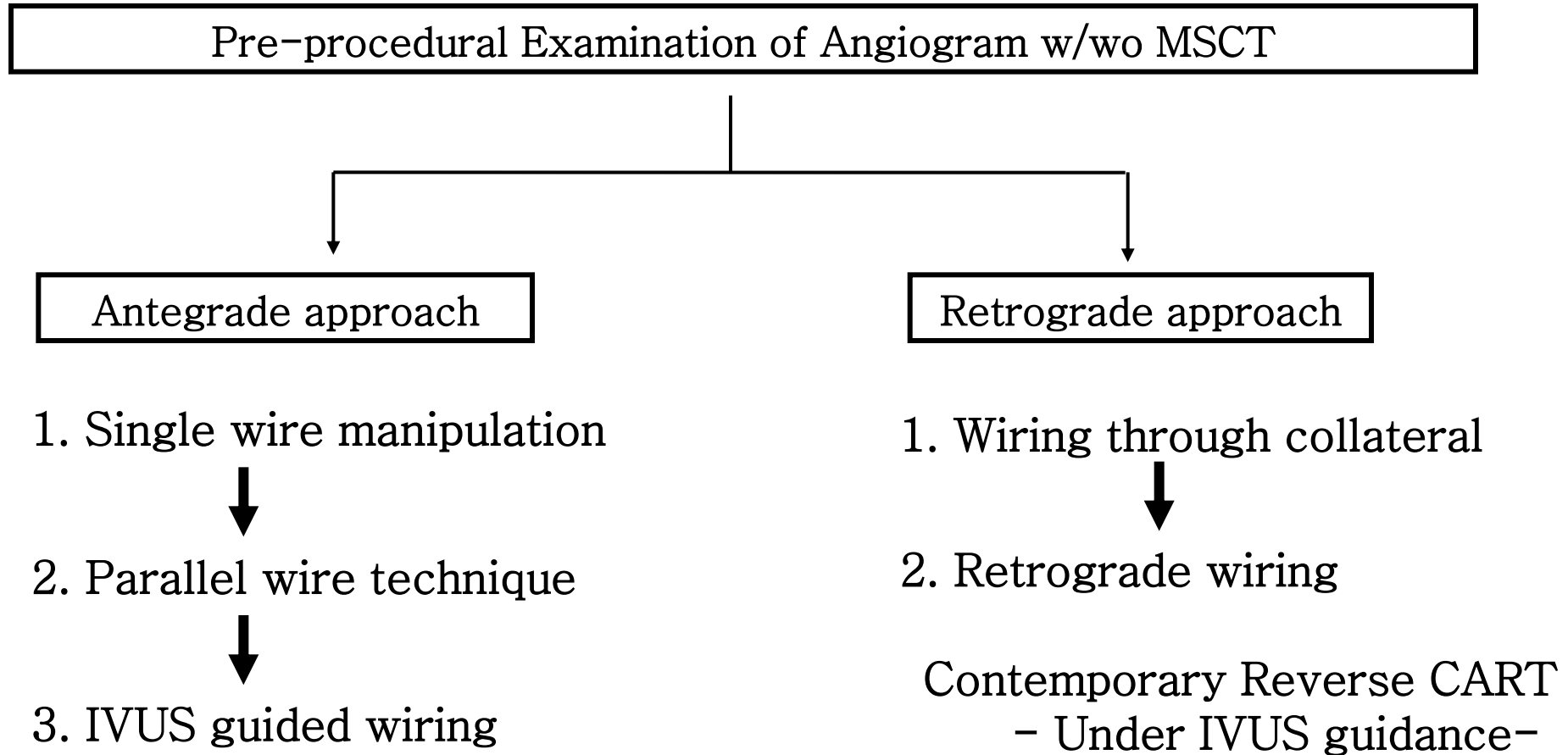


# Invited Case presentation & Focus review: CTO

Yasumi Igarashi M.D. Ph.D.

JCHO Hokkaido Hospital

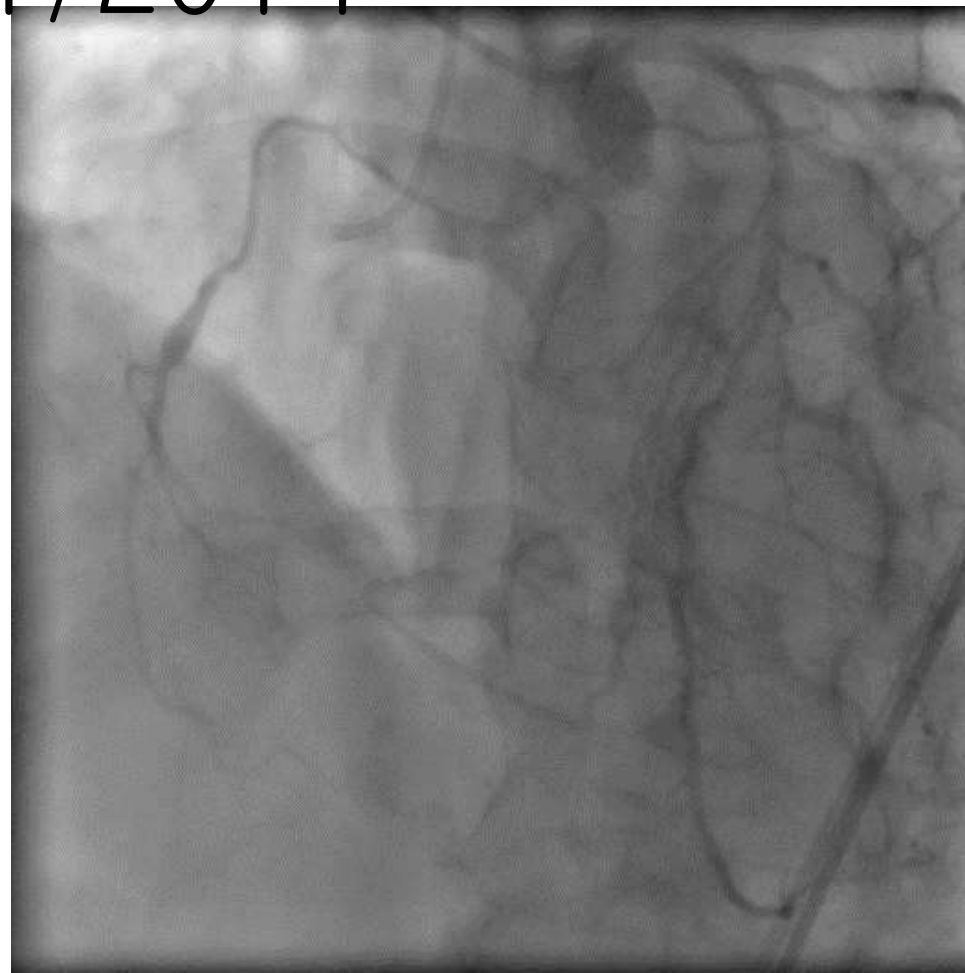
# Flow chart of Current CTO PCI Strategy



- Case 70's male
- Effort Angina (CCS II)
- Risk factors: HT, IDDM, Dyslipidemia, and Ex-smoker
- CKD stage III (e-GFR 40.8 )
- CAG RCA #1 100% #3 100%
- LVG EF 72%

# Control CAG findings(RCA)

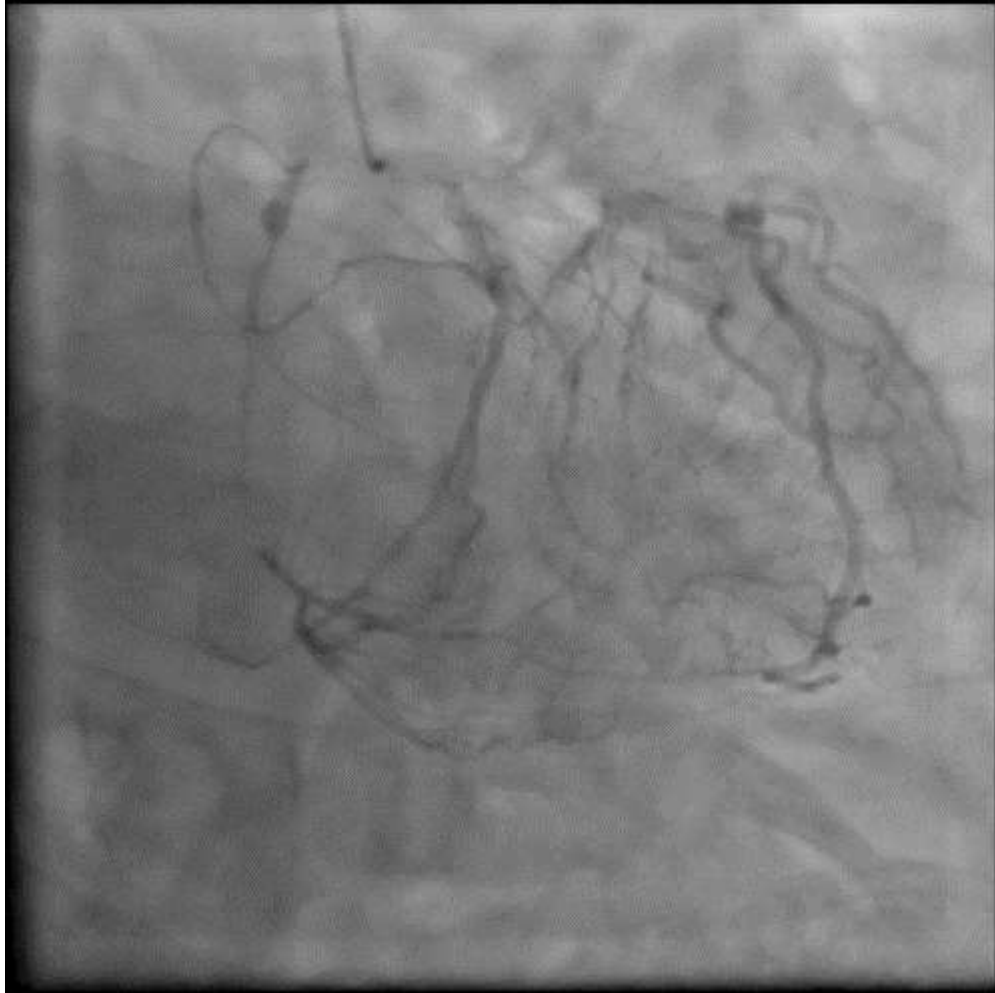
24/OCT/2014

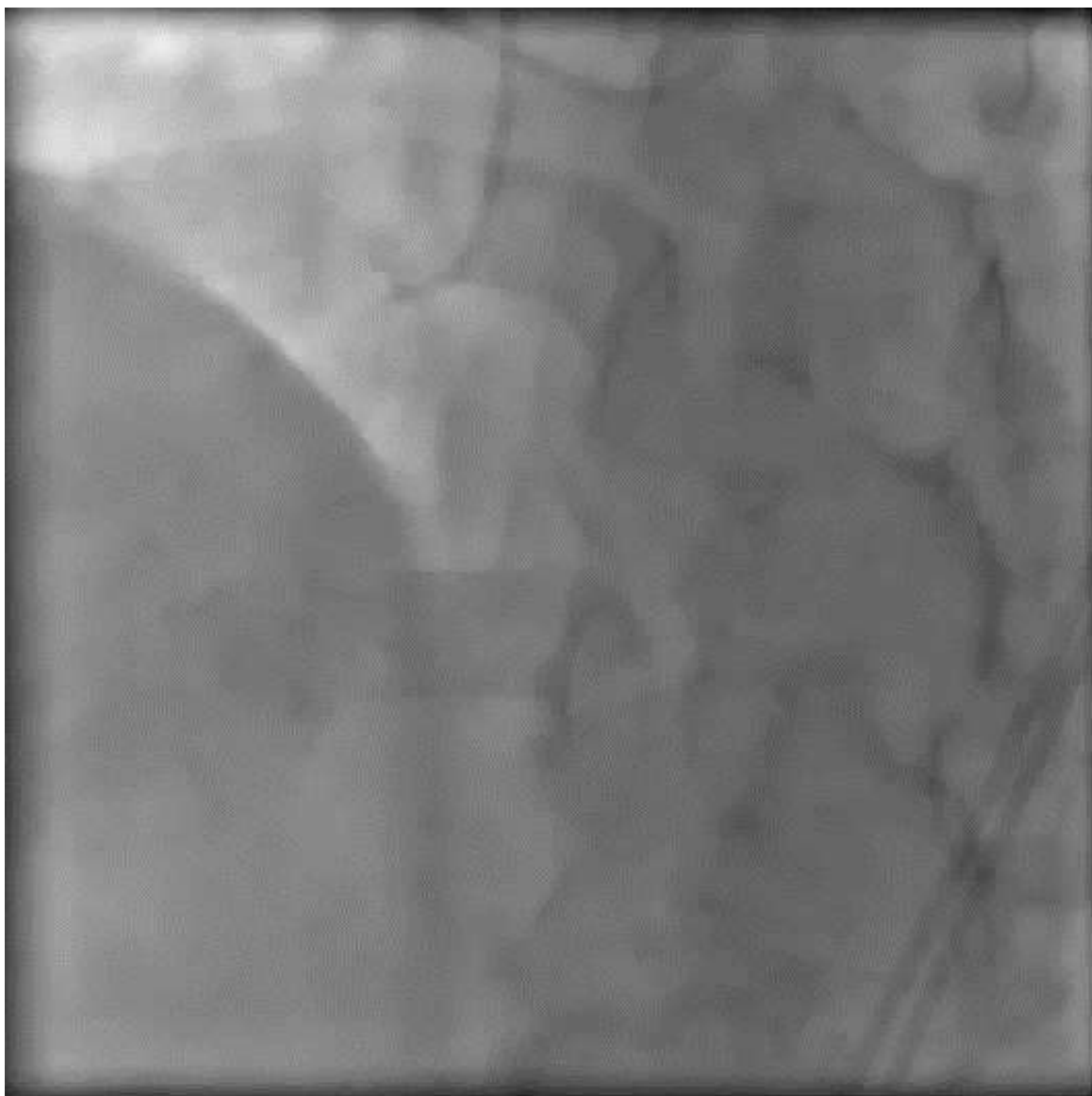


# Control CAG findings(LCA)



# Control CAG findings(LCA)





5785439  
203.00mm(180.92)  
20325: 304  
0.00  
5.26 for ECG Edit HP0.16  
HELICAL MODE

OGAWA KUNIO  
2014.10.31 16:09:18.312  
120kV/ 17mAs  
1.22s/0.62mm



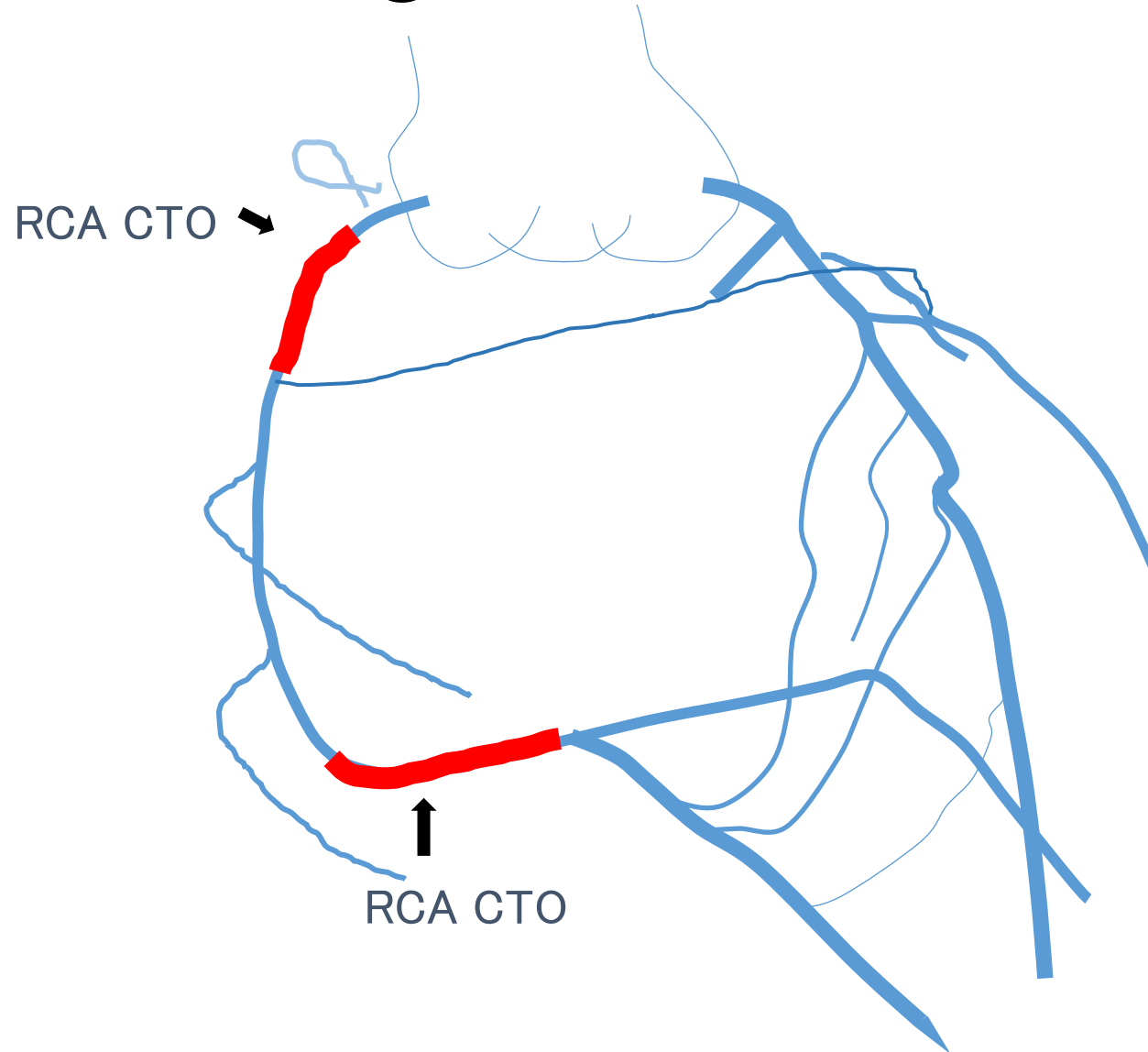
iopamiron370  
Optima CT660

F

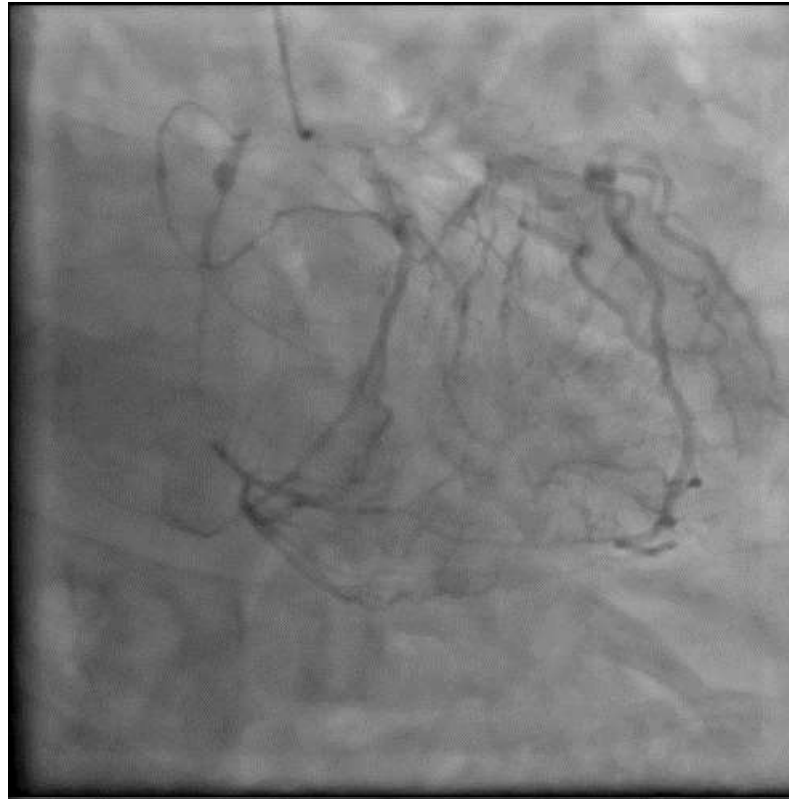


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# Whole Image of the Coronary Tree

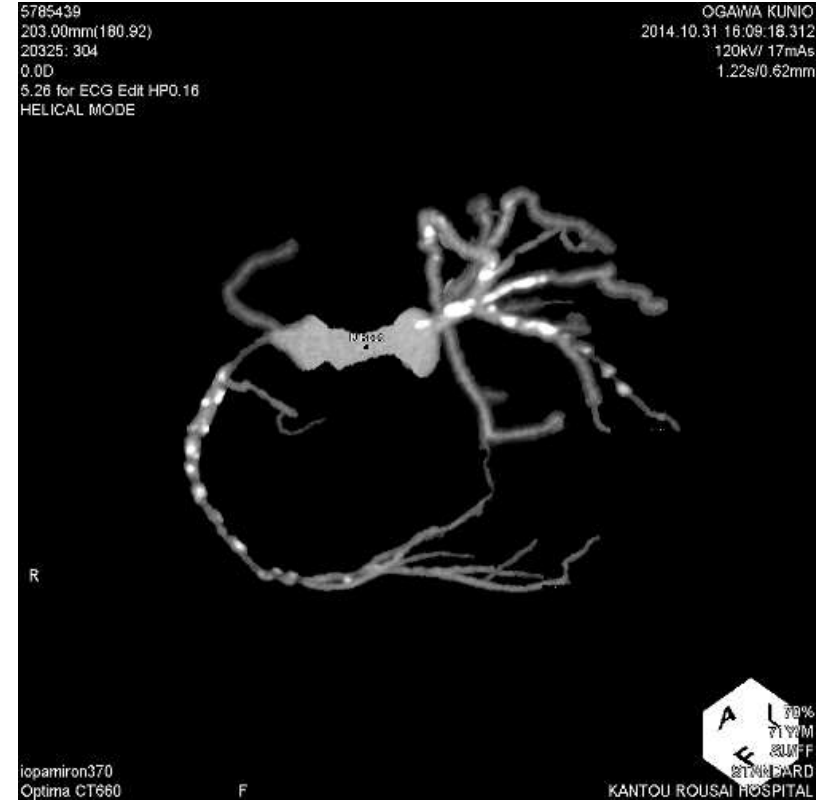
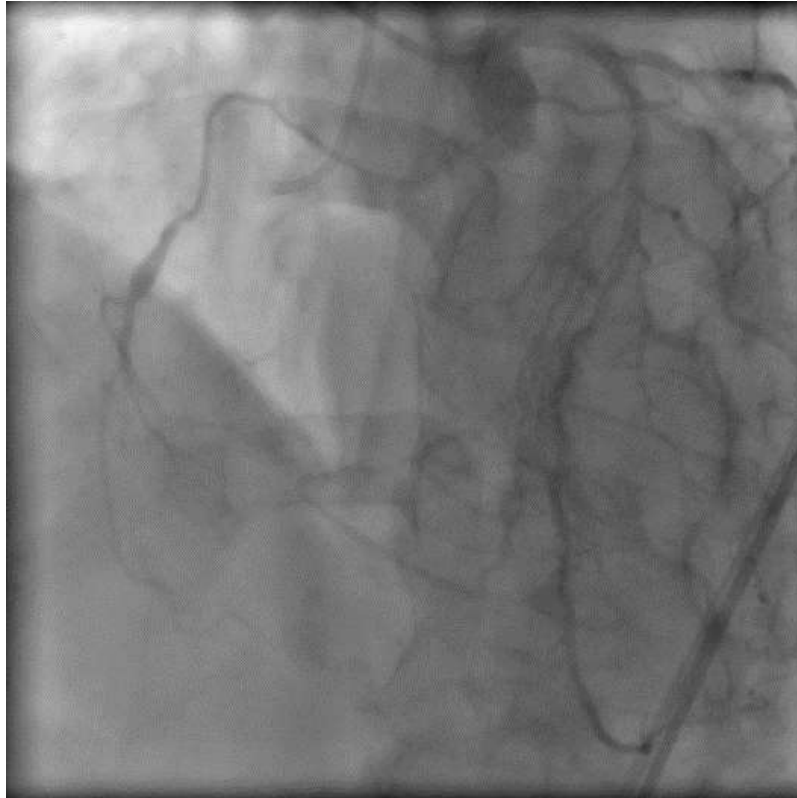
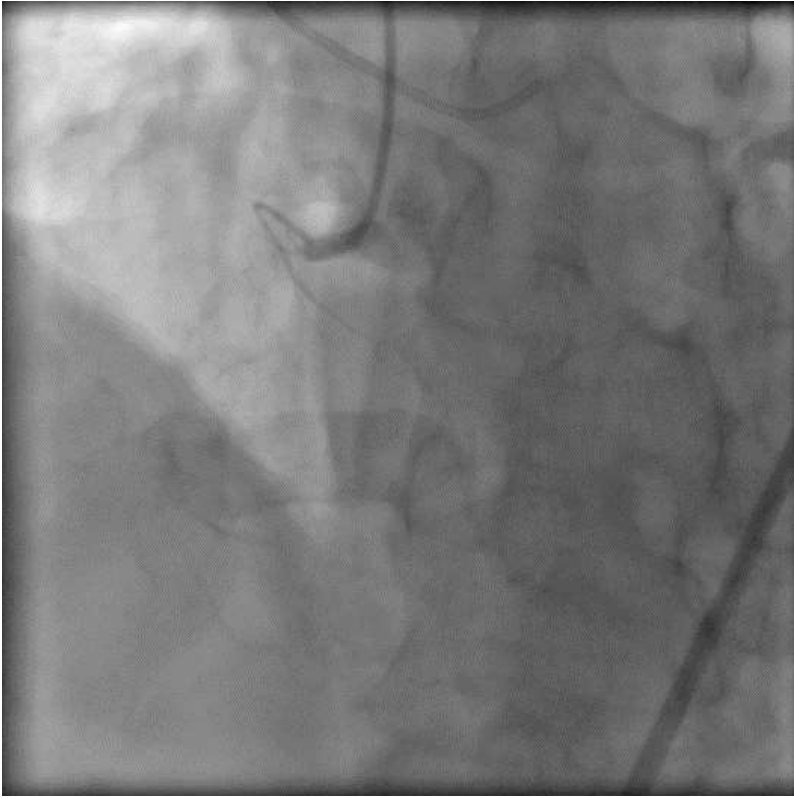






## Proximal CTO

- Short lesion(<10mm)
- Stump
- Slight bending
- Poor distal target
- Collateral supplied from CTO exit branch
- Calcified exit

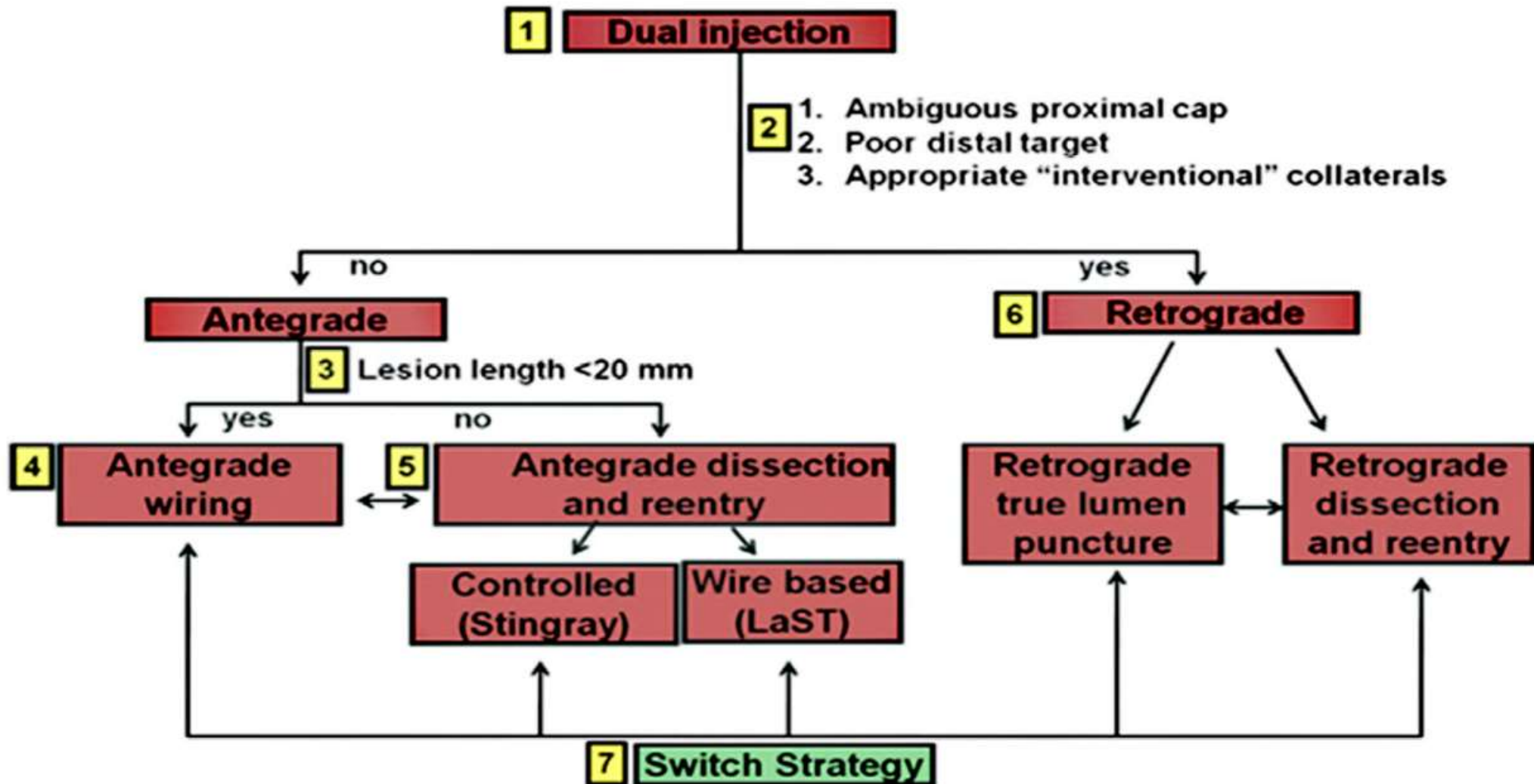


## Distal CTO

- Short lesion(<20mm)
- Tapered cap

- bifurcated exit
- Calcified entry

# Hybrid Strategy



# My Strategy

- Retrograde approach for distal CTO from LAD septal connection
- Antegrade approach for distal CTO from LCX-LA-RCA connection
- Reverse CART, original CART, KWT, or Knuckle wiring

If successful,

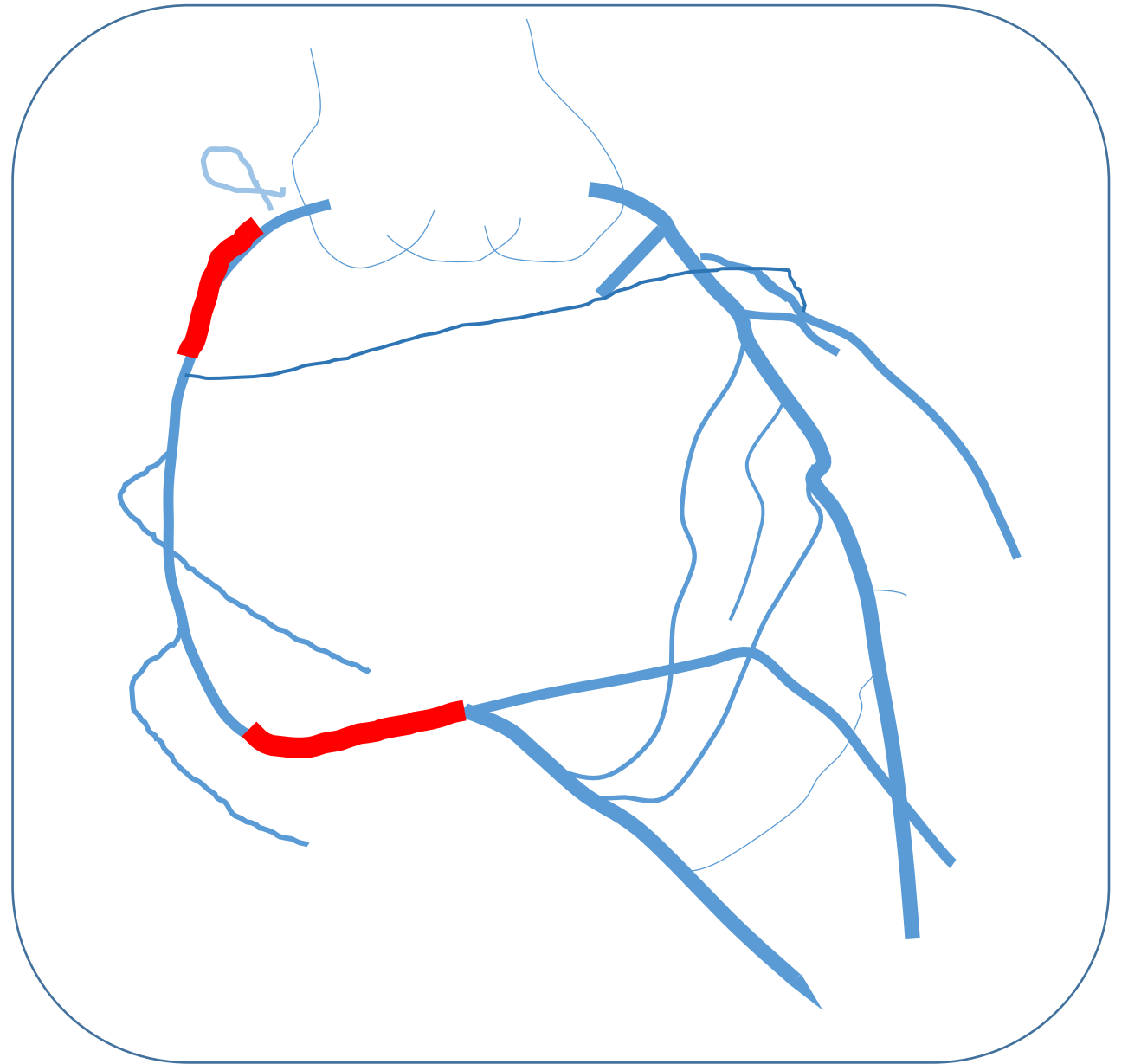
- Antegrade wiring for proximal CTO for reverse CART
- contemporary reverse CART

If failed,

- Antegrade wiring for proximal CTO(SWM,PWT)

If failed,

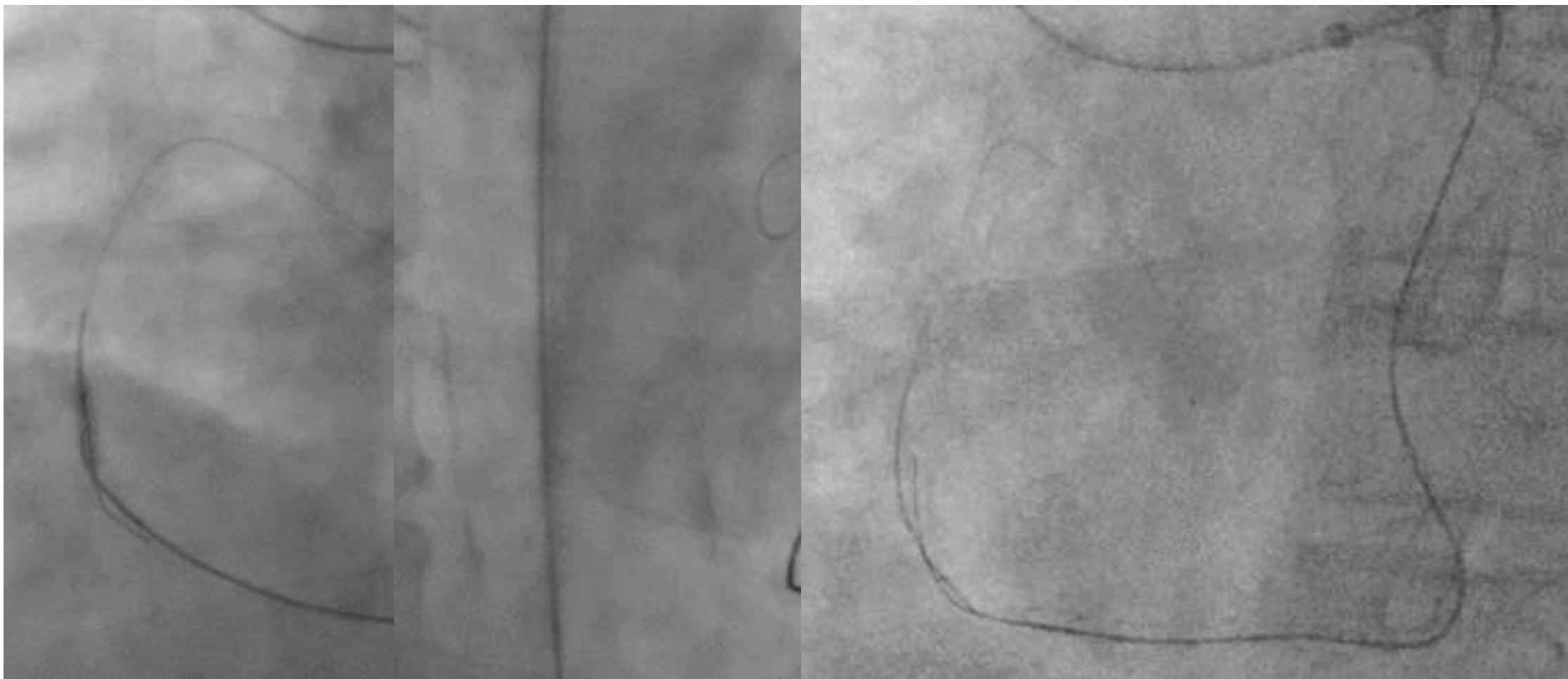
- Bilateral knuckle wire technique



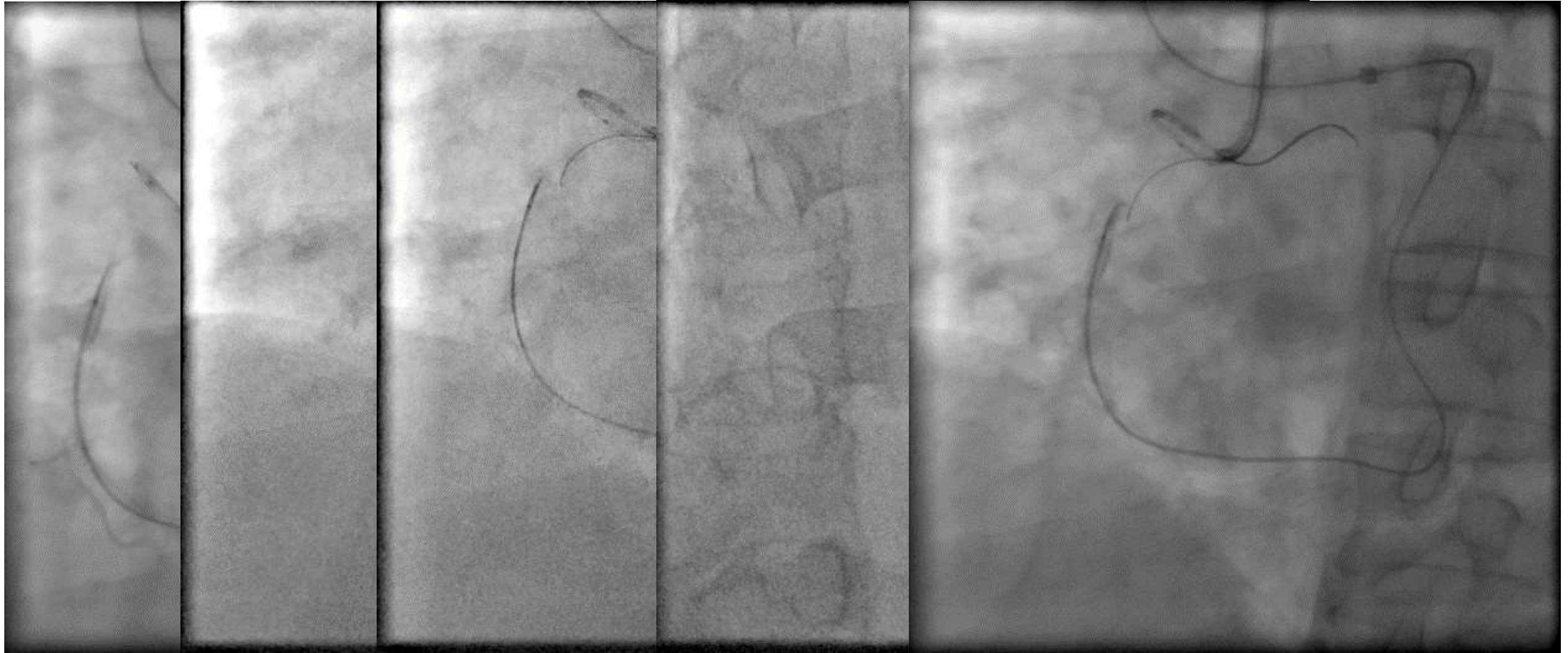
# Bilateral approach for distal CTO (1)



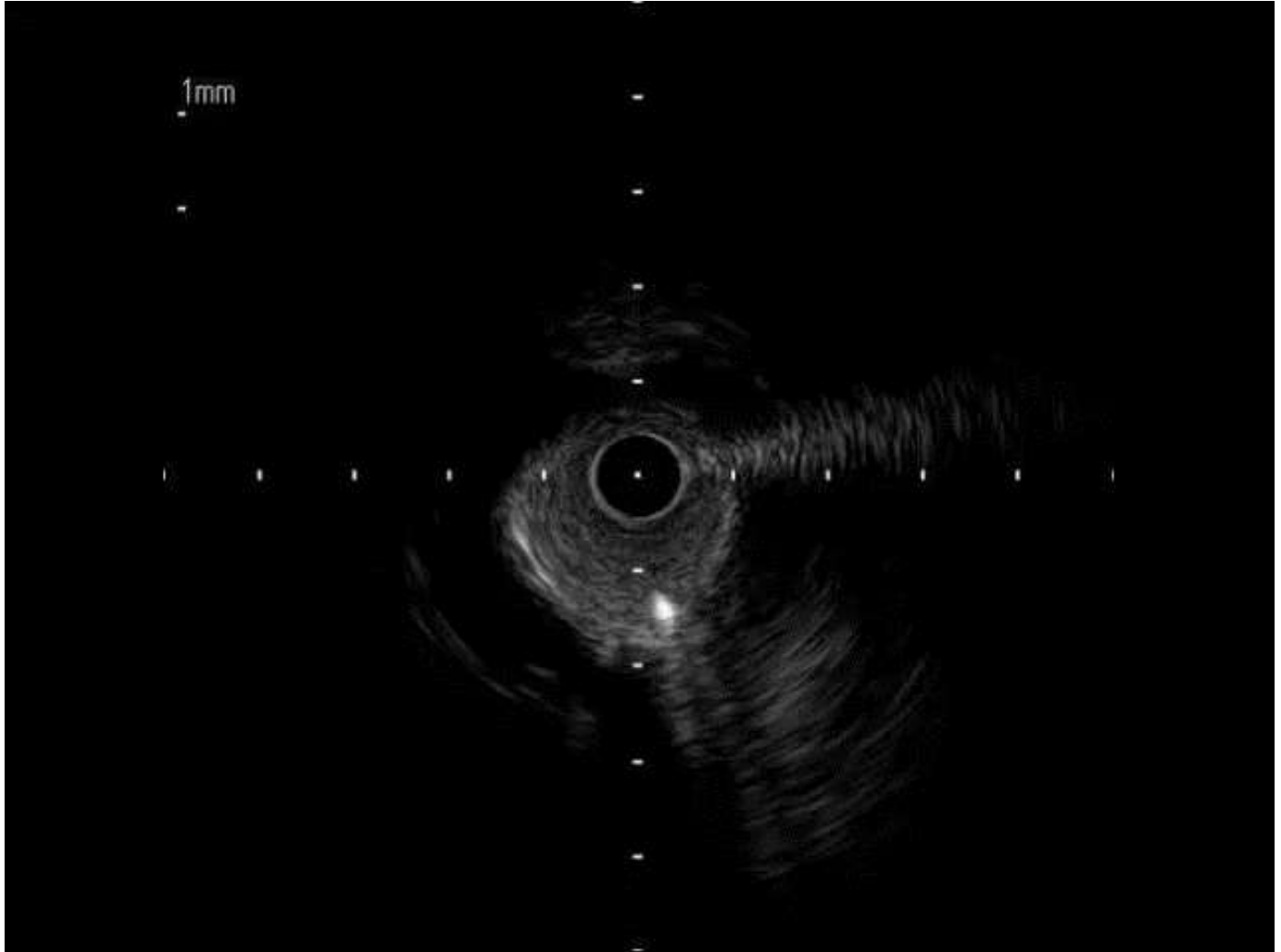
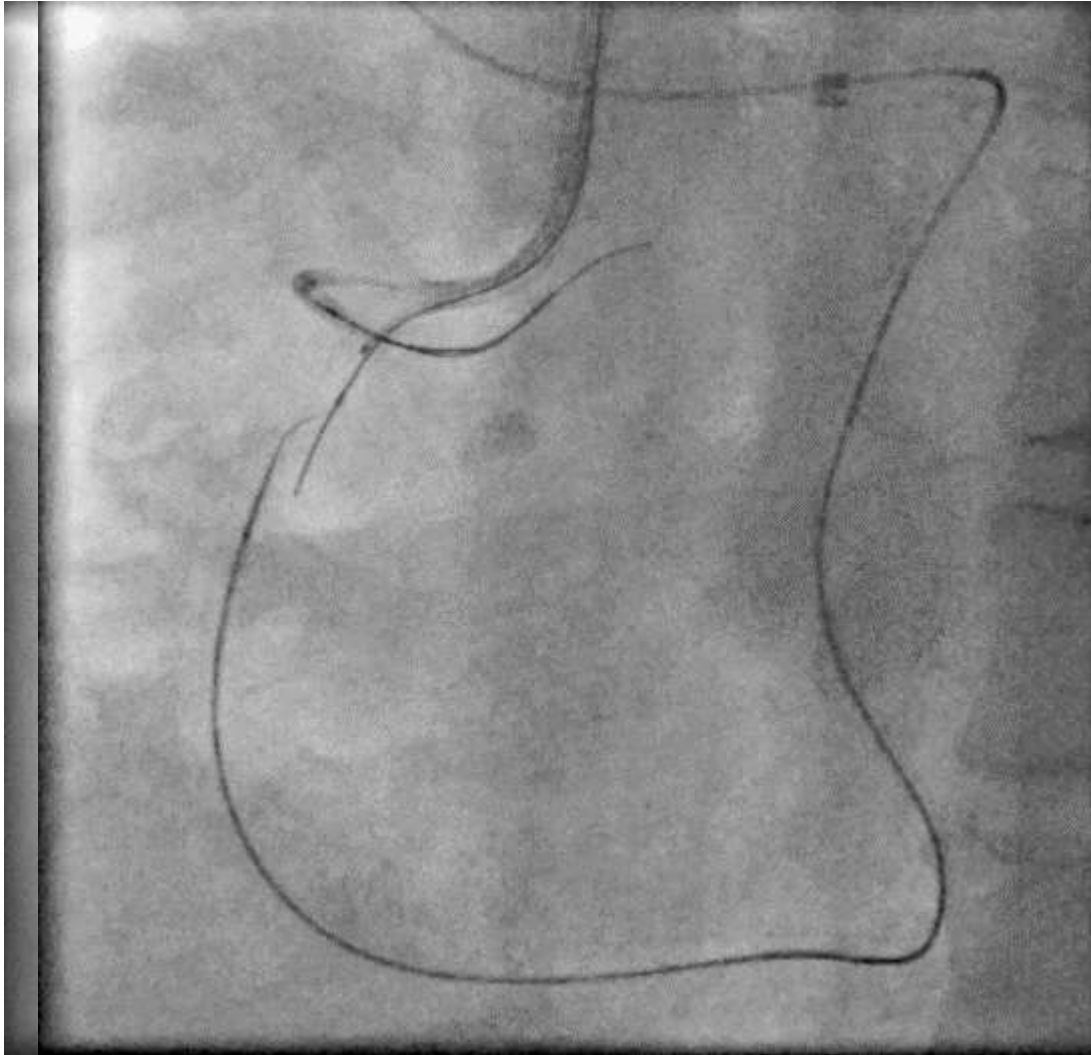
# Bilateral approach for distal CTO (2)



# Bilateral approach for proximal CTO (1)

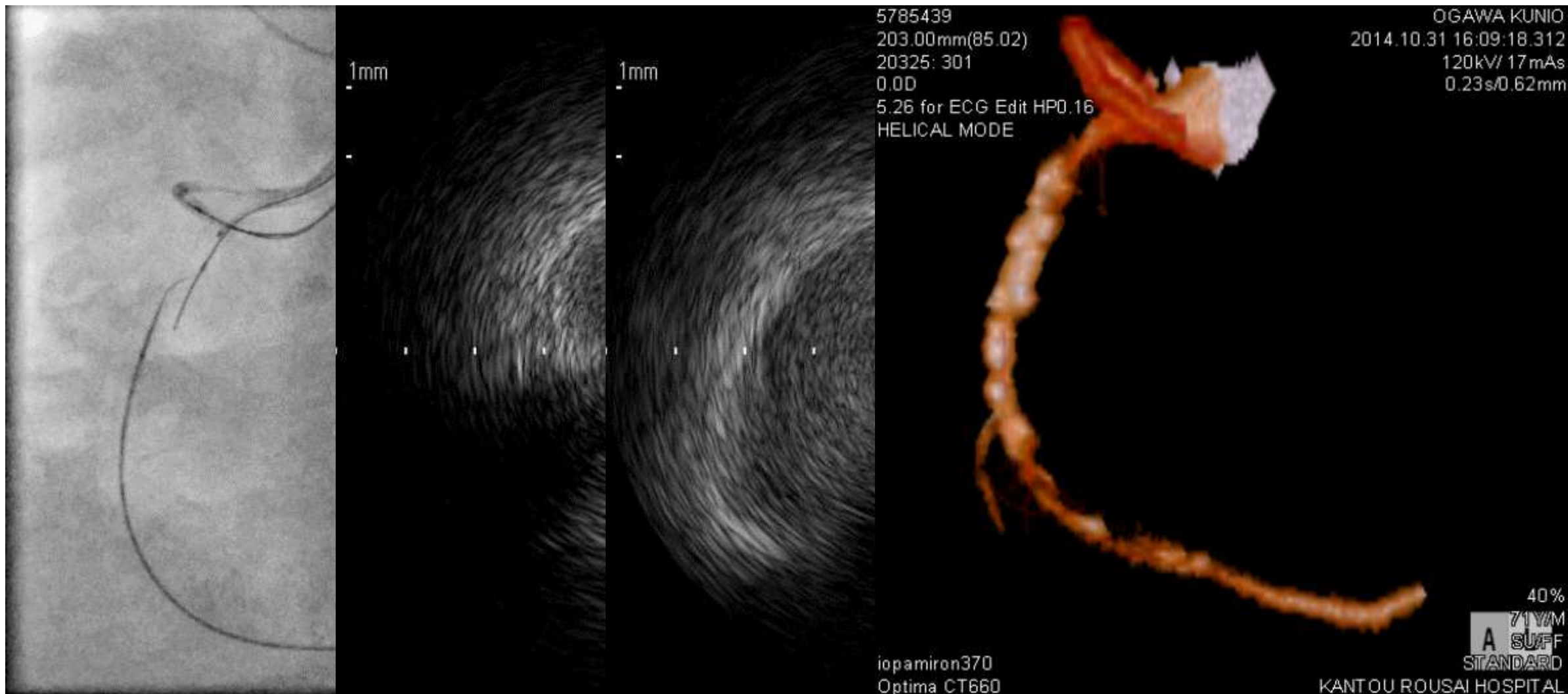


# Bilateral approach for proximal CTO (2)





# Procedure (4)



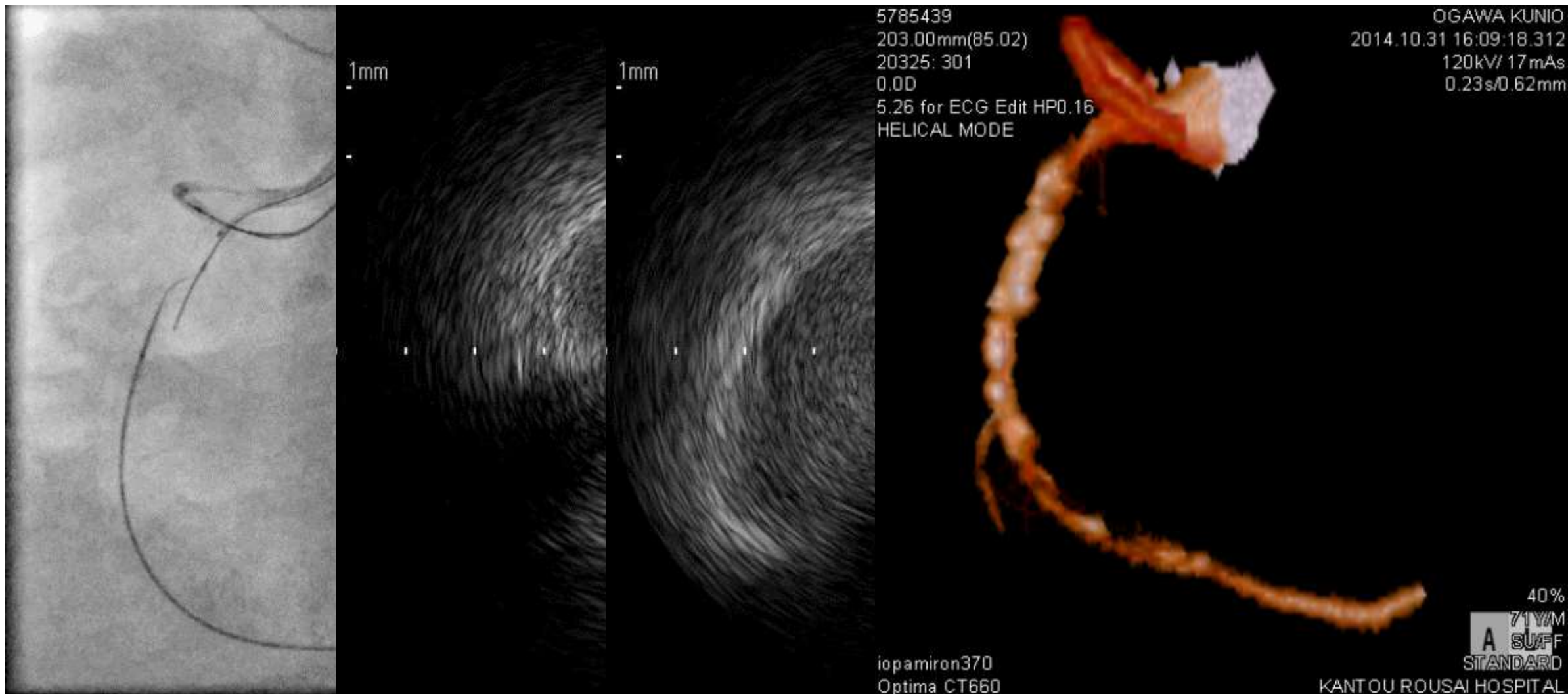
## Multivariate predictors of procedure failure in PCI for CTO

	Odds Ratio	p-Value	95% CI	Likelihood Ratio Test p-Value
Vessel bending, n	20.62	< 0.0001	4.72–90.09	< 0.0001
Vessel shrinkage, n	10.76	0.0078	1.87–62.05	0.0057
Severe calcification, n	4.54	0.0342	1.12–18.38	0.0307

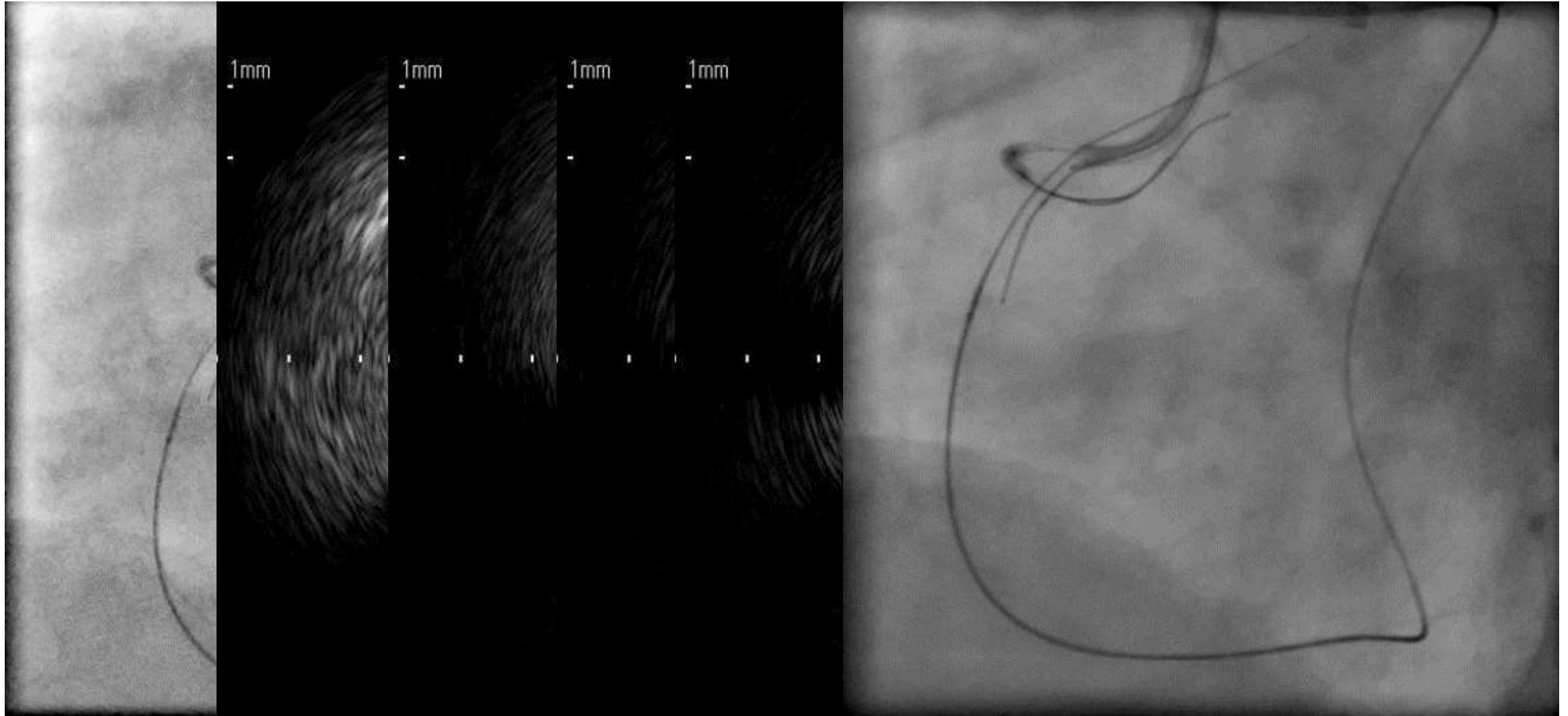
CI = confidence interval. The likelihood ratio test for the whole model was < 0.0001.

Mariko Ehara, Osamu Katoh, Takahiko Suzuki et al. Impact of Multislice Computed Tomography to Estimate Difficulty in Wire Crossing in Percutaneous Coronary Intervention for Chronic Total Occlusion. J Invasive Cardiol. 2009 Nov;21(11):575-82.

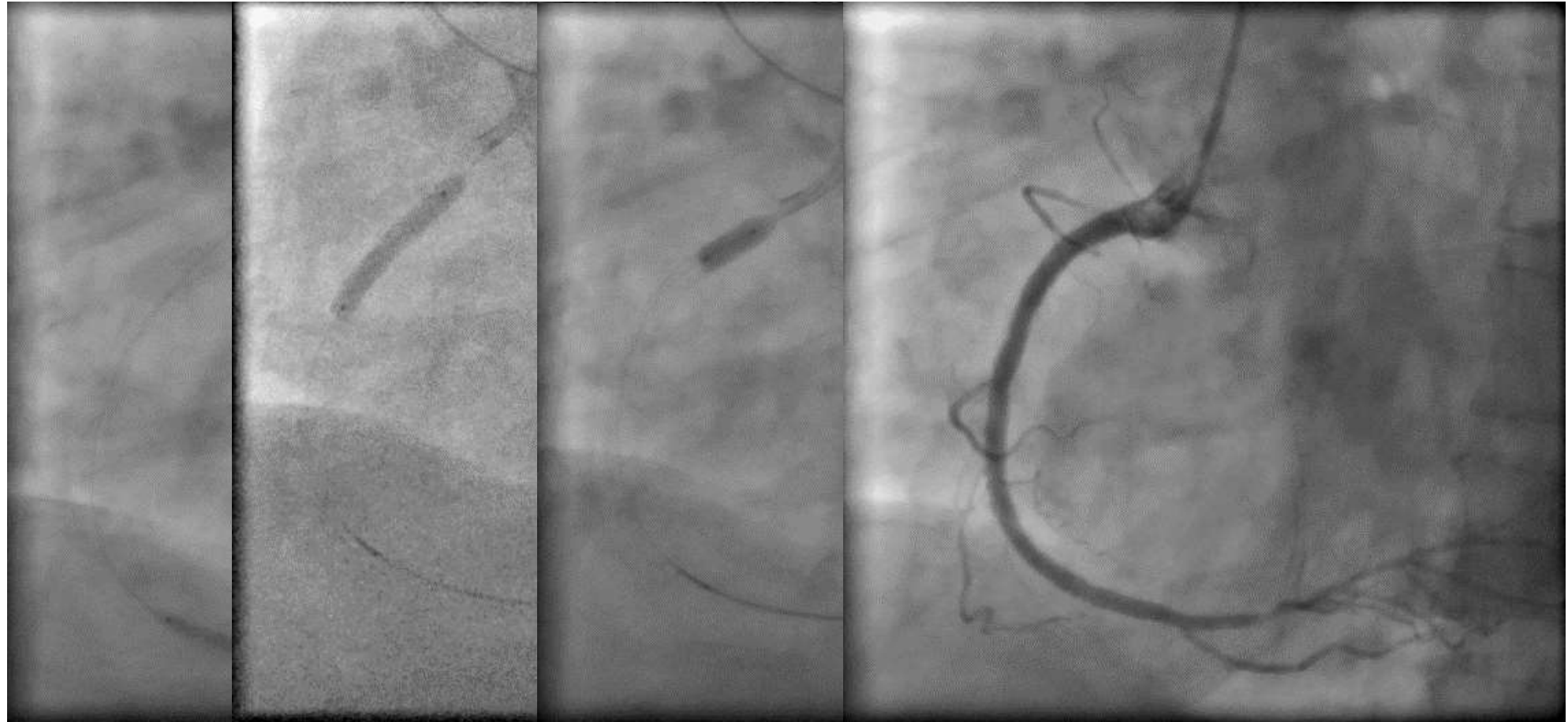
# Procedure (4)



# IVUS guided wiring



# DES implantation and Final CAG



Tailor made CTO strategy is necessary  
for complex CTO procedure!

# Take home message

- Pre procedural precise estimation of CAG and coronary CT is the first key step for successful CTO PCI.
  - 1) All collateral channels should be checked and judged available for retrograde approach or not.
  - 2) Vessel shrinkage finding is one of the significant predictor of CTO procedure failure. Operators can acquire this finding from only coronary CT before practice. Operator must care not only anatomy and calcium but vessel shrinkage findings from coronary CT.
- For long time patency we should avoid long segment subintimal tracking and stenting strategy.
- Coronary perforation is a common complication during CTO PCI procedure. Operators must pay attention and prepare how to manage against this unexpected complication.