A long RCA CTO with anomalous origin, involving multiple bifurcations

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Disclosure

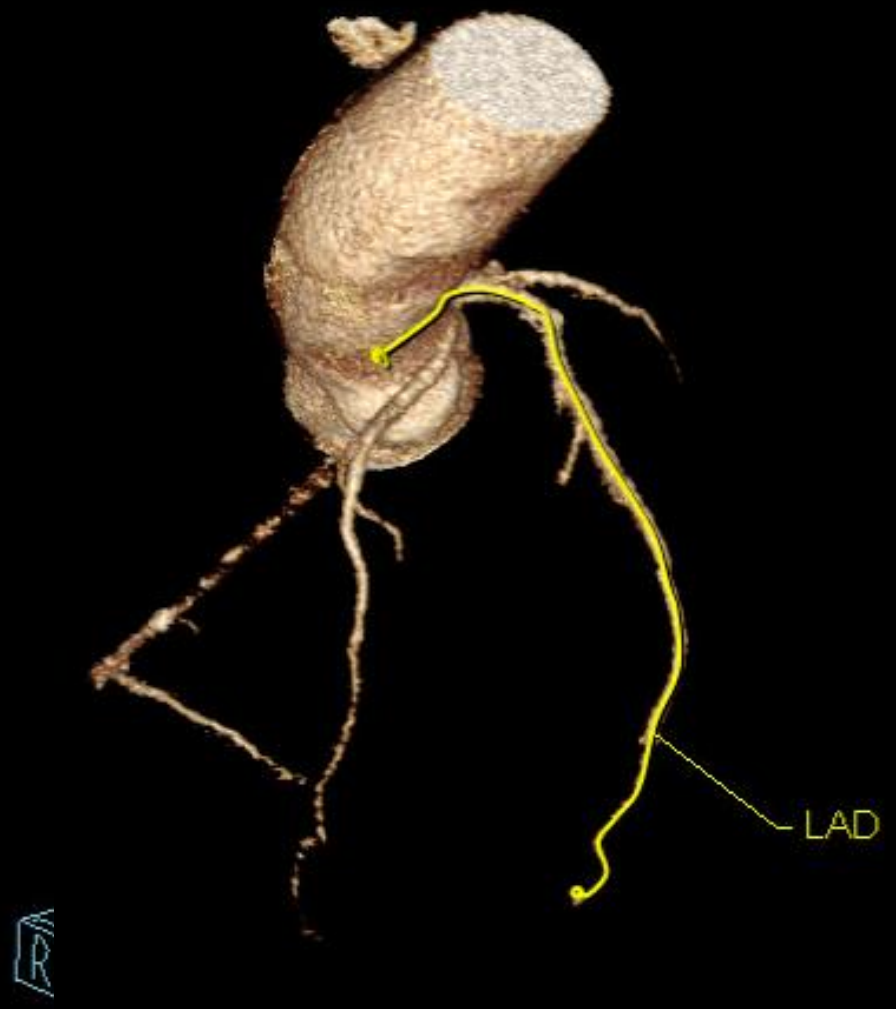
- No potential conflict of interest to report

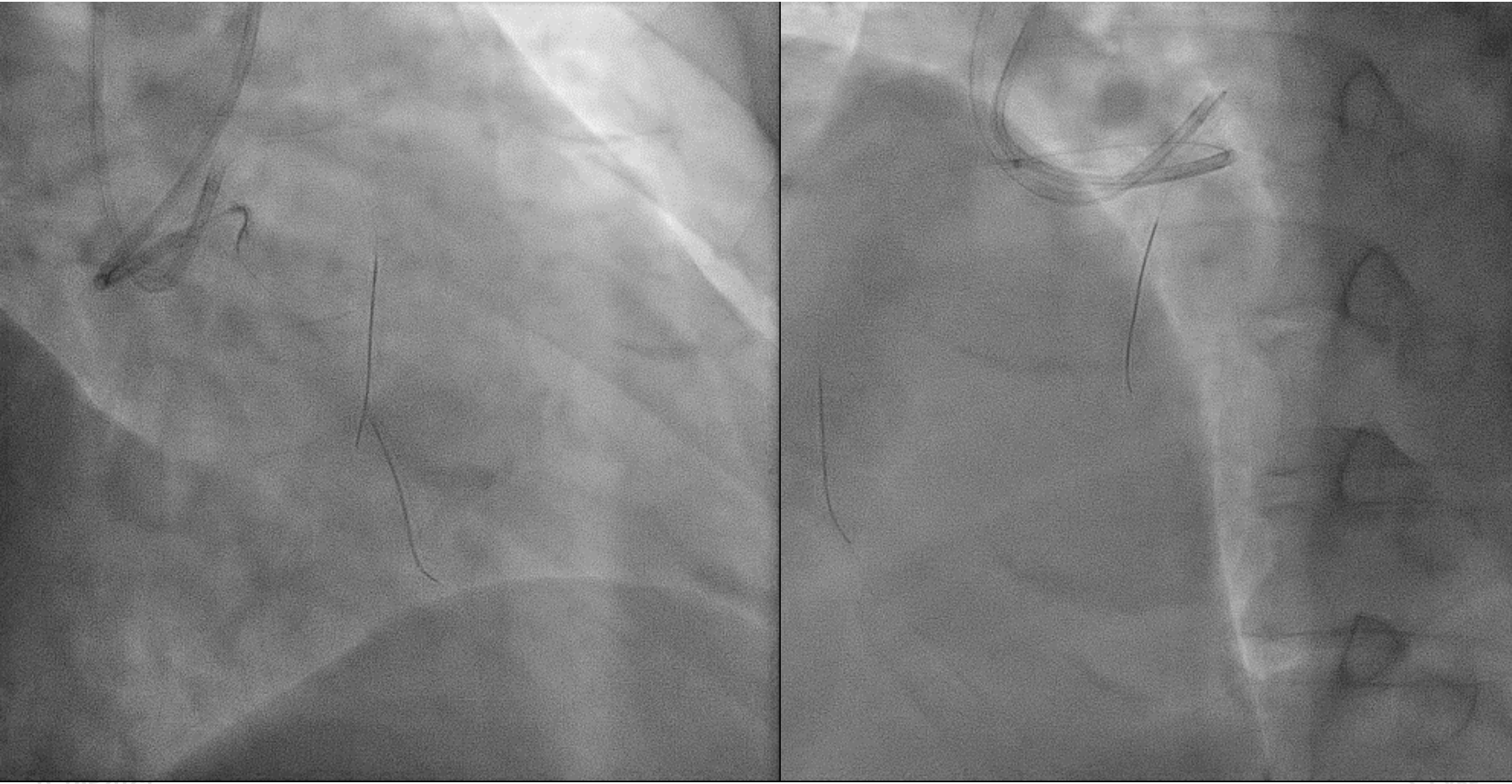
Basic information

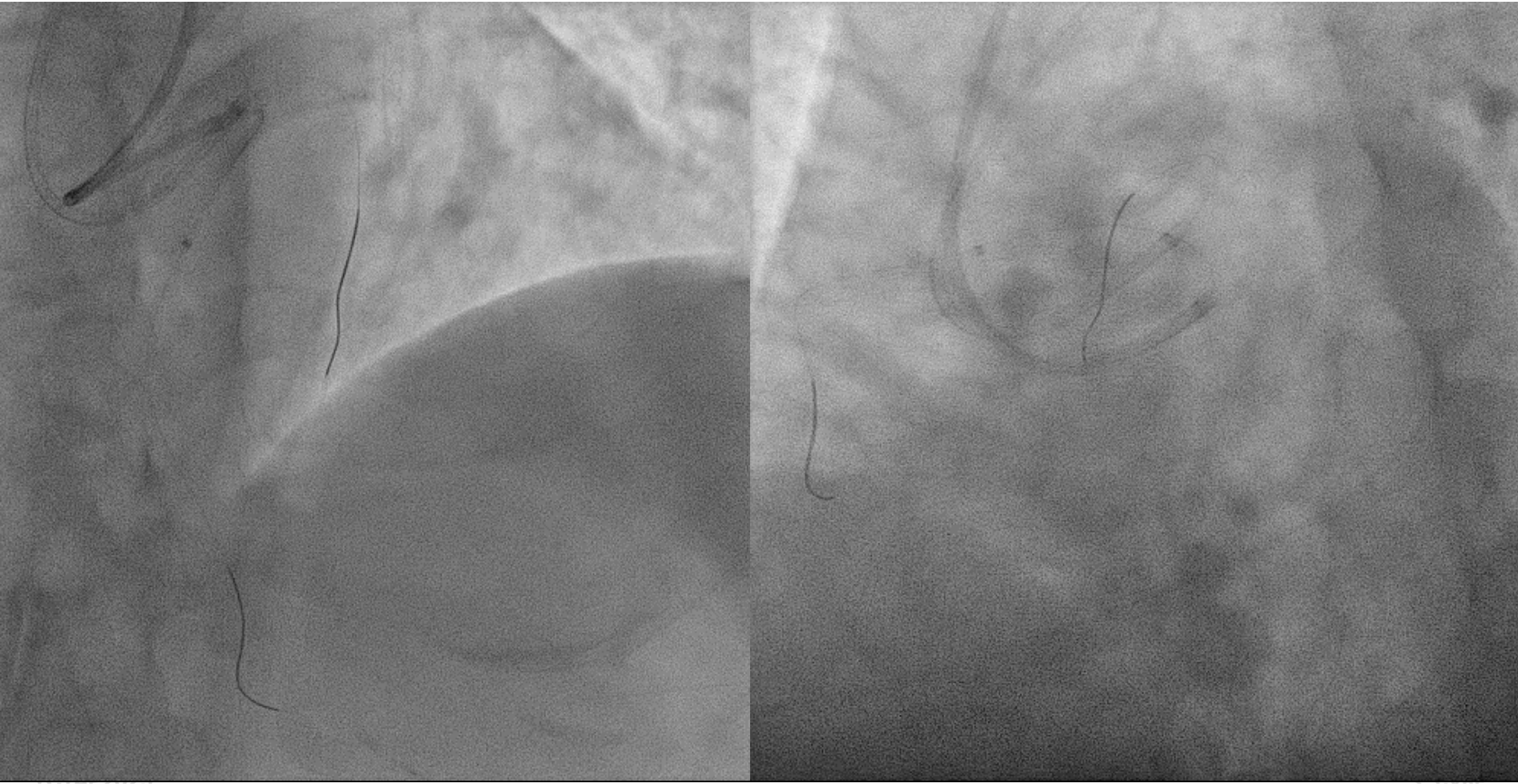
- **45** y/o **male** had progressive dyspnea for months
- PMx: hypertension, dyslipidemia, smoker

- ECG: sinus rhythm
- Treadmill exercise test: positive test for ischemia
- Echocardiography: Preserved LVEF
- Transferred to our hospital due to RCA CTO with anomalous origin

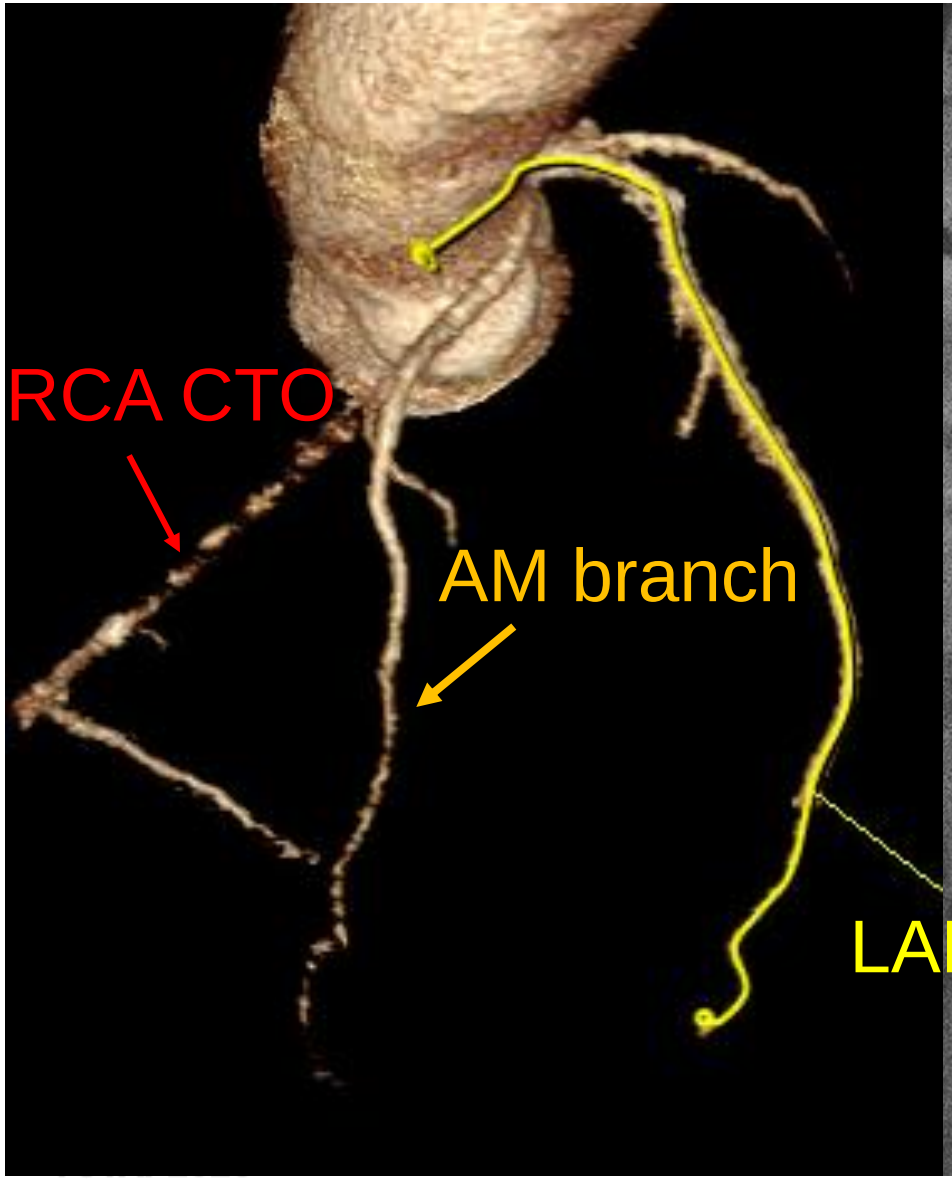

AM

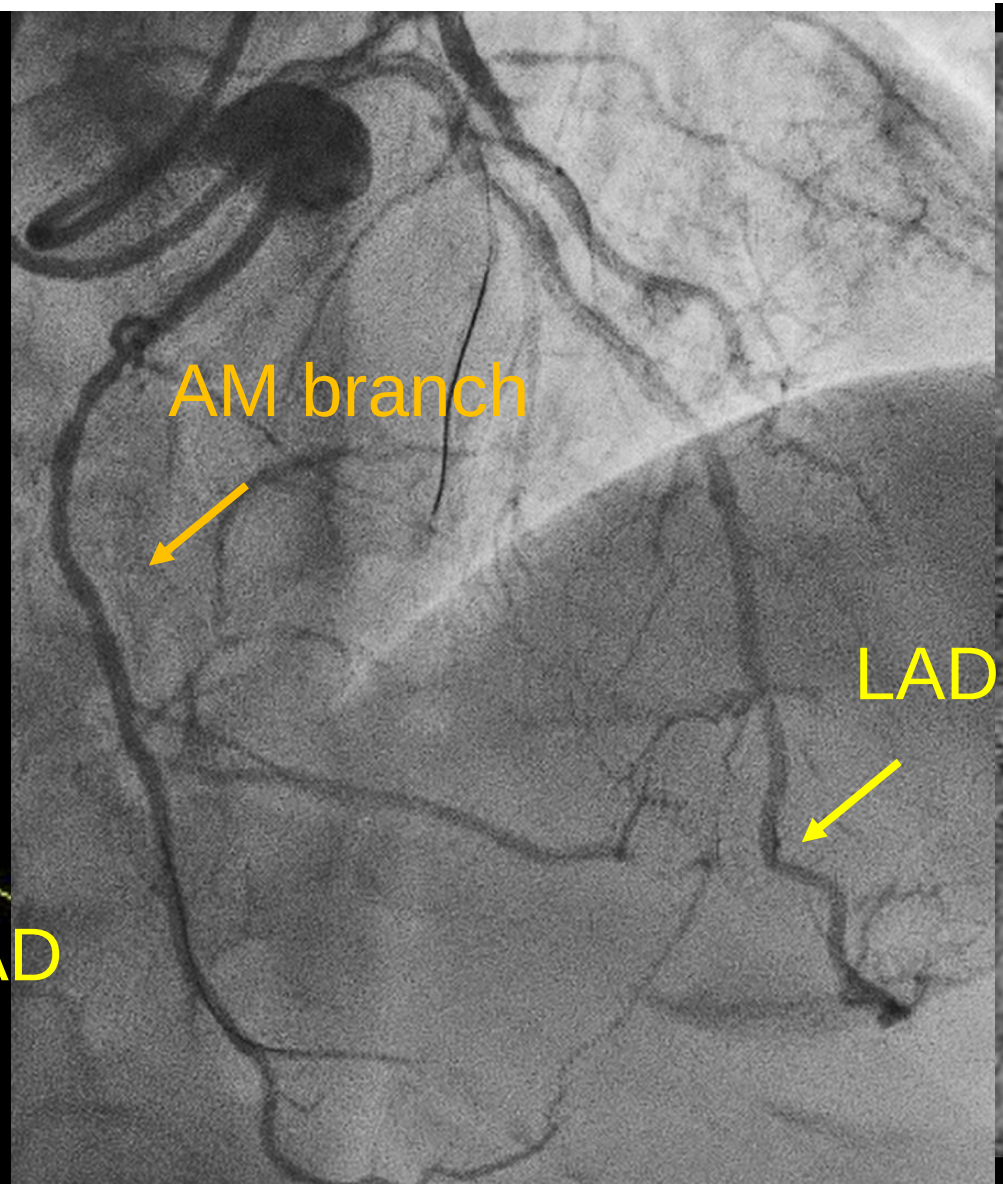

LAD

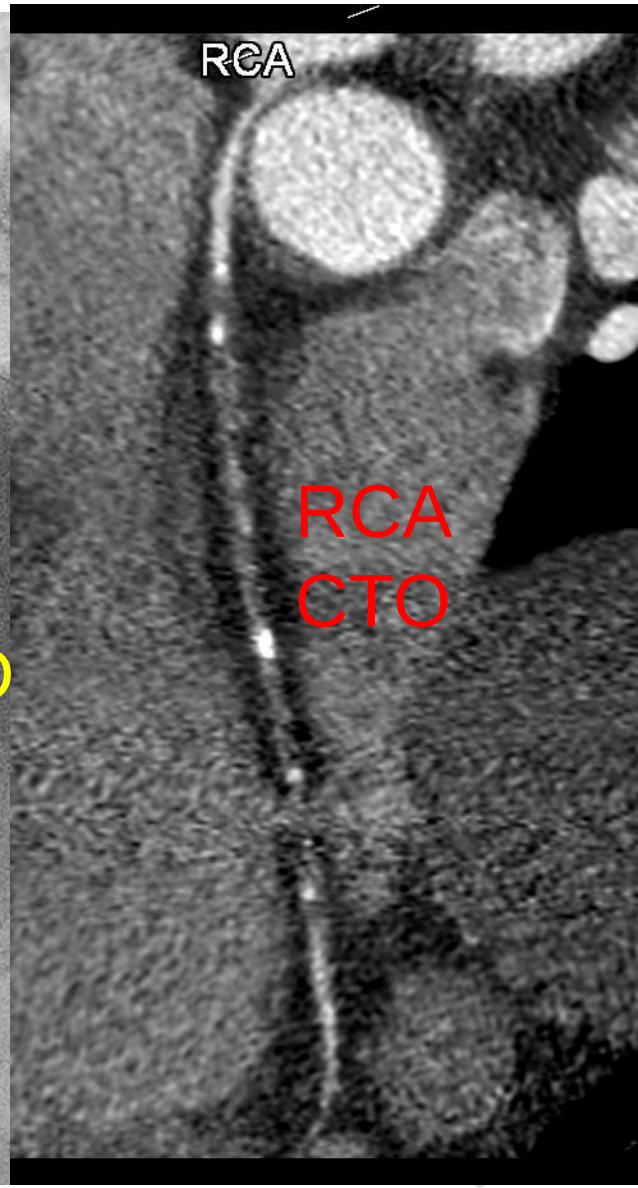




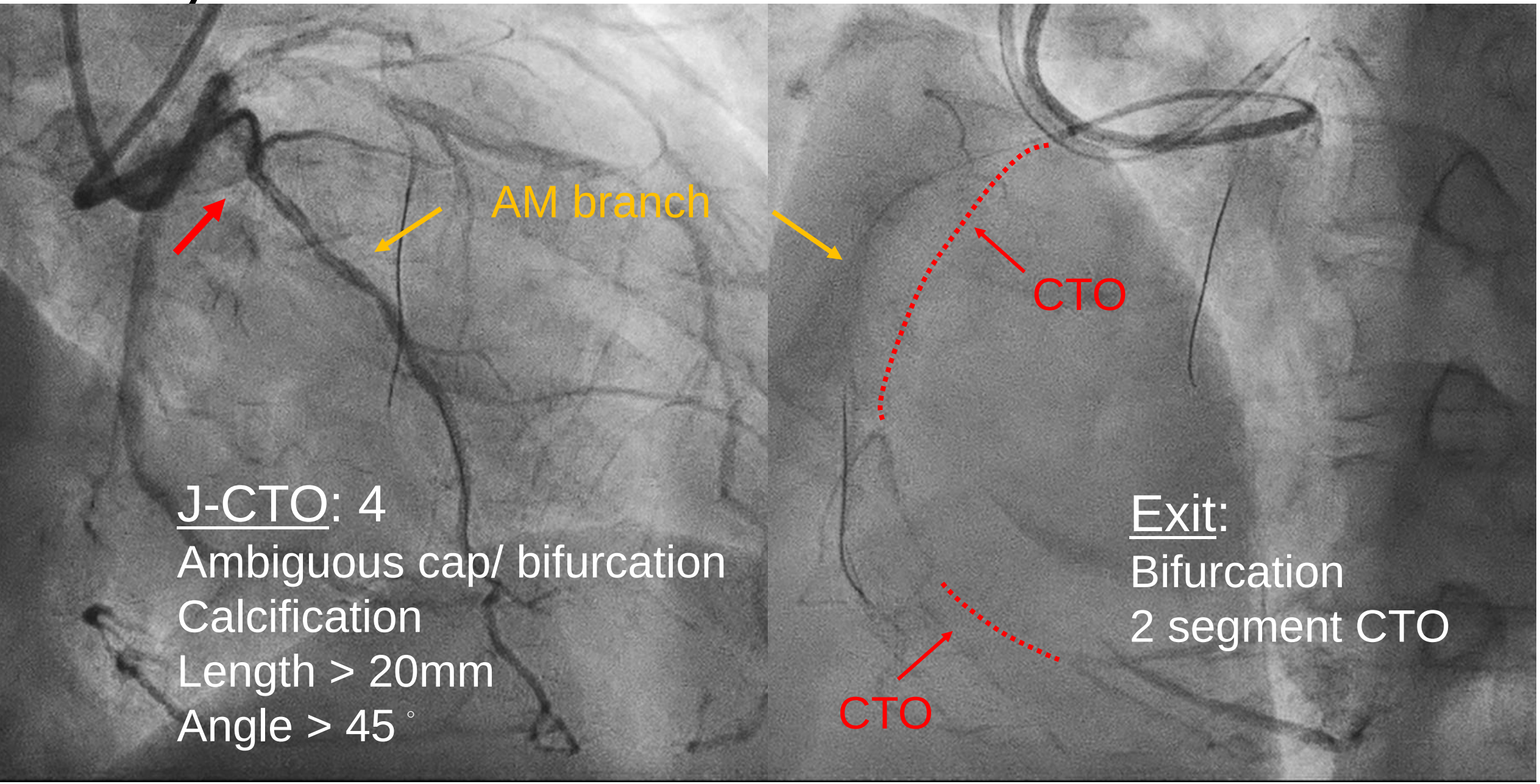
CCTA & CAG







Analysis of CTO



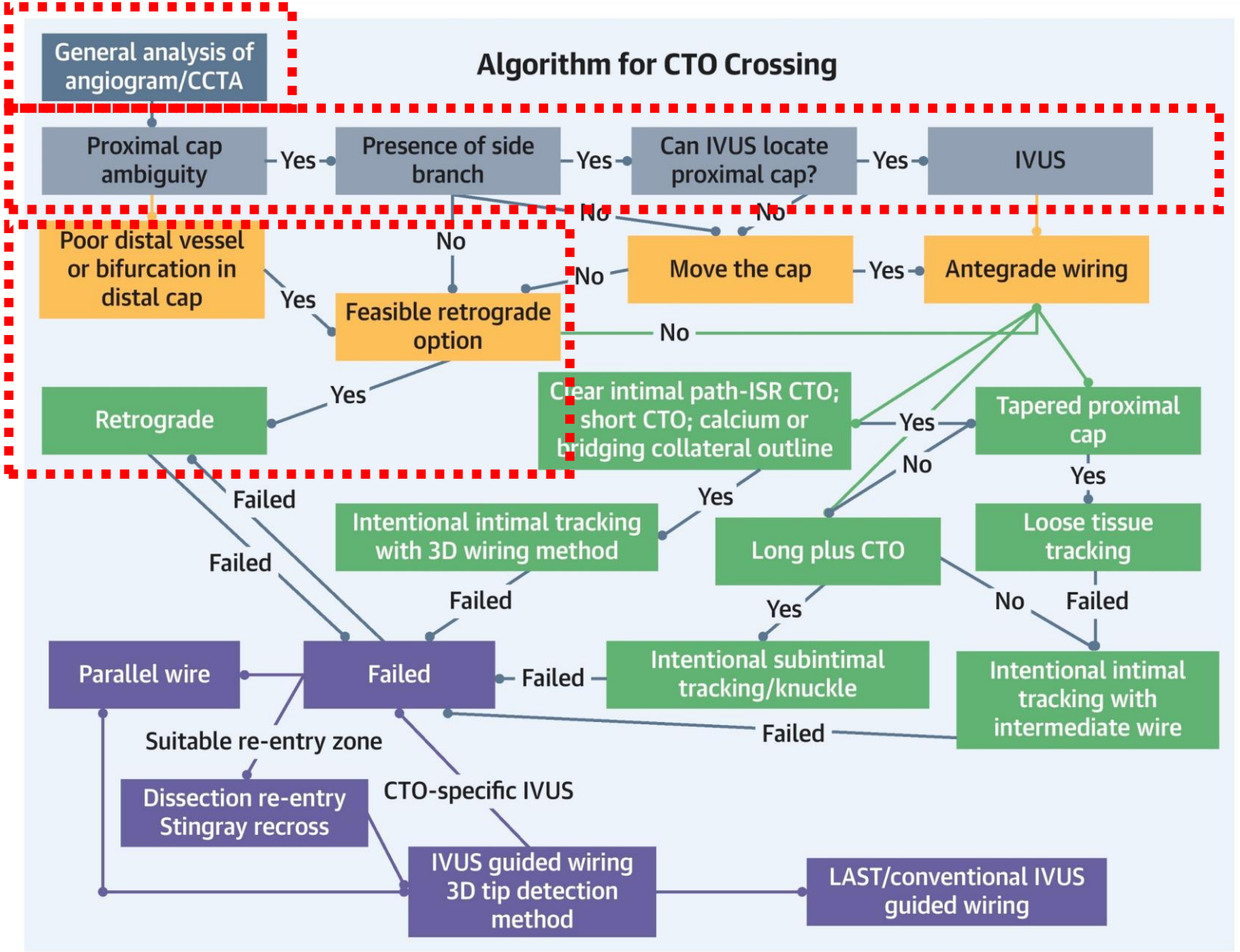
J-CTO: 4
Ambiguous cap/ bifurcation
Calcification
Length > 20mm
Angle > 45°

Exit:
Bifurcation
2 segment CTO

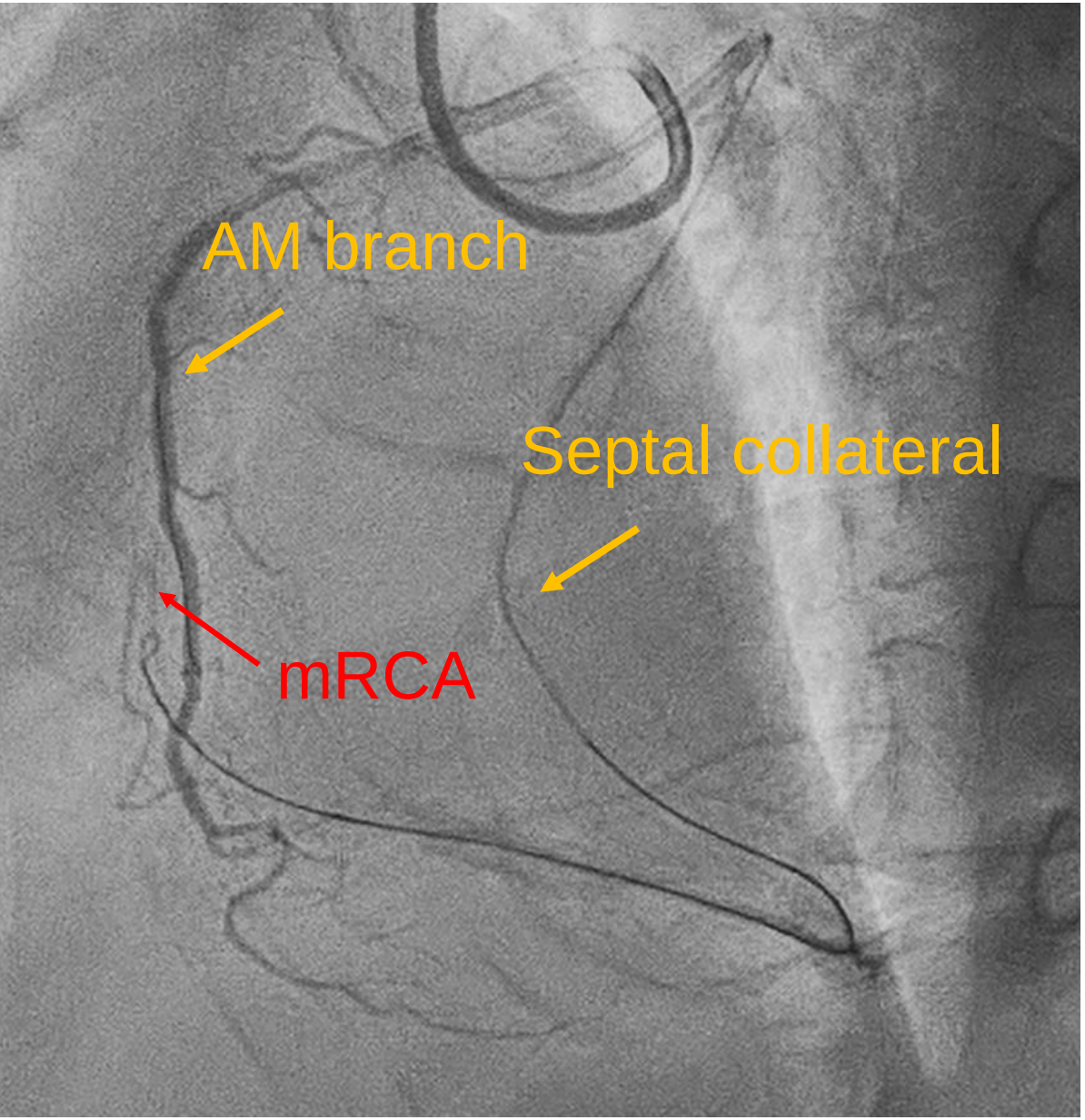
Key Questions ?

- The choice of Guide catheter
- How to conquer long CTO, preserving side branches

CENTRAL ILLUSTRATION: New APCTO Algorithm for CTO Crossing

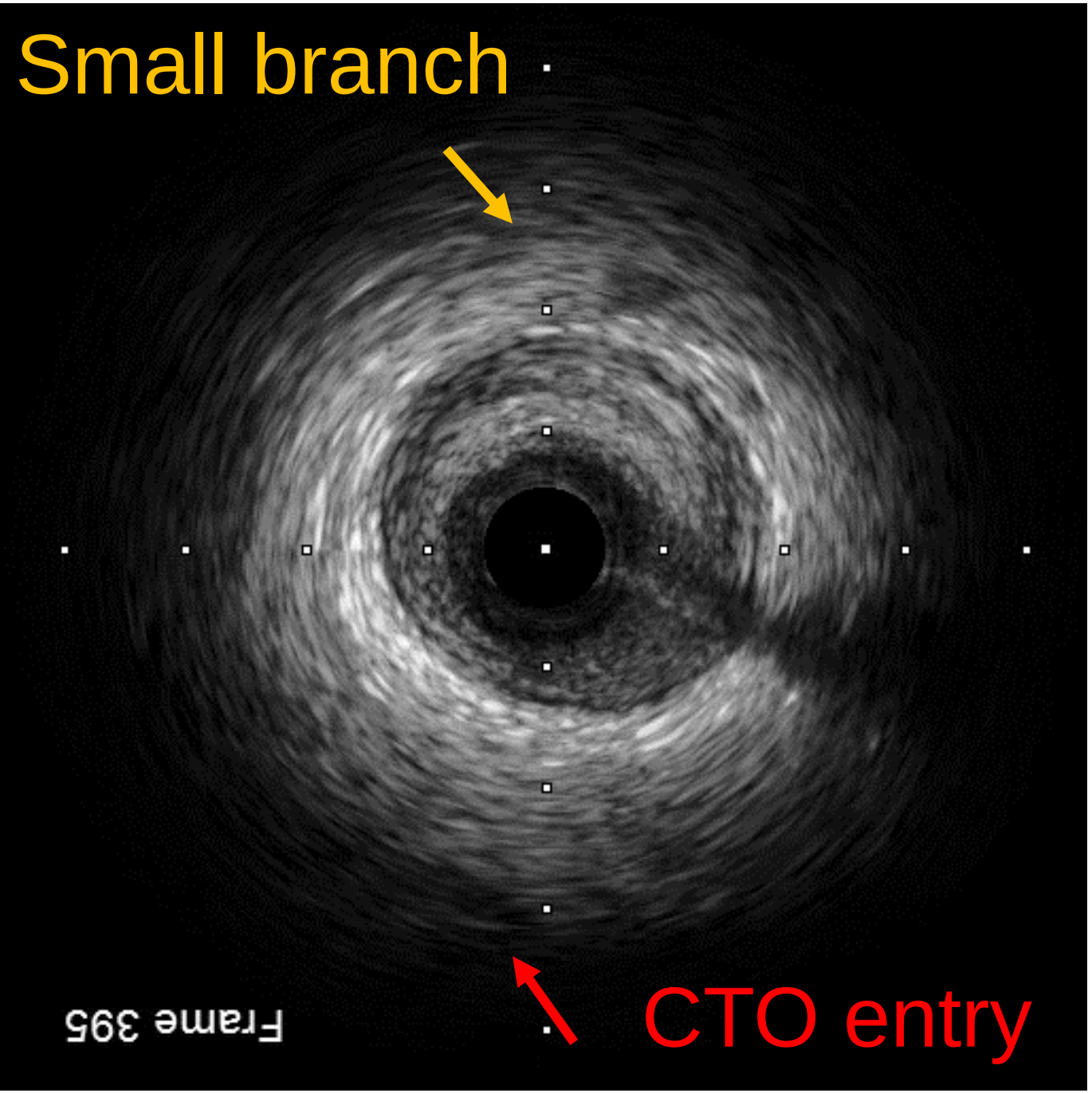


Wu EB, et al. JACC Asia. 2025;5(2):219-230.



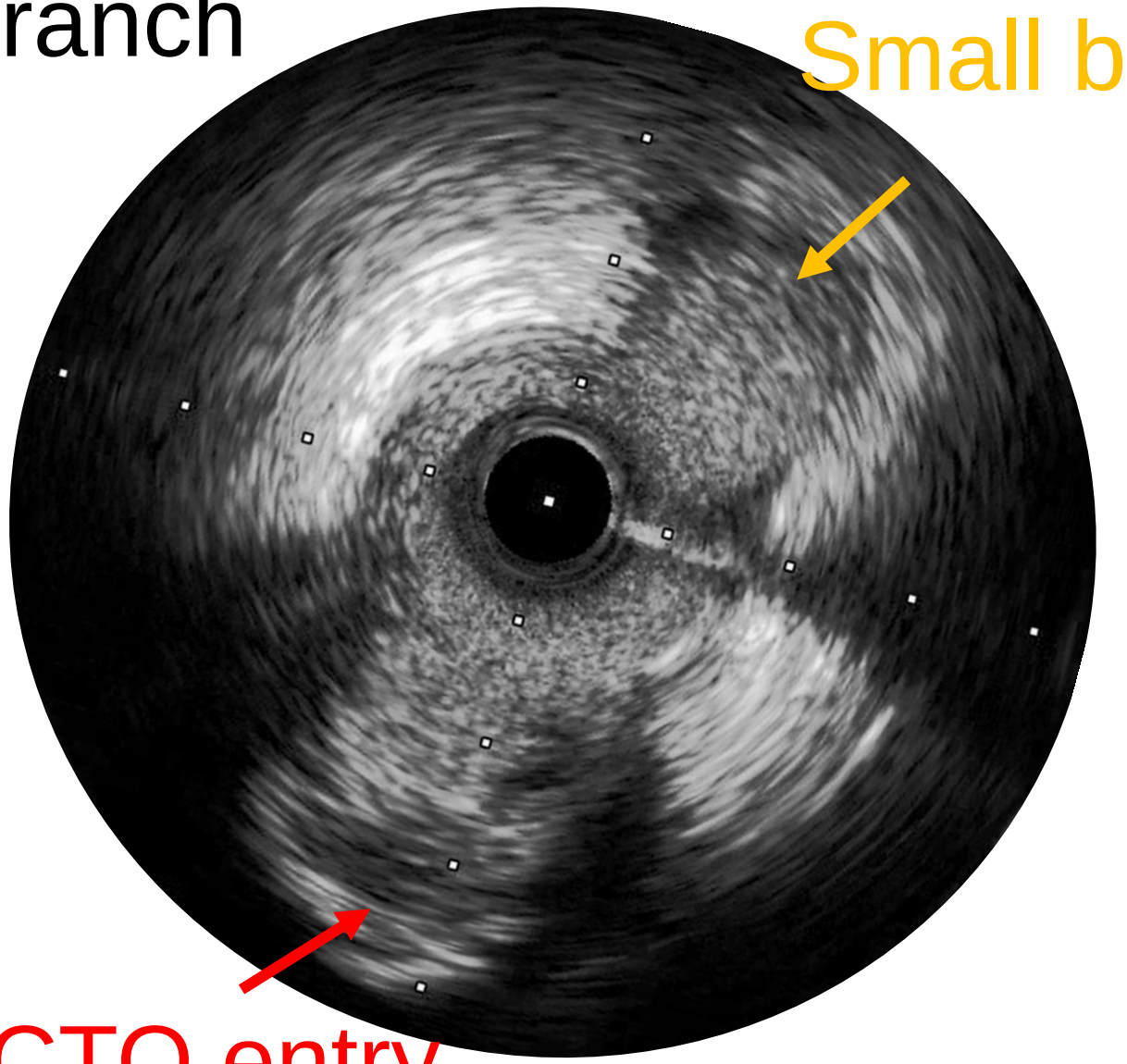
Strategy

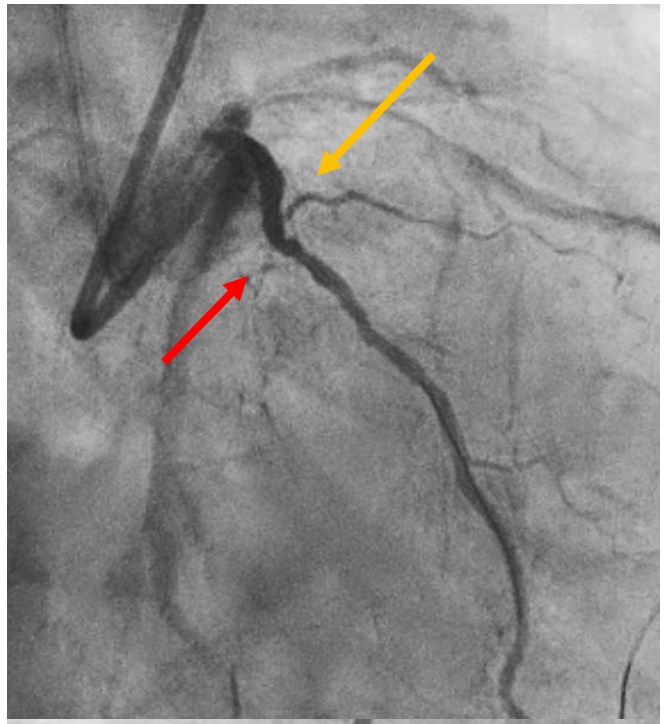
- RCA ***guide catheter***:
  EBU3.5 + extension catheter
- ***Early retrograde***:
  long lesion, 2 segment, bifurcation involved; good collaterals
- ***IVUS*** for antegrade puncture:
  ambiguous cap & bifurcation
- ***Hybrid*** treatment:
  DES + DCB for diffuse long lesion

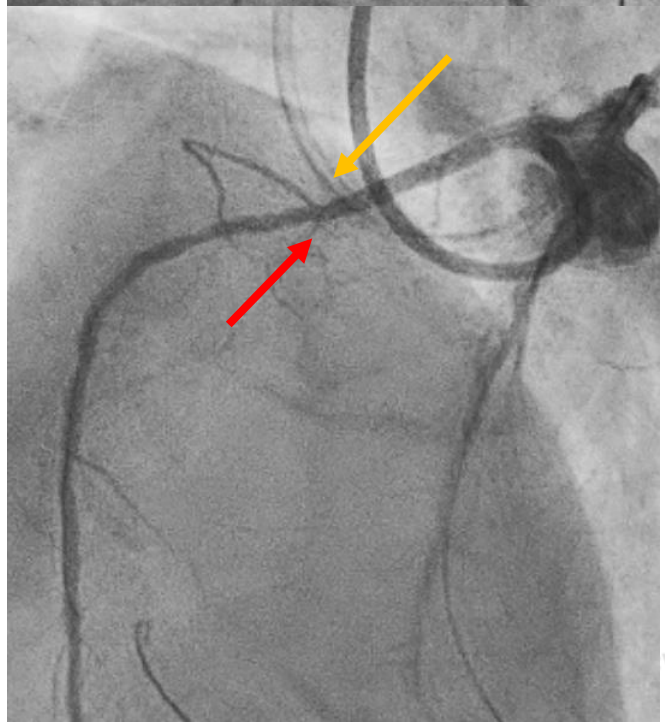


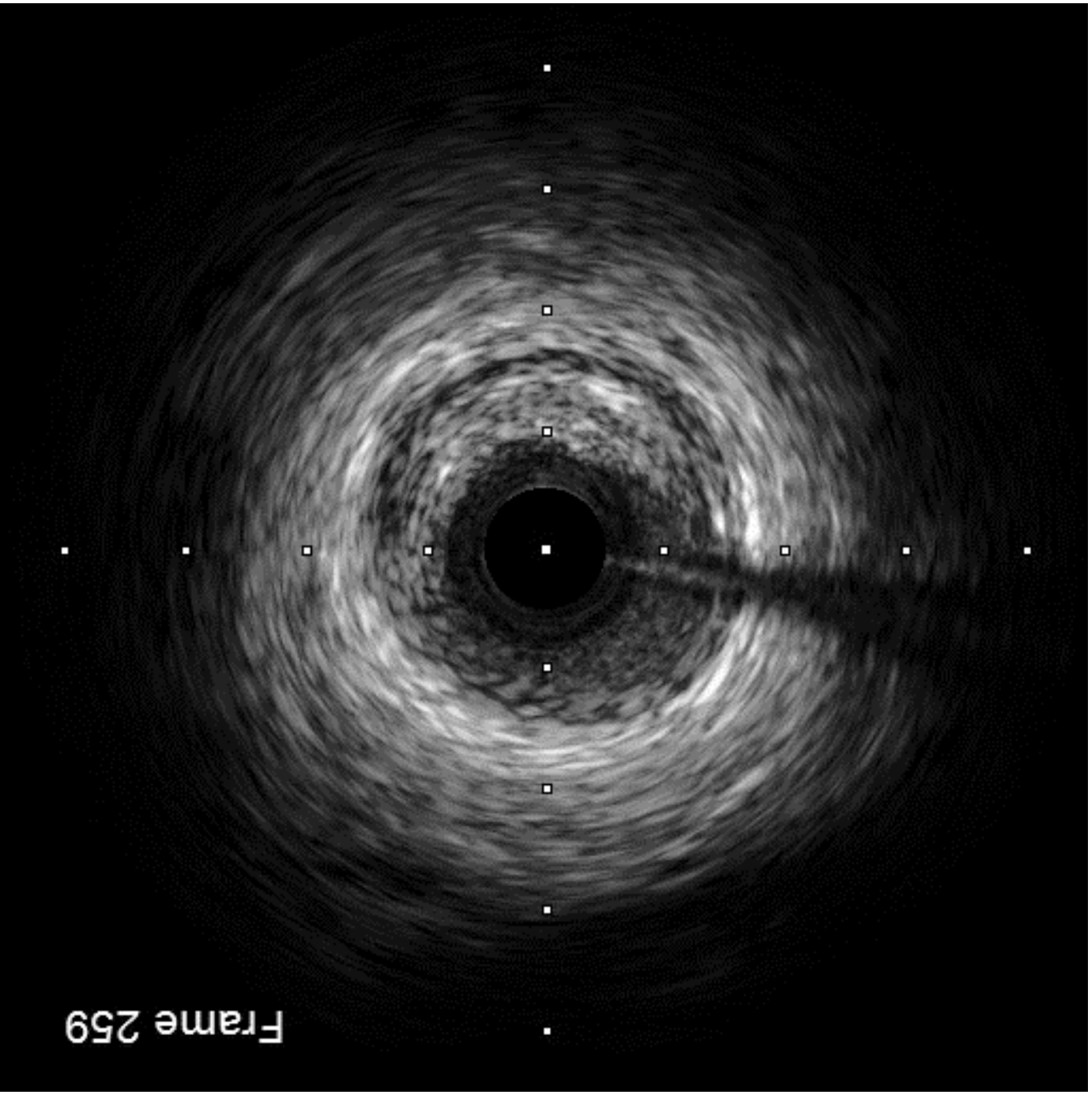
IVUS from
AM branch

IVUS from AM branch

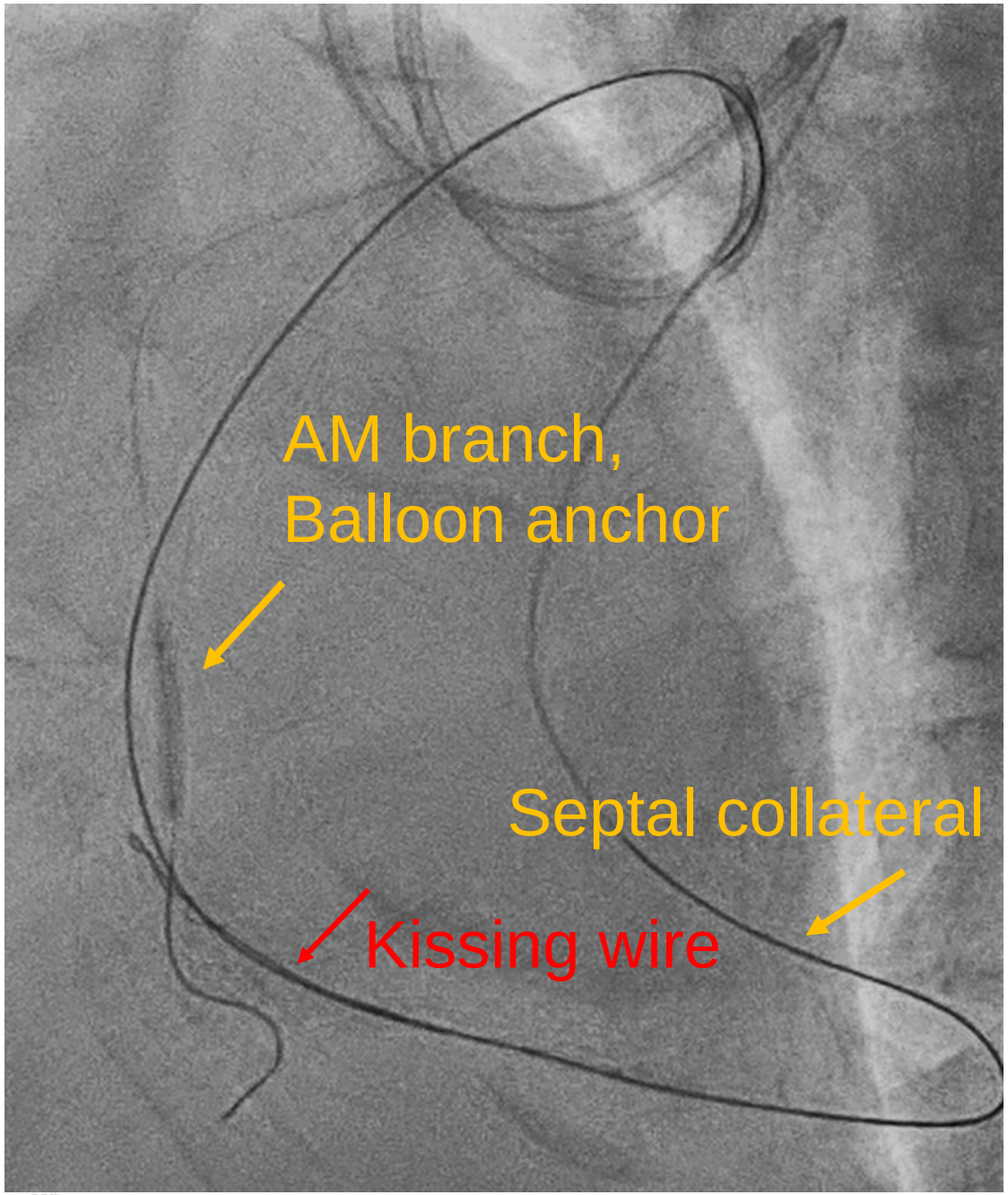








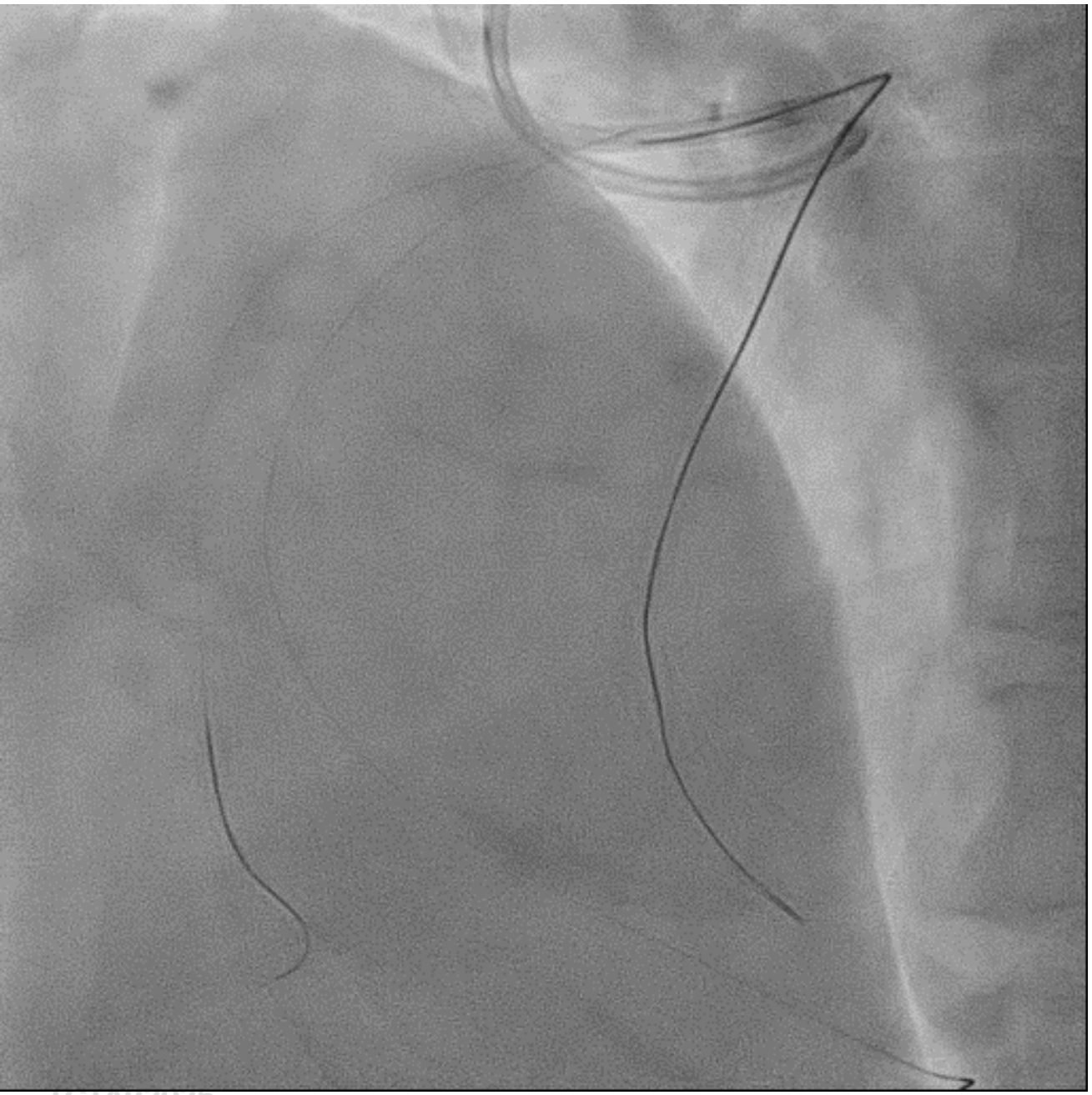
IVUS to confirm wire position



- **Retrograde**: SION > Gaia 2nd > Gaia 3rd (in caravel)

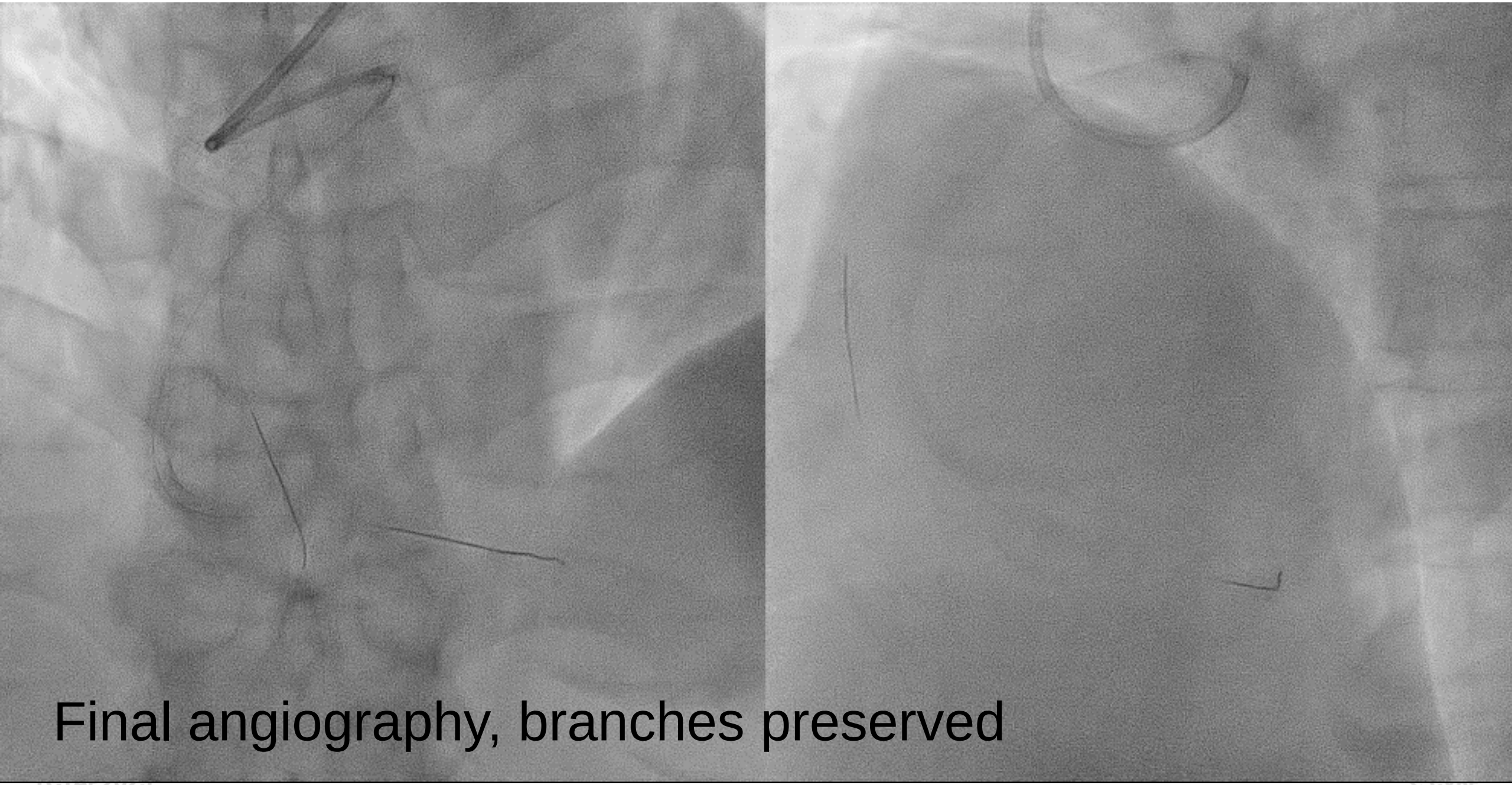
- **Antegrade**: XT-A > Gaia 3rd (in Sasuke, then Caravel)
- **IVUS** guided antegrade puncture & to check the wire position

- Kissing wire



Post balloon

- IVUS showed the wire
  all in the vessel
- Dissection & diffuse lesion
- 2 DES + 2 DCB



Final angiography, branches preserved

Case summary

For long RCA CTO w/ anomalous origin, multiple bifurcation involved

- Coronary **CTA** for CTO analysis

  (tortuosity, calcification, anomalous origin)
- **IVUS** to identify entry point/ confirm wire position
- Early **retrograde**

  (long lesion, 2 segment, bifurcation involved; good collaterals)
- **Hybrid** treatment with DES + DCB

  (CTO/ diffuse long lesion)

Key Questions ?

- The choice of Guide catheter
- How to conquer long CTO, preserving side branches

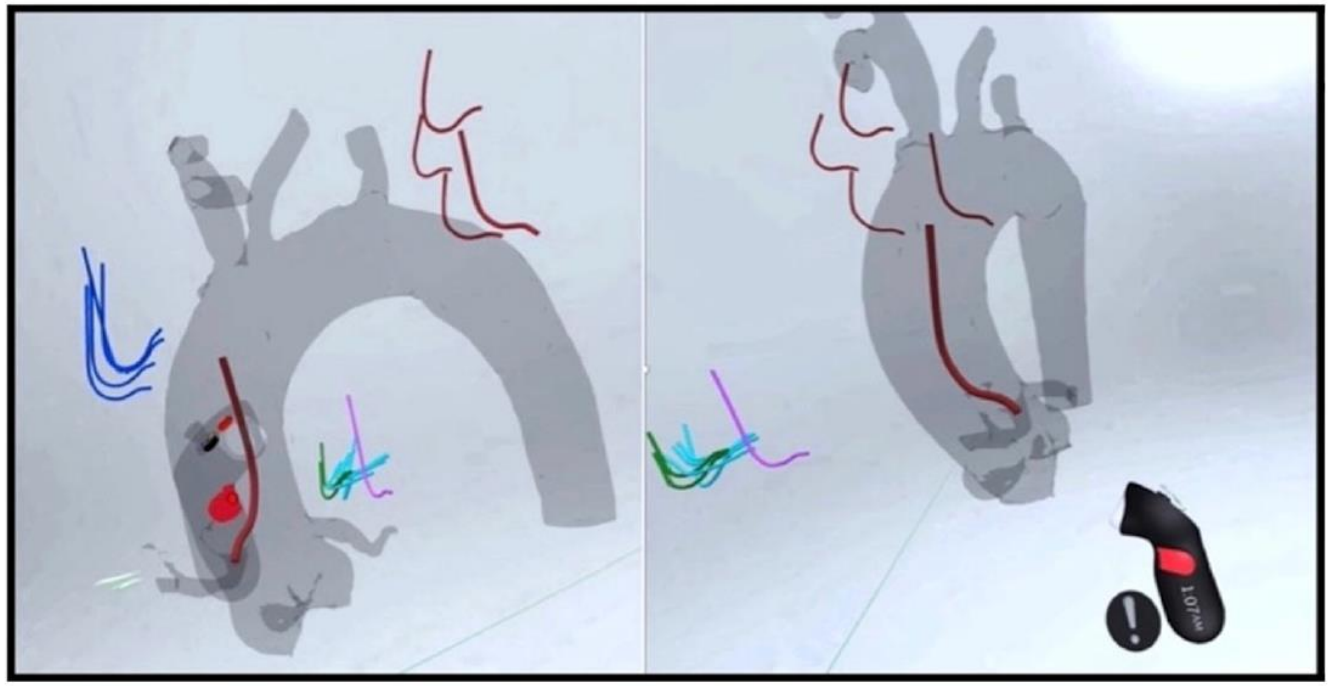
Catheterization and Cardiovascular Interventions

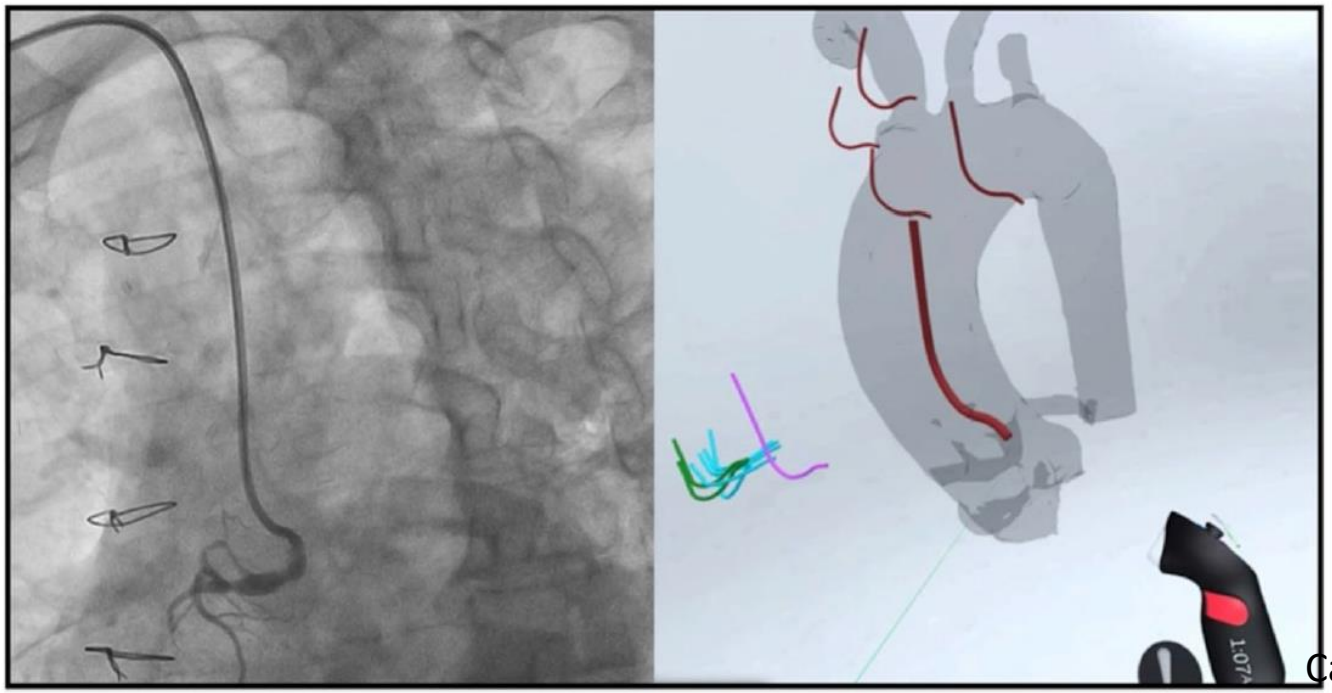
WILE

CASE REPORT

Pre-Procedural Virtual Reality Guiding Catheter Simulation Navigating Successful Percutaneous Coronary Intervention of a Chronic Total Occlusion of an Anomalous Origin of the Right Coronary Artery

Masataka Yoshinaga[1] | Takashi Muramatsu[2] | Hiroki Higami[3] | Kenya Nasu[4]



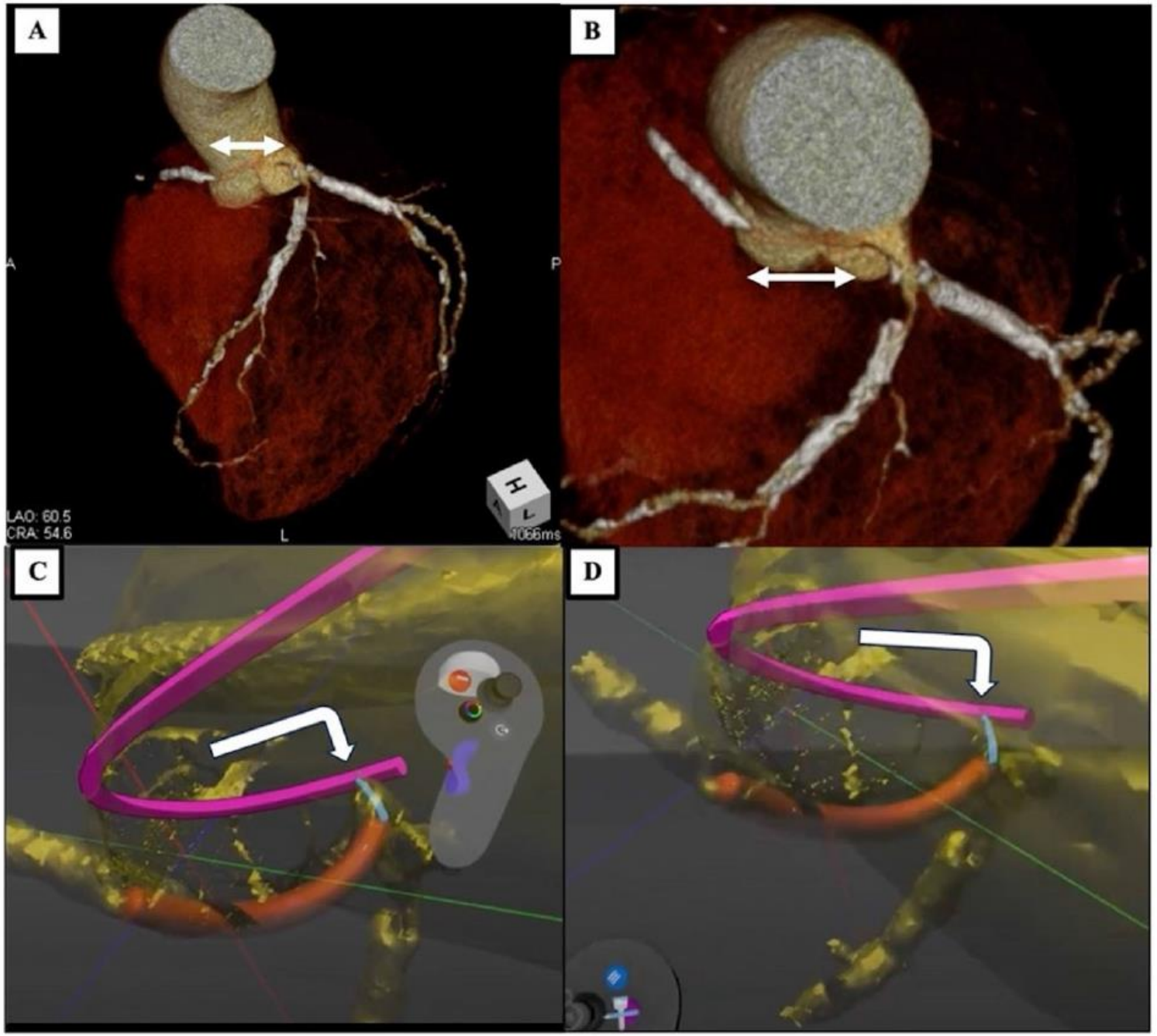


Case 1

VR guiding catheter simulation system

SAL .75
Right radial, 7Fr.

Catheterization and Cardiovascular Interventions, 2025; 105:124–130



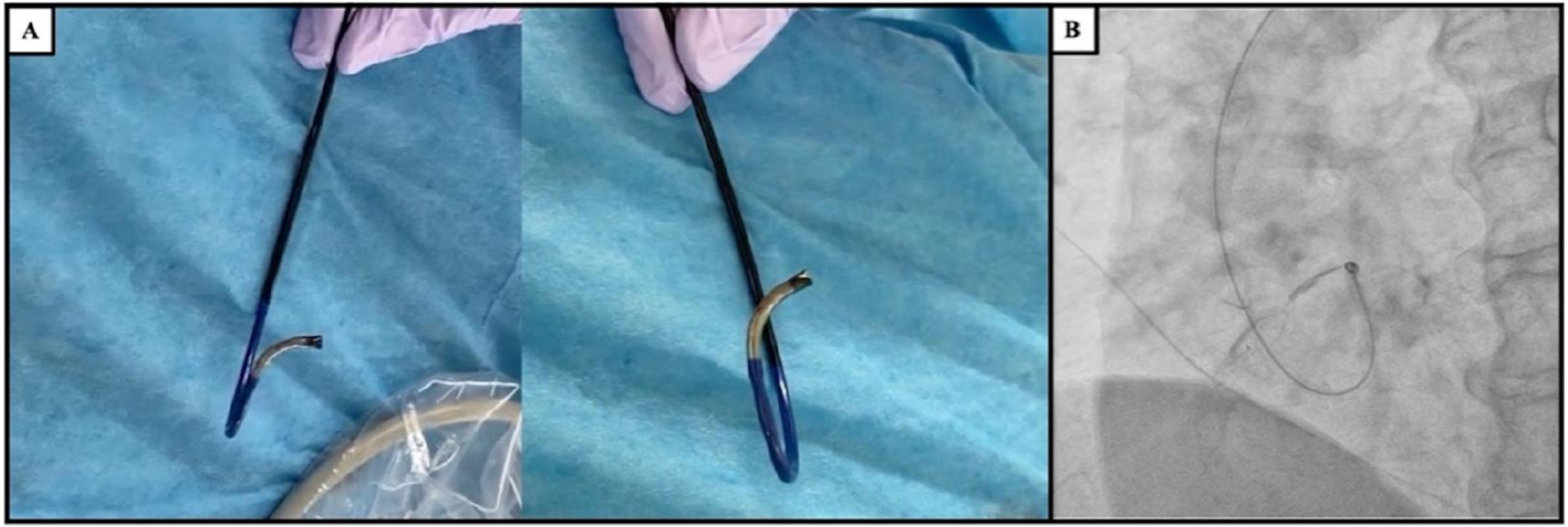
Case 2

Difficult to engage with current commercial GCs

Catheterization and Cardiovascular Interventions, 2025; 105:124–130

Case 2

Modify SPB 4.0
with forceps and burner



Catheterization and Cardiovascular Interventions, 2025; 105:124–130

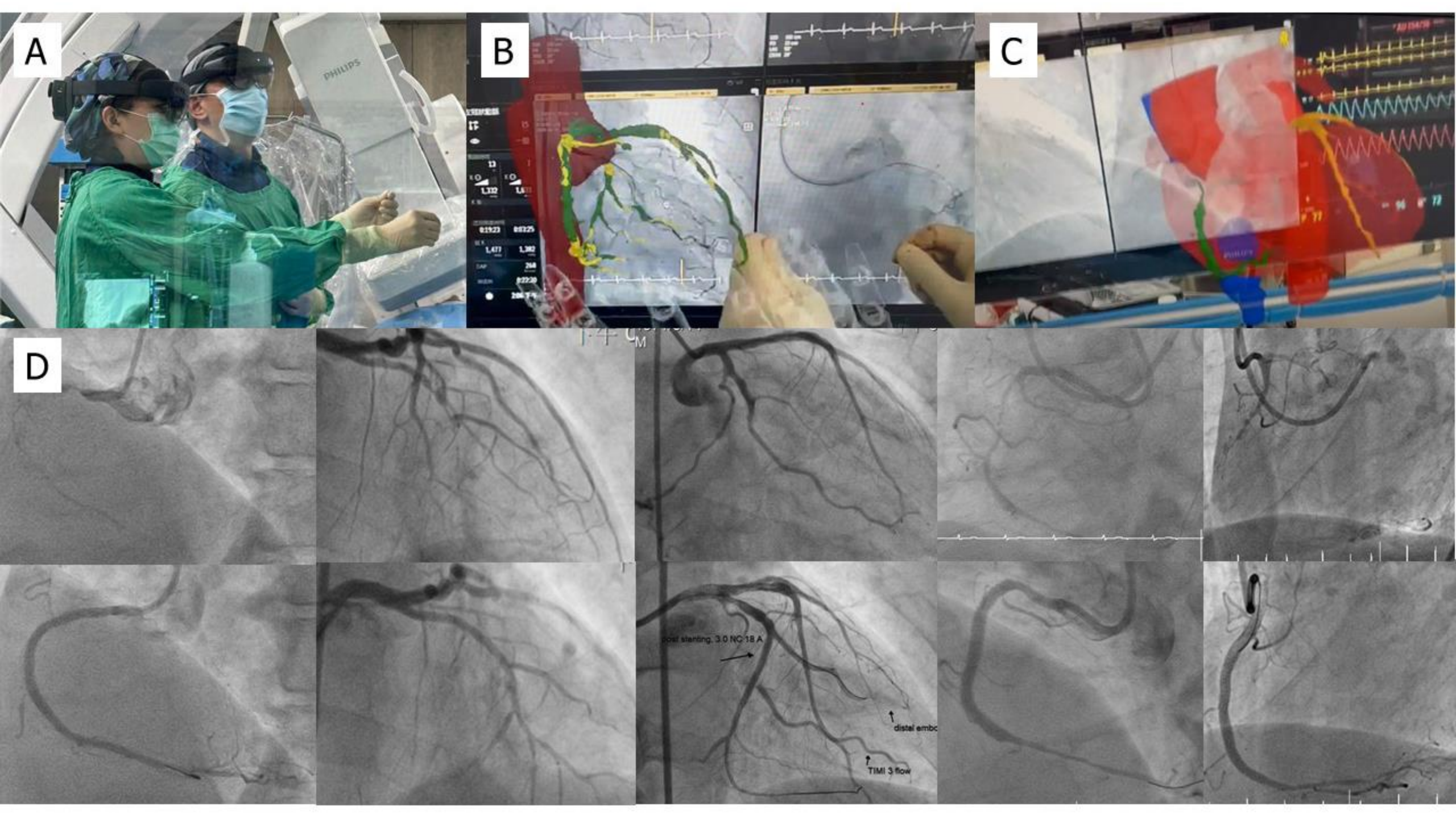
And more ??

Microsoft Hololens

Utilizing Mixed Reality Technology to Facilitate Coronary Chronic Total Occlusion Antegrade Wiring: A Pilot Study

Cheng-Wei Lien, MD[1,2], Hao Yun Lo, MD[3], Wen-Jeng Lee, MD[4], Li-Pin Chen, RT[5], Chih-Cheng Wu, MD[1,2], Ching-Ting Tan, MD[6], Hsien-Li Kao, MD[7], and Mu-Yang Hsieh, MD, PhD[1,2,7]

Mu-Yang Hsieh, drake1128@gmail.com
National Taiwan University Hospital, Hsin-Chu branch, The Intelligent Healthcare Innovation Center
Intelligent Jet Biomedical co., Ltd.


A
B
C
D
PHILIPS
post stenting, 3.0 NC 18 A
distal embo
TIMI 3 flow

Conclusion

Follow up the CTO **Algorithm**

Image guided PCI

(IVUS, CTA, 3D wiring, PP method, 3D printing)

Utilize/ Embrace new device and **Technology**

(AI, virtual reality, mixed reality)

Taiwan
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