

Importance of penetration plane method for CTO crossing

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Disclosure

- The presenter has nothing to disclose regarding this presentation.

Wire crossing is still challenging in CTO PCI

- **We need to control the wire 3-dimensionally** inside the CTO lesion to achieve wire crossing.
- **When a wire is advanced while changing the tip direction, the wire track curve becomes a complicated 3-dimensional curve with torsion,** which makes wire behavior unpredictable and uncontrollable.
- **There is a need for a novel wire manipulation method** to overcome this difficulty.

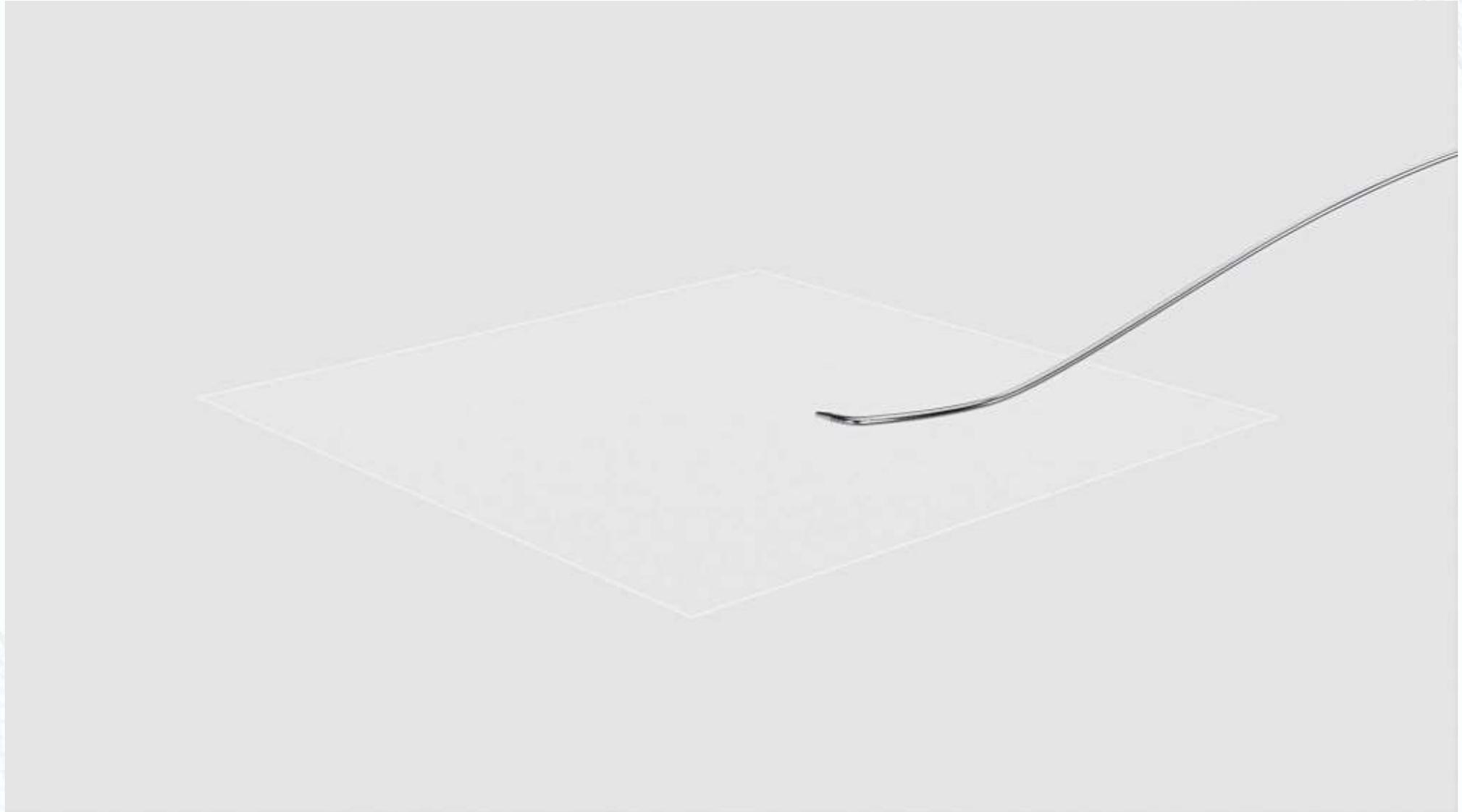
Penetration plane (PP) method

- Wire manipulation method **aiming to make a 3-dimensional wire control simpler, more reliable, and reproducible**

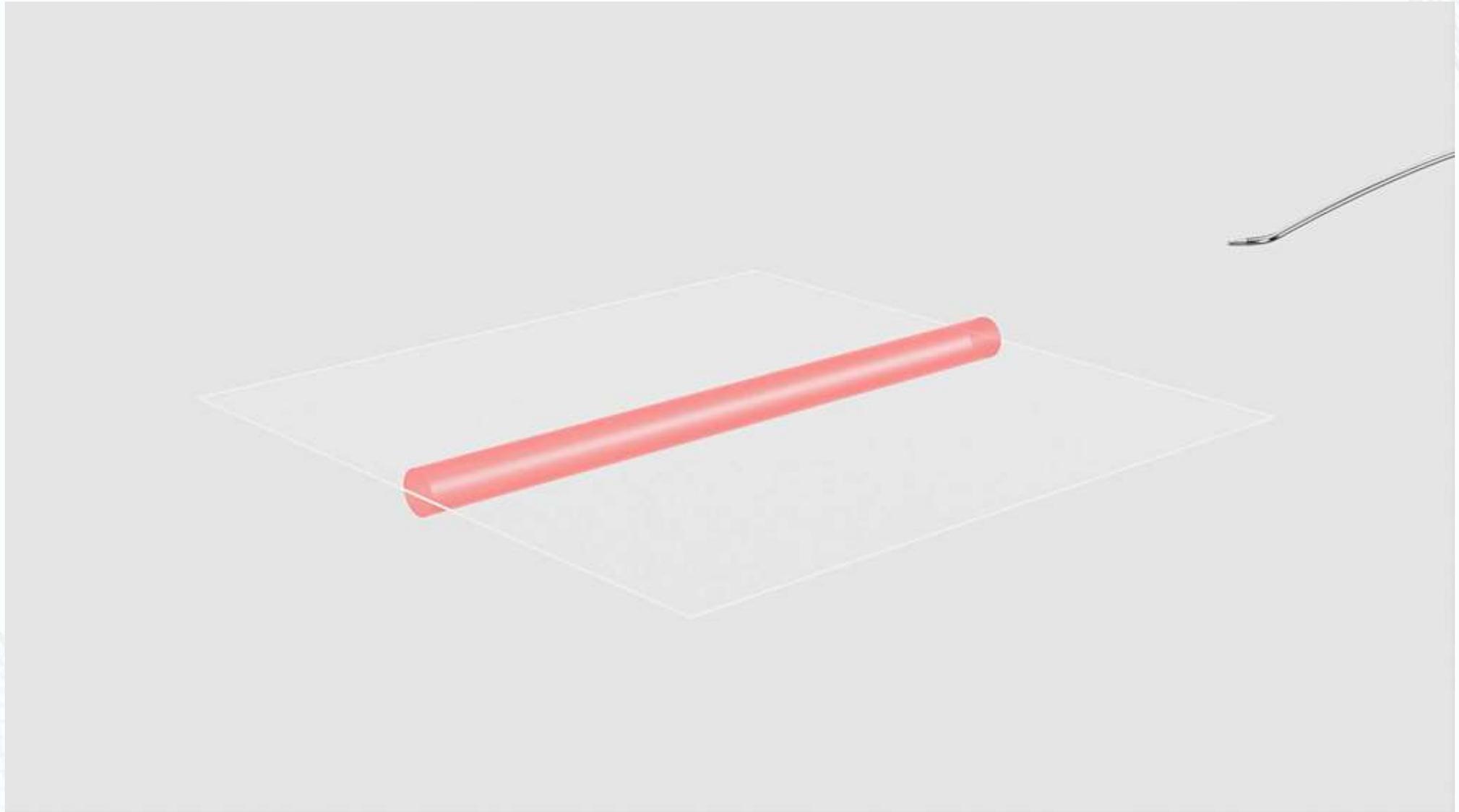
3 key points for mastering the PP method

- **Principle of wire control using tip deflection**
- **Definition of working views named PPV and OPV**
- **Wire manipulation method using PPV and OPV**

How does the wire advance by tip deflection?

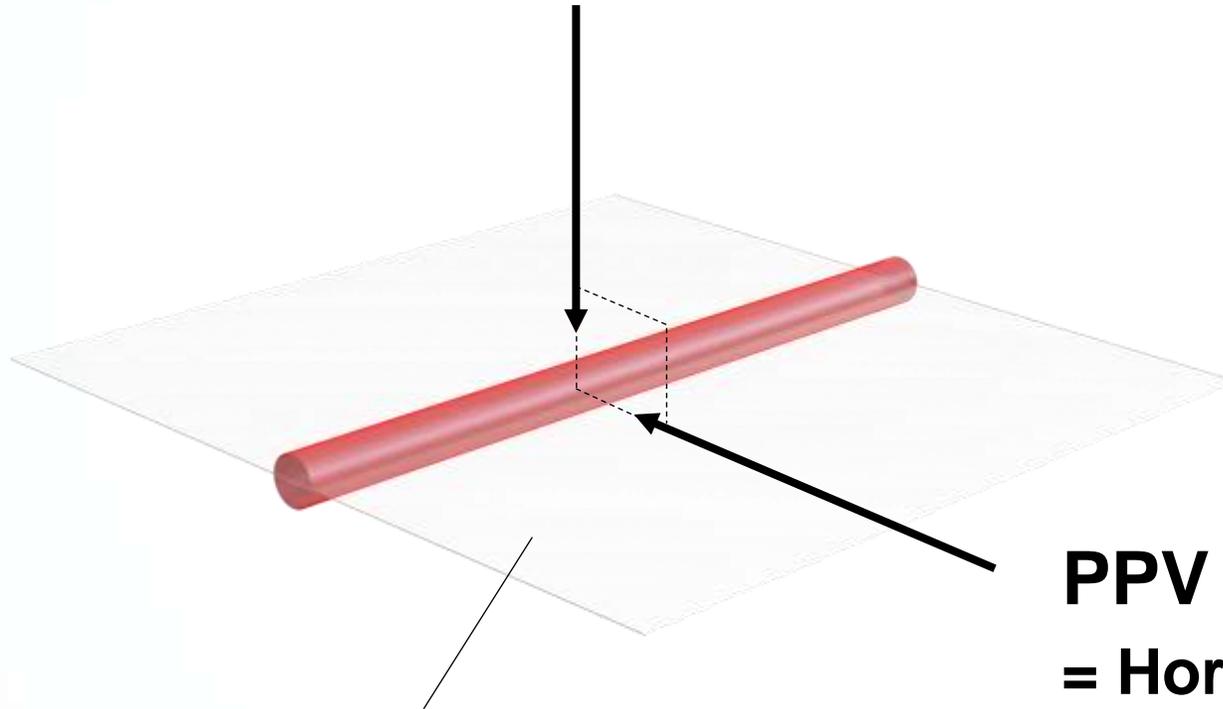


Rationale of the PP method



Setting of PPV and OPV as working views

OPV (objective perpendicular view)
= Vertical view of the PP



PPV (penetration plane view)
= Horizontal view of the PP

Penetration plane (PP)

How to manipulate the wire using PPV and OPV

PPV



90deg rotation
(same direction)



Wire advancement



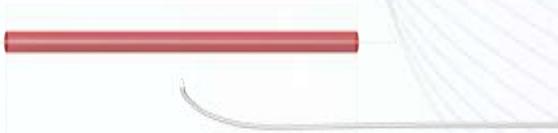
Switching
view



OPV



or



90deg rotation



Issues for clinical application of the PP method

- Calculated view angles can be out of the movable range of the C-arm or can cause an overlap of the operation area with other structures.

⇒ **Concept of oblique PPV and OPV**

- Movement of the fluoroscopic images due to cardiac, respiratory, and body motion makes it challenging to understand the tip direction accurately.

⇒ **ECG-synchronized fluoroscopy, template matching, and more**

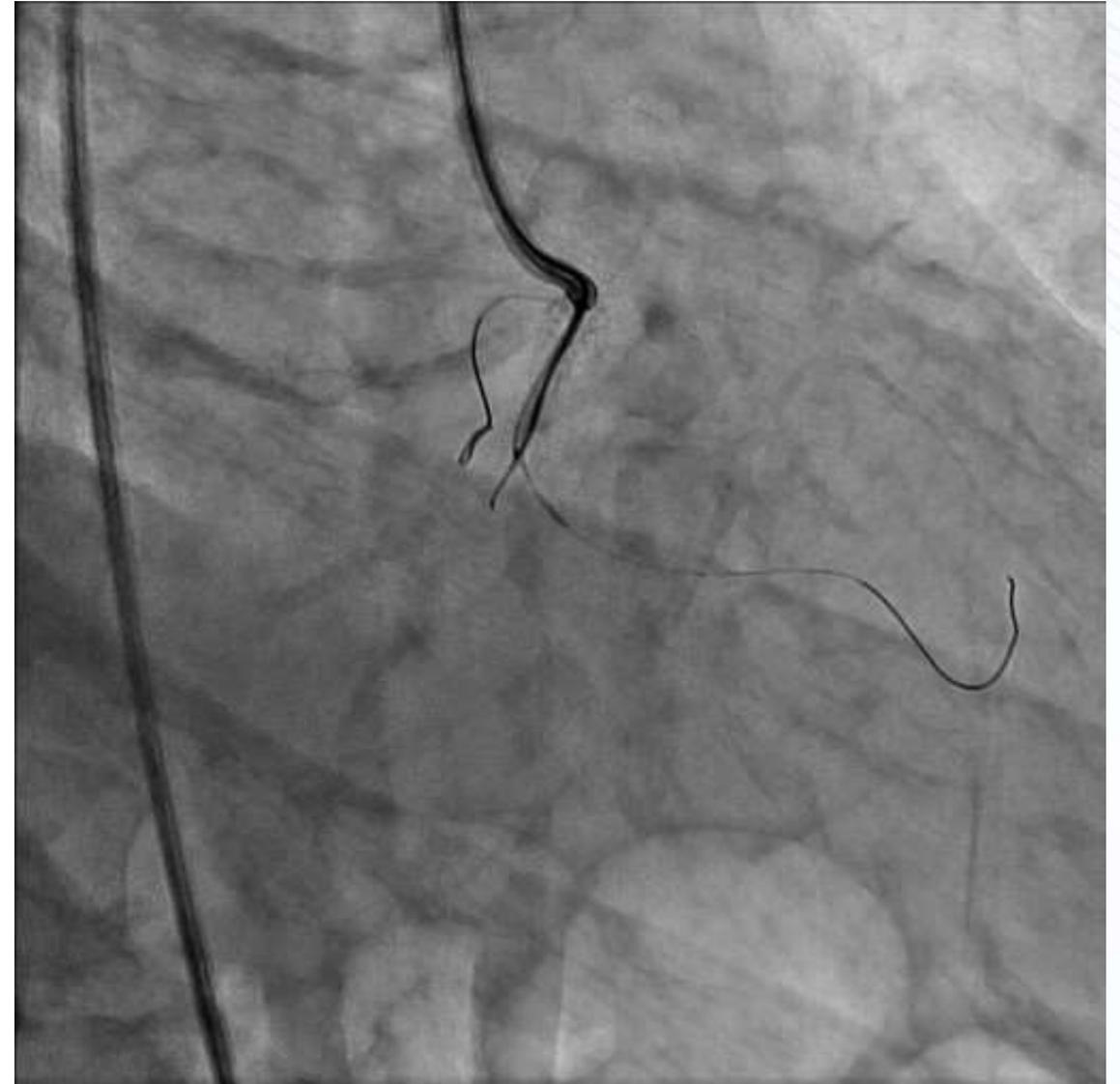
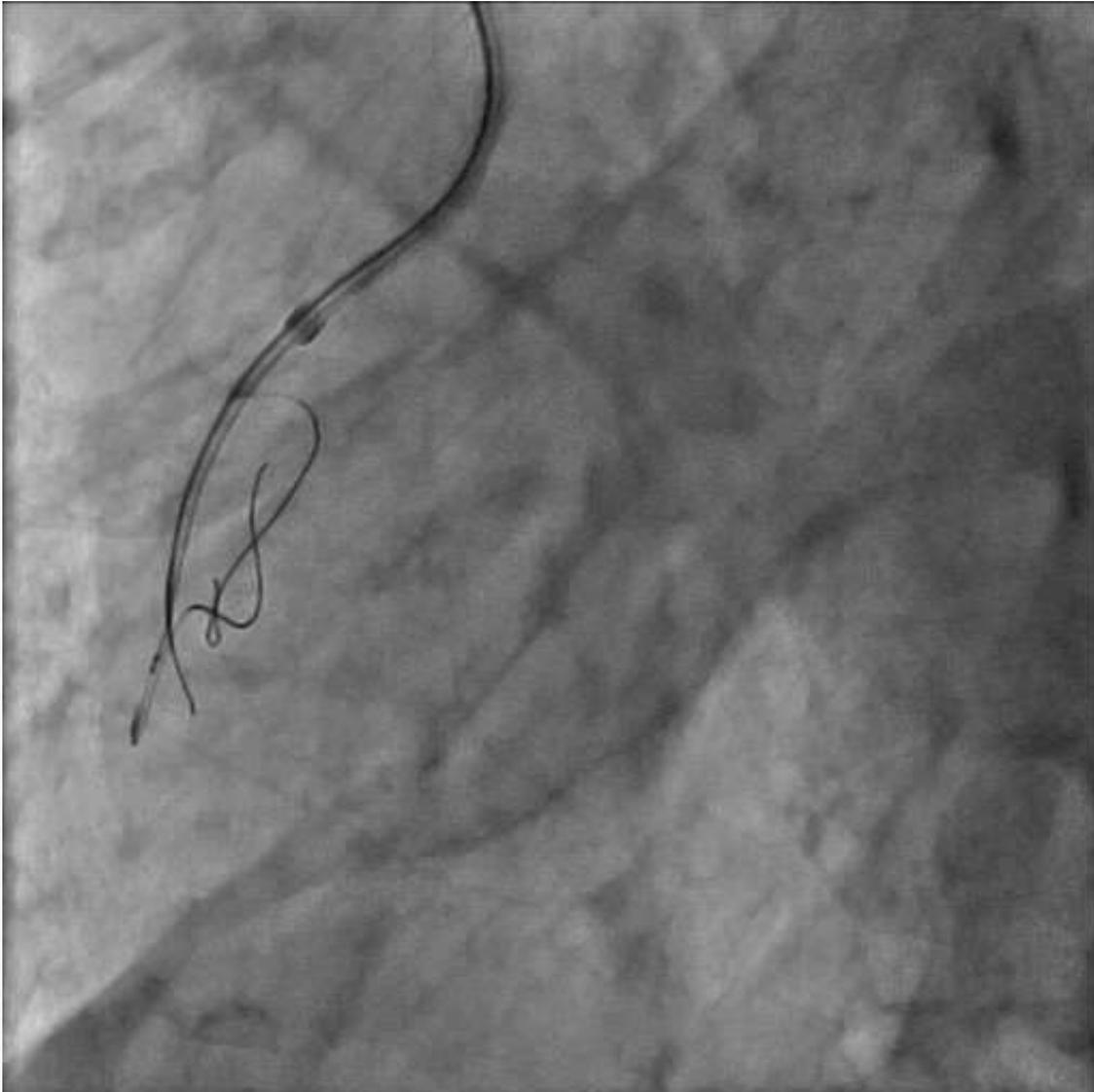
- Inability to keep the target visible during wire manipulation can impair the reliability and accuracy of the wiring.

⇒ **Distal true lumen mapping**

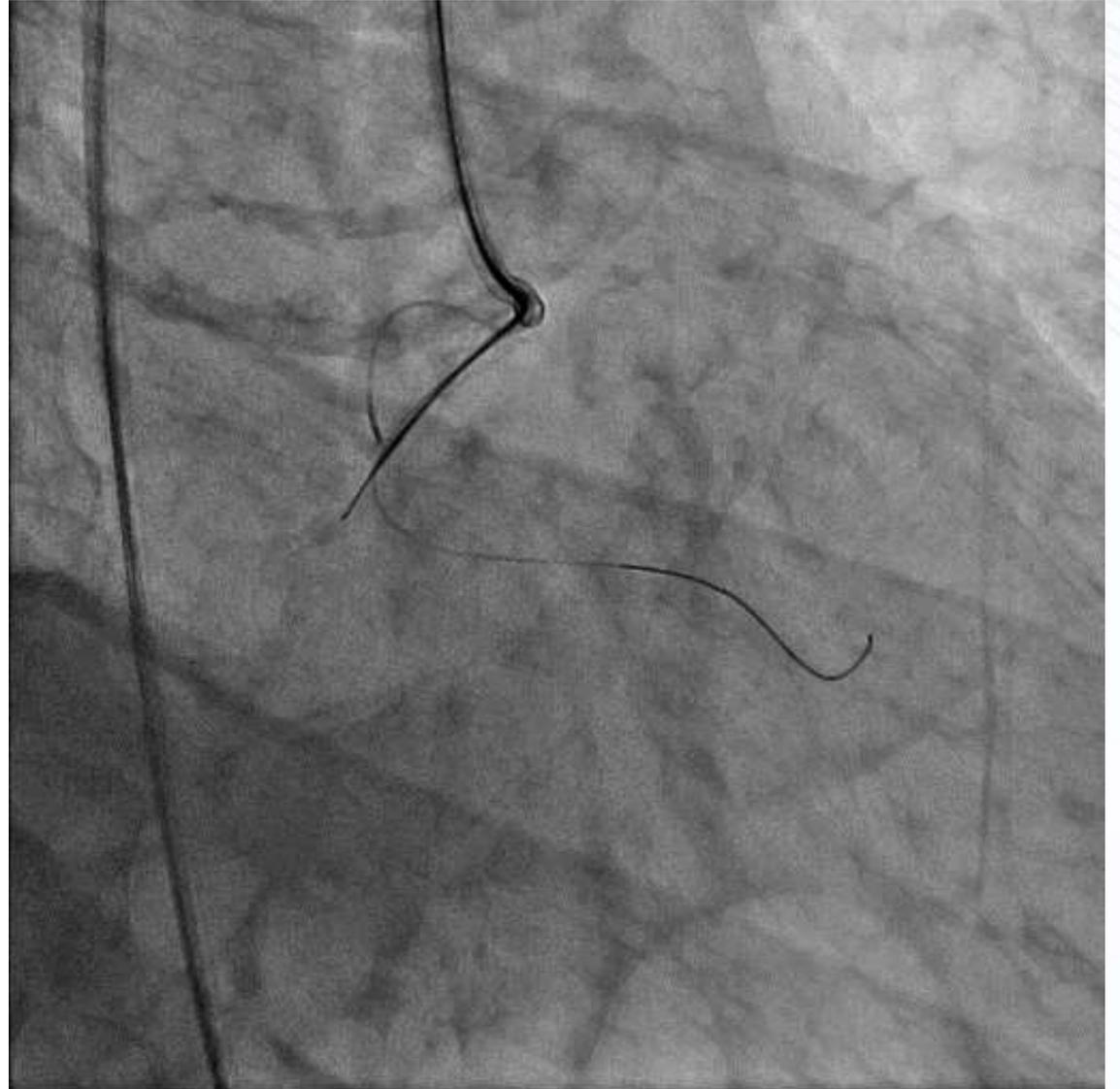
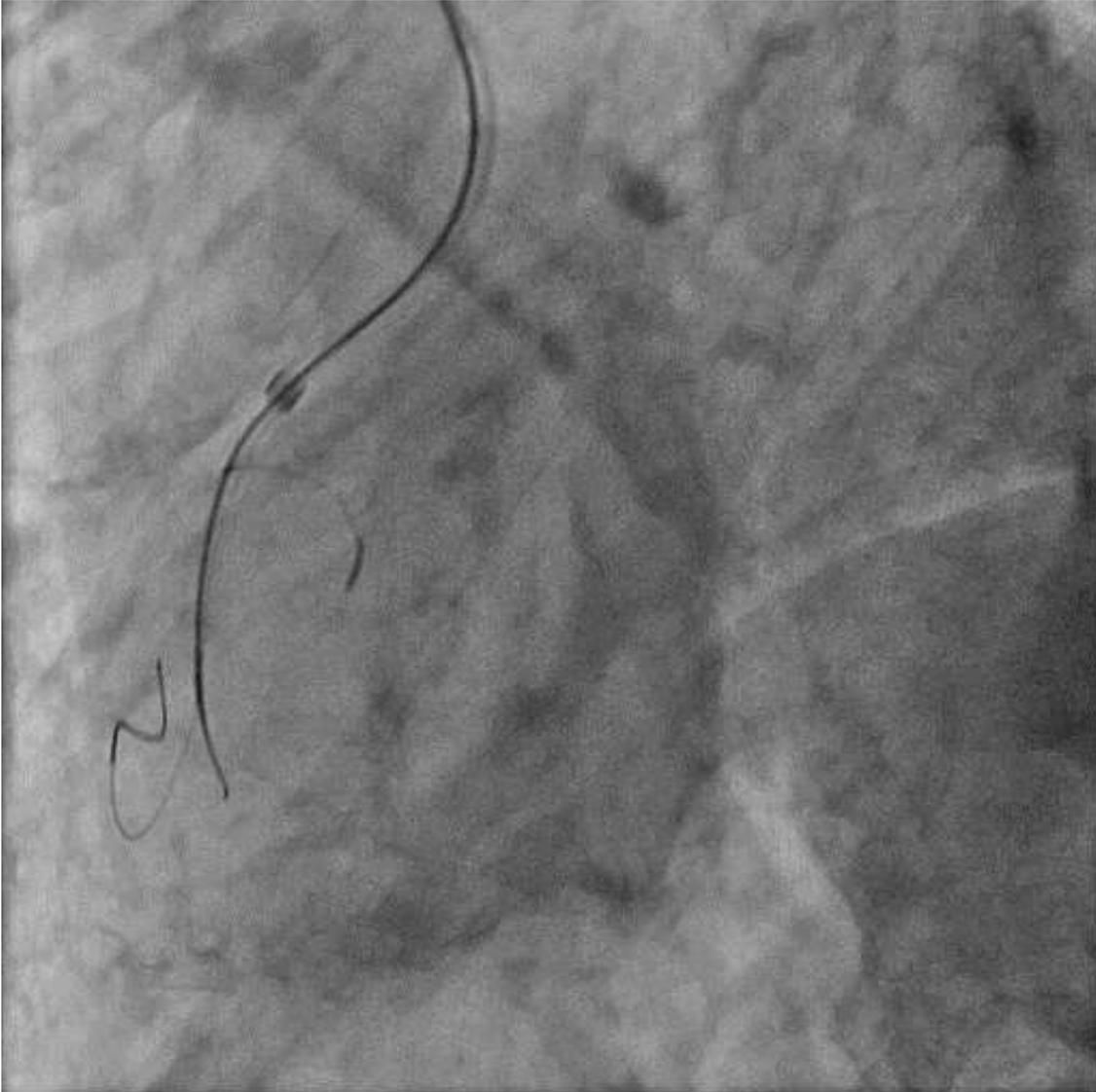
Clinical application of the PP method: RCA CTO



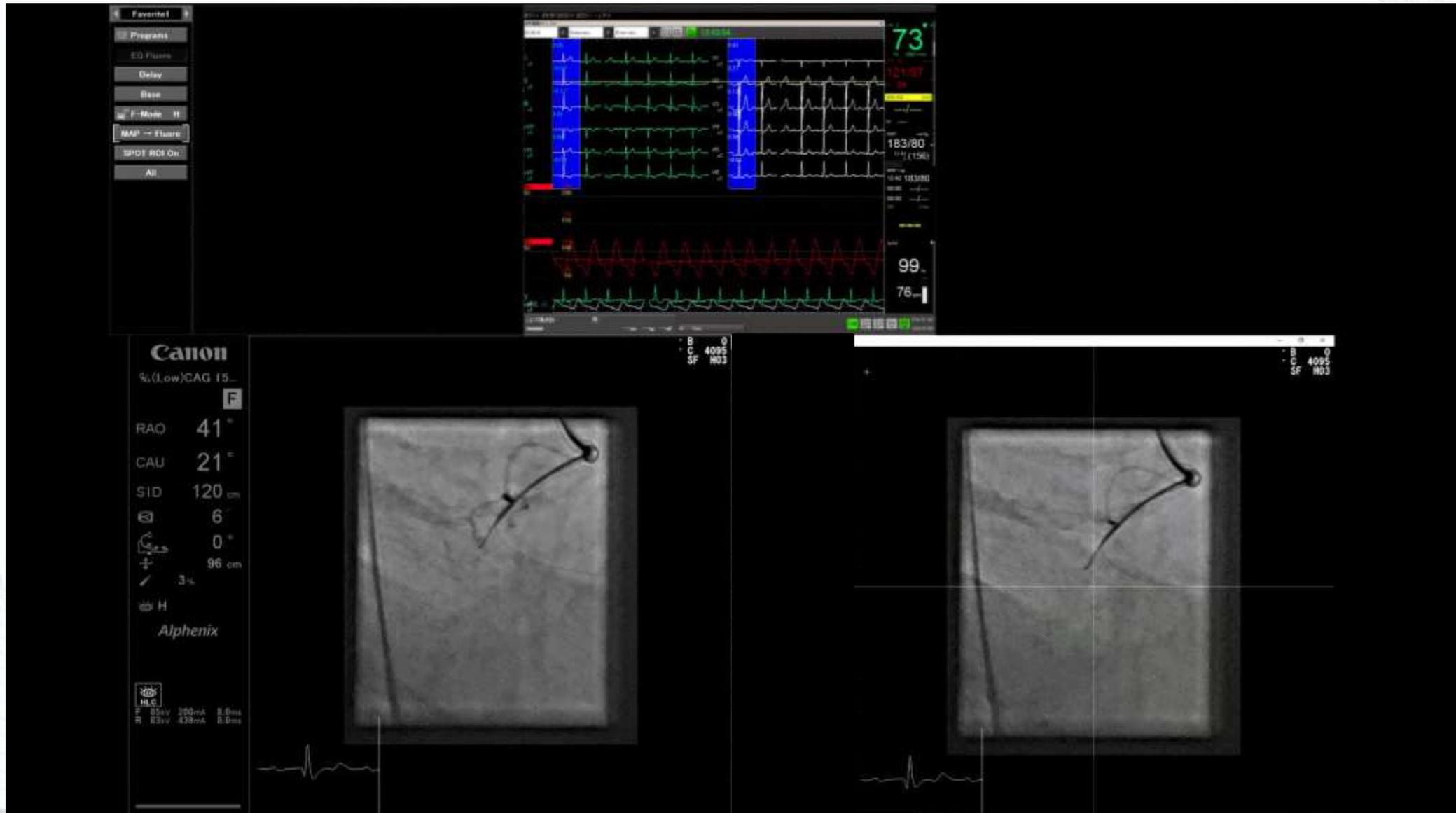
IVUS-guided entry w/ Gaia Next 4



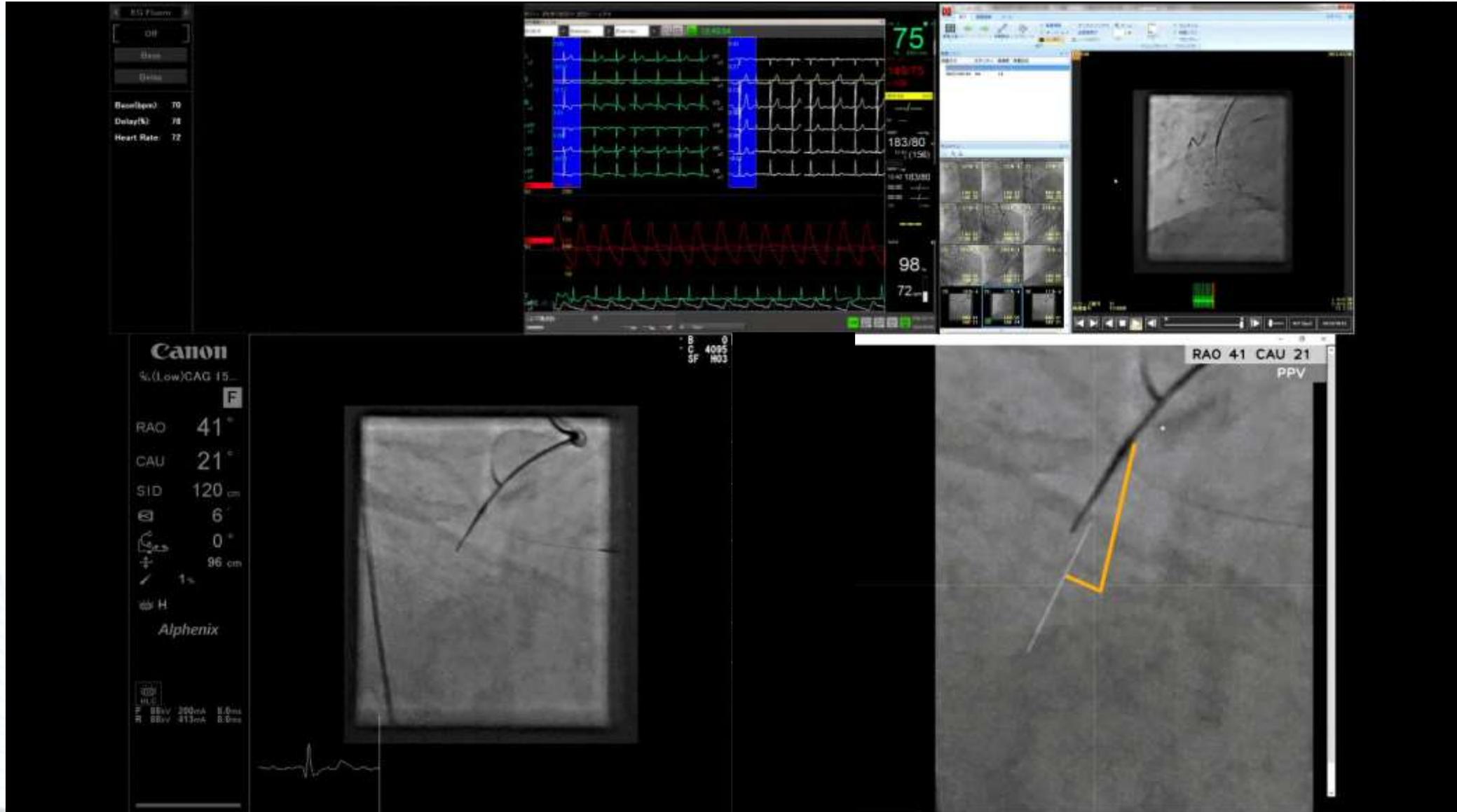
Angiography after IVUS-guided entry



Distal true lumen mapping



PP method wiring w/ Gaia Next 4



Successful wire crossing



Conclusion

- **Penetration plane method that keeps a wire track curve on a plane** makes a 3-dimensional wire control simpler, resulting in more reliable and reproducible antegrade wire crossing.