

Complex PCI: Make It Simple!

A Case of Hip Joint Fracture in Old-Aged Woman

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‘What makes ‘Complex PCI’

Patient background

**Aged
Female
Diabetes
Chronic renal failure, hemodialysis
Anemia
Systemic arteriosclerosis**

Lesion character

**Unprotected LMT
Multi-vessel disease
Low EF
Only remaining circulation**

Procedure

Low-skill operator...

Clinical situation

**ACS
Shock
Heart failure
Renal failure**

These factors usually come along with multiple factors.

Case : 80's, female

Chief complaint : *Loss of consciousness, hip joint pain*

Present history :

She was referred to our ER for her hip joint fracture due to falling down by temporary loss of consciousness.

At the ER she was completely awake, however her cloth was wet with her cold sweat.

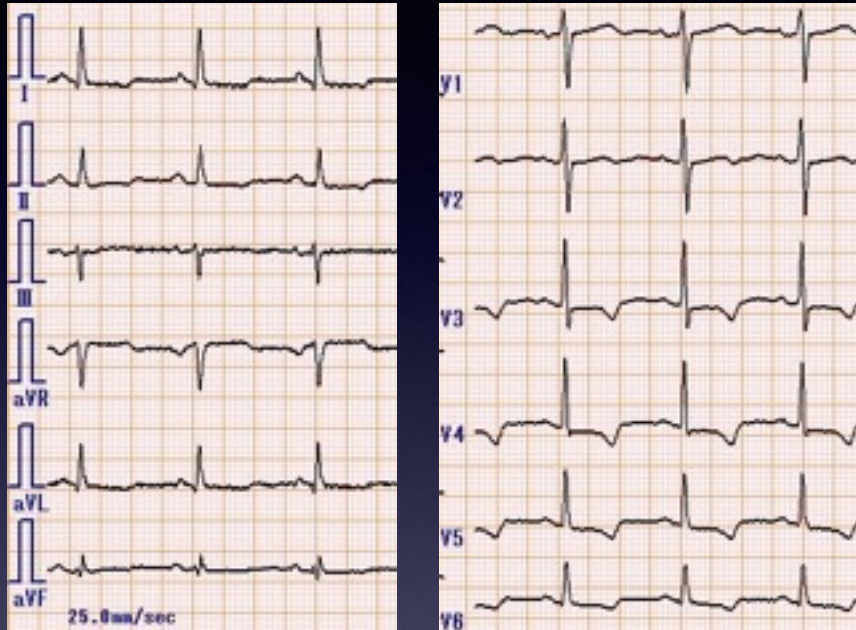
Coronary risk factors : *Hypertension, Dyslipidemia*

Vital state at ER :

BP 156/78, HR 78/min (regular), SpO2 97%(RA)

Examinations

ECG



NSR, ST dep. in **V3-6**

UCG

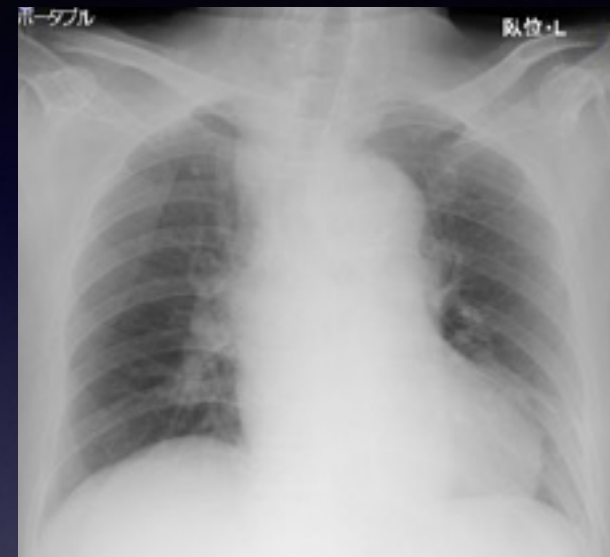
LVDd/Ds=50/41

EF=38%

IVST/PWT=9/9

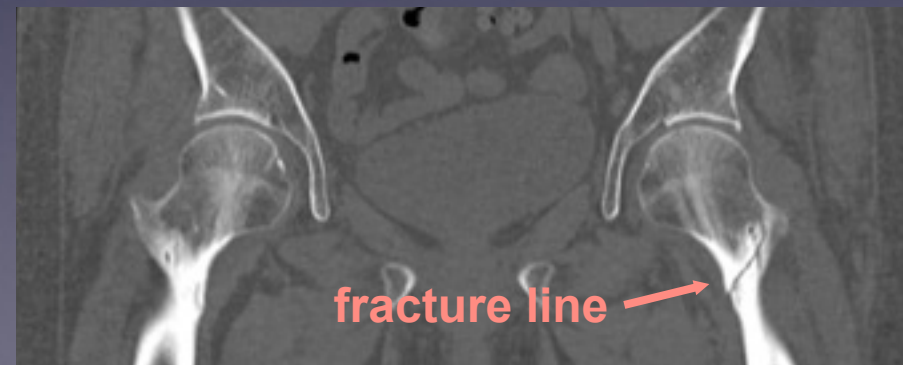
LV Wall motion: diffuse hypokinesia
(inferior~severe hypo to akinesia)

CXR

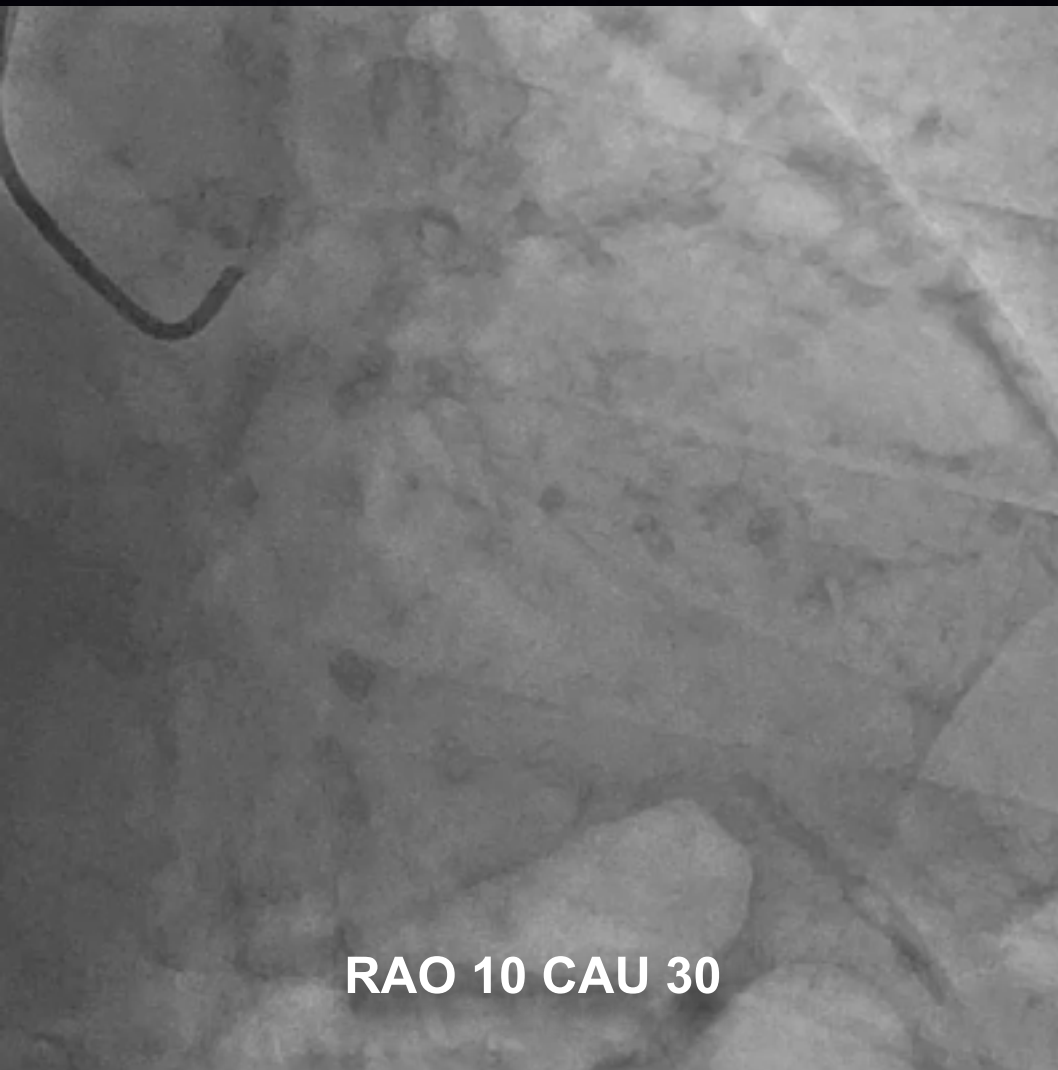


CTR=55.3%

CT (hip joint)



Control CAG (LCA)



RAO 10 CAU 30



RAO 30 CRA 30

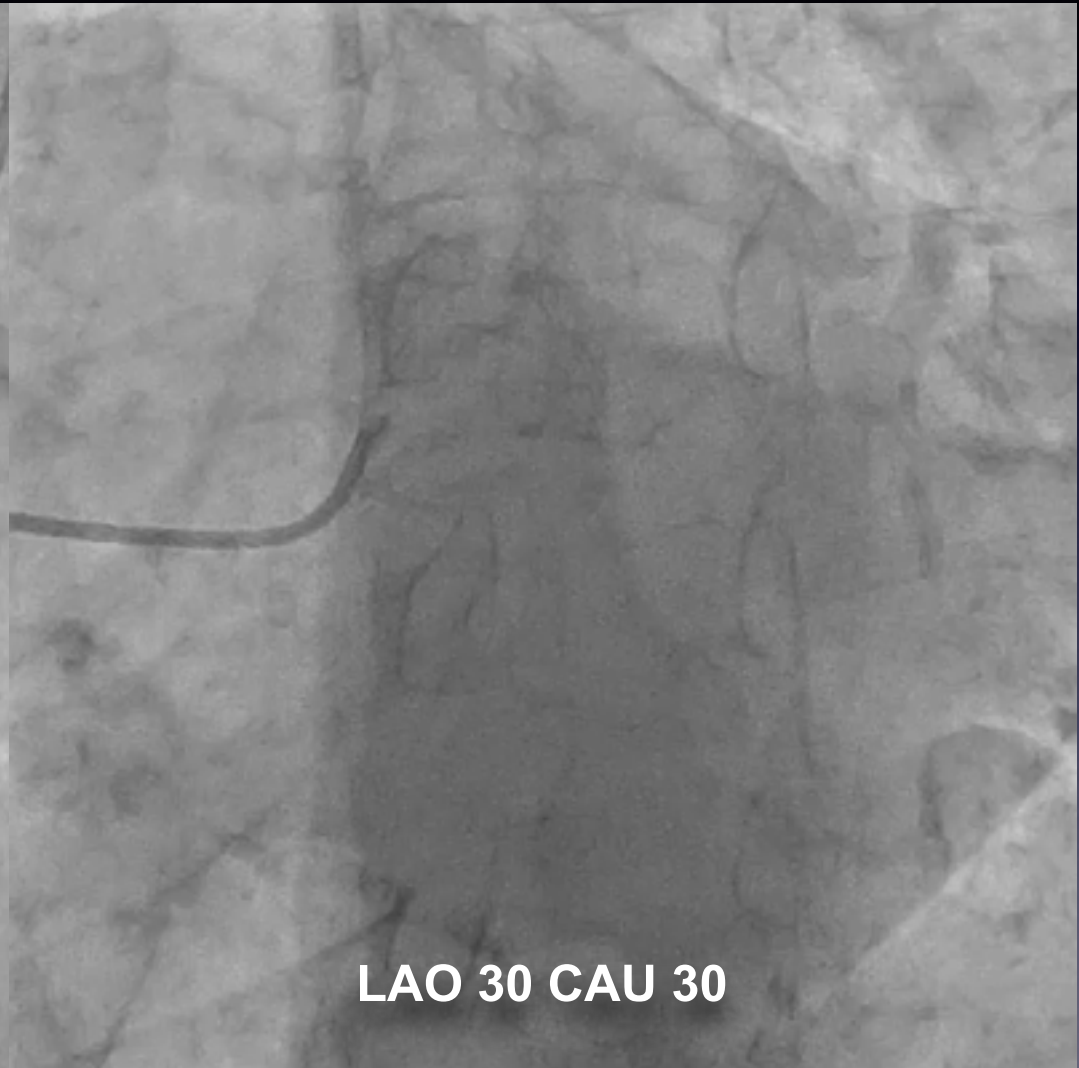
Seg.5 (os/d)=75/90%, Seg.6 (os)=90% Seg.7=90%,
Seg.11(os)=90%, Seg.13=99%-TIMI3 *collateral (-)

Rakuwakai Marutamachi Hospital, Kyoto, Japan

Control CAG (LCA)



LAO 30 CRA 30



LAO 30 CAU 30

Seg.5 (os/d)=75/90%, Seg.6 (os)=90% Seg.7=90%,
Seg.11(os)=90%, Seg.13=99%-TIMI3 *collateral (-)

Control CAG (RCA)



LAO 20 CRA 30



RAO 30

Seg.1(d)=99%-TIMI3 (with dissection), Seg.2=50% *collateral (-)

***Tripple vessel disease with LMT lesion
(probably ACS in proximal RCA)***

Guidelines

2014 ESC/ESA Guidelines on non-cardiac surgery: cardiovascular assessment and management

Coronary pathology underlying fatal perioperative myocardial infarctions revealed that two-thirds of the patients had significant left-main or three-vessel disease.

No trial has yet investigated the role of prophylactic revascularization in patients with NSTEMI-ACS requiring non-cardiac surgery; therefore, if the clinical condition requiring non-cardiac surgery is not life-threatening, priority should be given to the management of NSTEMI-ACS.

Opinions !

orthopedic surgeon

Hip joint surgery must be done within 3 weeks to keep the activity of daily living !!

Patient

wanna go back home as soon as possible !!

Cardiovascular surgeon

*risk of mortality(EuroscoreII): 4.2%

*SYNTAX Score: 45

Of course CABG is possible, but repeat operation would be too invasive for her age...

- Decision -

For early revascularization, PCI should be done at one time if possible.

Considerations before procedure (1)

Which vessel should be treated first?

- Loss of consciousness with cold sweat may indicate that this time episode was caused by the acute coronary event in RCA.***
- Echocardiogram also indicate the abnormality in inferior wall.***



RCA should be treated first.

Considerations before procedure (2)

Is Balloon Pumping support mandatory?

- ✓ Vital state is stable before procedure (BP 156/78, HR 78/min).
- ✓ Aorta is elongated, which may cause aortic injury especially in this high aged patients.



**Preparation is mandatory but not from the beginning.
PCI should be done not to collapse the hemodynamics
and to prevent stunned-myocardium.**

Considerations before procedure (3)

What should we care before starting RCA intervention?



- ✓ For the temporary pacing in case of ischemia-induced bradycardia, venous sheath should be secured.
- ✓ Wiring should be done carefully, because it could easily go into sub-intimal space at the dissected lesion.

Considerations before procedure (4)

What should we care before starting RCA intervention?



- ✓ **IVUS information is mandatory for the determination of the need for distal protection.**
- ✓ **Time to hemodynamic change due to ischemia during IVUS procedure indicates the time-limitation during whole procedure.**
- ✓ **If the IVUS indicates hard plaque, pre-dilatation should be done with appropriate sized balloon (**reference or 1-size down**) for the solid lesion-dilatation without excess vessel injury.**

Considerations before procedure (4)

What should we care before starting RCA intervention?



- Stent should be completely apposite to the vessel wall with an appropriate size, not to cause SAT even without DAPT (during perioperative period).**
- Each procedure should be done as quickly as possible to shorten the ischemic time during procedure. (This pt has also LMT disease...)**

Considerations before procedure (5)

What should we do after RCA intervention?

If successfully finished...

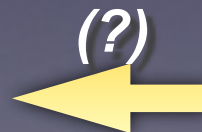
*Distal embolism,
Slow/no reflow,
etc...*



**LCA
intervention**

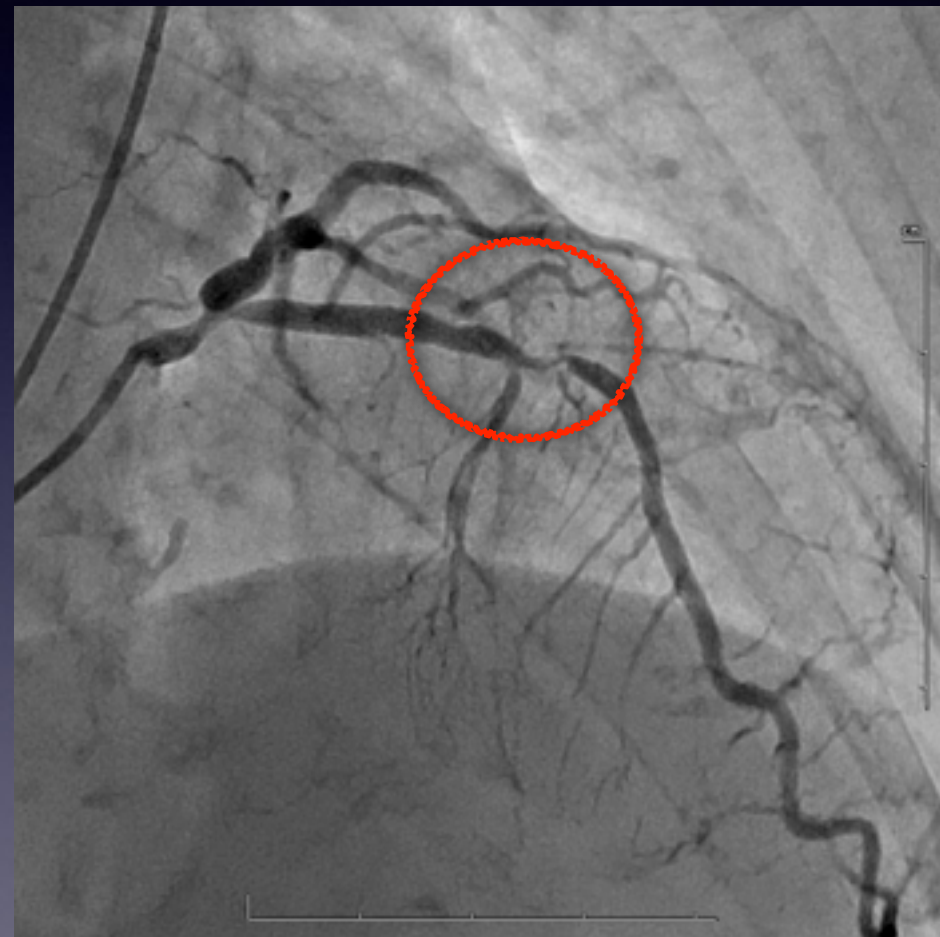
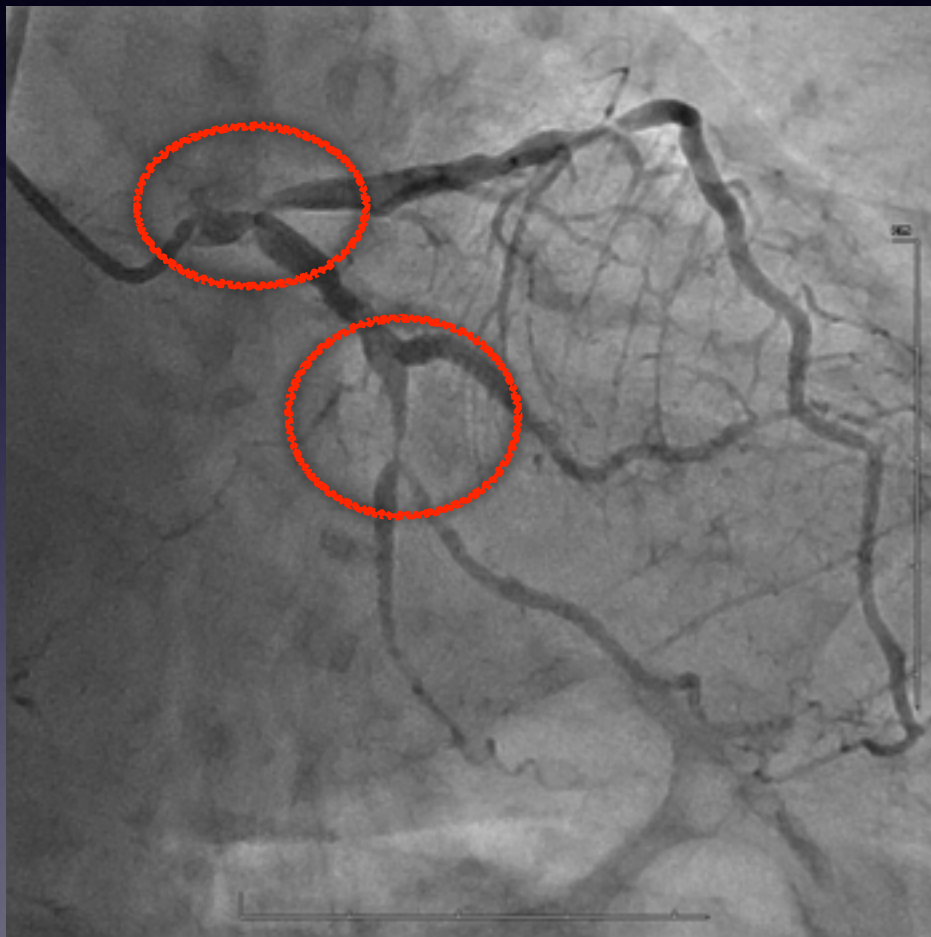


IABP, PCPS



Considerations before procedure (6)

Which vessel should we treat after successful RCA PCI?



Considerations before procedure (6)

Which vessel should we treat after successful RCA PCI?



✓ **LMT distal is true bifurcation lesion, which may need two-stent strategy.**

✓ **Stenting to distal LCx would become more difficult, once LMT crossover stenting was done.**



LCx distal lesion.

Considerations before procedure (7)

Which vessel should be next?



Although the LAD mid lesion has also severe stenosis, simple stenting procedure could be possible without losing branches.



LAD mid lesion

Considerations before procedure (8)

How should we treat the LMT lesion?



IVUS information is essential for making strategy.



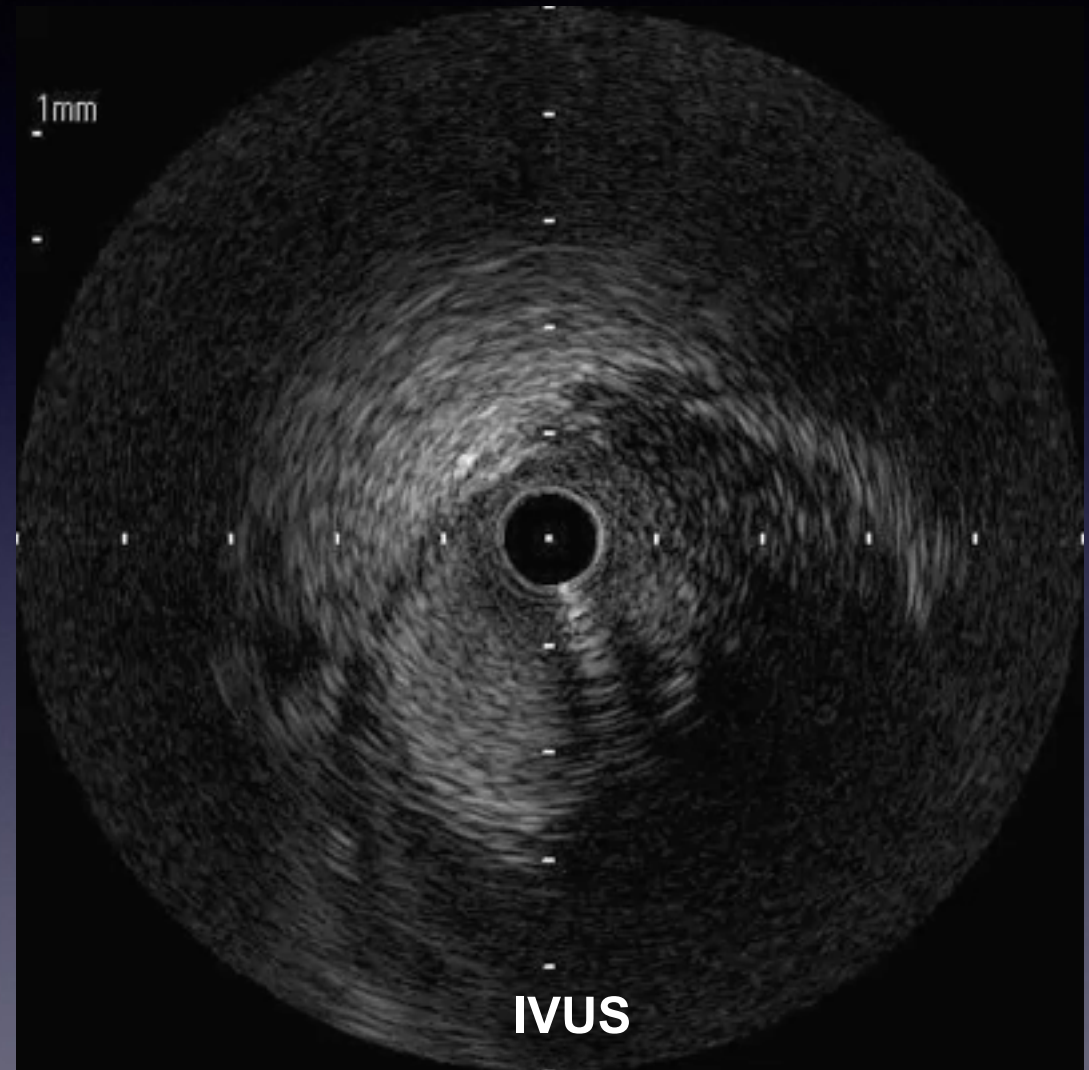
Decide after IVUS estimation.

Now its time to start !!

Pre procedural IVUS (RCA)



LAO20 CRA30

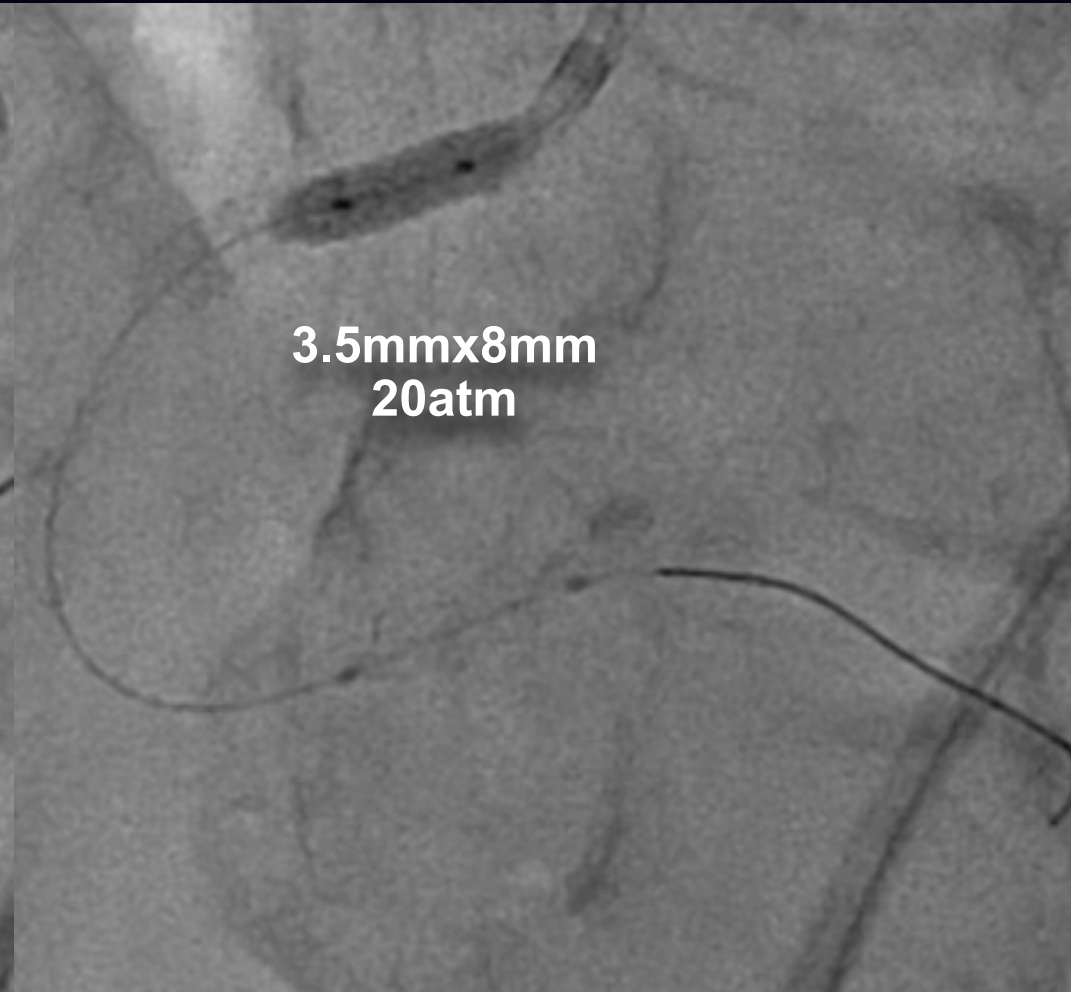
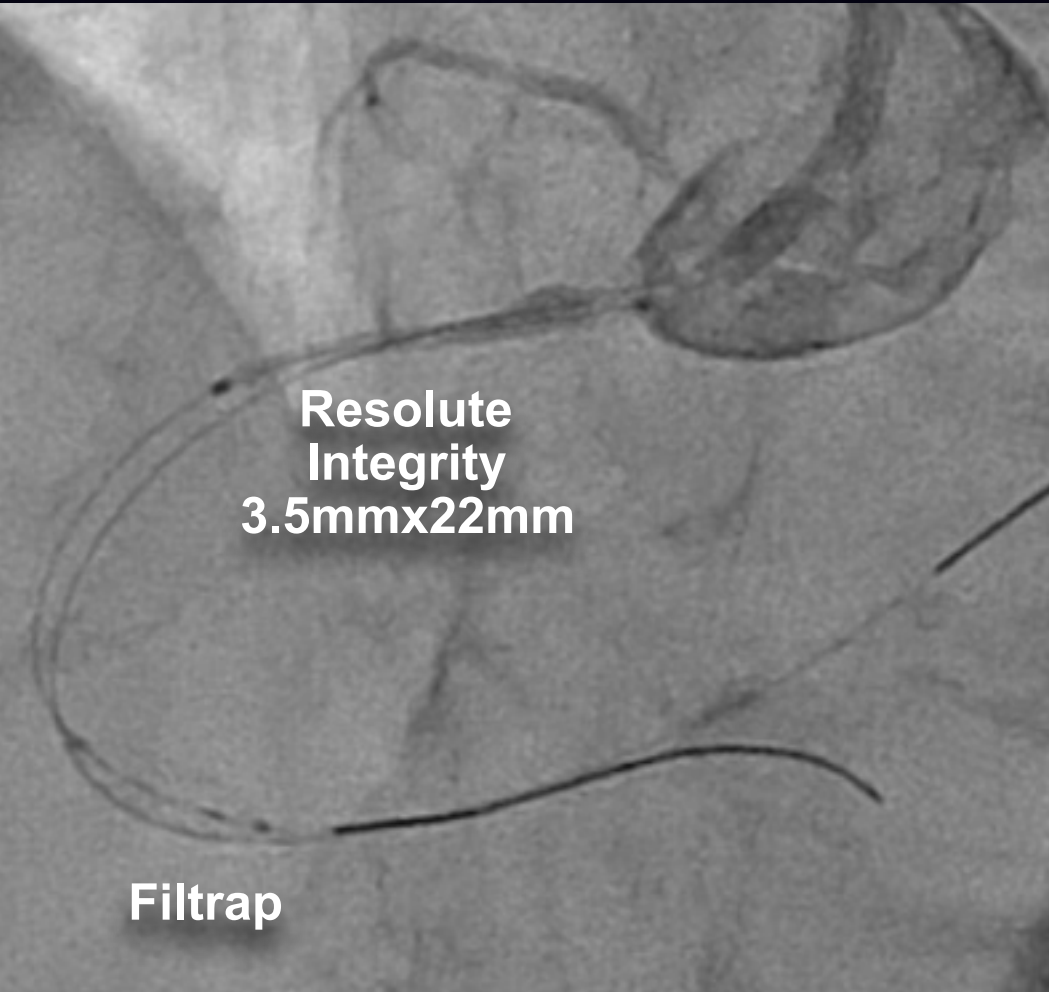


IVUS

GC: SherpaNX Balanced 7Fr JR4SH Wire: SION blue Other: 5.0mm Filtrap

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Stenting under distal protection



Angiogram post stenting



So Next...

What should we do after RCA intervention?

If successfully finished...

*Distal embolism,
Slow/no reflow,
etc...*



**LCA
intervention**

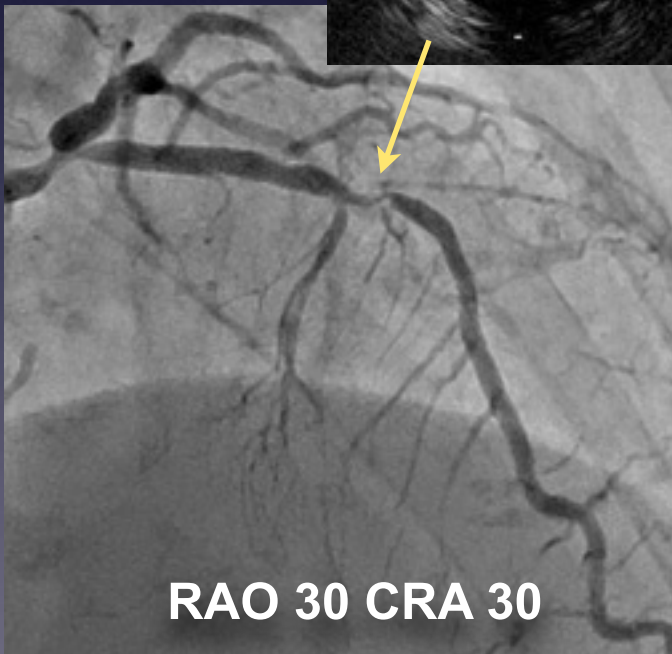
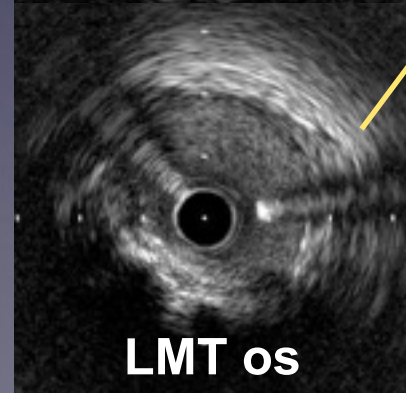
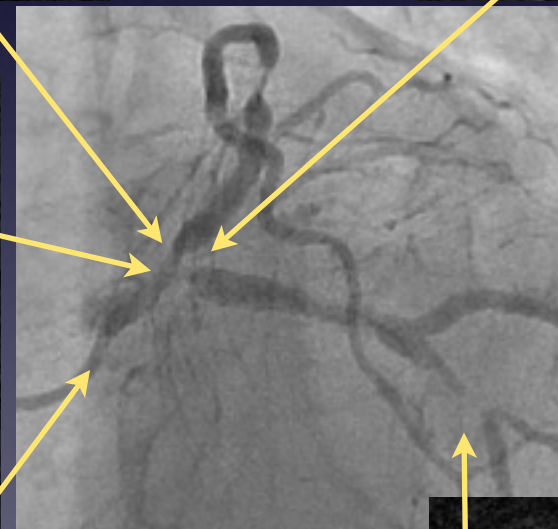
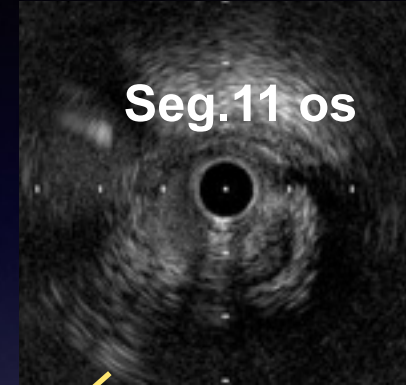
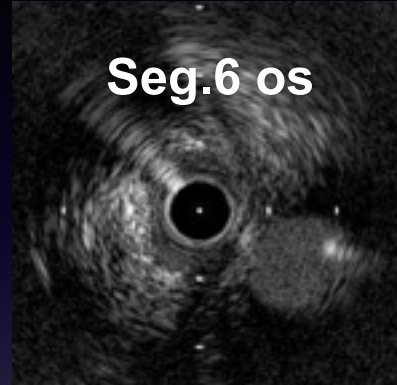
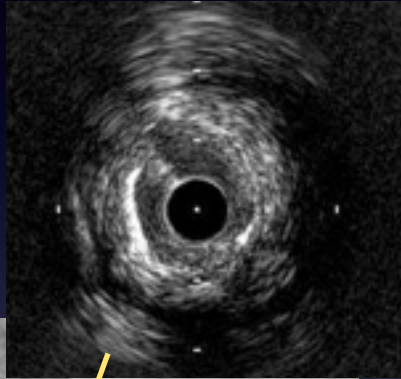


IABP, PCPS

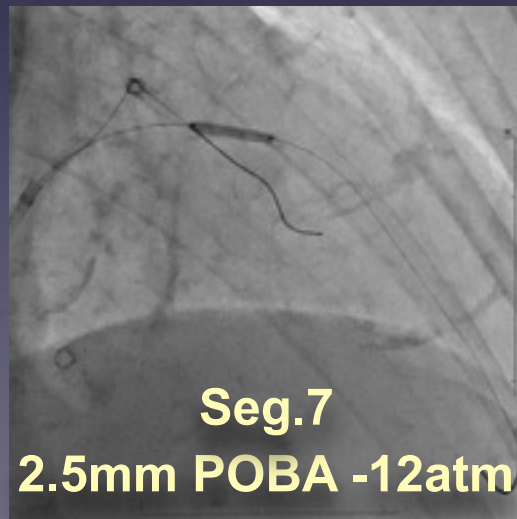
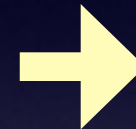
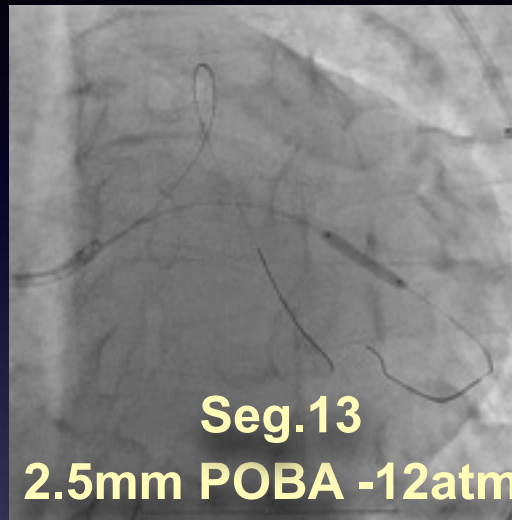
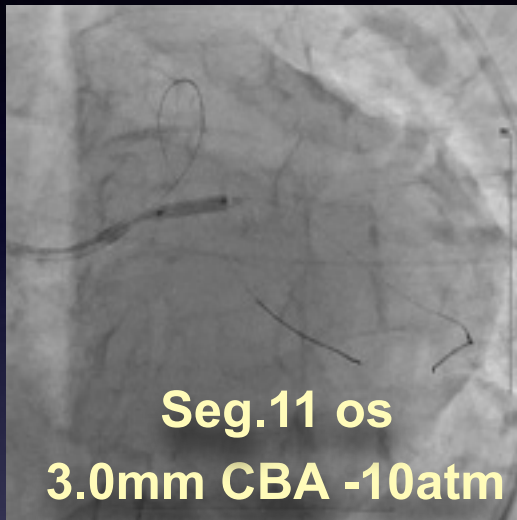


Pre procedural IVUS (LCA)

GC: SherpaNX Balanced
7Fr JL4SH

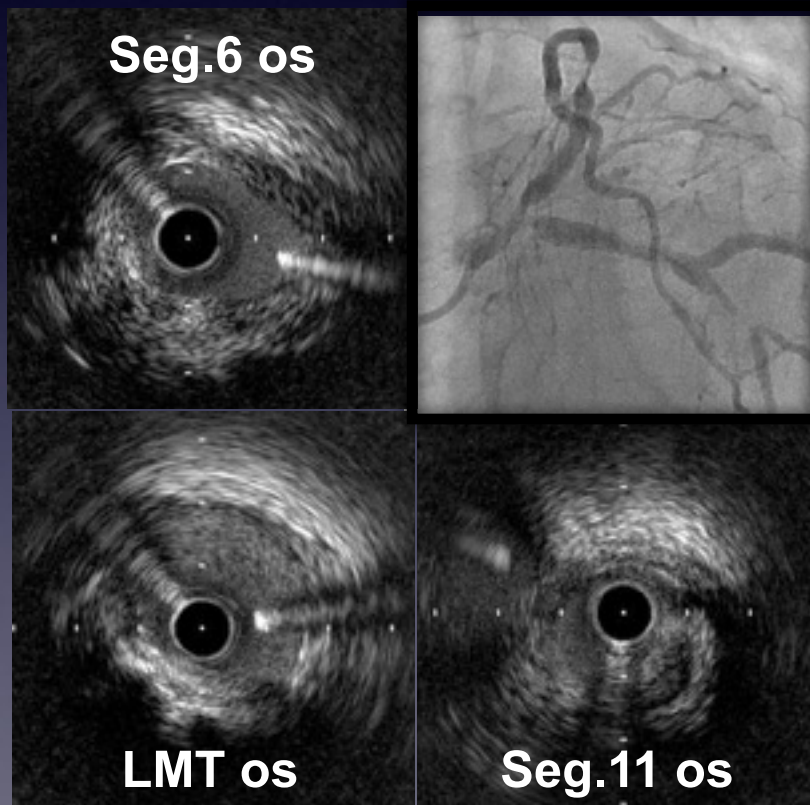


PCI procedure (LCx & LAD)



Before treating LMT

What is the most suitable stenting for LMT lesion?



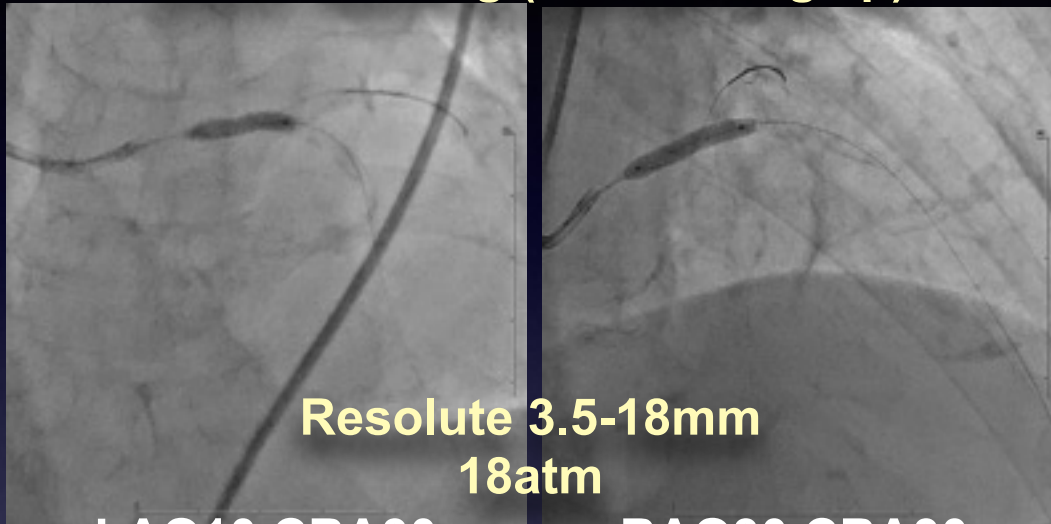
- ✓ Both ostium (LAD and Cx) should be covered by the stent. (Because both LAD and Cx has large territory.)
- ✓ Two-stent strategy is mandatory.
- ✓ T-stenting, mini-Crush, or Culottes
- ✓ The angle is about 60 degree.



mini-Crush

Mini-Crush stenting for LMT

Direct stenting (LMTos~Seg.6p)



Resolute 3.5-18mm
18atm

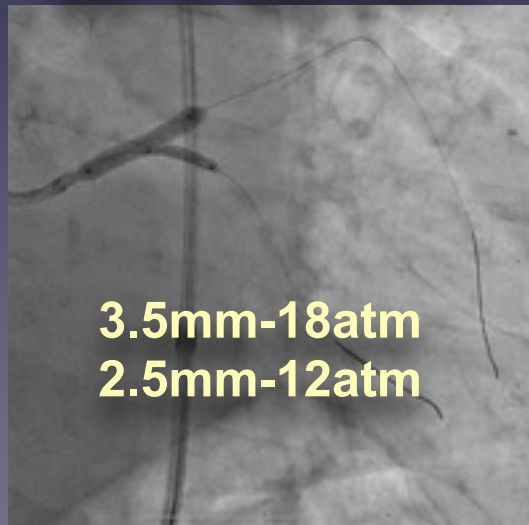
LAO10 CRA30

RAO30 CRA30

wire recross

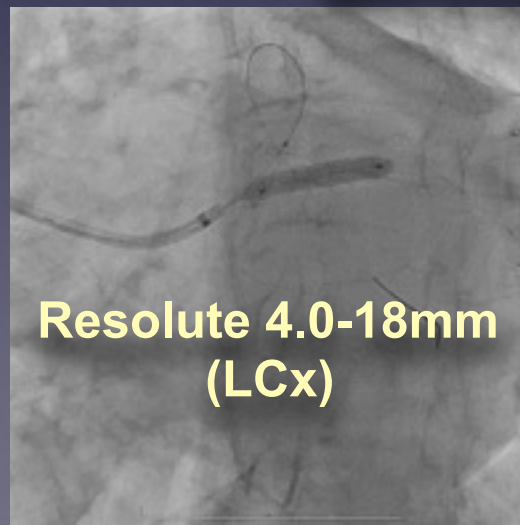


KBT to Seg.5-6/11

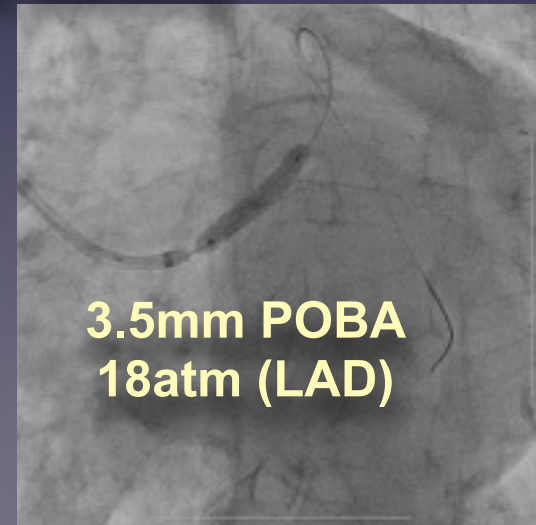


3.5mm-18atm
2.5mm-12atm

Mini-crush stenting



Resolute 4.0-18mm
(LCx)



3.5mm POBA
18atm (LAD)

Final CAG (LCA)

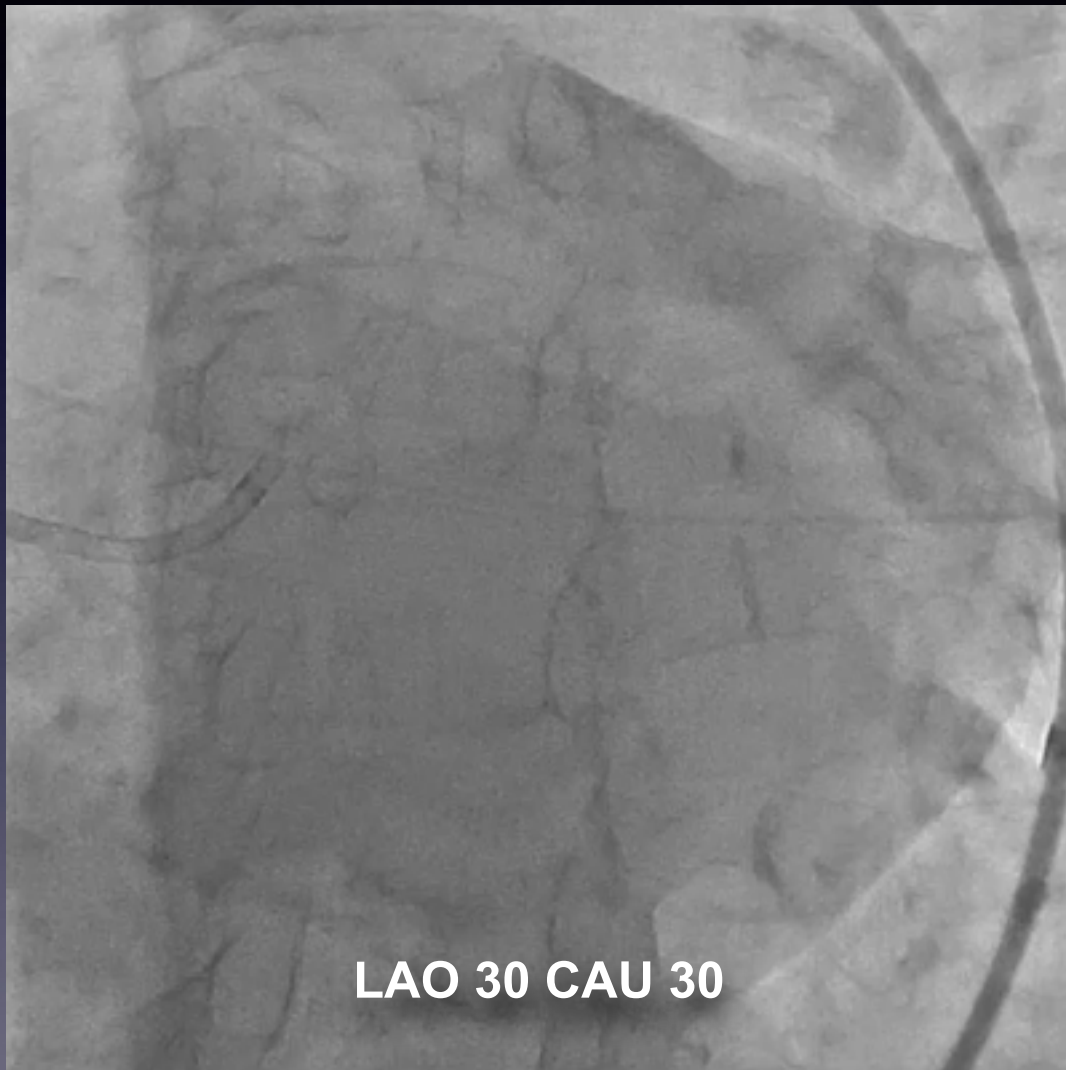


RAO 30 CAU 30



RAO 30 CRA 30

Final CAG



Total fluoroscopy time

43min

Total Contrast volume

150ml

Clinical course after procedure

Peri-procedural period : no elevation of cardiac enzymes

Post 1 week : ST-T abnormalities recovered completely

Post 2 weeks : SAT(-), EF improved up to 61%

Case summary

- ✓ We have experienced a case of 80's female with non-ST-elevation acute coronary syndrome who needed non-cardiac surgery.**
- ✓ Coronary angiogram showed LMT+3VD including ACS lesion in RCA.**
- ✓ We successfully performed this complex PCI with minimum fluoroscopy time and minimum contrast volume without deteriorating the hemodynamics.**

Management of 'Complex PCI'

- Patients with depressed LV function, only remaining circulation and/or large amount of myocardium at risk identify a very high risk patient population for intraprocedural complications.
- The risk assessment and preparation prior to PCI is the key to success in performing complex PCI.

This is the solution for Complex PCI:

Make It Simple!