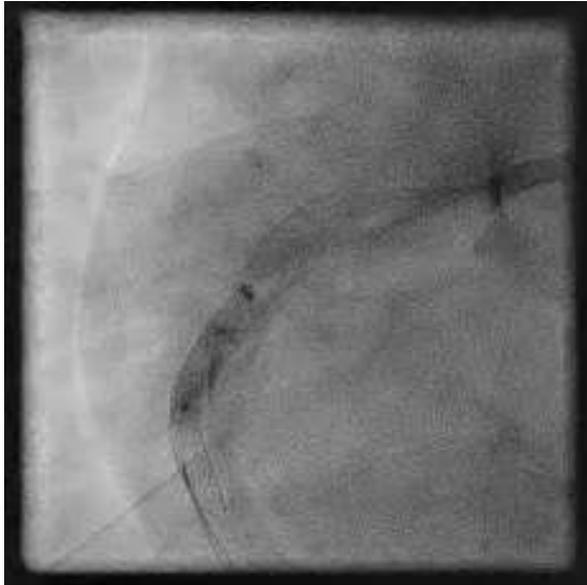
Distal bifurcation: true Lu

Calcification $\geq 180^\circ$ arc

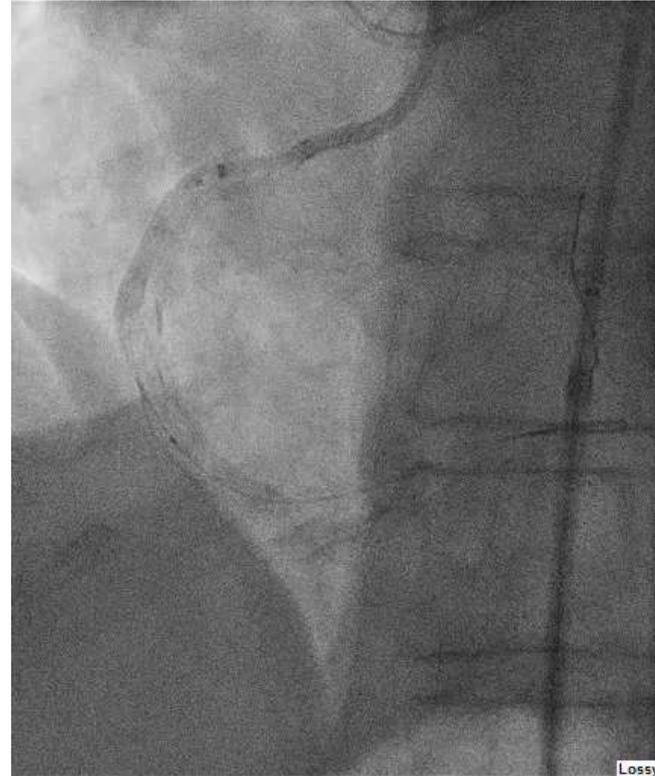
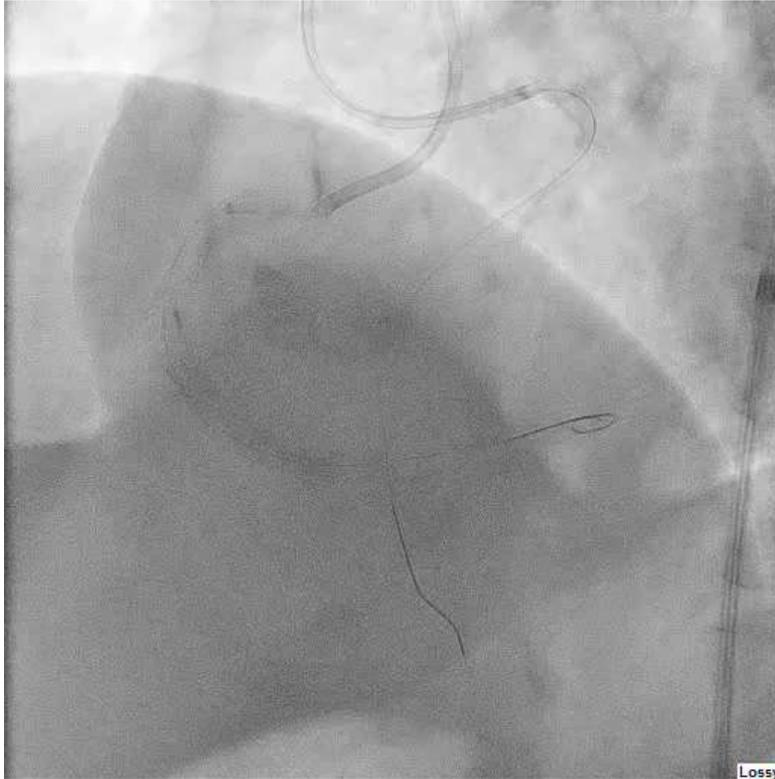
Additional NCB predilatation → DES 3.0/38 x2
Underexpanded stent adjacent to calcification with
buried MC tip



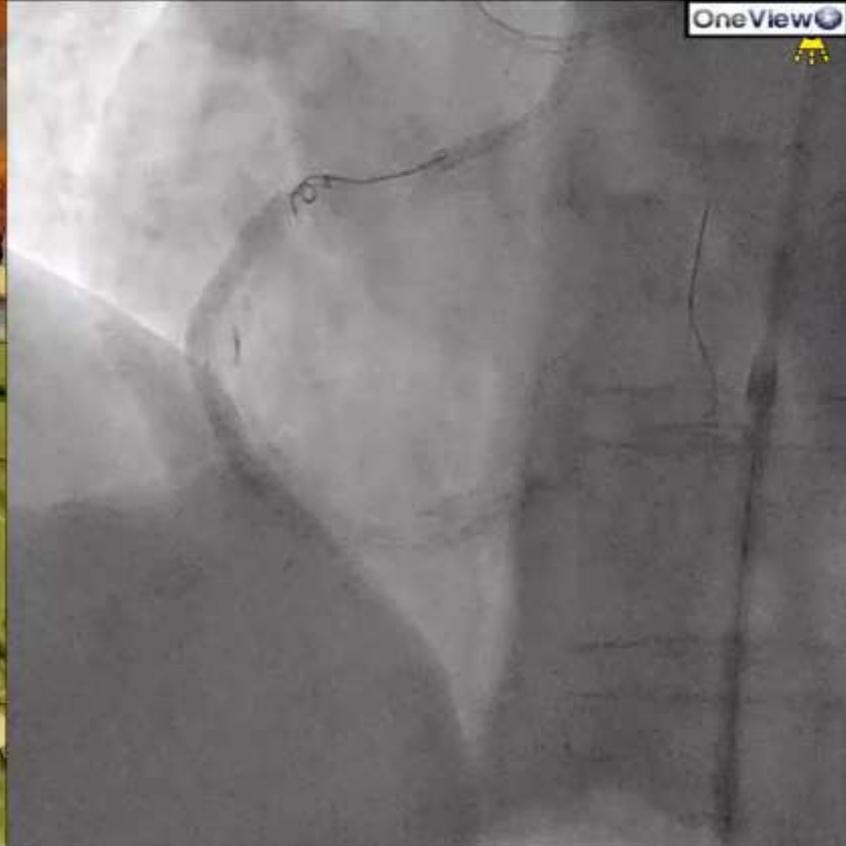
**Upsizing NC balloon to achieve better expansion.
Finally, stent expanded optimally 3.5mm...4.0mm**



Perforation! DES balloon immediately inflated, but it didn't seal the perf. Why?



**Decision: bring larger balloon to seal the perf.
Loss of Guiding catheter position and difficulties in
restoring it.**



Rapid Hemodynamic deterioration Tamponade?

12/01/2023
11:50:31

HR 54



AO

70

38

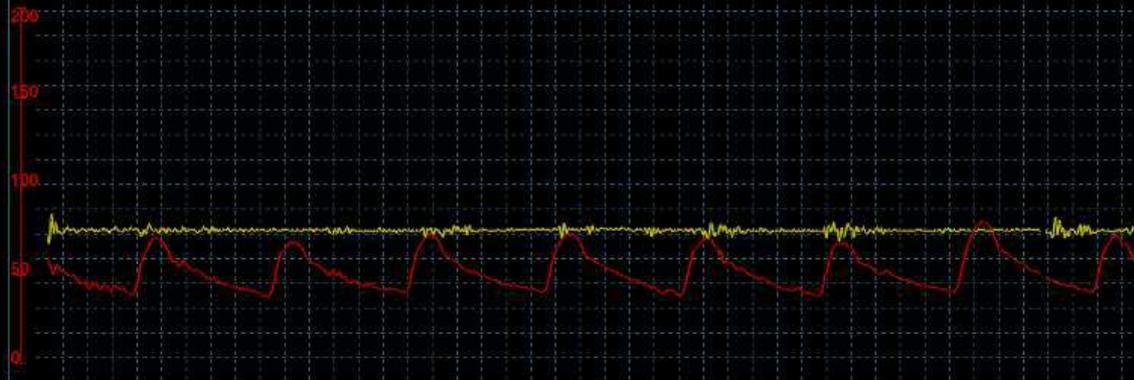
(52)

BP2

74

73

(75)



25 mm/sec

Monitor

Rapid Hemodynamic deterioration Tamponade?

12/01/2023
11:50:31

HR 54



AO

70

38

(52)

BP2

74

73

(75)



25 mm/sec

Monitor

Rapid Hemodynamic deterioration Tamponade?

12/01/2023
11:51:42

HR 49



AO

66

40

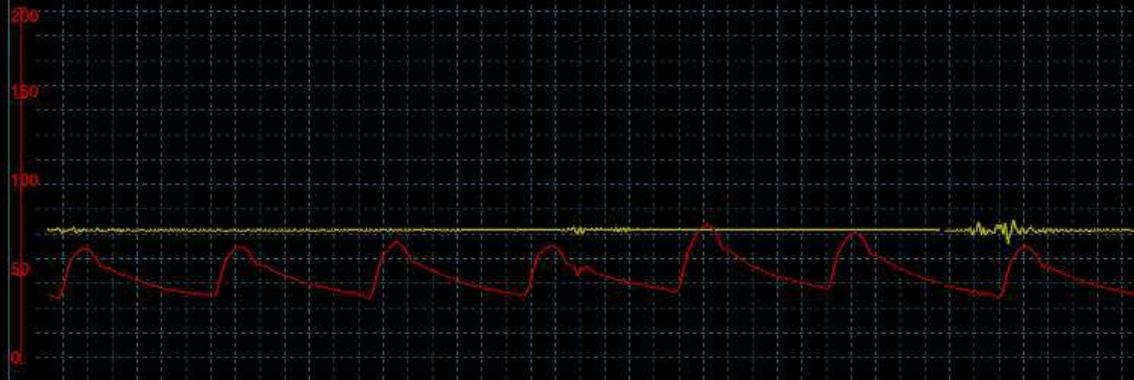
(49)

BP2

75

75

(75)



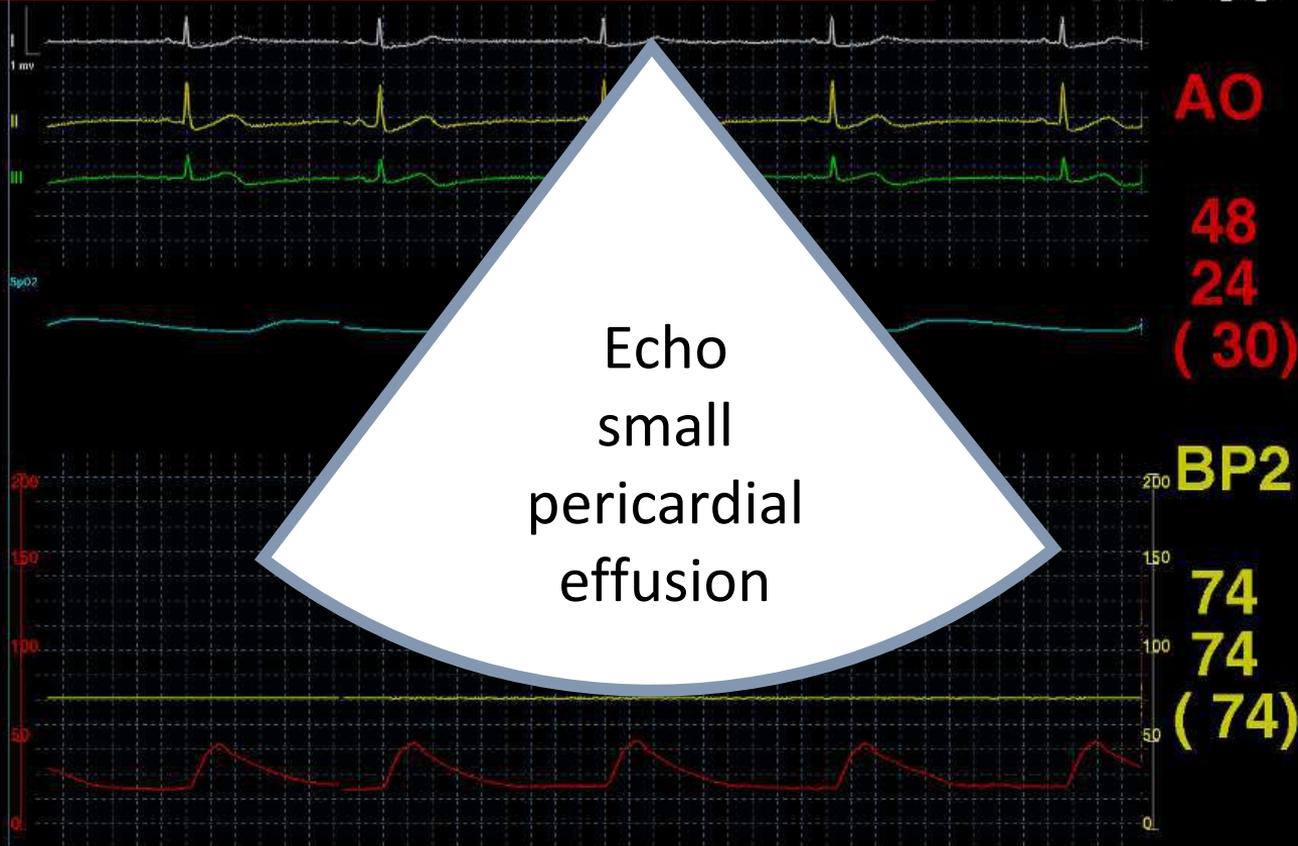
25 mm/sec

Monitor

Rapid Hemodynamic deterioration Tamponade?

12/01/2023
11:53:59

HR 36



25 mm/sec

Monitor

Catch-up #1:

1. Perforation Ellis-III

2. Rapidly evolving hemodynamic shock → IV
noradrenalin

3. Ischemia

4. *Small* pericardial effusion

Decision?

Larger SC balloon in place.
Rapid deterioration. CPR.
Pericardicentesis attempted – no fluid.



IC Adrenalin

12/01/2023
12:10:43

SPO2: -

RSP: 71

HR 94

SpO2 rel. probe

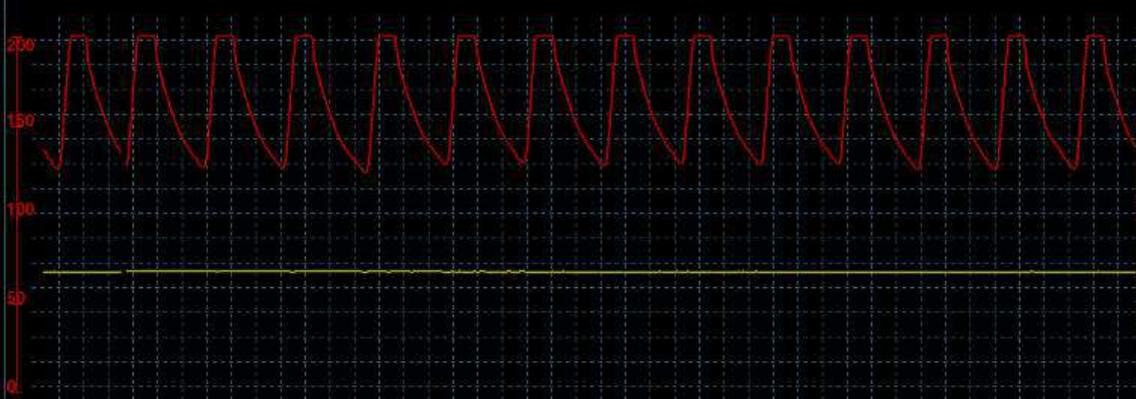


AO

219

126

(164)



BP2

68

68

(68)

25 mm/sec

Monitor

**RCA angiography – leak persists.
No chest compressions needed at the moment.**



Catch-up #2:

1. Perforation Ellis-III without significant effusion
2. Hemodynamic crash → CPR + Pressors IV/IC
3. Larger balloon in place with persisting leak

Decision?

Additional hemodynamic deterioration

12/01/2023
12:14:44

HR 57



AO

76

43

(57)

BP2

68

68

(68)



25 mm/sec

Monitor

Trying to place the ping pong catheter

PEA - Asystole



Catch-up #3:

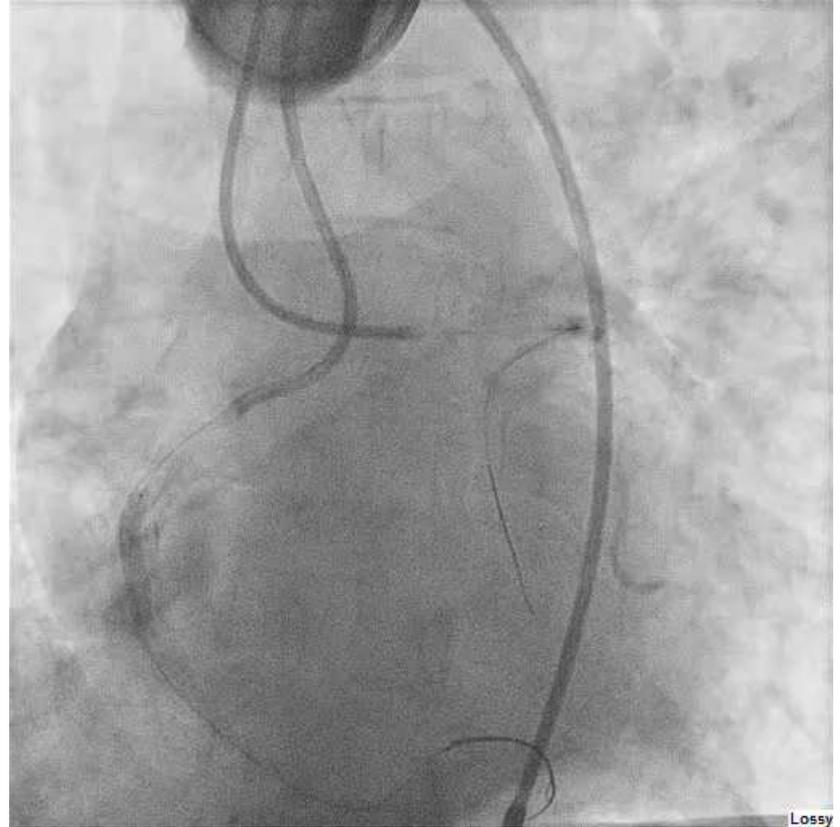
1. Critical uncontrolled bleeding with 'dry pericardial tap'
2. Hemodynamic instability, PEA and CPR
3. No gear in left coronary system

Protamine?

After Protamin 50 mg IV. Asystole and CPR. Non selective injection - Occluded LMCA



**Protamine caused catastrophic thrombosis.
POBA to LMCA and LAD-LCX
Call for ECMO**

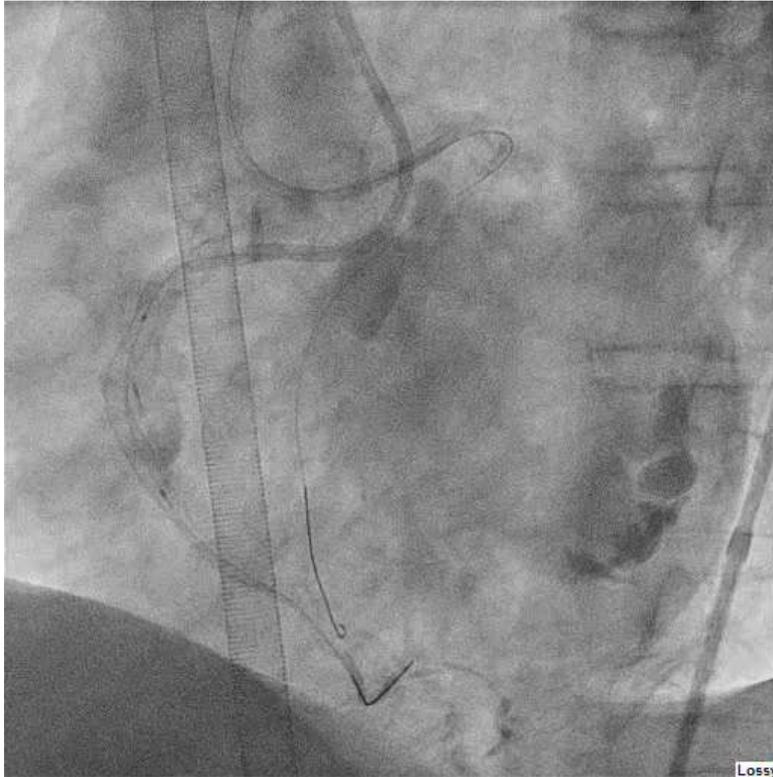


ECMO in place.

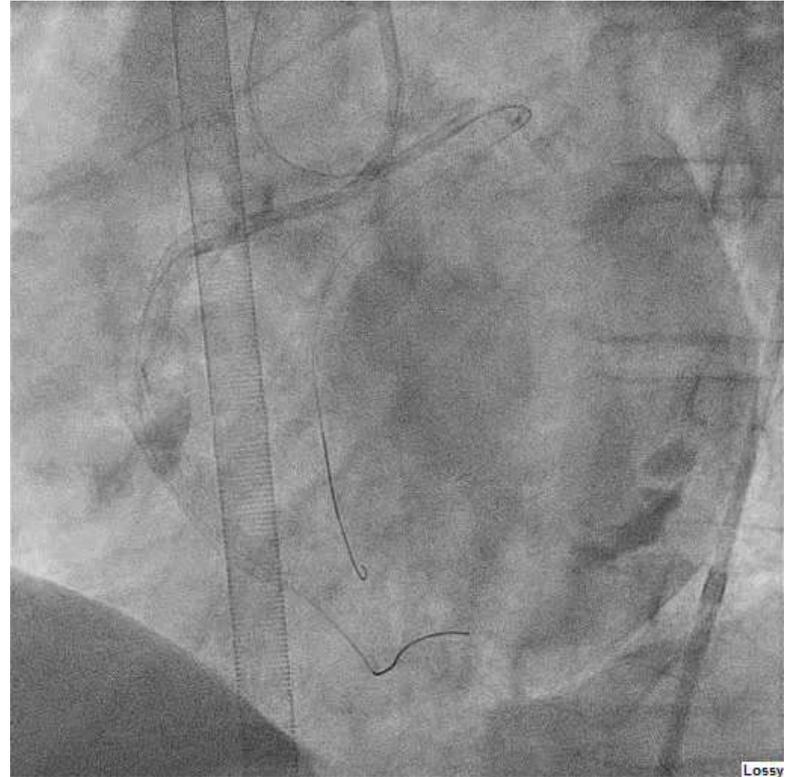
We are trying to restore the order



Two covered stents up to RCA ostium

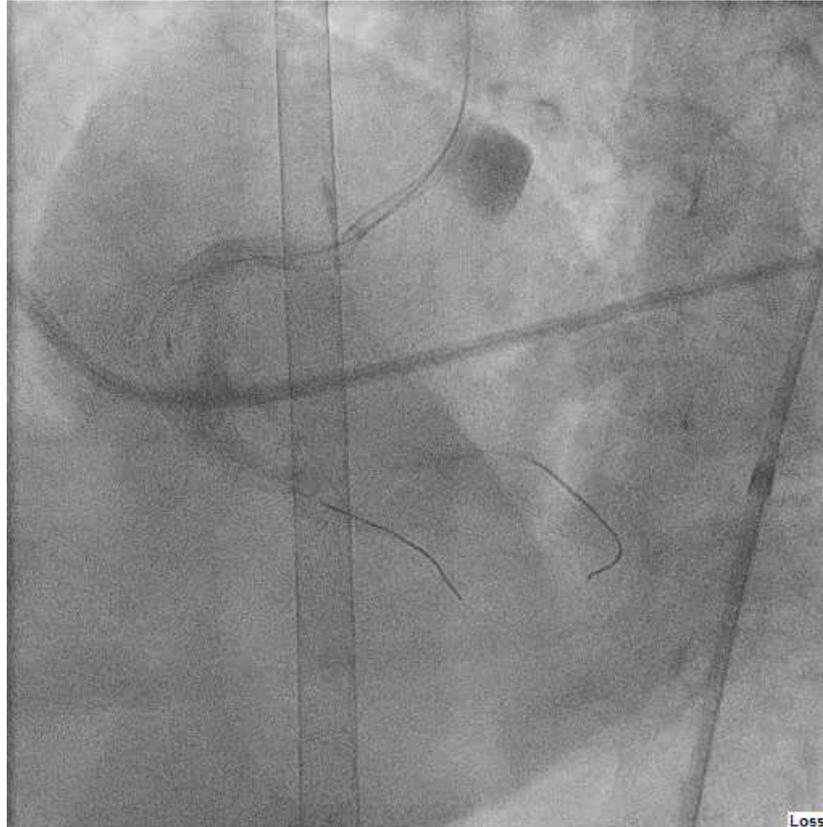


Lossy

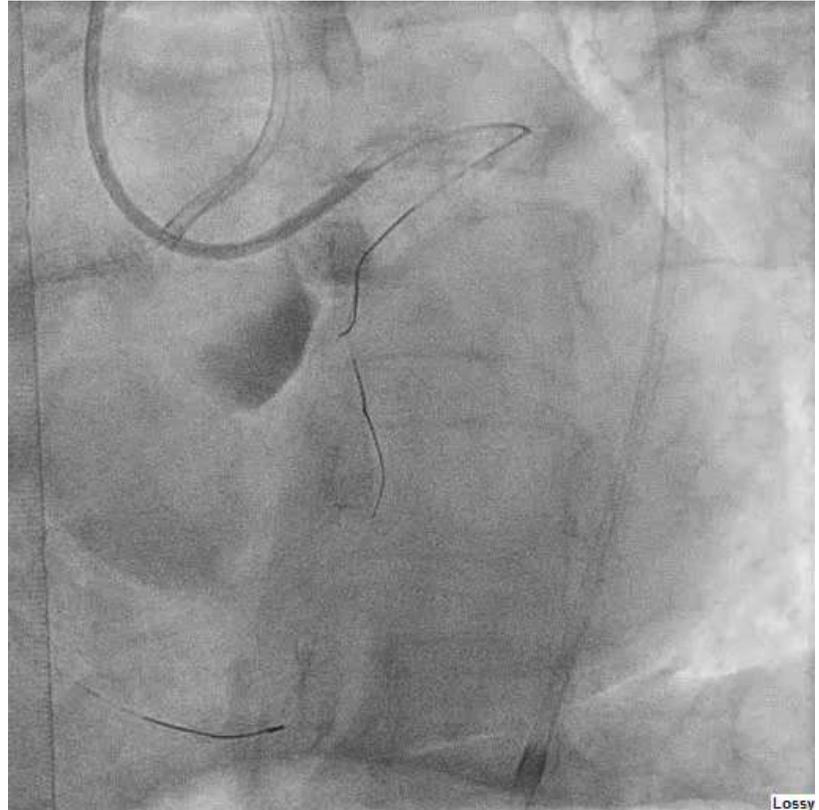
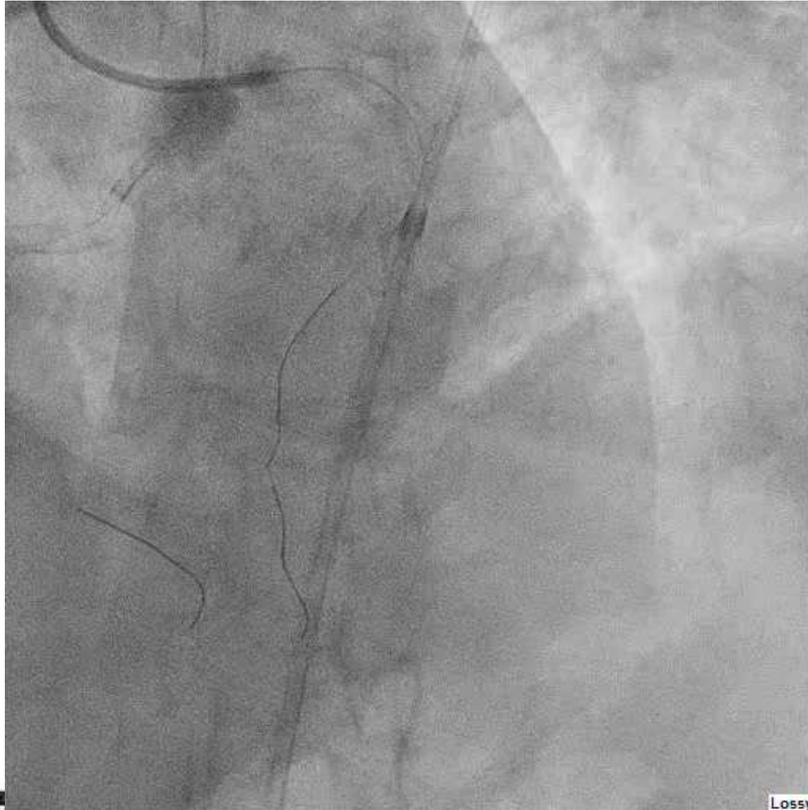


Lossy

POBA to dist RCA, PDA and PLB



POBA to major branches in Left coronary system

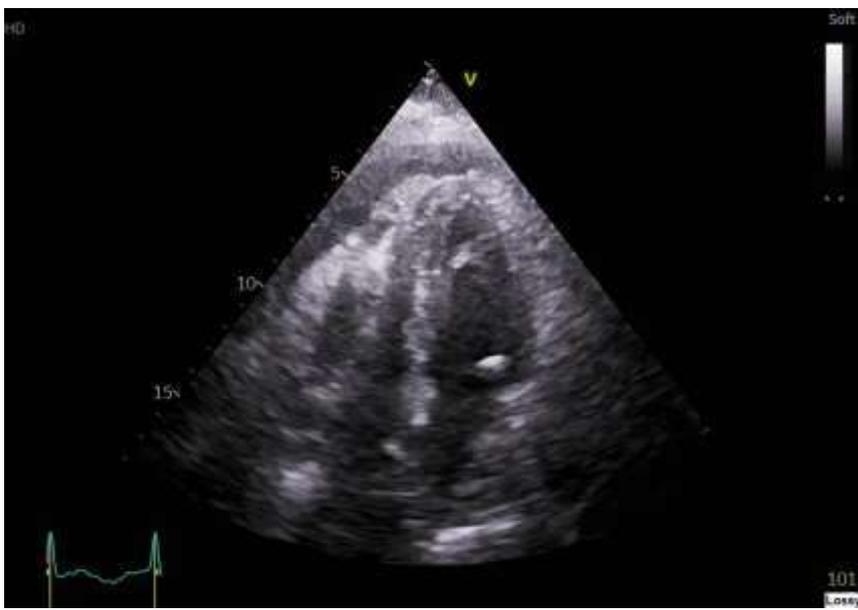




ICU

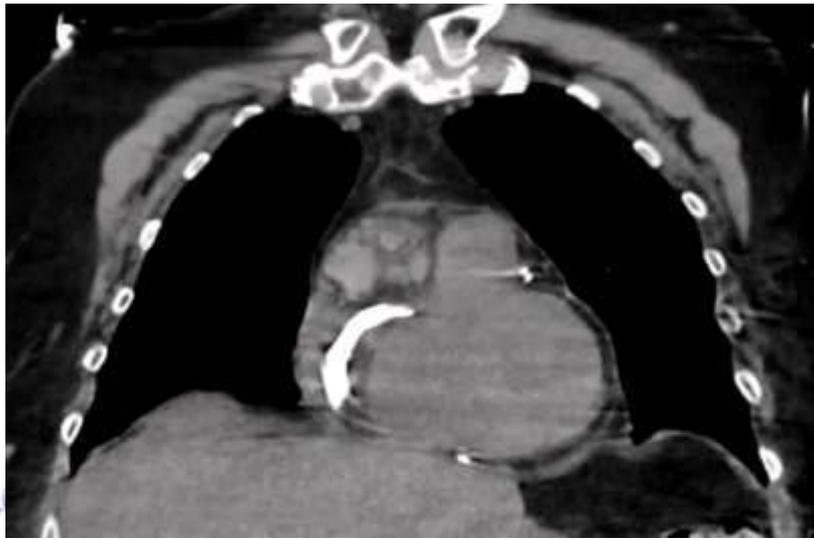
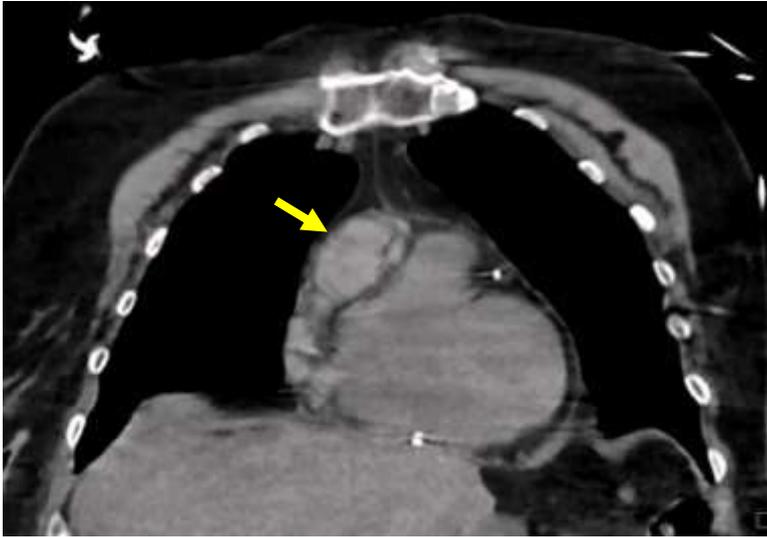
- Patient is extubated and alert.
- Severe LV Dysfunction,
- No pericardial fluid.
- ECMO: difficulties to preserve flow.





Next day

- ECMO hemodynamics behaves like “Hypovolemia” → blood, plasma and inotropes required.
- Patient deteriorated into hypotension and desaturation.
- Pleural and Pericardial effusion appeared.
- Pleural and pericardial drainage – serous / serosanguinous fluid.



Chest CT

- Large RA compressing hematoma
- Surgical consultation

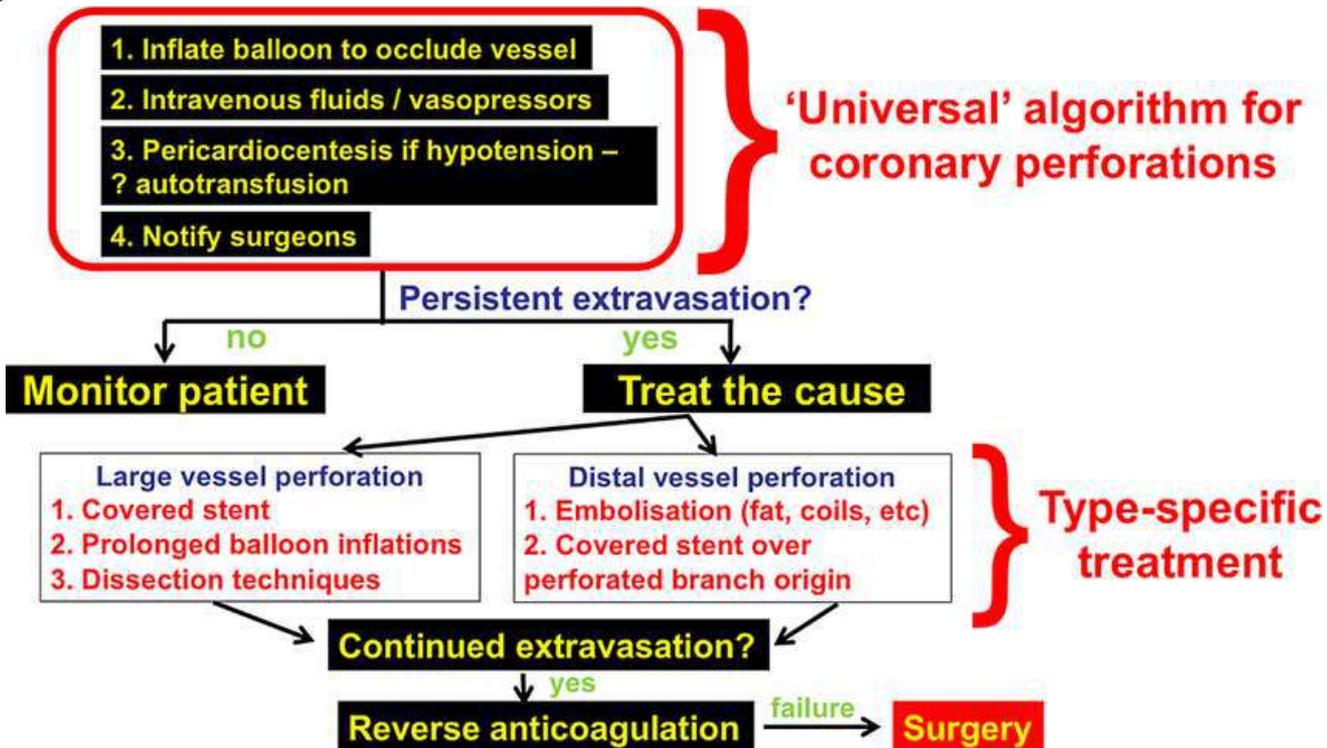
Hours later, Acute neurological deficit developed.
ICH. Exitus





Complications of chronic total occlusion percutaneous coronary intervention

J. Karacsonyi · E. Vemmou · I. D. Nikolakopoulos · I. Ungi · B. V. Rangan · E. S. Brilakis



Messages

- Apical collateral may present a risk and restrict maneuverability.
- Don't push too hard. If retrograde microcatheter doesn't advance, consider another pathway.
- Twisting stuck microcatheter will result in detachment.
- Debulk – IVL, rota.
- Accept suboptimal stent result.
- Balloon inflation inside a stent within severely calcified segment may be ineffective.
- Time. If there's no fluid, there's no tap.
- Protamine may cause catastrophic thrombosis, avoid when possible, use lowest dose.

Thank
you!



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