

# Minimizing contrast-induced nephropathy in CTO PCI

**Hirokazu Konishi, MD, PhD**  
**Toyohashi Heart Center, Japan**

# Disclosure

- There are no financial conflicts of interest to disclose concerning the presentation.

# Contrast induced acute kidney injury

## *definition*

- There are several definition for contrast induced acute kidney injury (CI-AKI)
- One of the most widely adopted is Kidney Disease Improving Global Outcomes definition:
  - ① An increase in serum **creatinine  $\geq 0.3$  mg/dl (within 48 hr)** after contrast media exposure
  - ② An increase to  **$\geq 50$  % within 7 days**

# Strategies to prevent CI-AKI

*method*

- **Hydration** using normal saline before and after PCI

- **Reducing** contrast media

Contrast-volume / creatinine-clearance < 2 target value  
< 1 ideal

# Contrast-sparing strategies for CTO-PCI

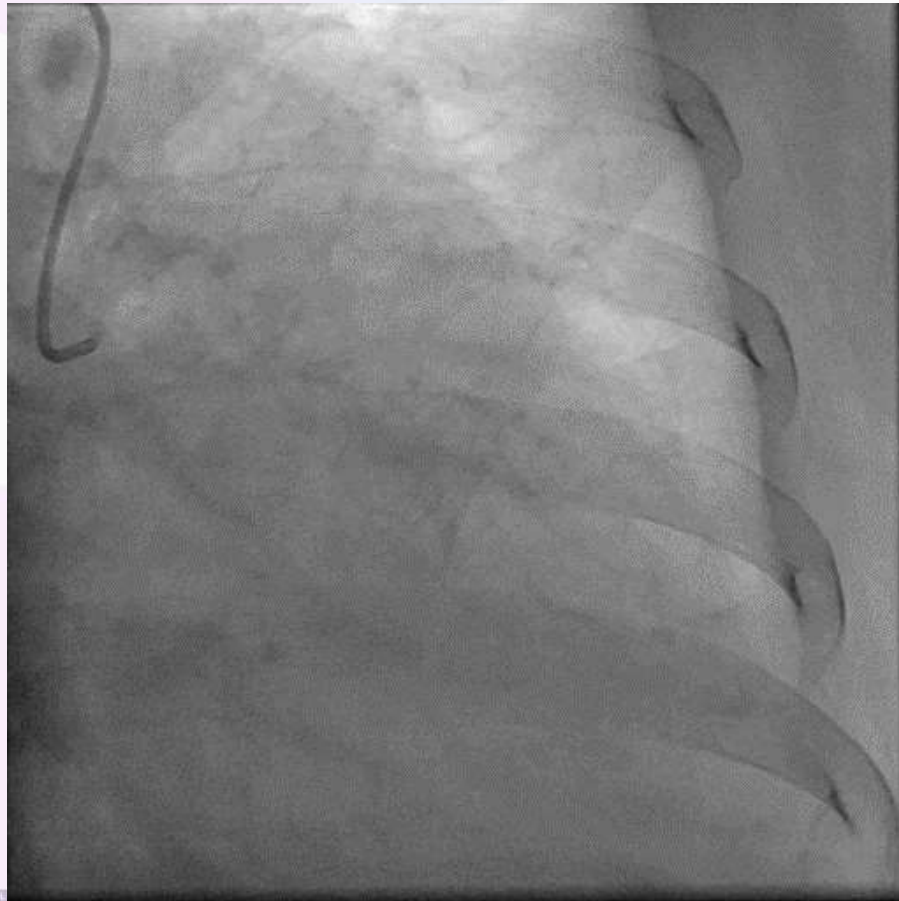
## *Procedural strategies*

- Display previous coronary angiograms on cath lab monitors
- Use biplane angiography
- Use of **micro-catheter** saving volume of contrast injection
- Extensive use of **IVUS**:
  - ① CTO entry point (IVUS in side-branch)
  - ② IVUS guided rewiring
  - ③ Stenting position marking

# Case 1 70's female, cre 1.7 (eGFR 23)

*Using micro-cath injection, retrograde approach*

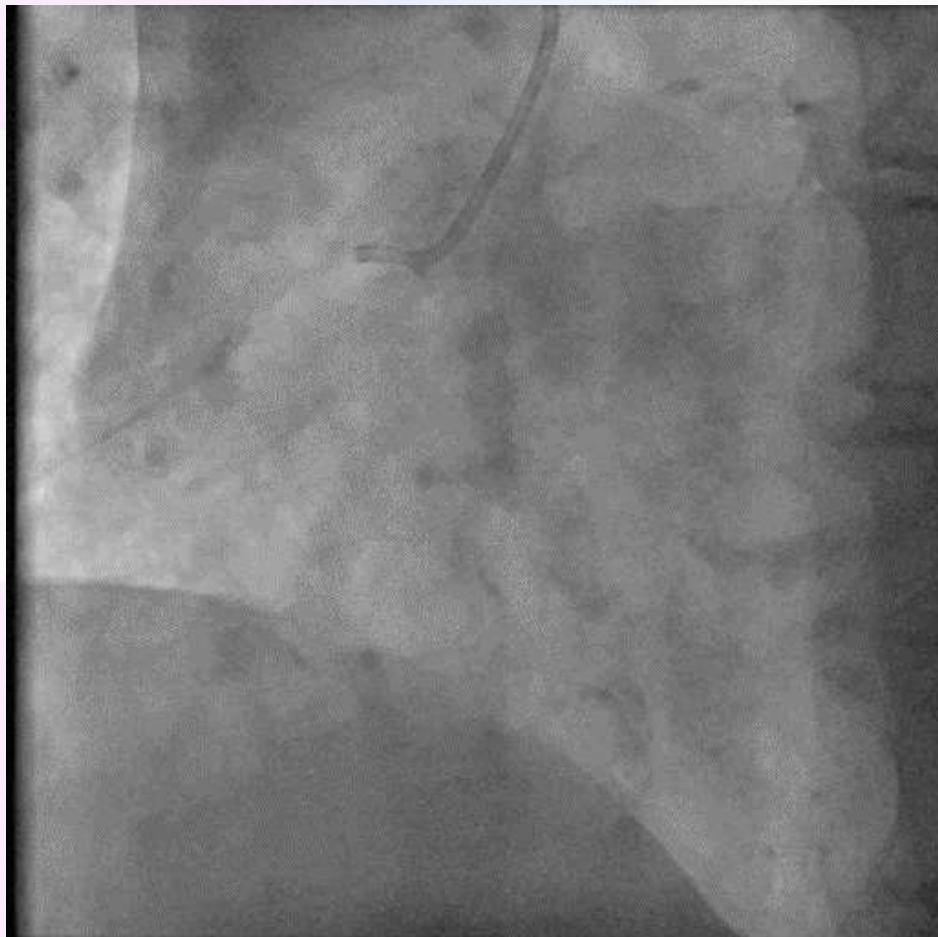
RAO30 Caud30



RAO30 Cran30



LAO 50



RAO 20



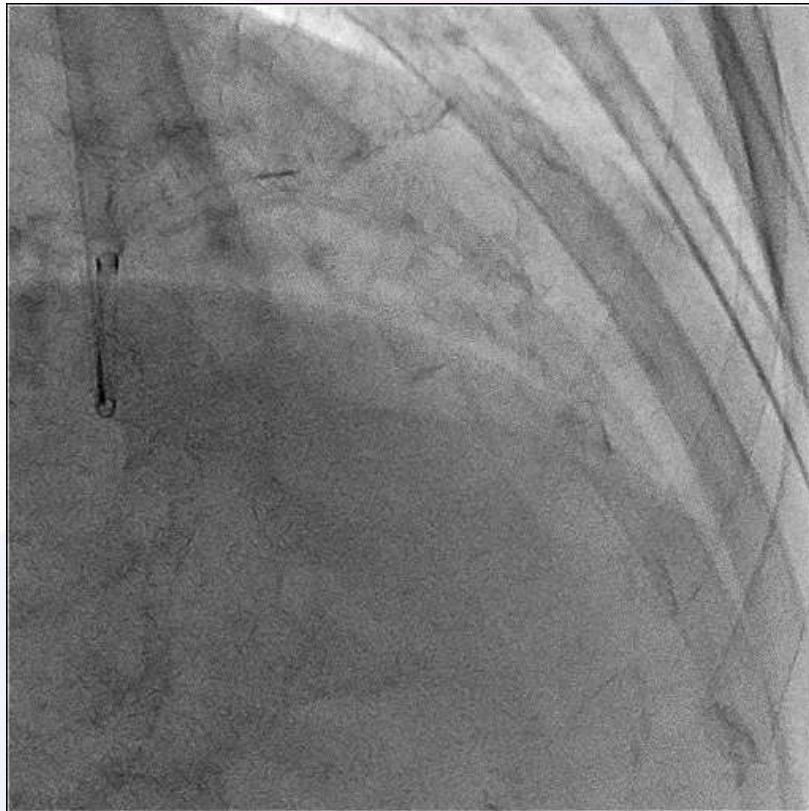


# PCI for LAD CTO

*Tip injection using micro-cath*

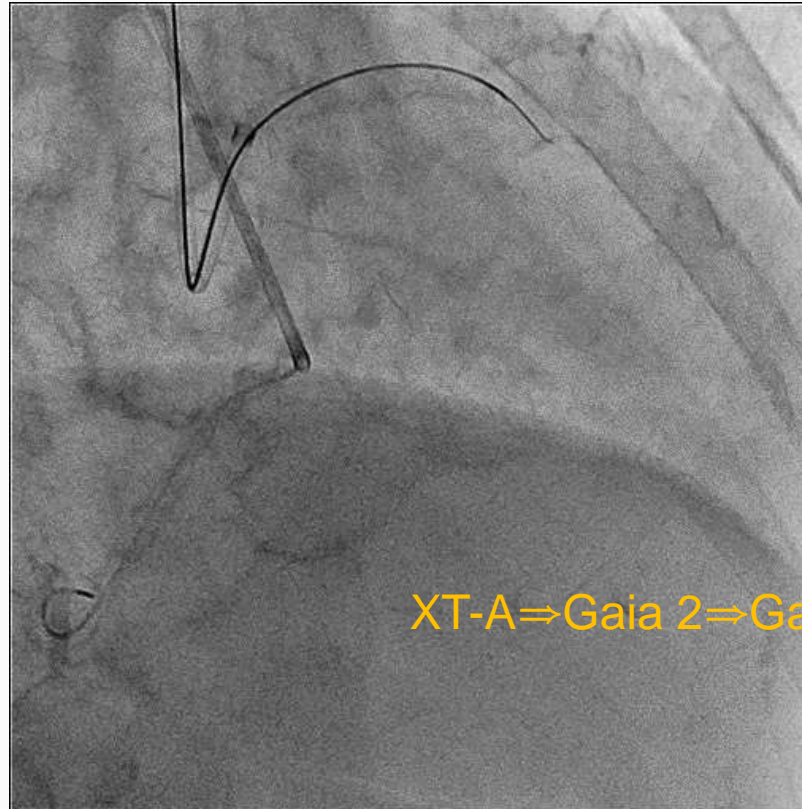
**Ante tip injection**

RAO30 Cran30

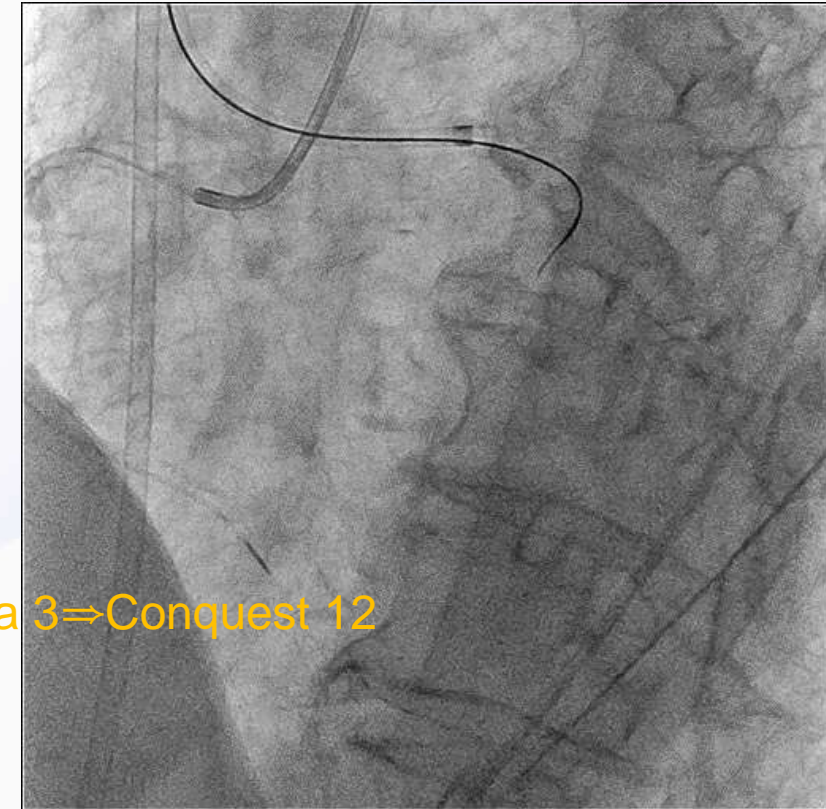


**Retro tip injection**

RAO30 Cran30



LAO50 Cran20



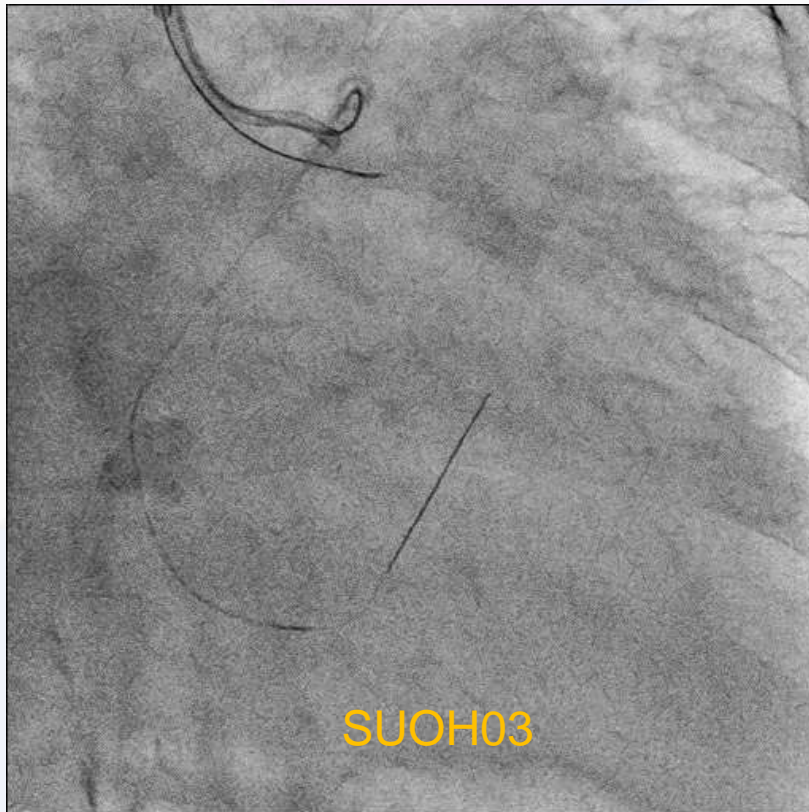
XT-A⇒Gaia 2⇒Gaia 3⇒Conquest 12



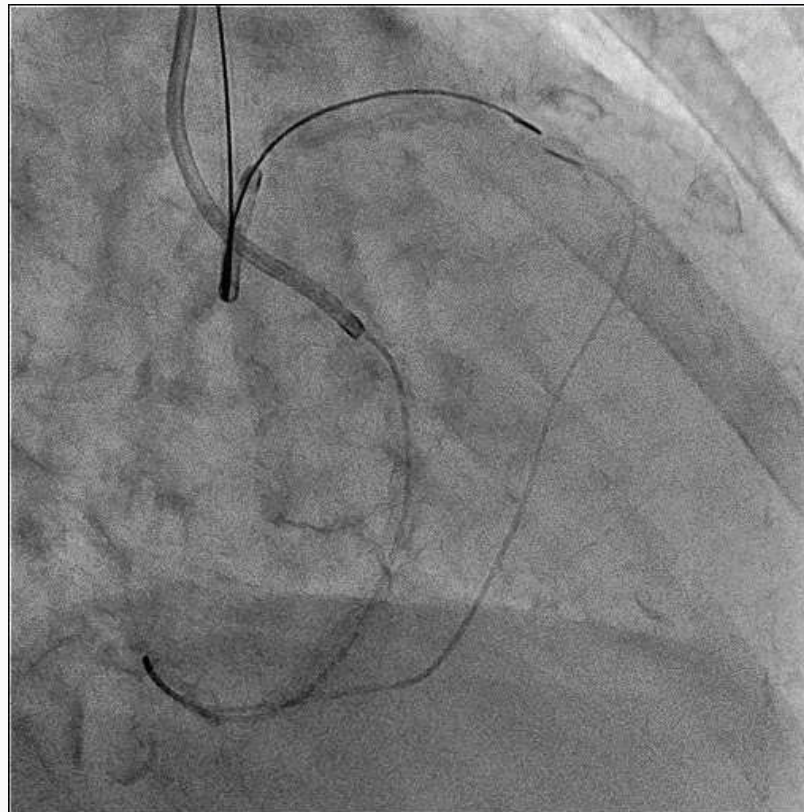
# Retrograde approach

*Switch to retro immediately*

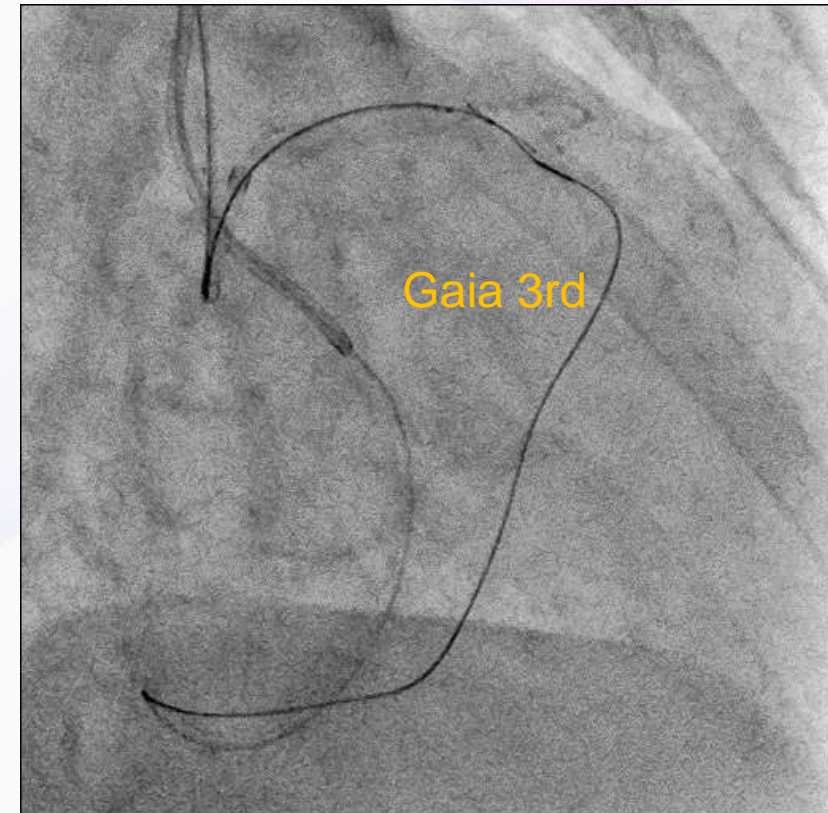
RAO30 Cran30



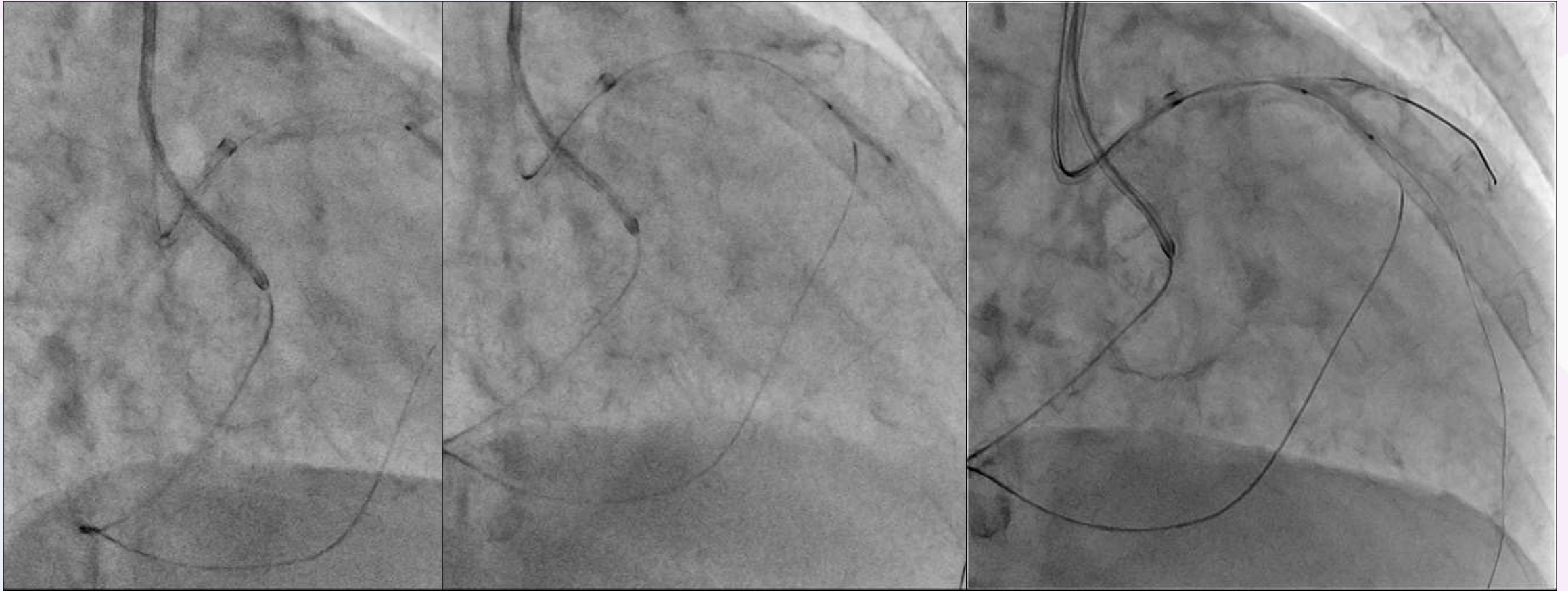
Retro tip injection



Retro direct cross

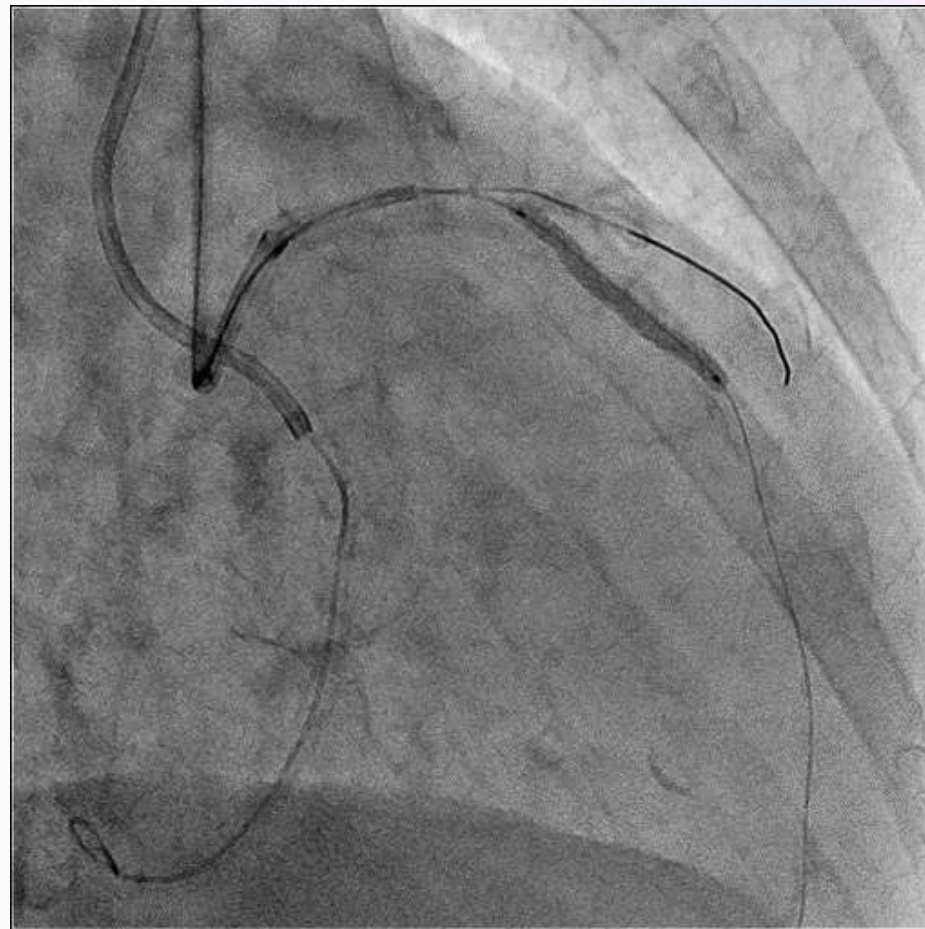
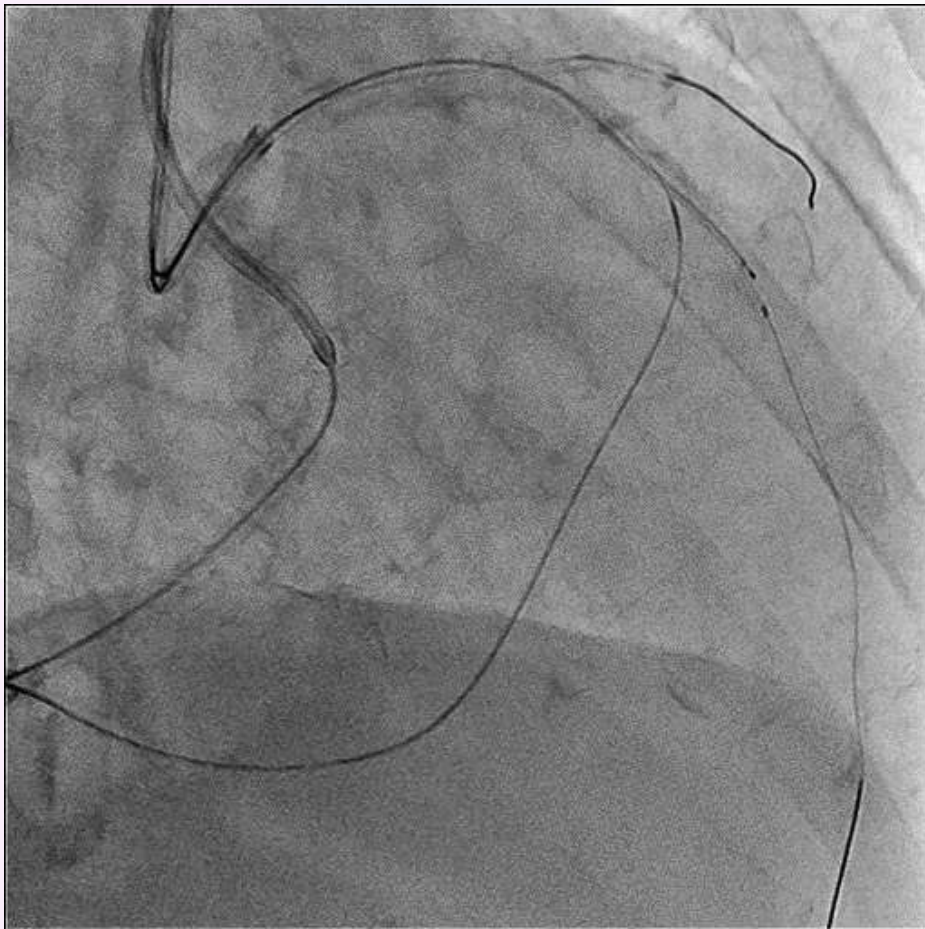


# Externalization $\Rightarrow$ POBA



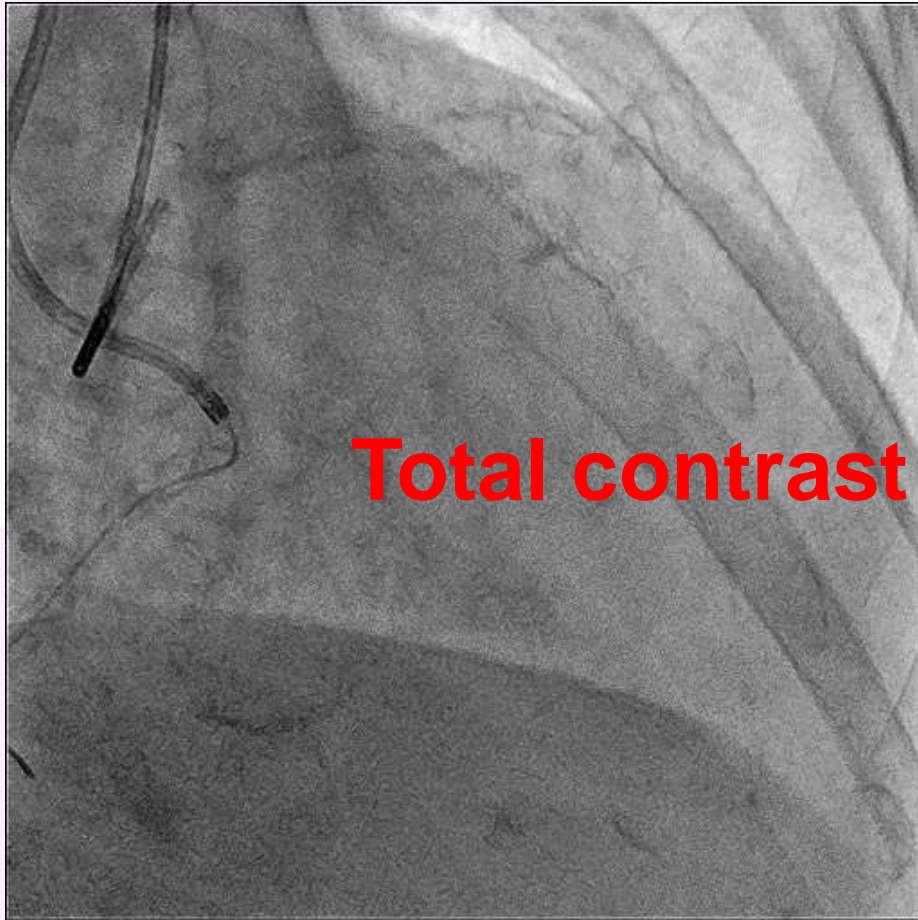


# IVUS marking $\Rightarrow$ stenting

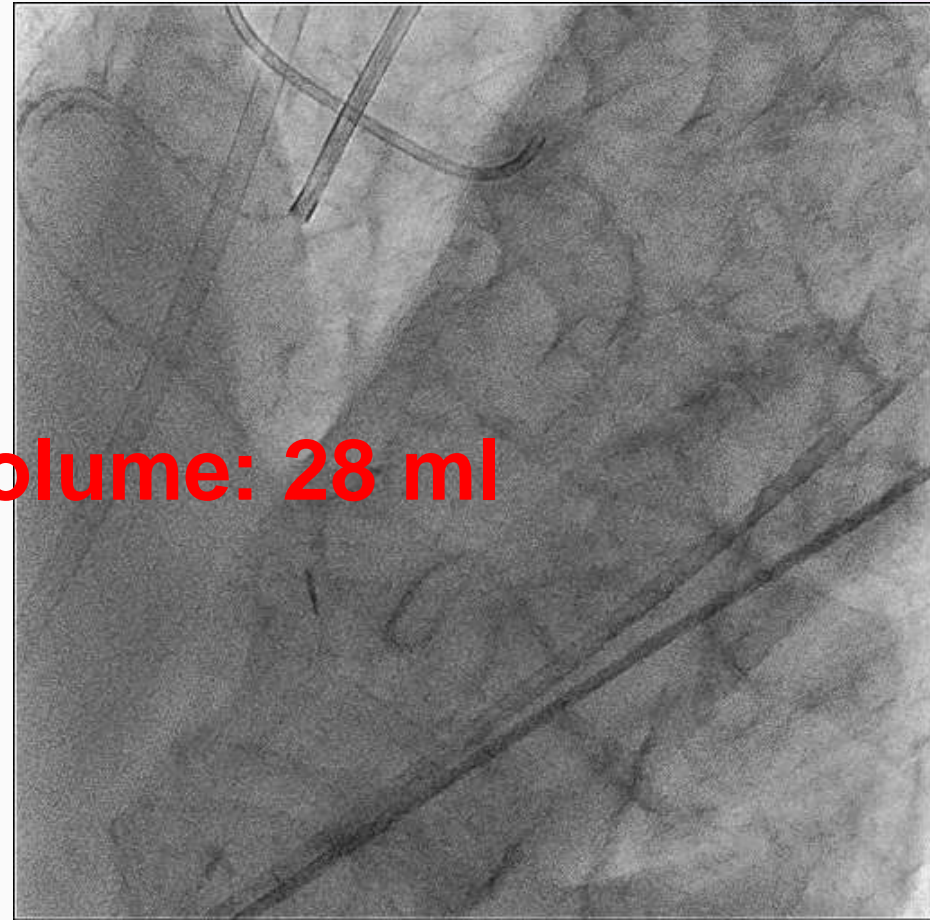


# Final angiography

RAO30 Cran30



LAO50 Cran30



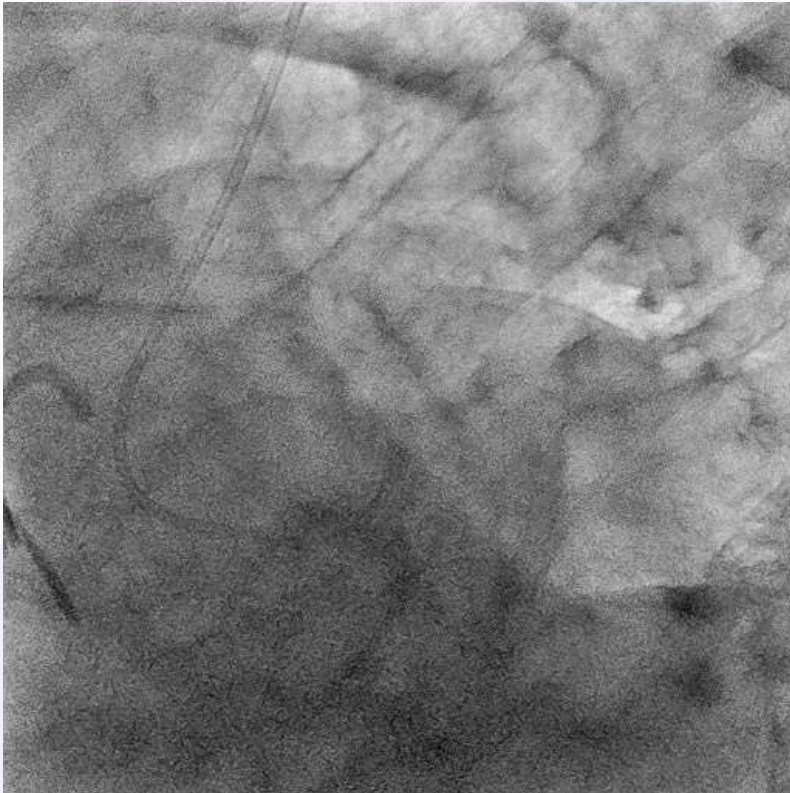
**Total contrast volume: 28 ml**



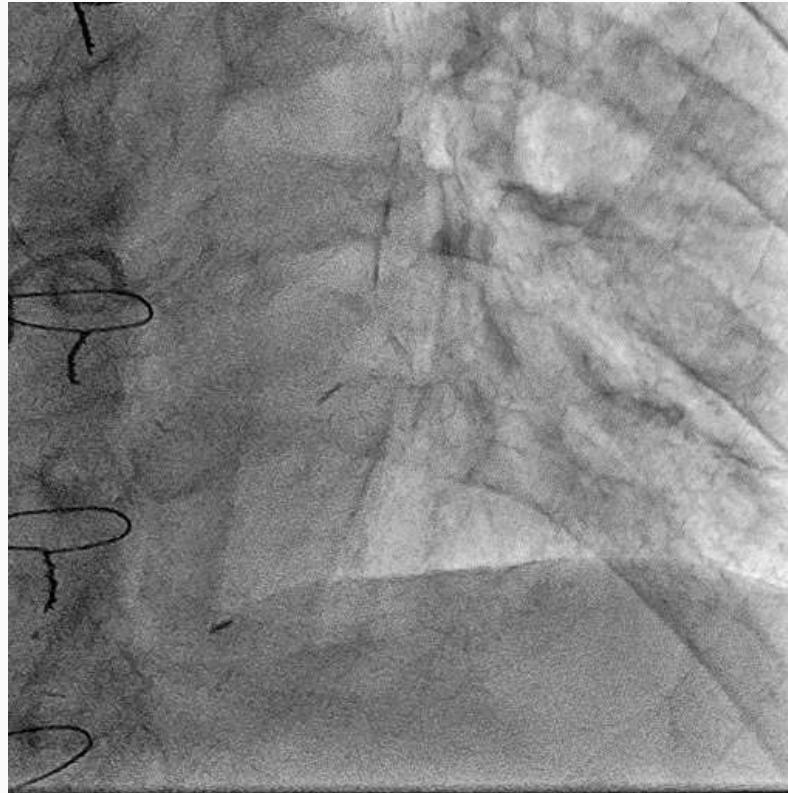
# Case 2 80's male, cre 1.6 (eGFR 30)

*Calcification guide wiring, wire marking*

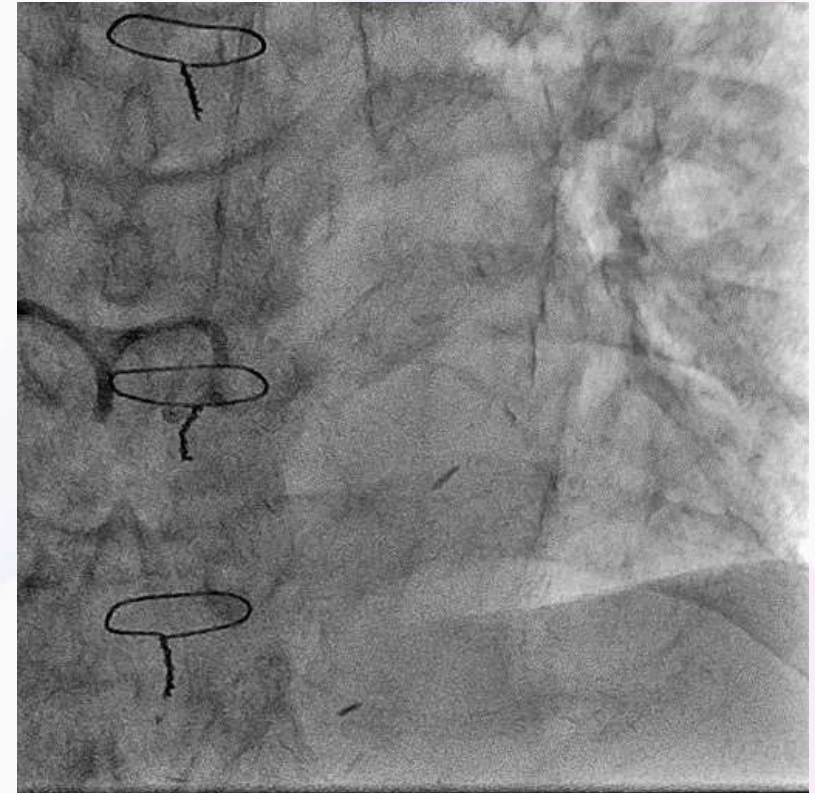
LAO70 Caud40



Cran40

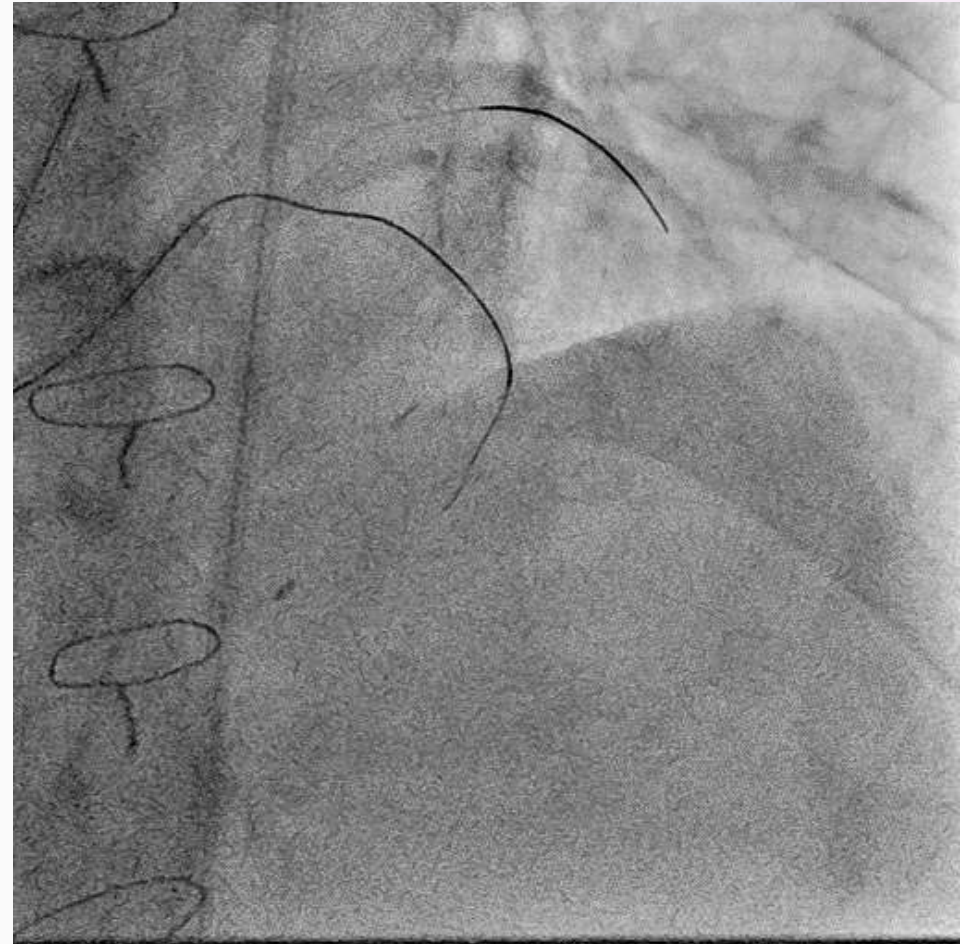
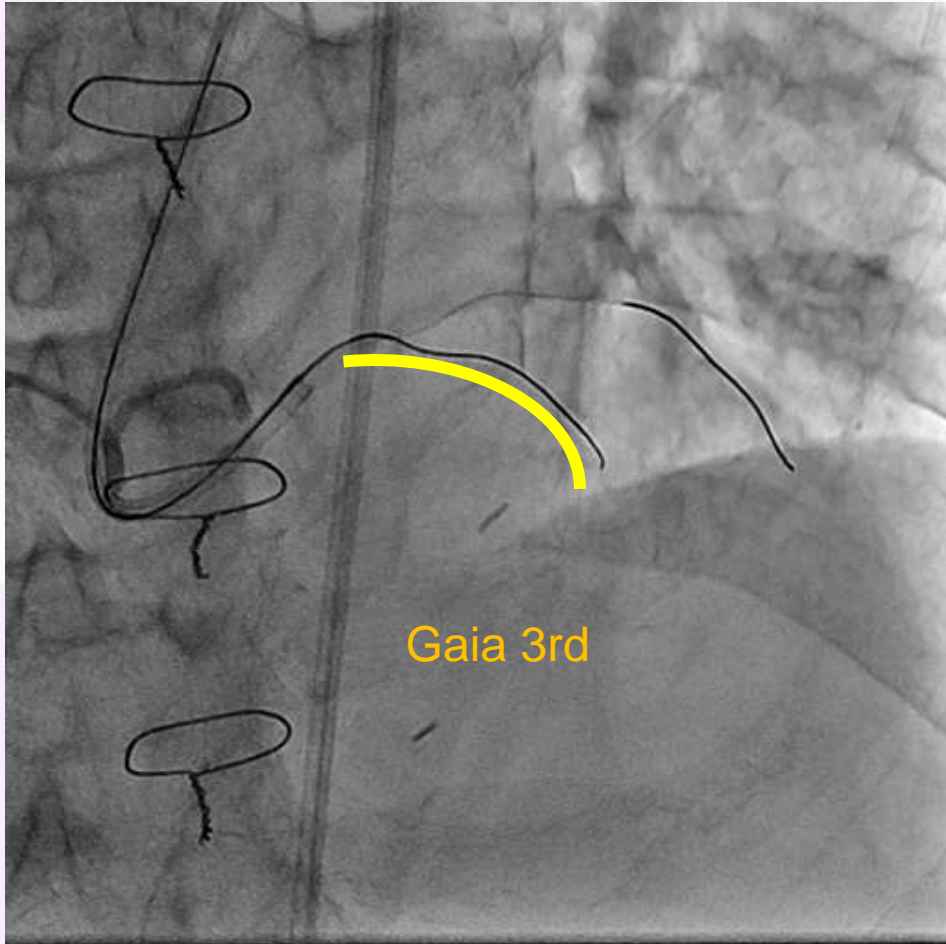


Cran40



# PCI for LAD CTO

## *Calcification guide wiring*

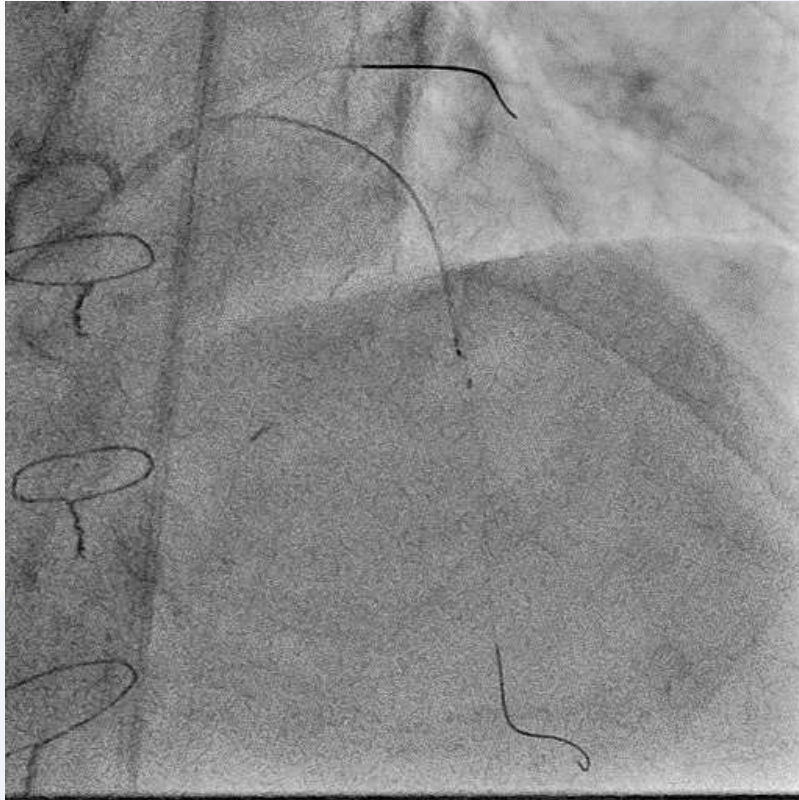




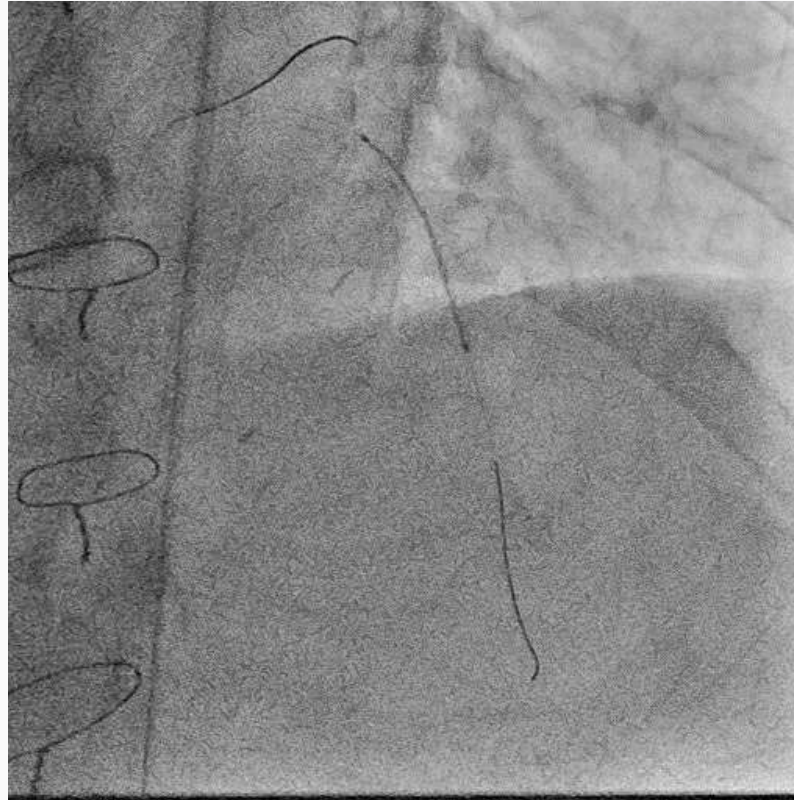
# Stenting

*IVUS marking, wire marking*

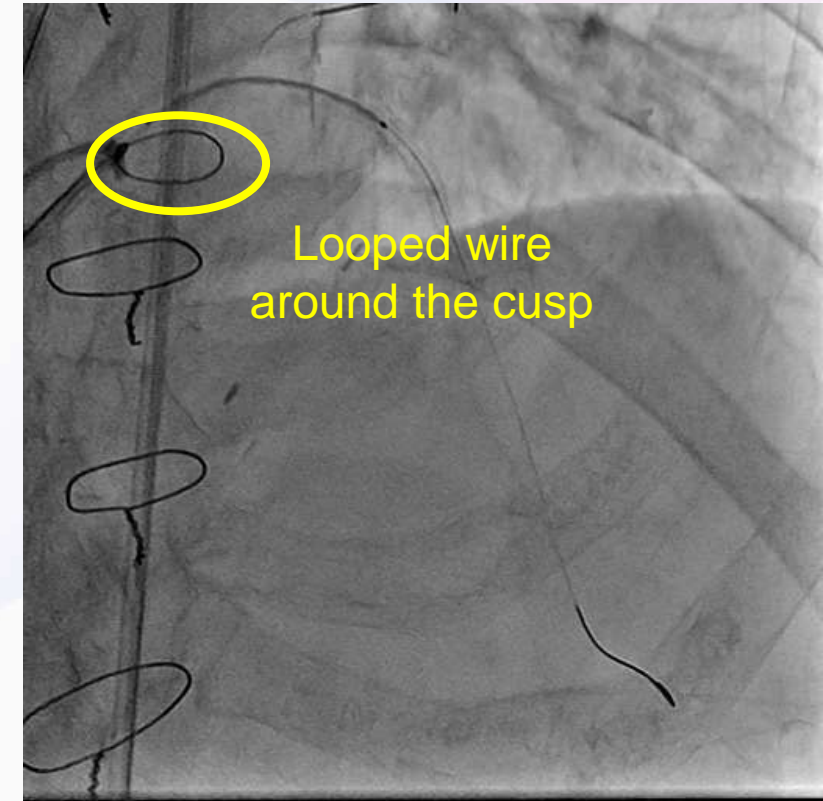
**IVUS marking**



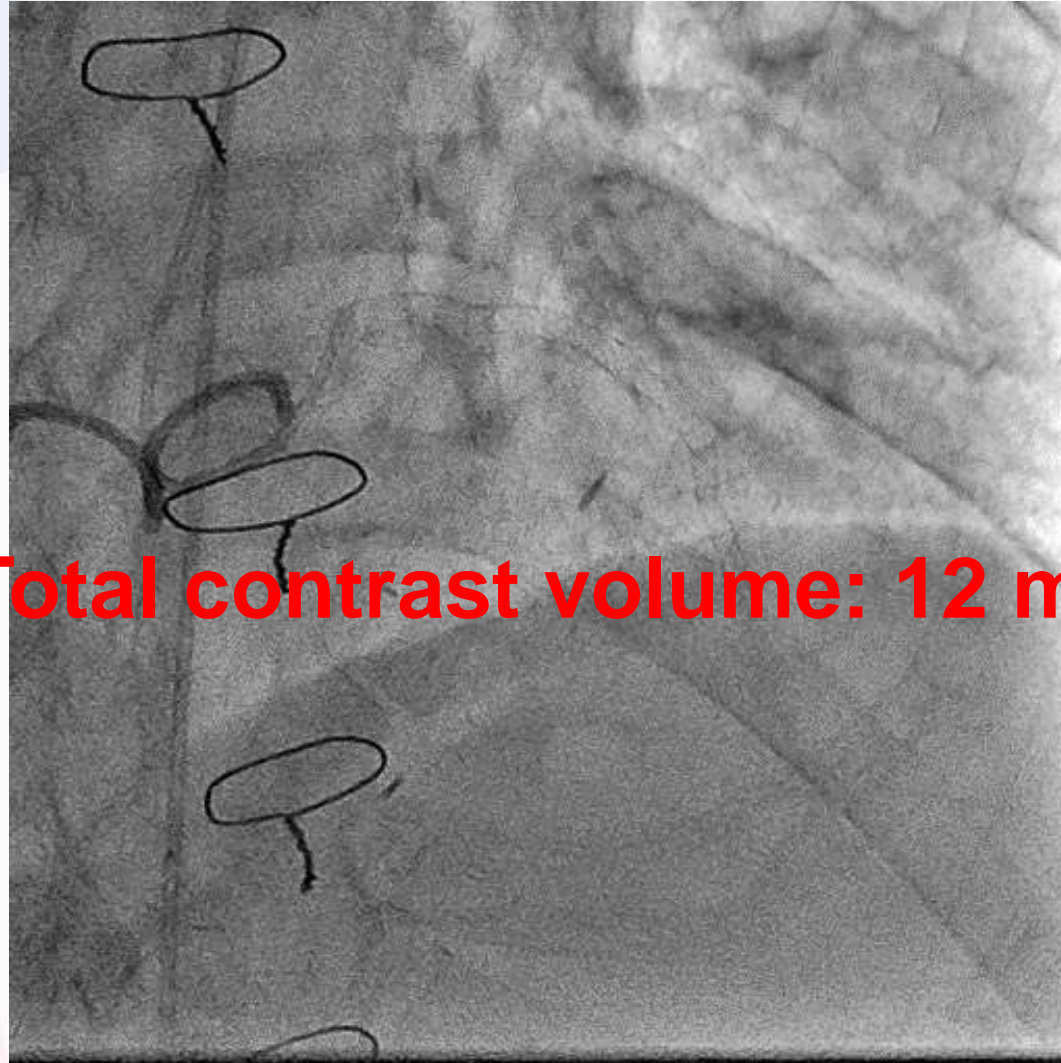
Stenting



**Wire marking**



# Final angiography



**Total contrast volume: 12 ml**

# Conclusion

- Once, CI-AKI is established, there are no specific treatment, hence the goal is prevention.
- Decreasing contrast-volume is the single most important measure.

Use of micro-cath saving contrast-volume

Extensive use of IVUS

Switch to retrograde approach immediately