



The Nuts and Bolts of Reverse CART

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Nagoya Heart Center
Gifu Heart Center*



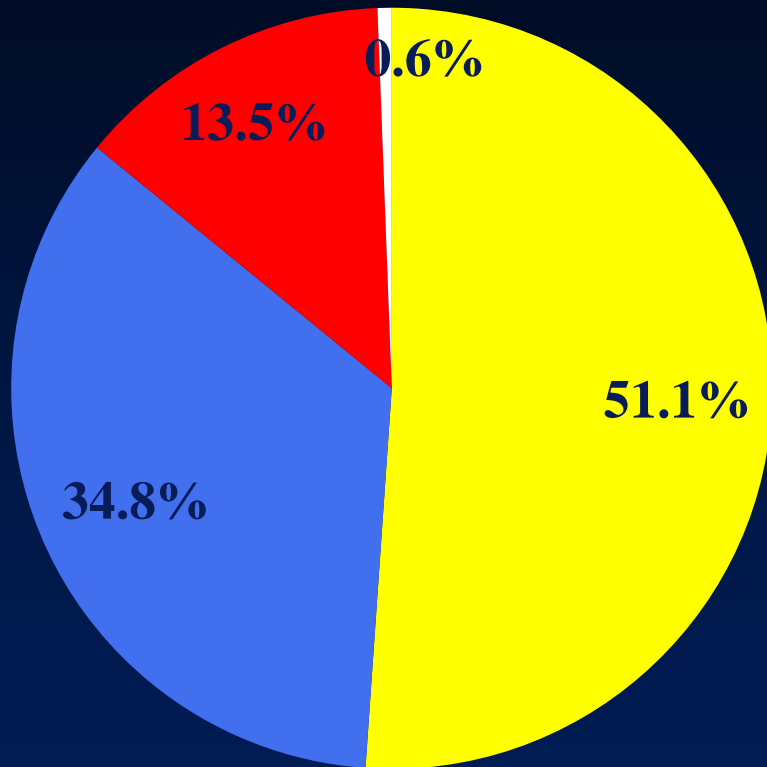
Disclosure

Within the past 12 months, the presenter or their spouse/partner have had a financial interest/arrangement or affiliation with the organizations listed below.

Physician Name**Company/Relationship****Etsuo Tsuchikane, MD, PhD****Boston Scientific, Japan Consultant****Asahi Intecc, Japan Consultant**

Change in CTO crossing strategy

Retrograde Summit Registry 2012



Reverse CART



Traditional CART



Retrograde direct crossing



Kissing wire



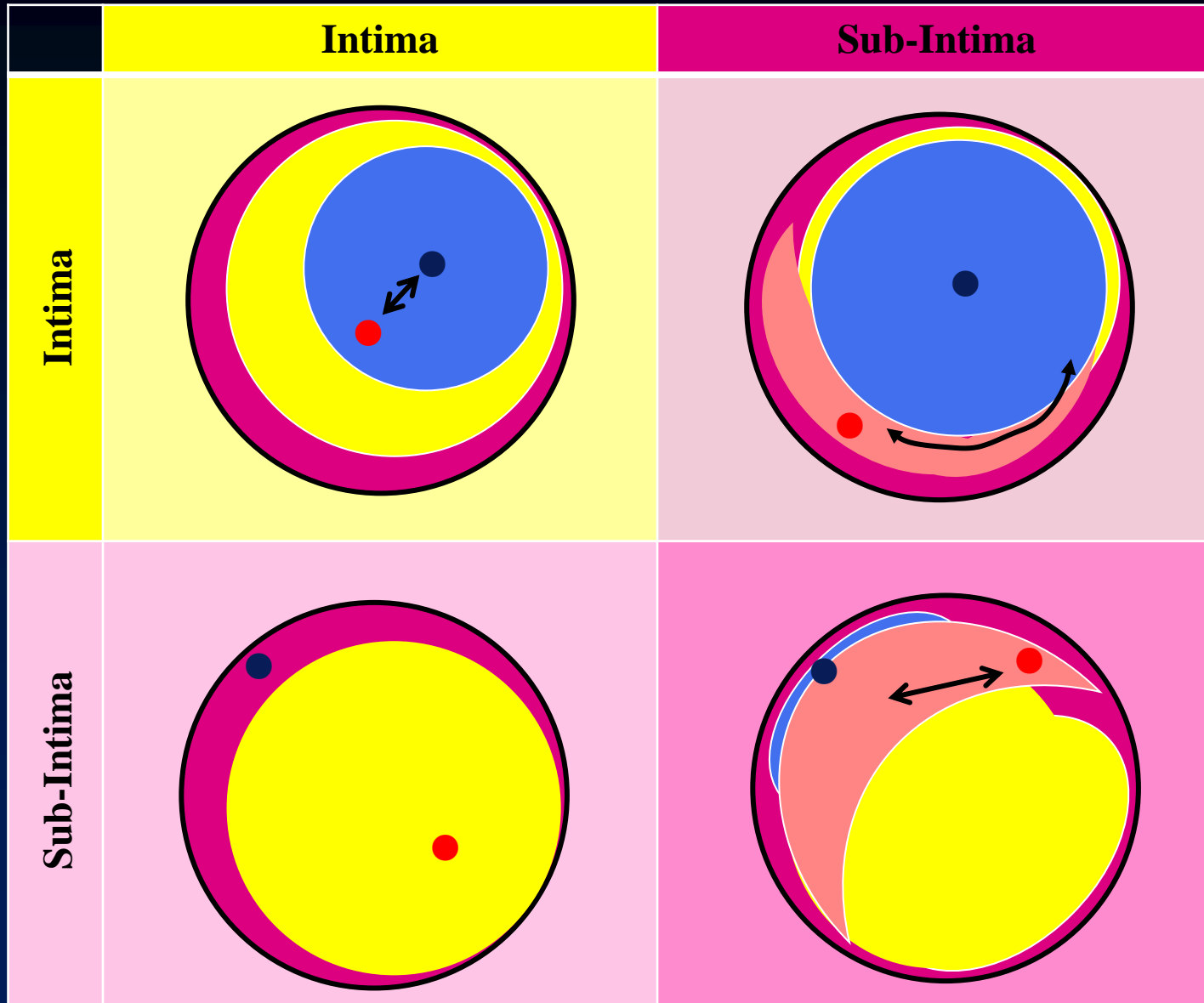
Limitations of Classic Reverse CART

- In the classic reverse CART, a retrograde wire was advanced first (including attempt at the retrograde direct crossing).
- Connection was made at the position where bilateral wires was overlapped.



● Retrograde wire position

Antegrade wire position ●



Intima

Sub-Intima

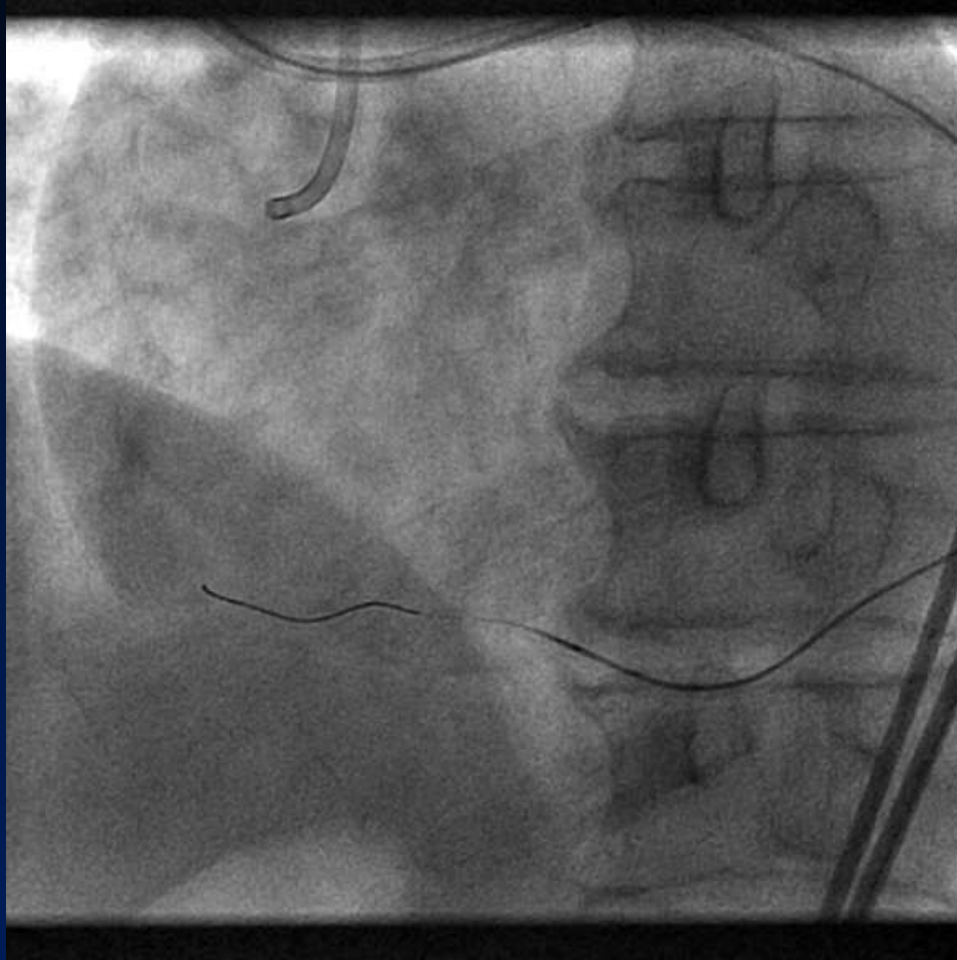
Antegrade balloon

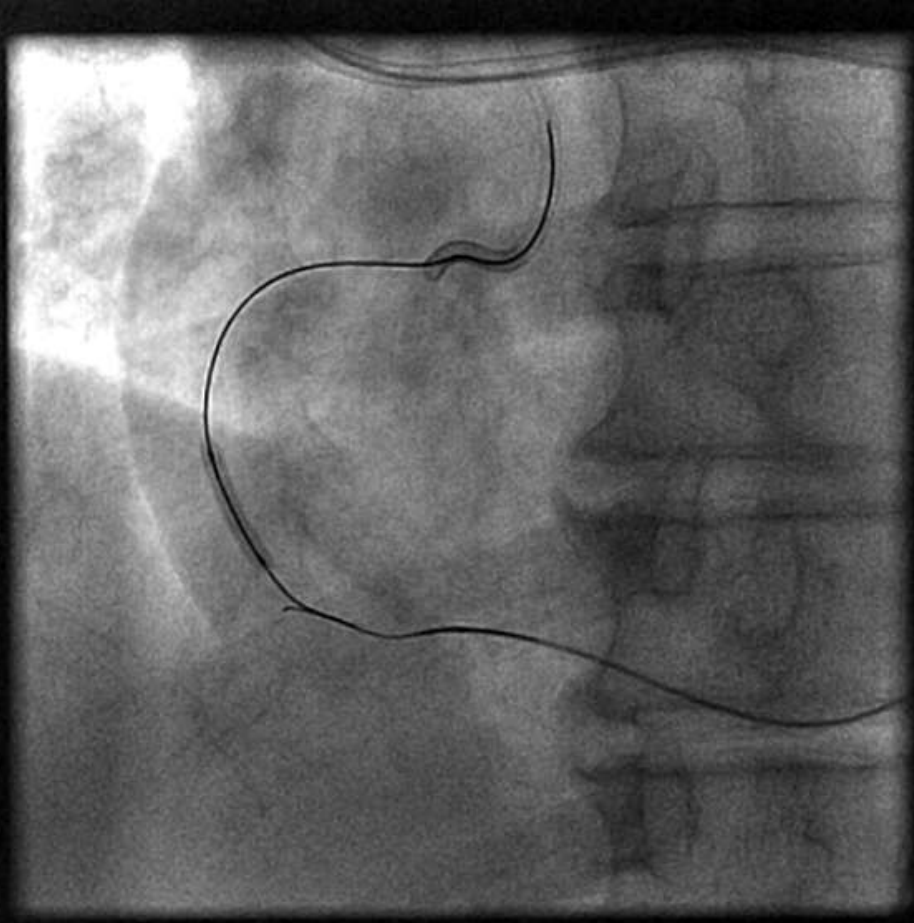
Dilated space

Calcified plaque

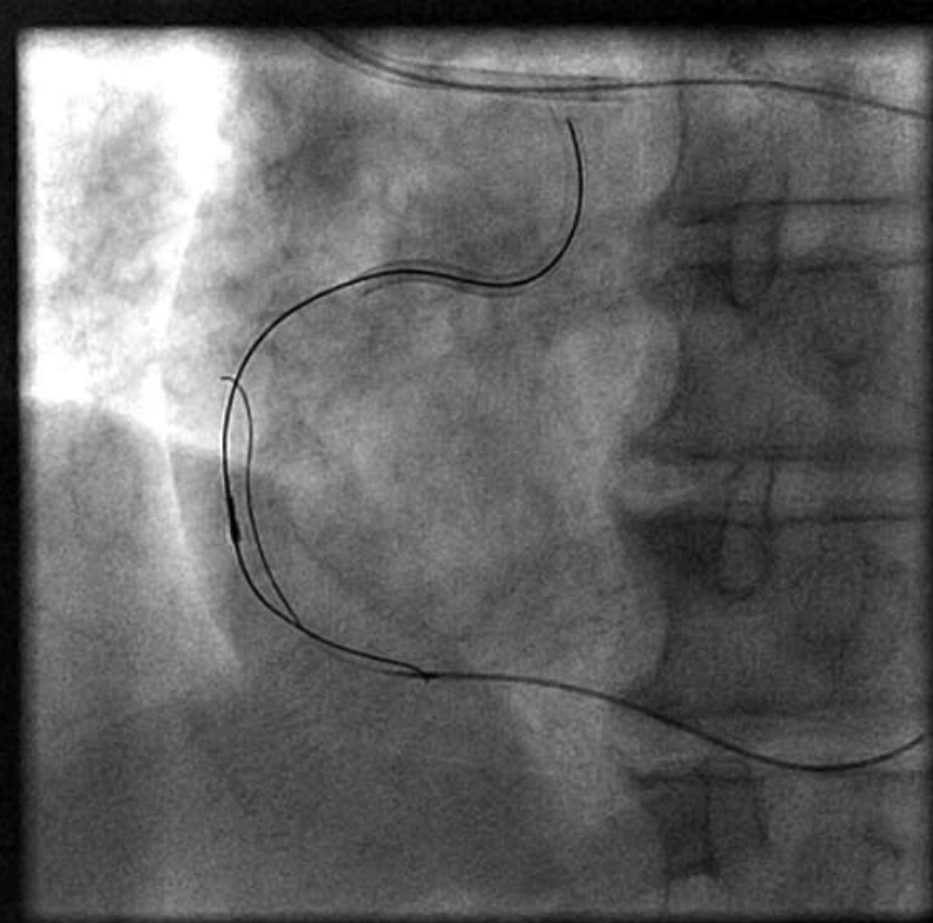


Mid RCA CTO, 2nd Attempt



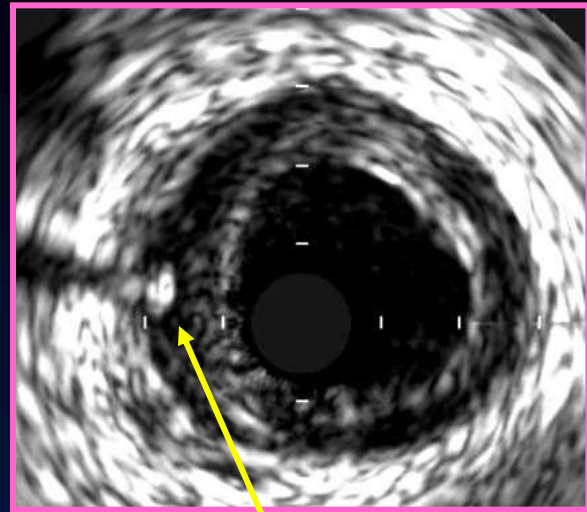
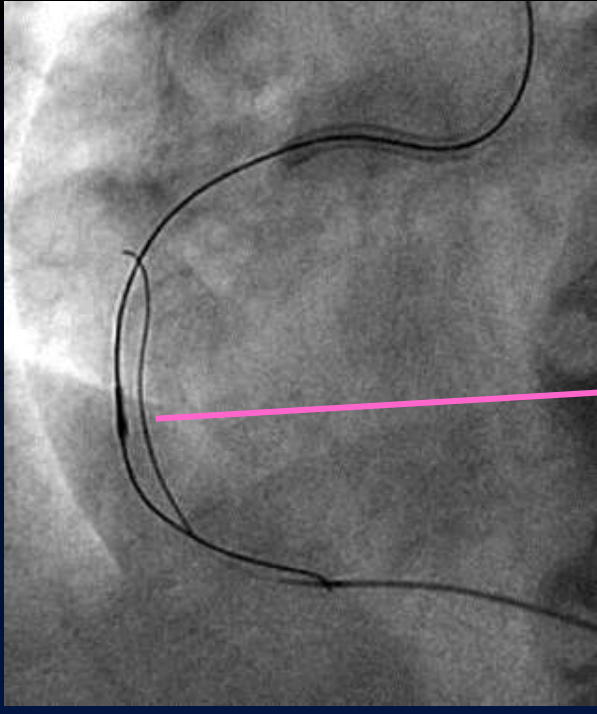
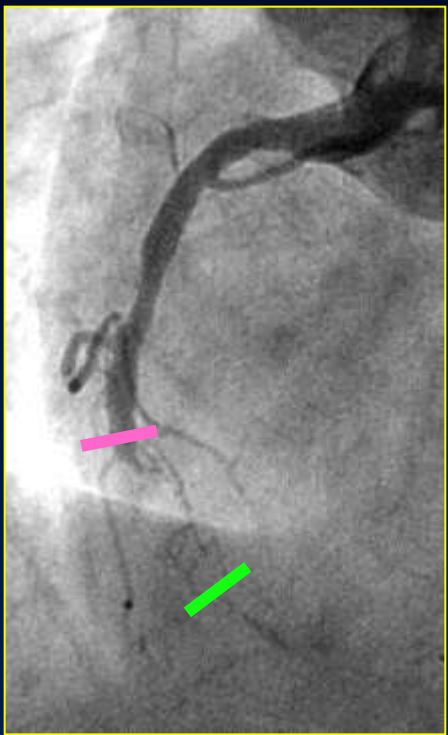


2.5mm ballooning

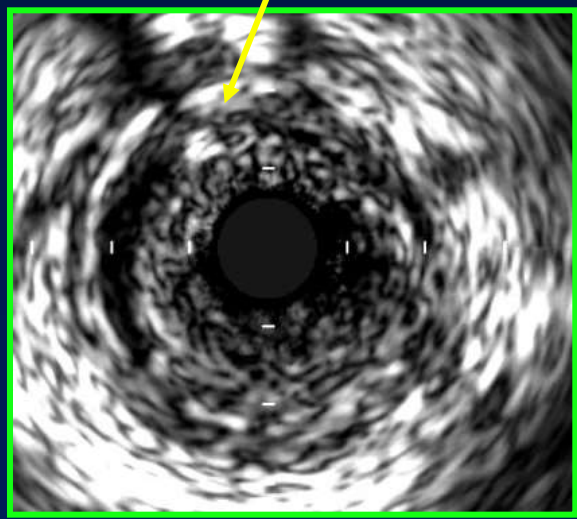
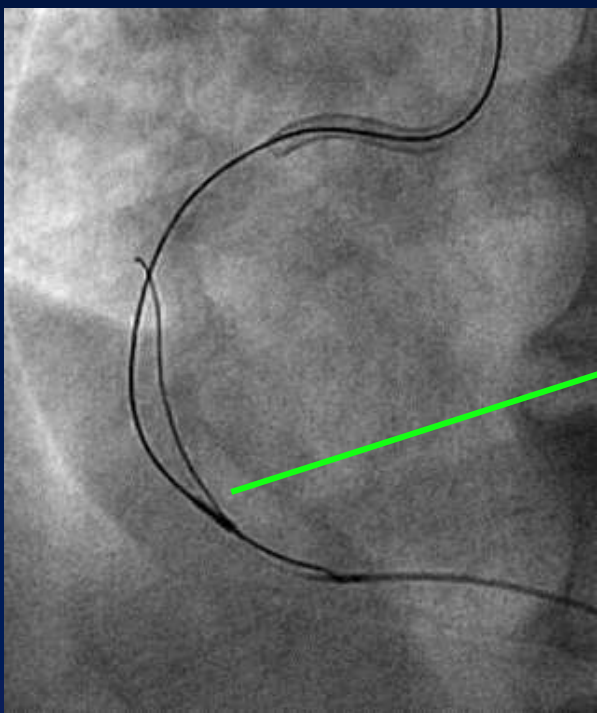


***Unsuccessful reverse CART
→ IVUS examination***

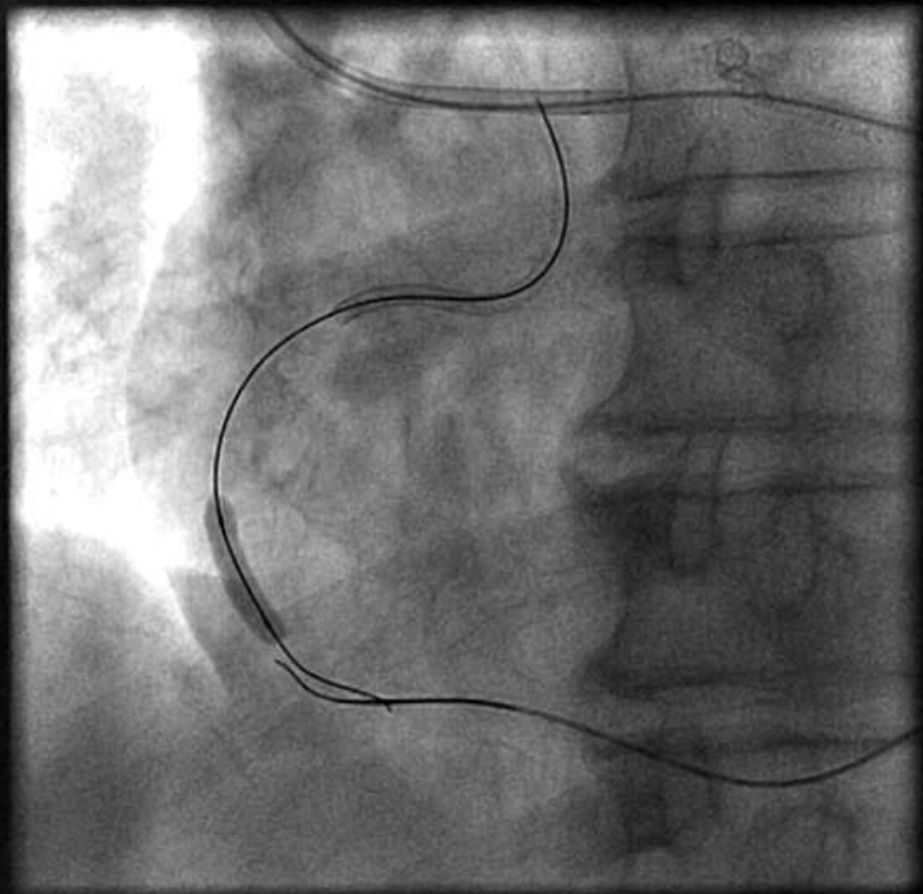
CTO



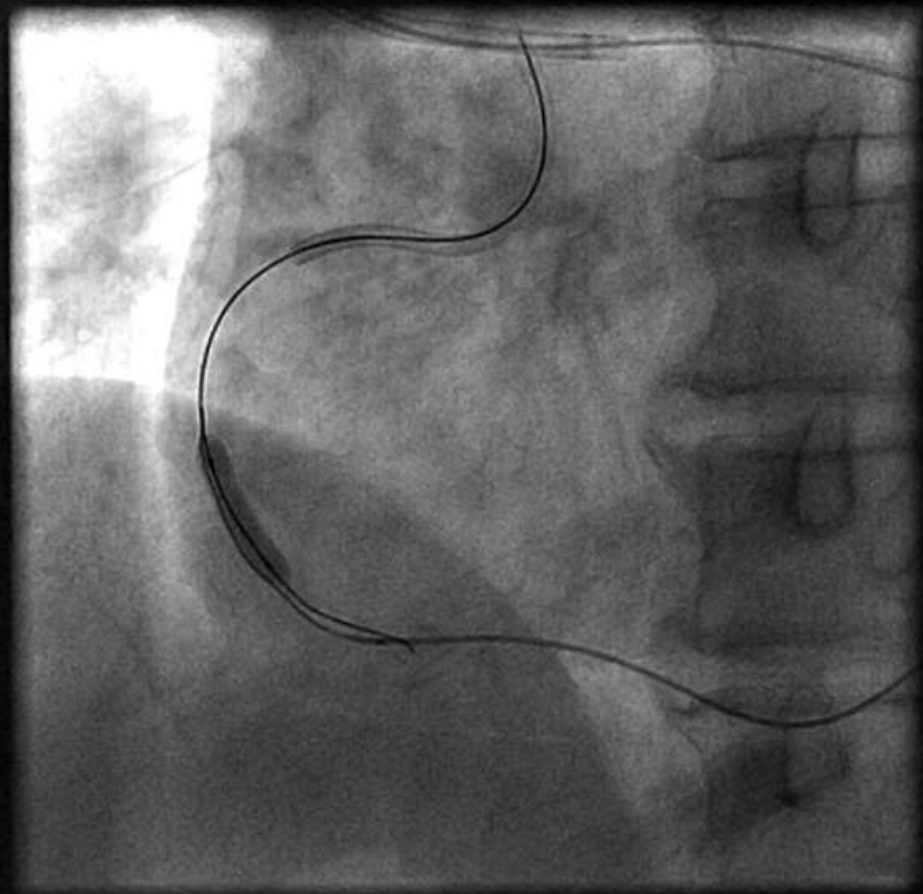
Retrograde wire



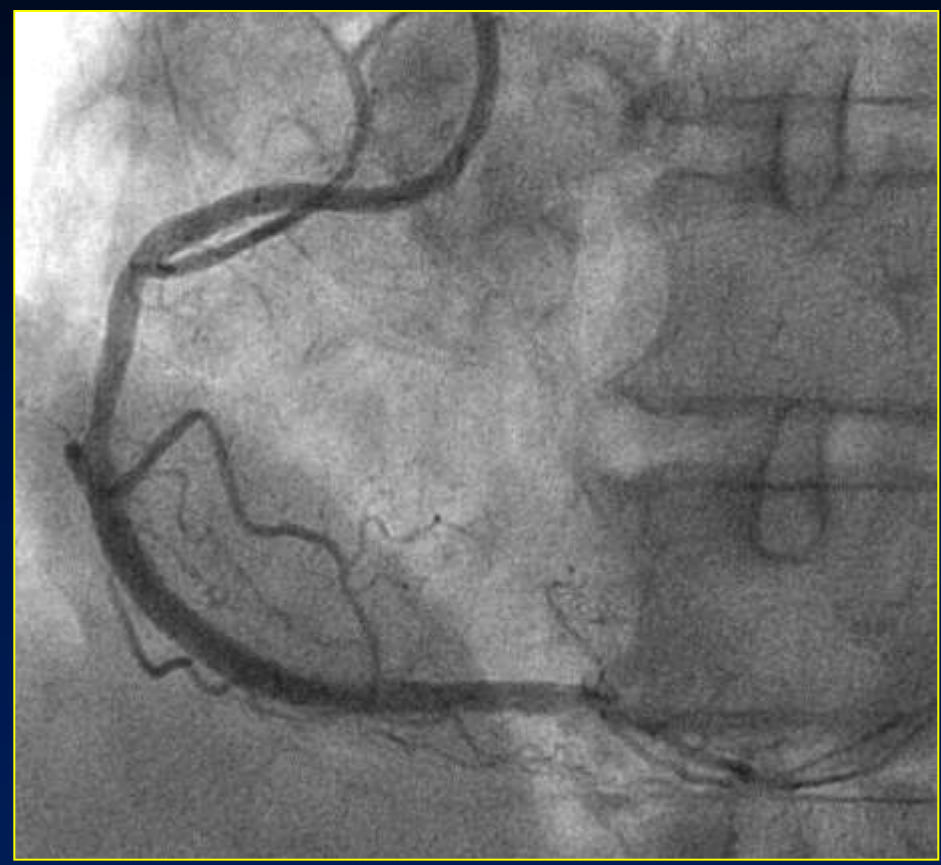
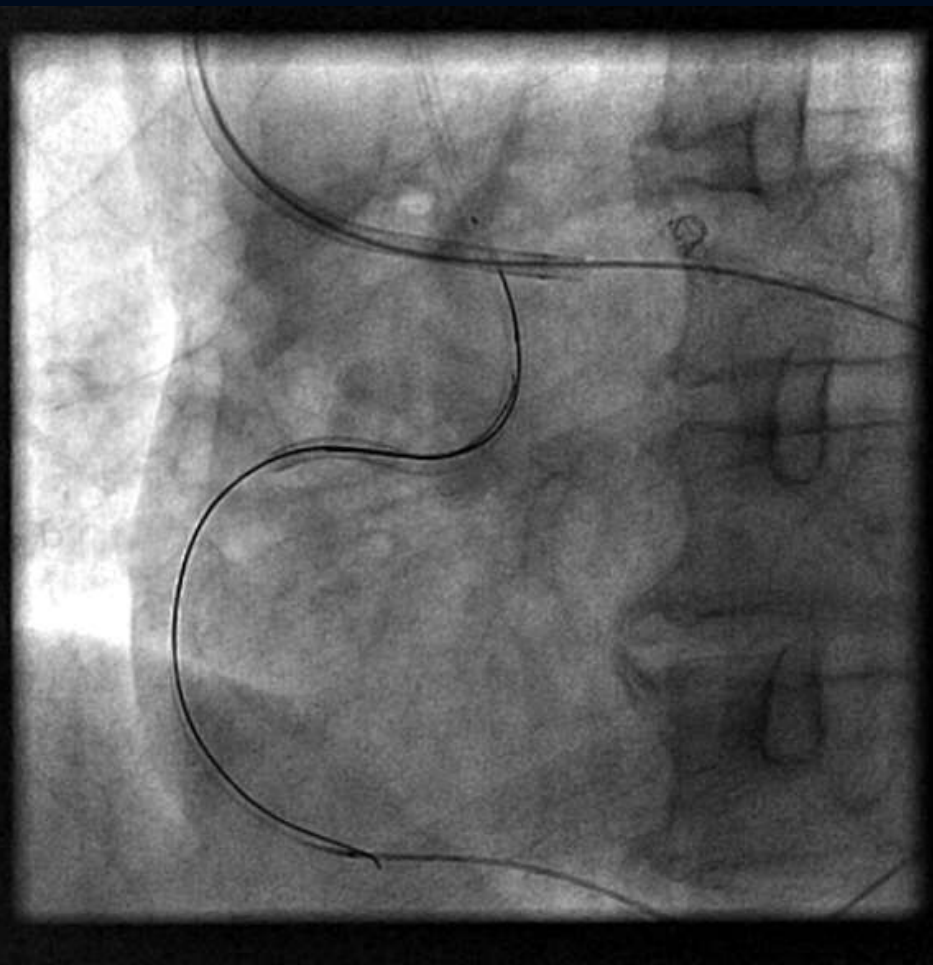
1mm



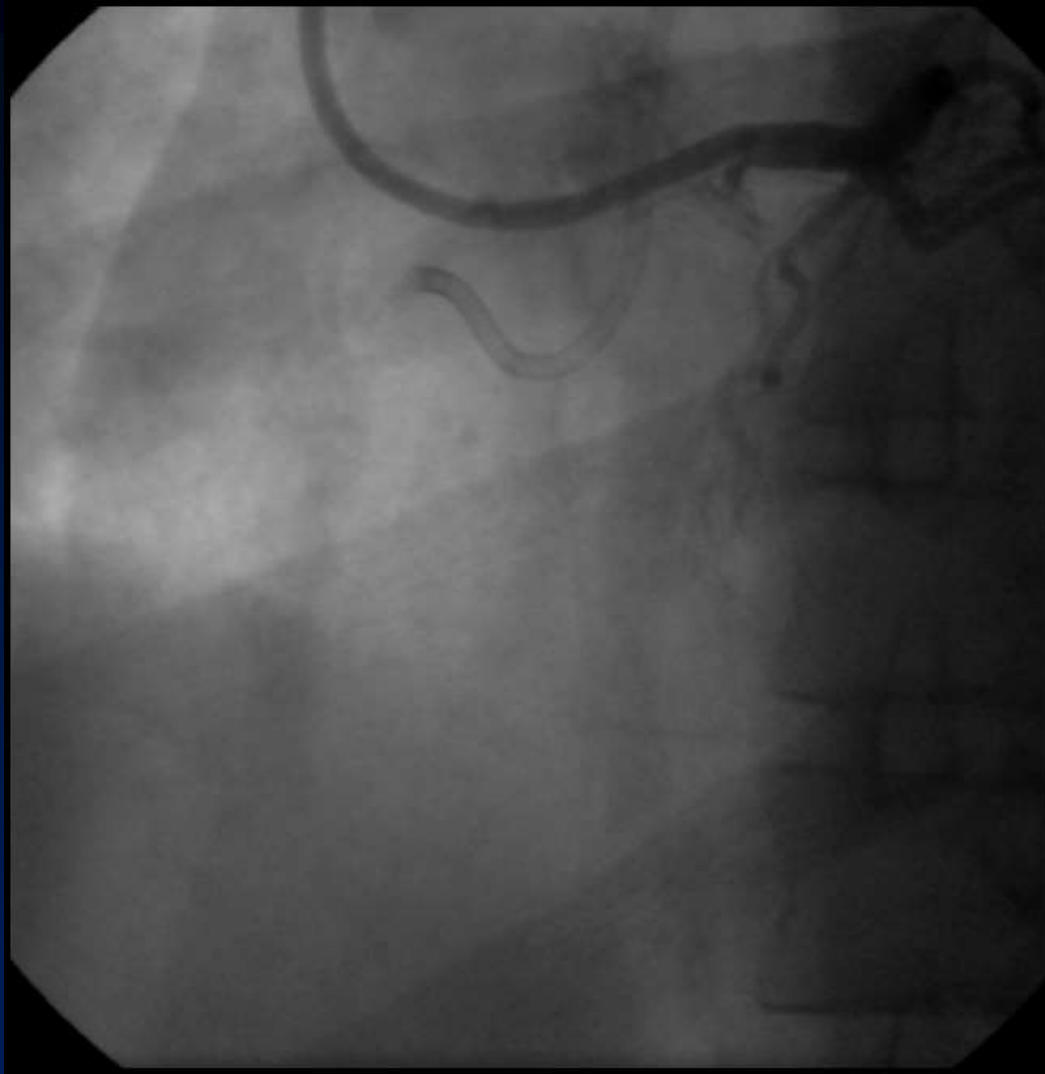
3.5mm ballooning

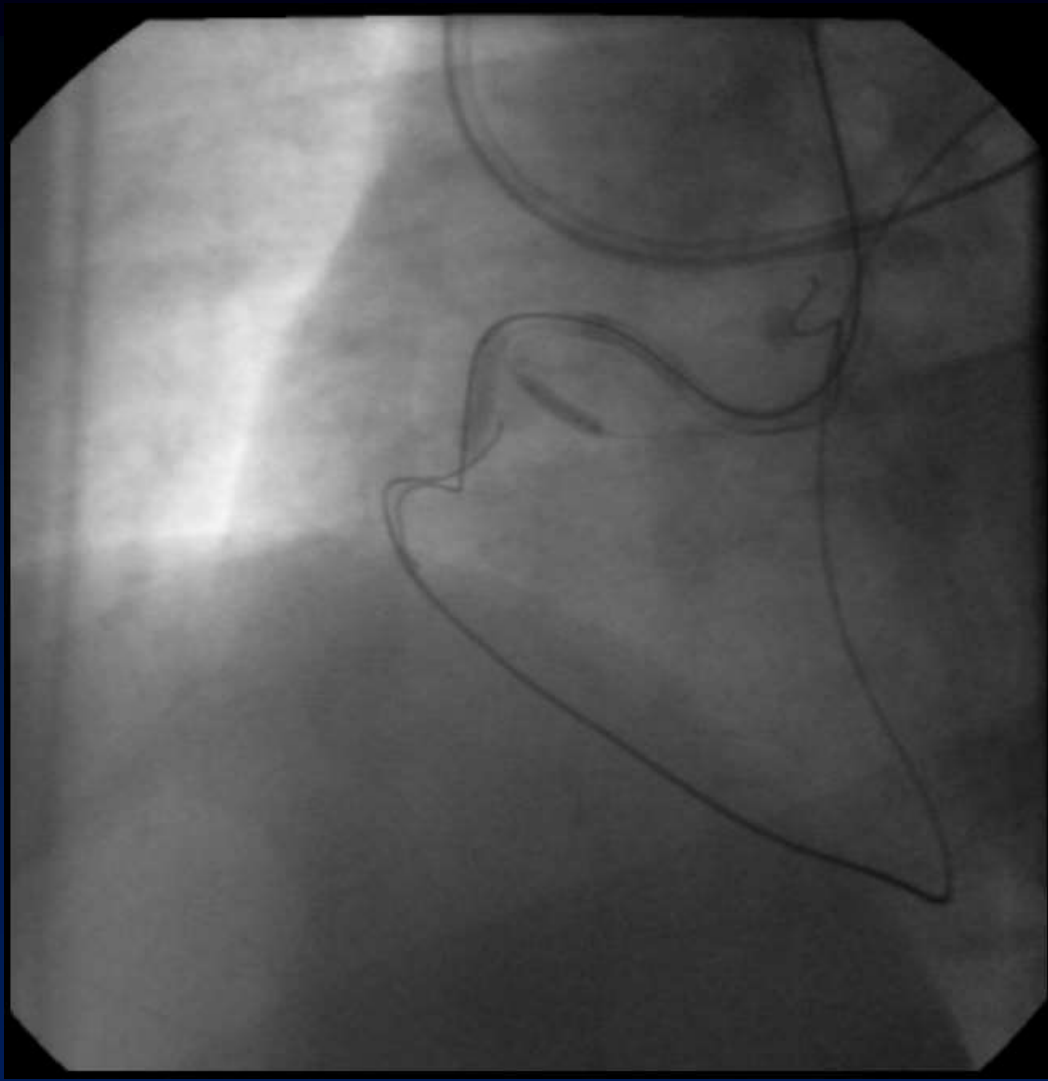


Wire touched balloon!

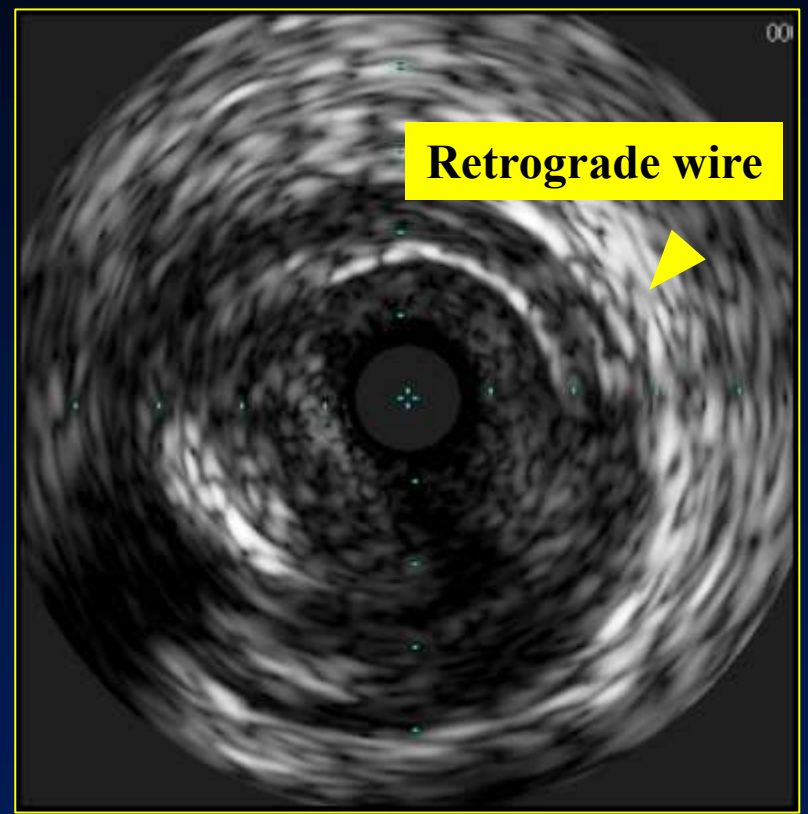


Successful reverse CART

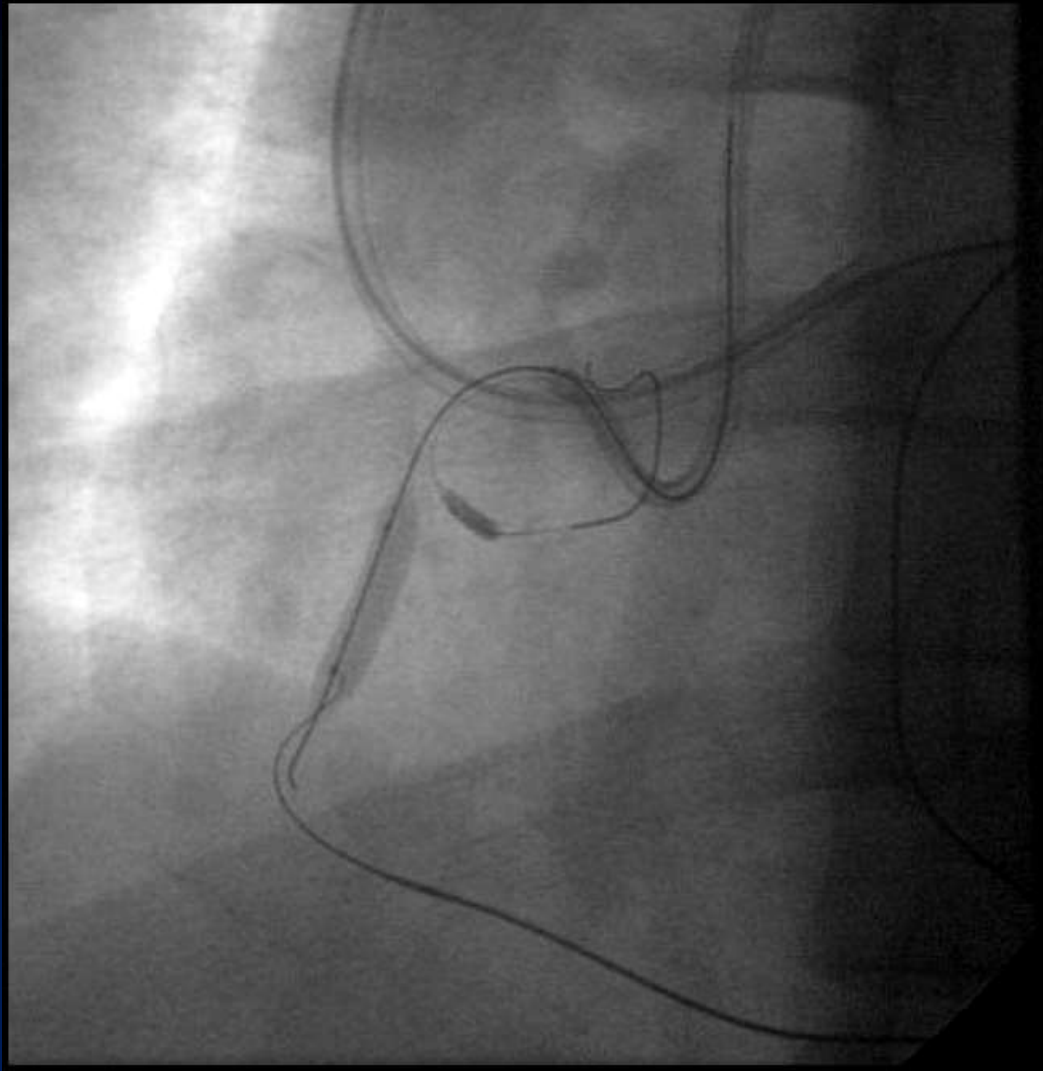




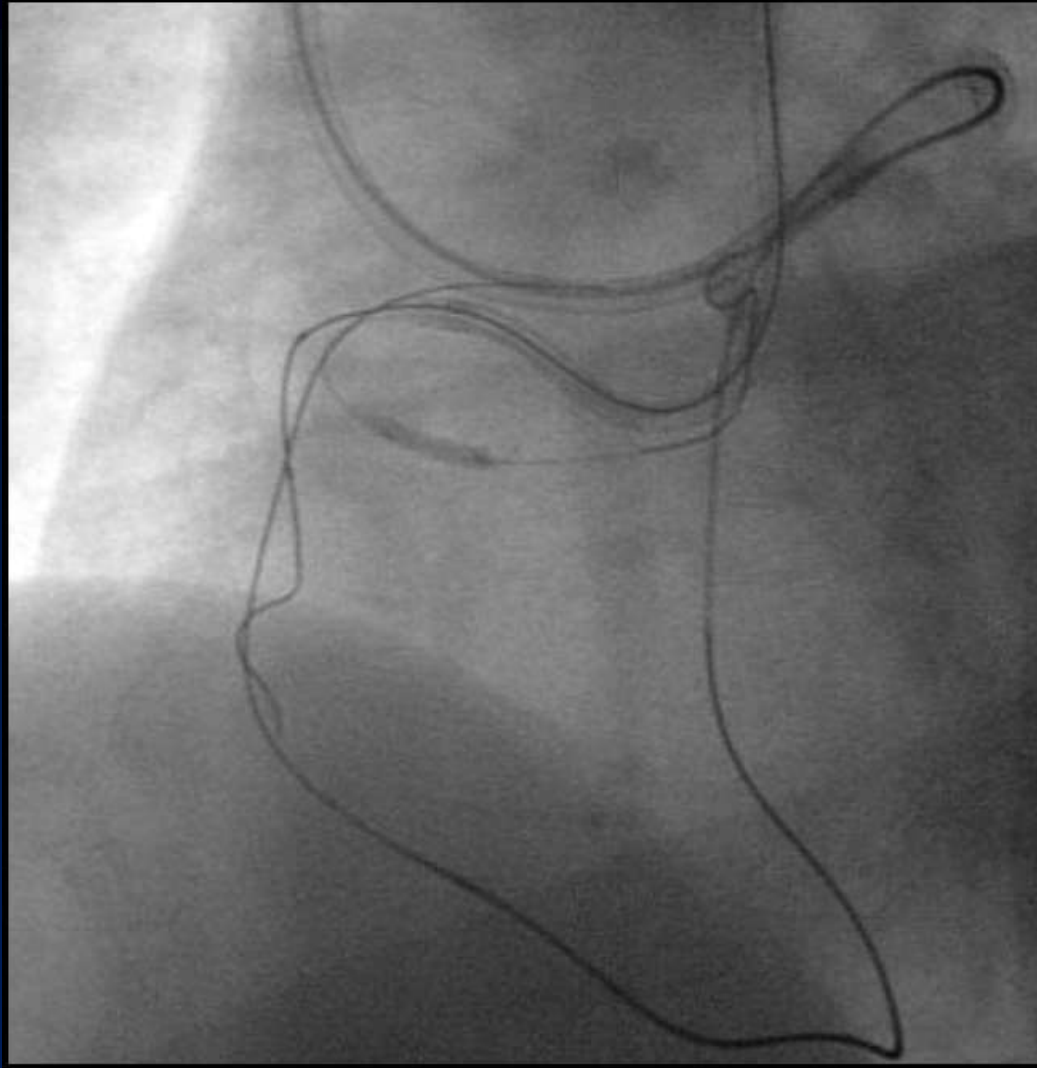
3.0 mm balloon



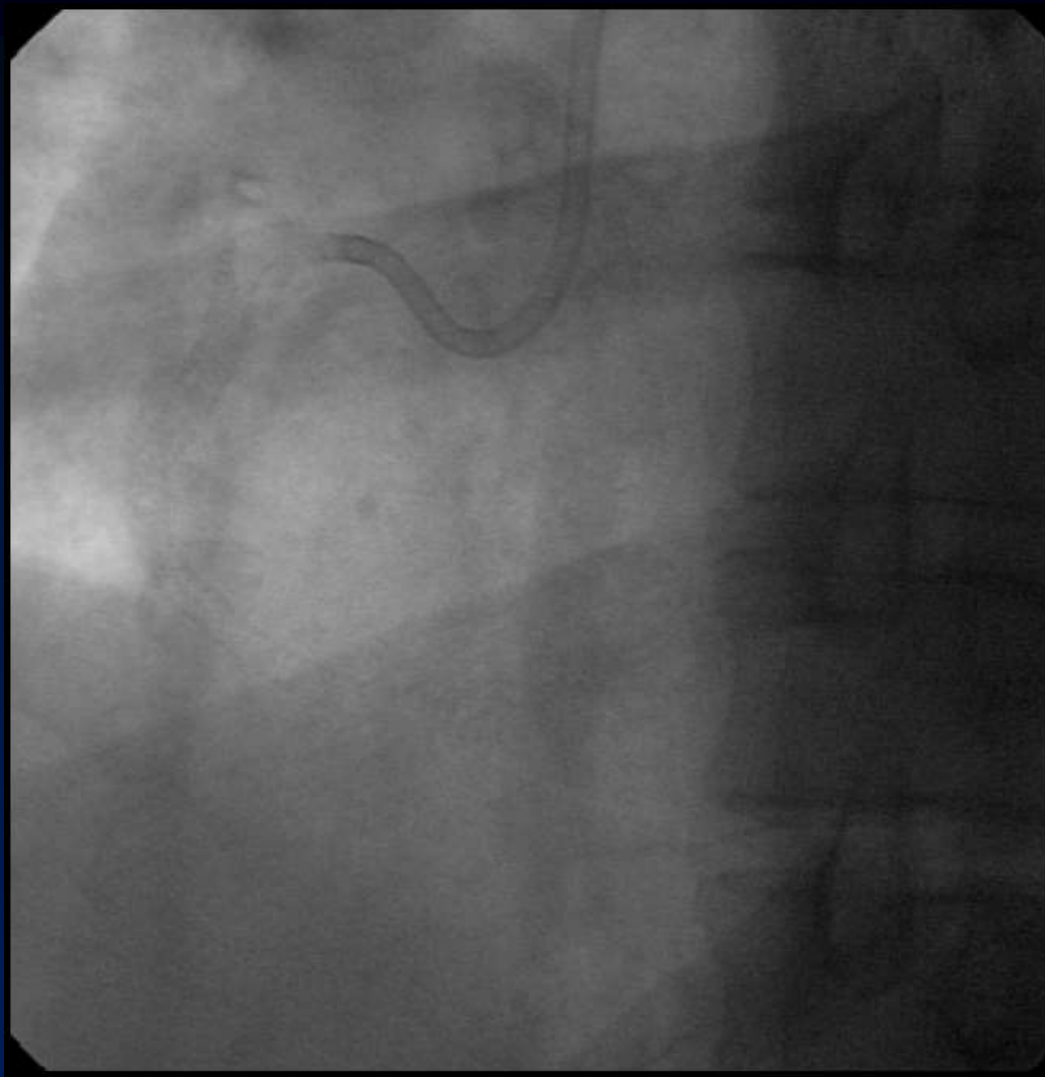
Too big vessel (6 mm) !



*4.5 mm balloon and retrograde **Conquest** for penetration*



Successful reverse CART



Final angiogram

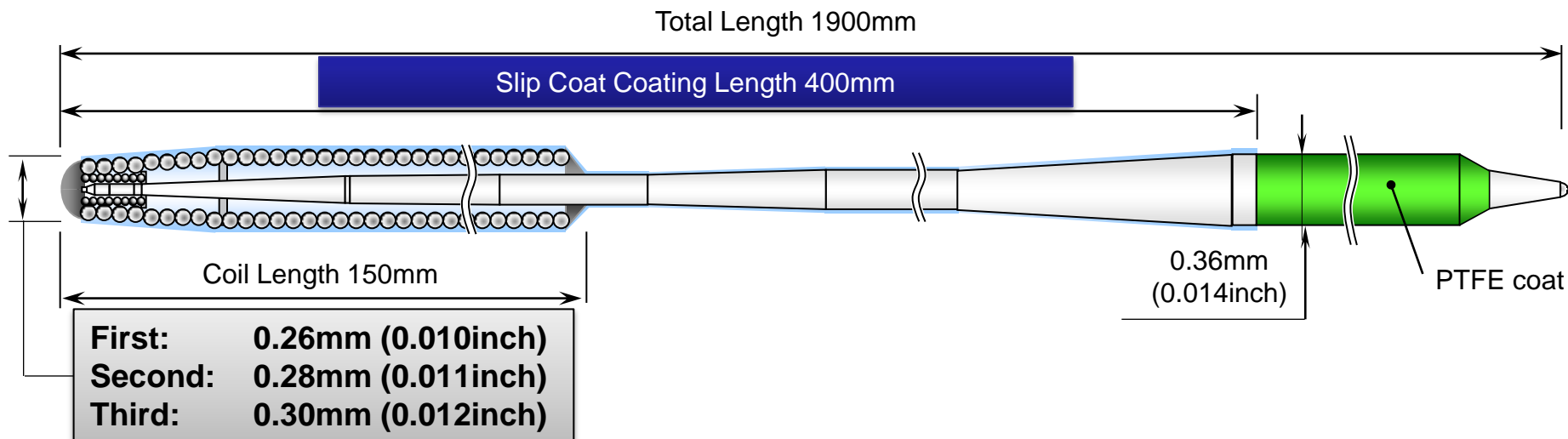


Limitations of Classic Reverse CART

- In the classic reverse CART, a retrograde wire was advanced first (including attempt at the retrograde direct crossing).
- Connection was made at the position where bilateral wires was overlapped.
- Once the retrograde dissection was created by retrograde wiring, the further retrograde direction control became very difficult.
- In those situations even if we used IVUS guidance, sometimes it took a very long time to make a connection (with many kinds of wire).

GAIA Basic structure

ASAHI intecc; Japan



Various lineups for the different situation or lesion

ASAHI Gaia First

Diameter : 0.26mm (0.010") - 0.36mm (0.014")

Tip load : 1.7gf

ASAHI Gaia Second

Diameter : 0.28mm (0.011") - 0.36mm (0.014")

Tip load : 3.5gf

ASAHI Gaia Third

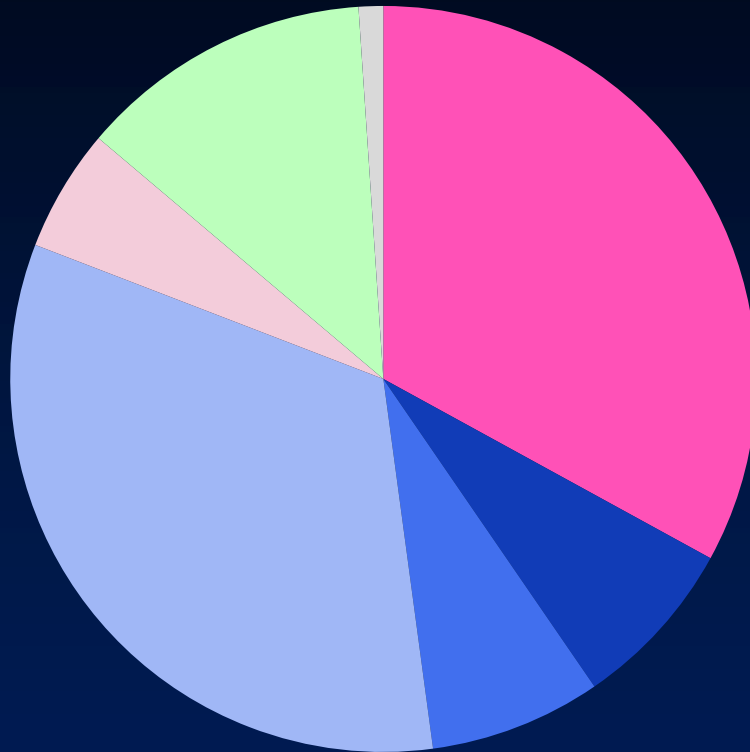
Diameter : 0.30mm (0.012") - 0.36mm (0.014")

Tip load : 4.5gf

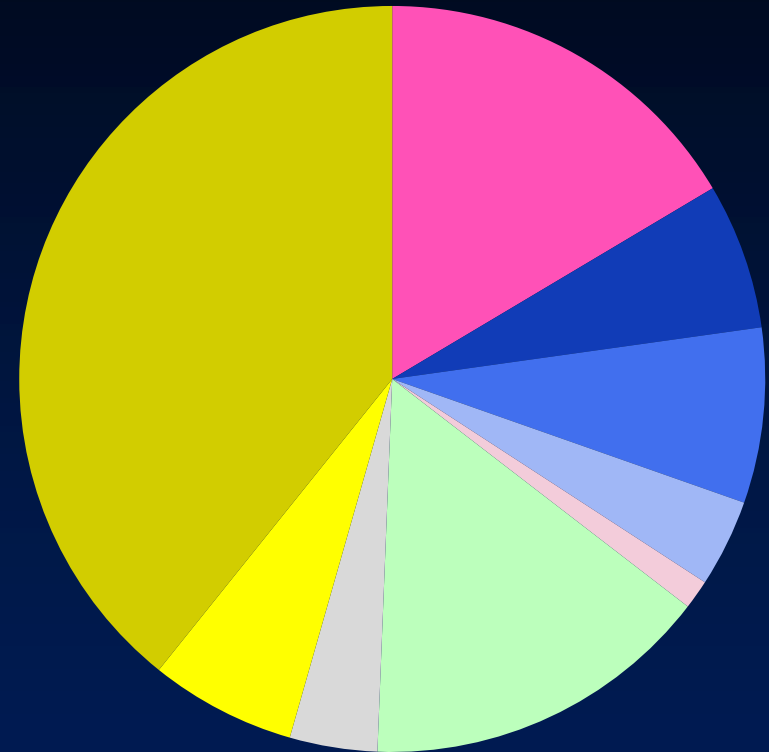
Long hydrophilic coating that enhance the smooth controllability in micro catheter.




Wire used for CTO crossing in both approaches

Before June 2012



After June 2012



 Conquest family
 Ultimate 3
 others



 Miracle 12
 Pilot 200

 Progress 120
 XTA

 GAIA 1st

 GAIA 2nd



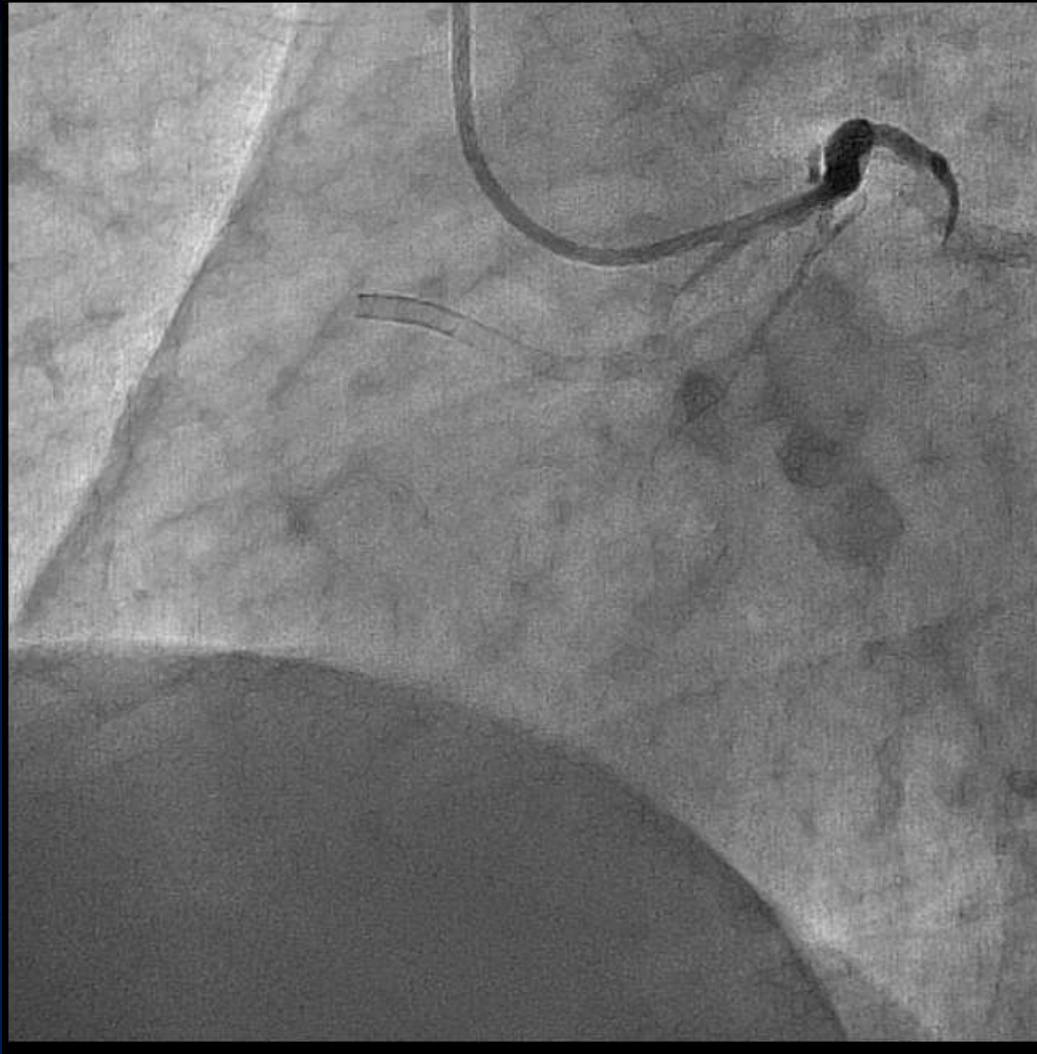


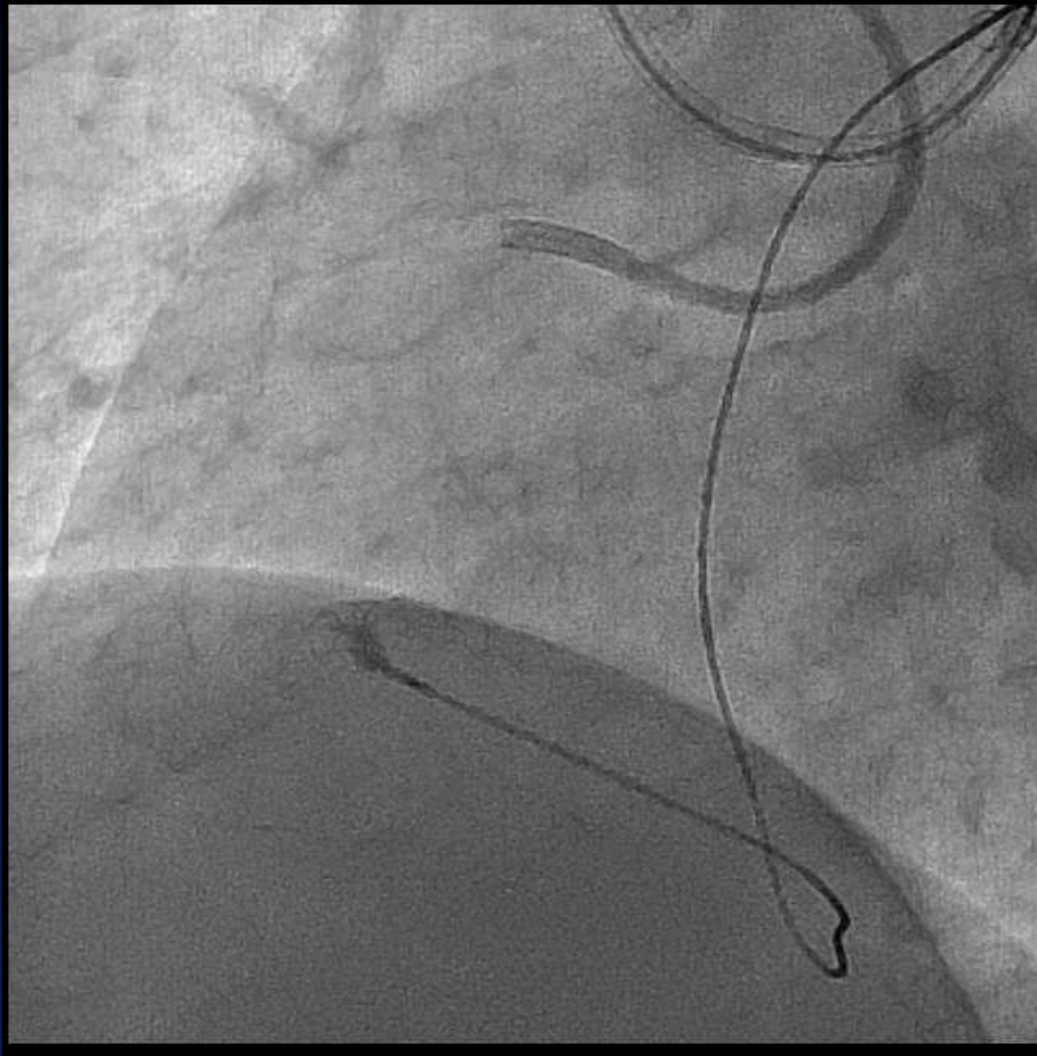
Contemporary Reverse CART with GAIA

- GAIA enables the intentional retrograde wire direction control.
- However once the retrograde dissection is created, the precise control become difficult even if GAIA is used.
- Before retrograde wiring with GAIA, antegrade preparation should be recommended to facilitate reverse CART.

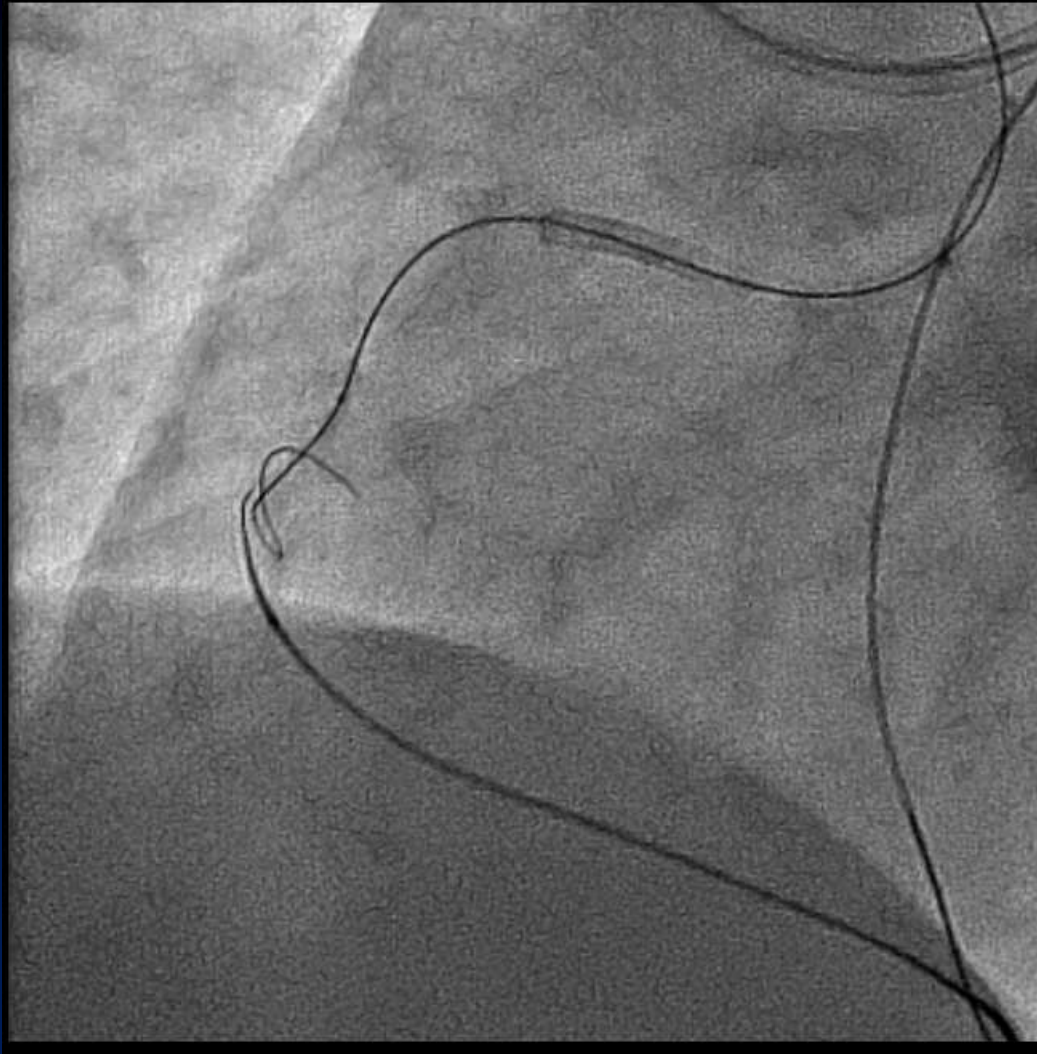


RCA CTO

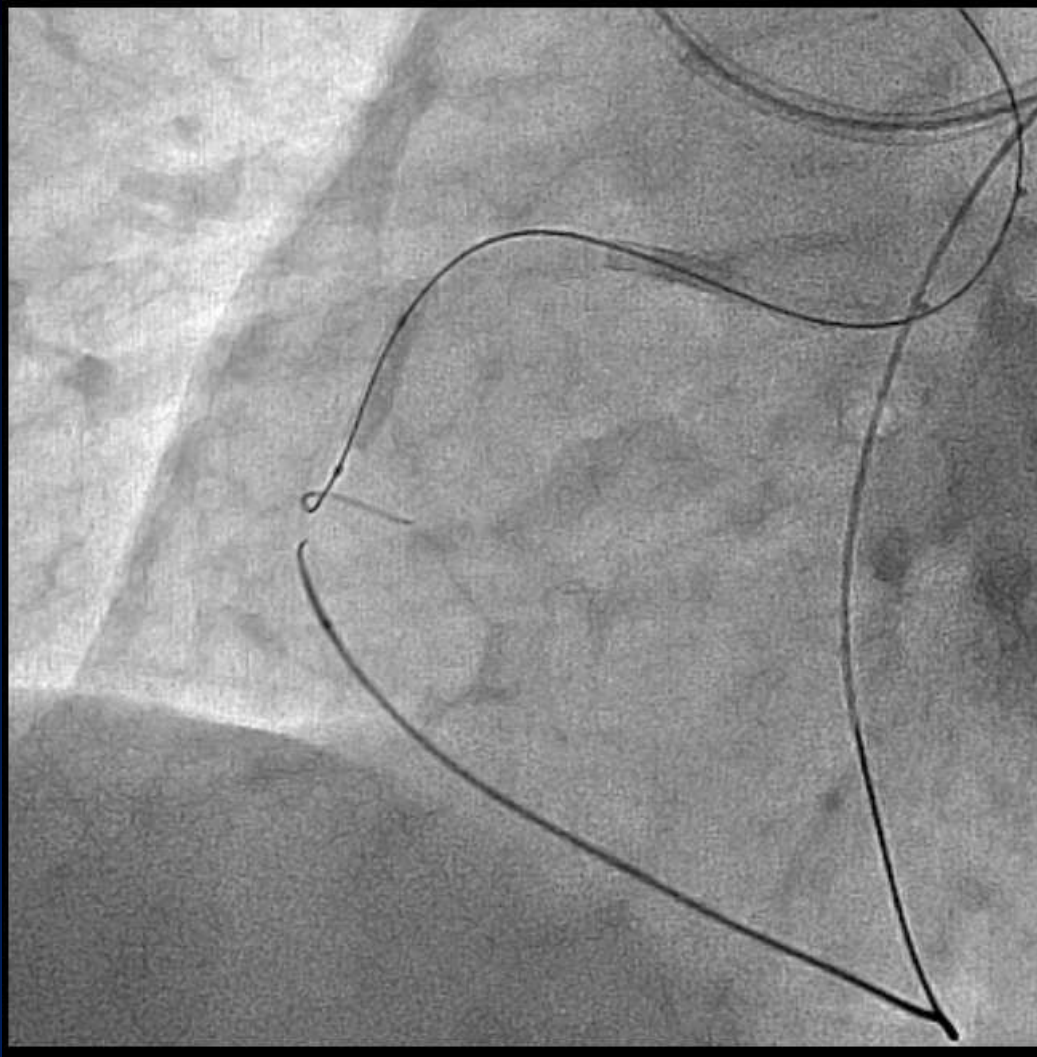




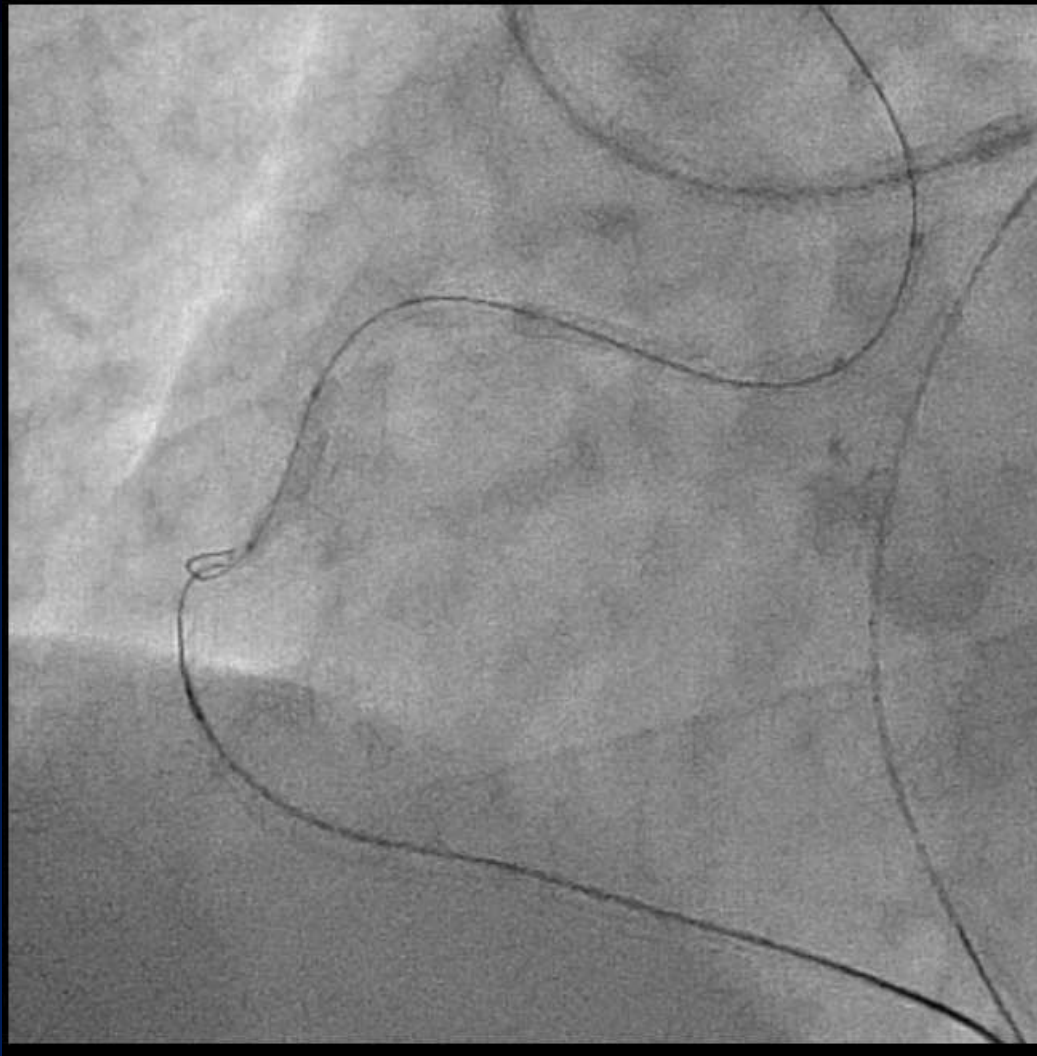
CTO with diffuse narrowing



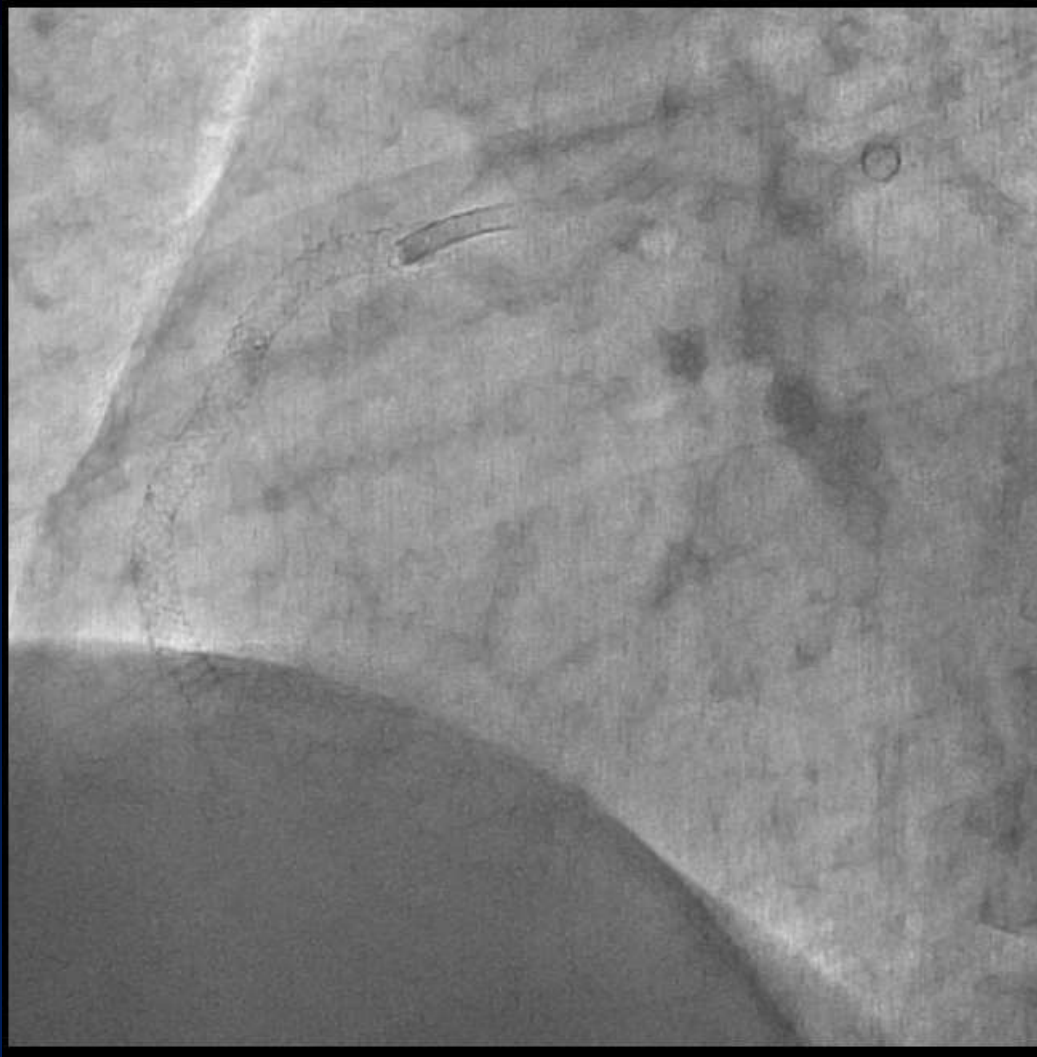
Antegrade preparation for reverse CART



Antegrade preparation for reverse CART



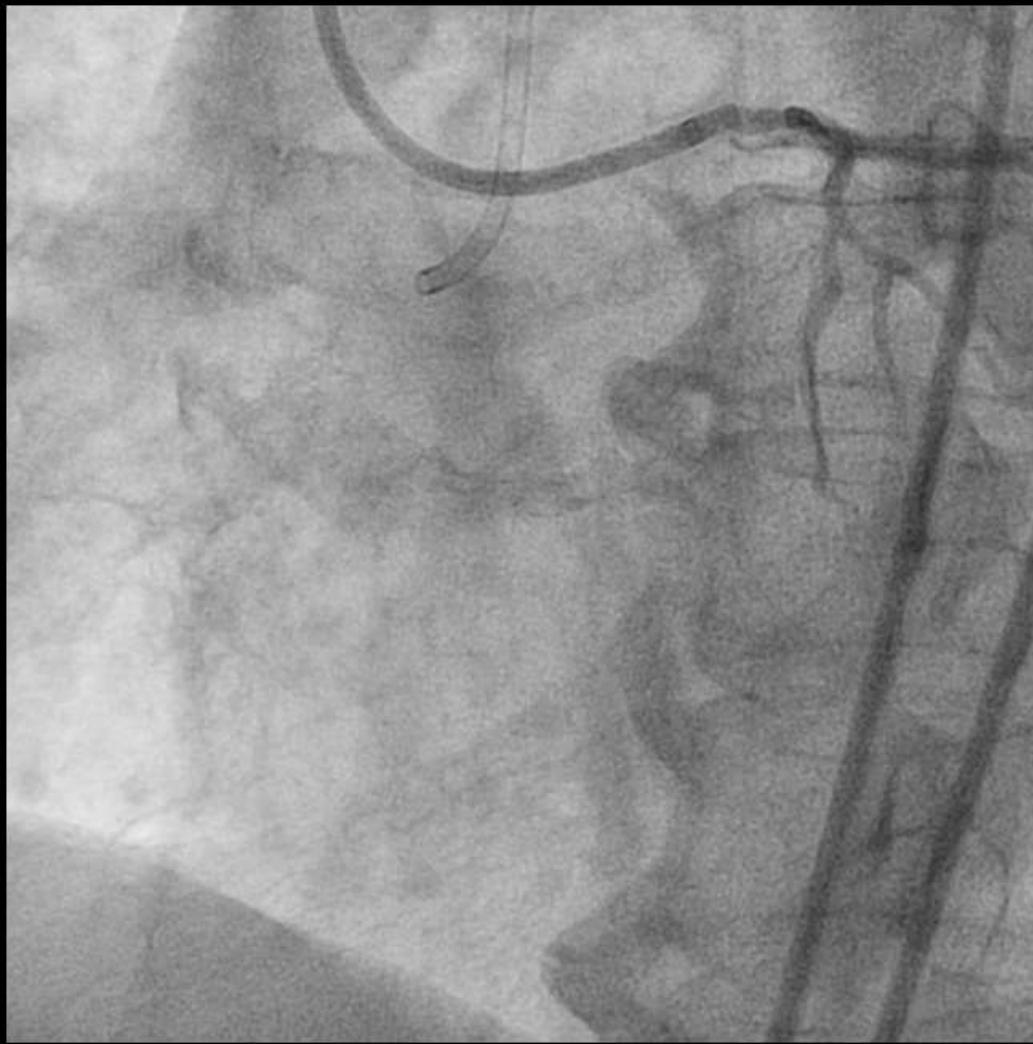
Retrograde wiring with GAIA 2nd

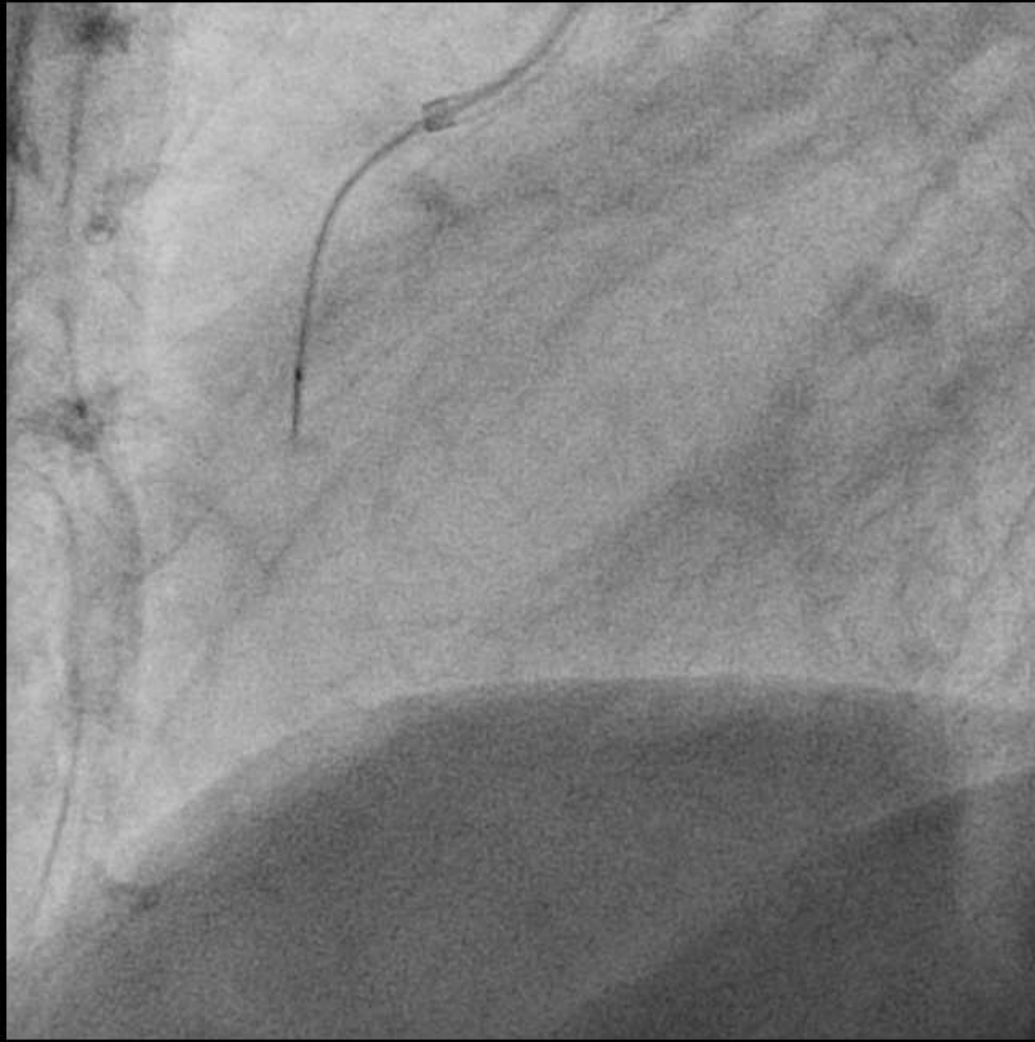


Final angiogram

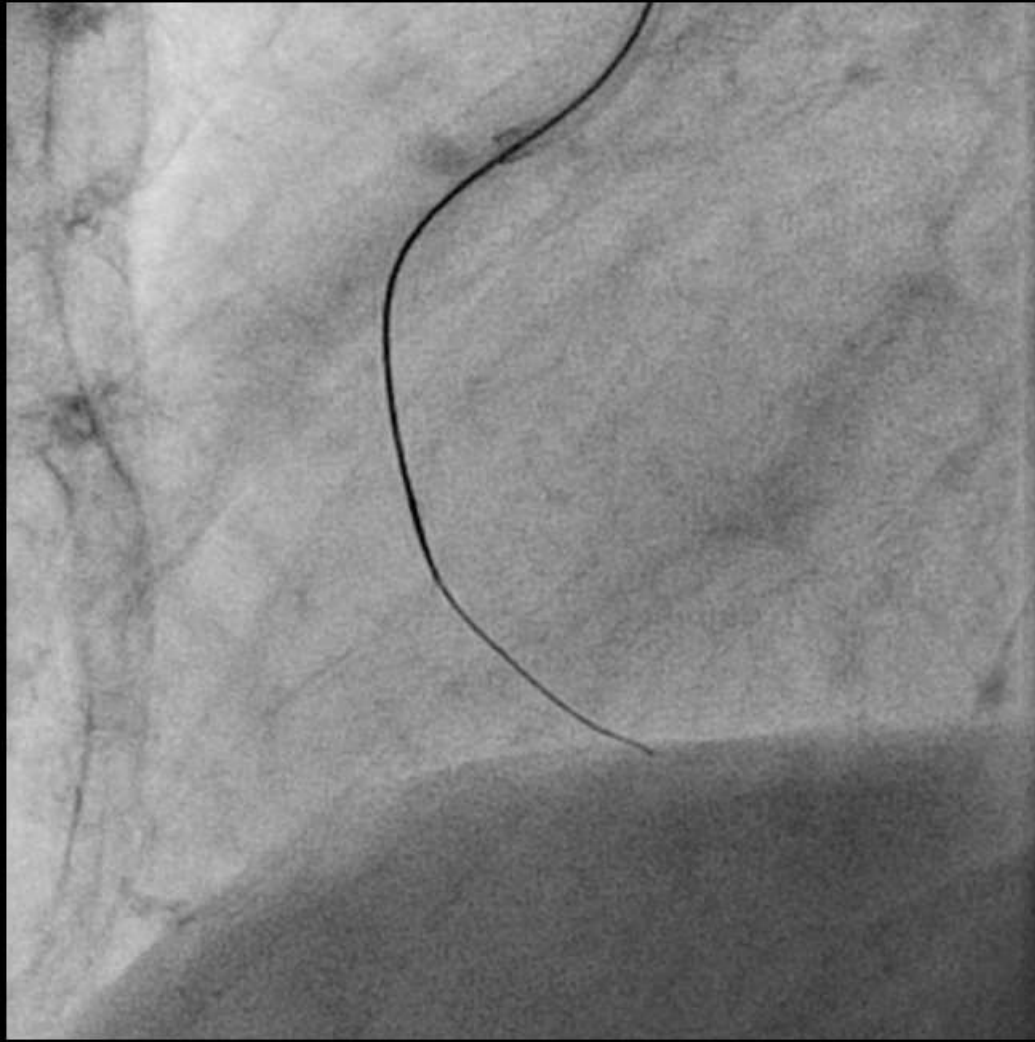


RCA CTO

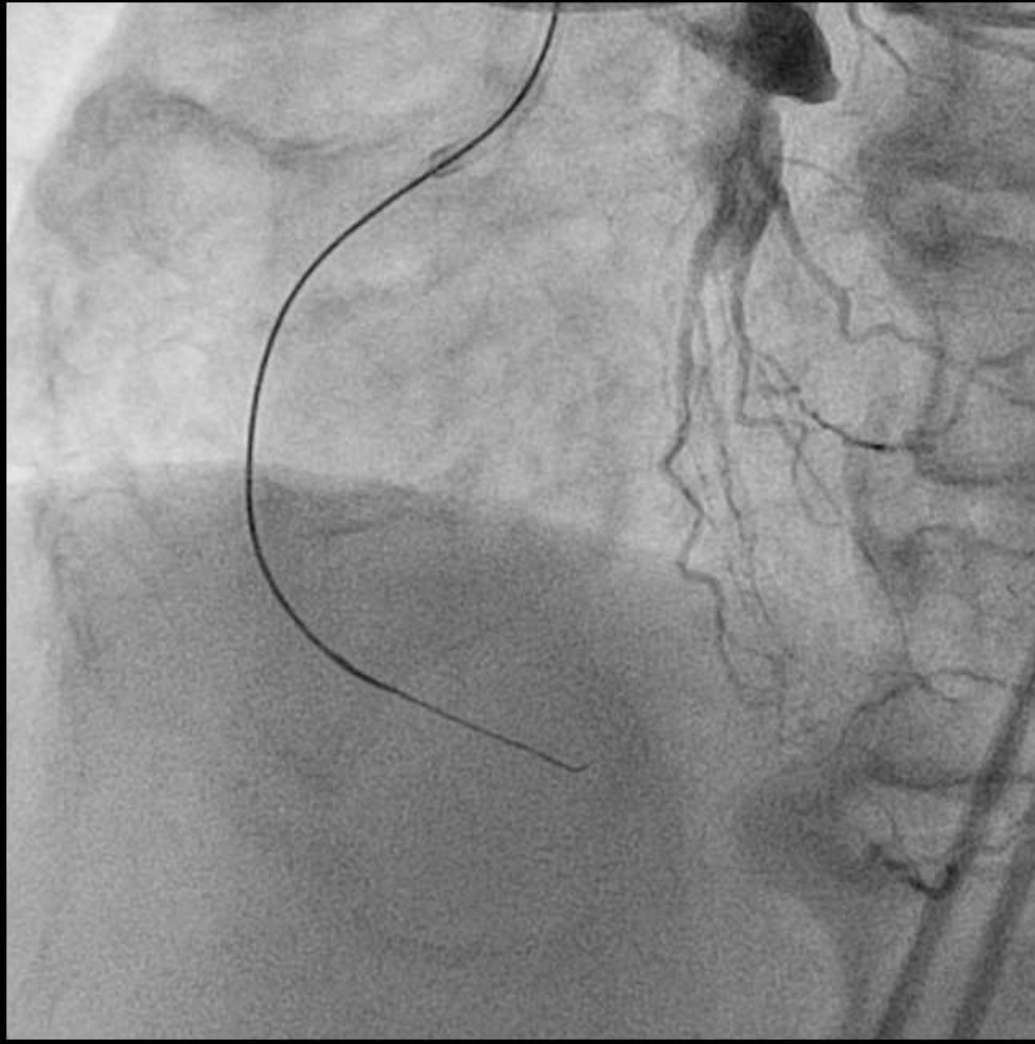




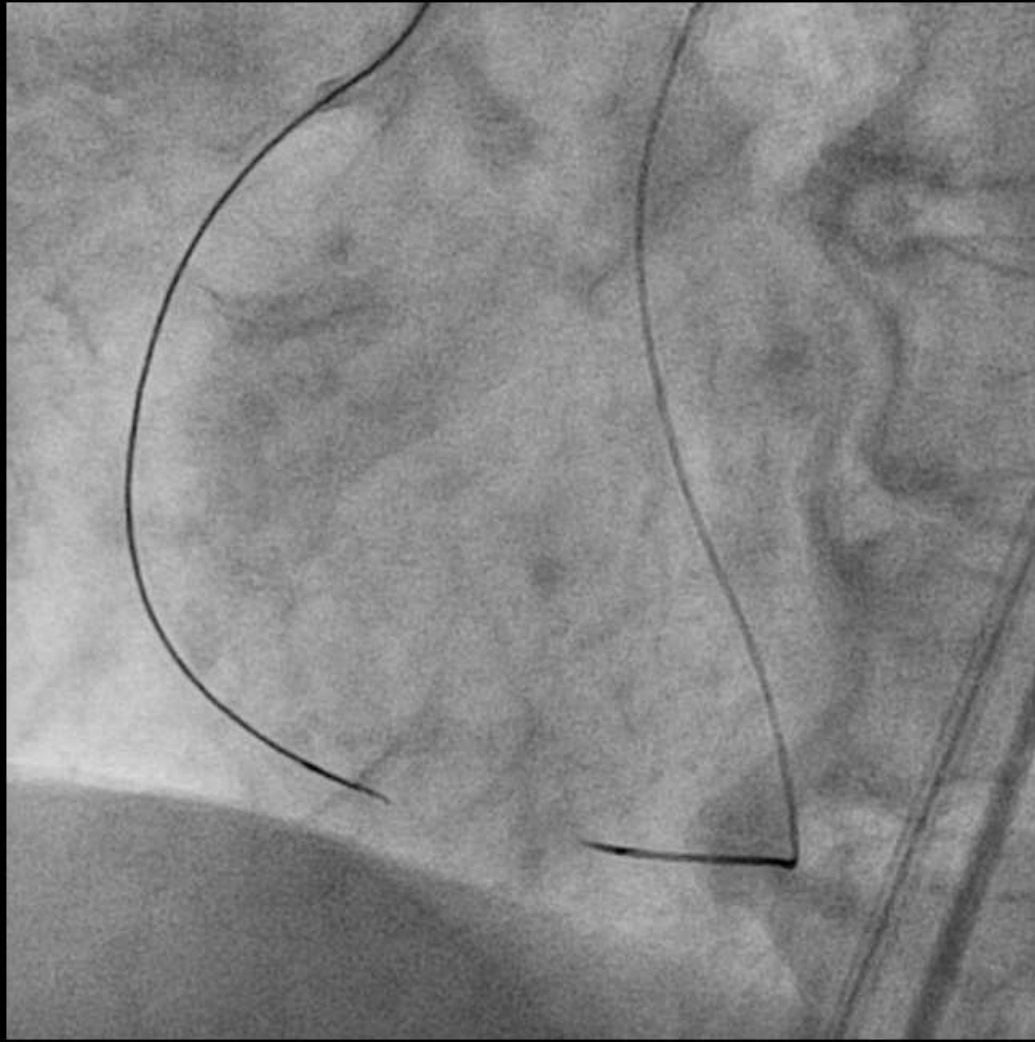
Antegrade tip injection



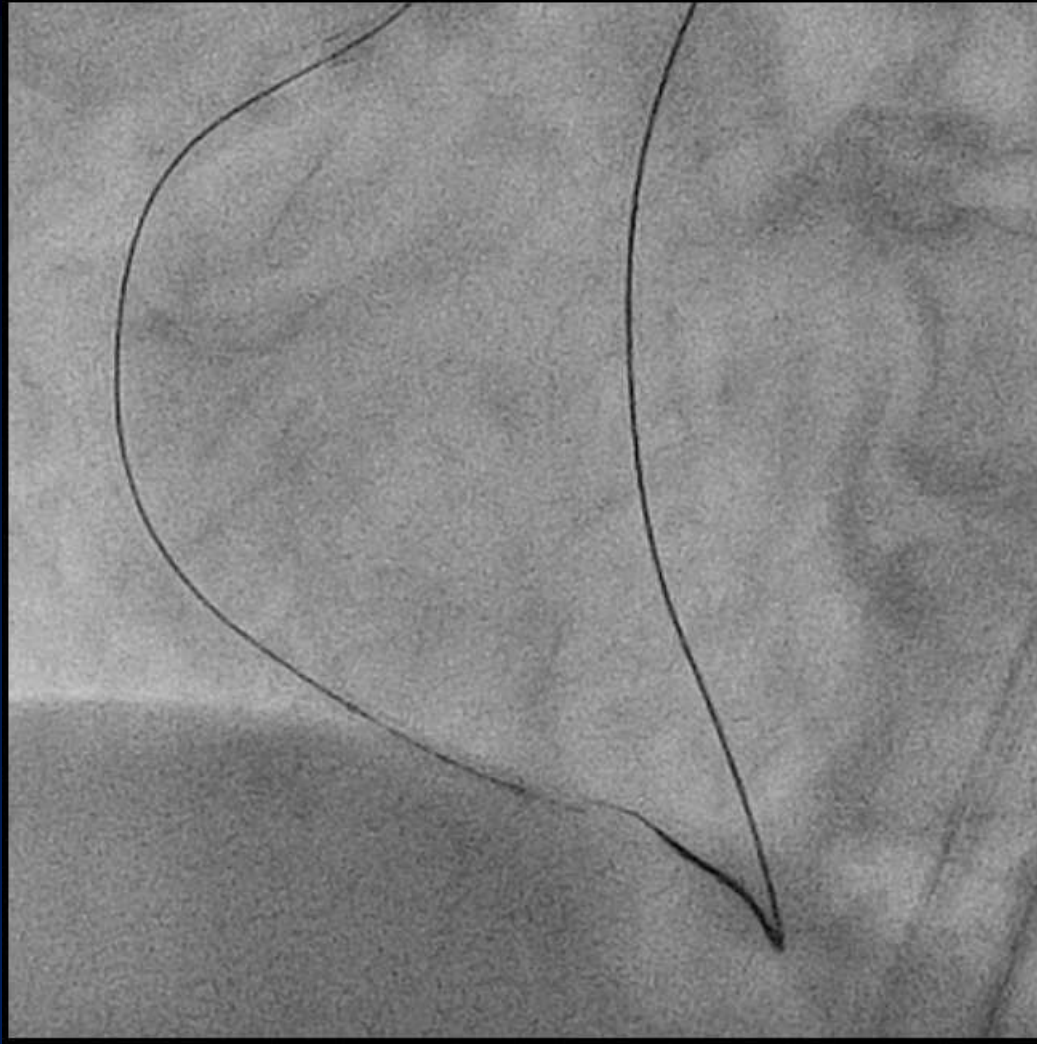
Antegrade wiring using GAIA 2nd



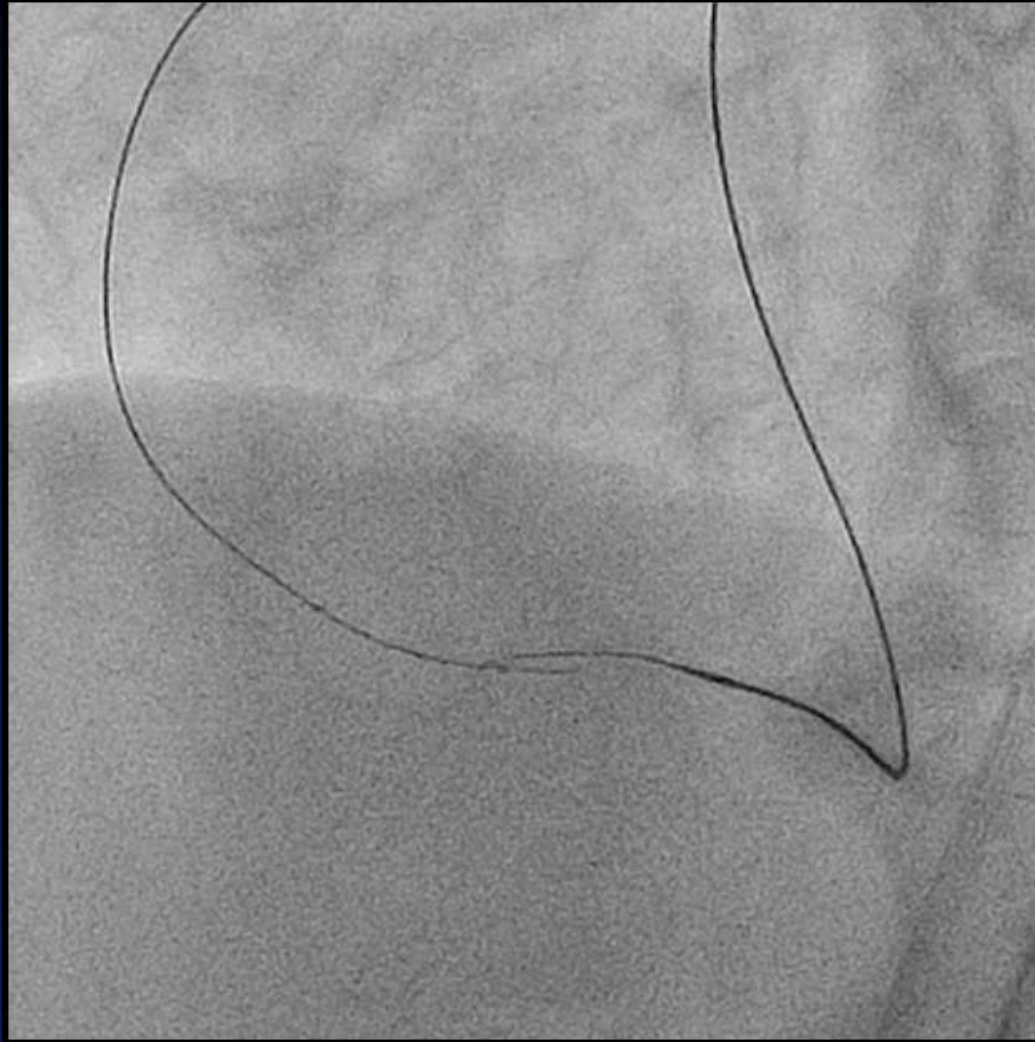
Antegrade preparation was completed



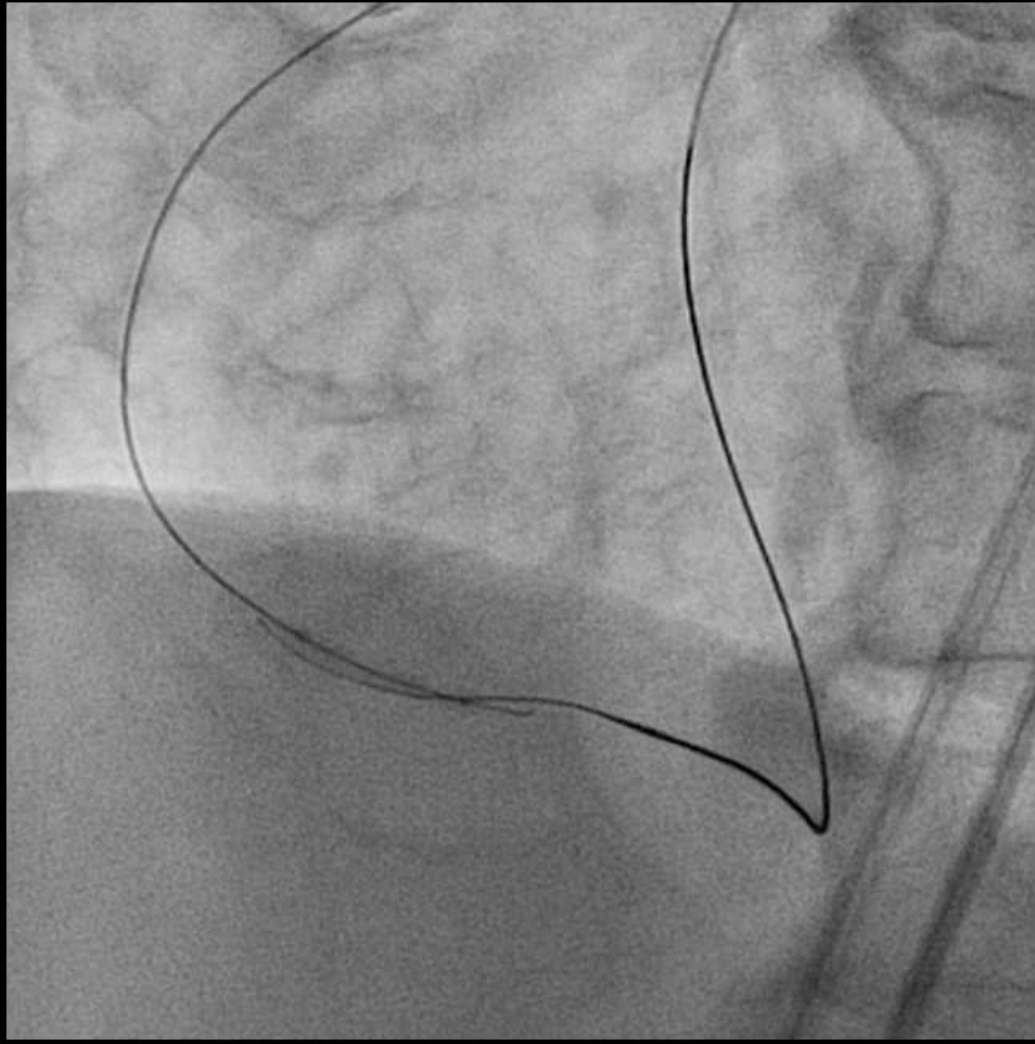
Retrograde tip injection



Retrograde wiring using GAIA 2nd toward balloon



Retrograde wiring using GAIA 2nd toward balloon



Successful reverse CART



Final angiogram

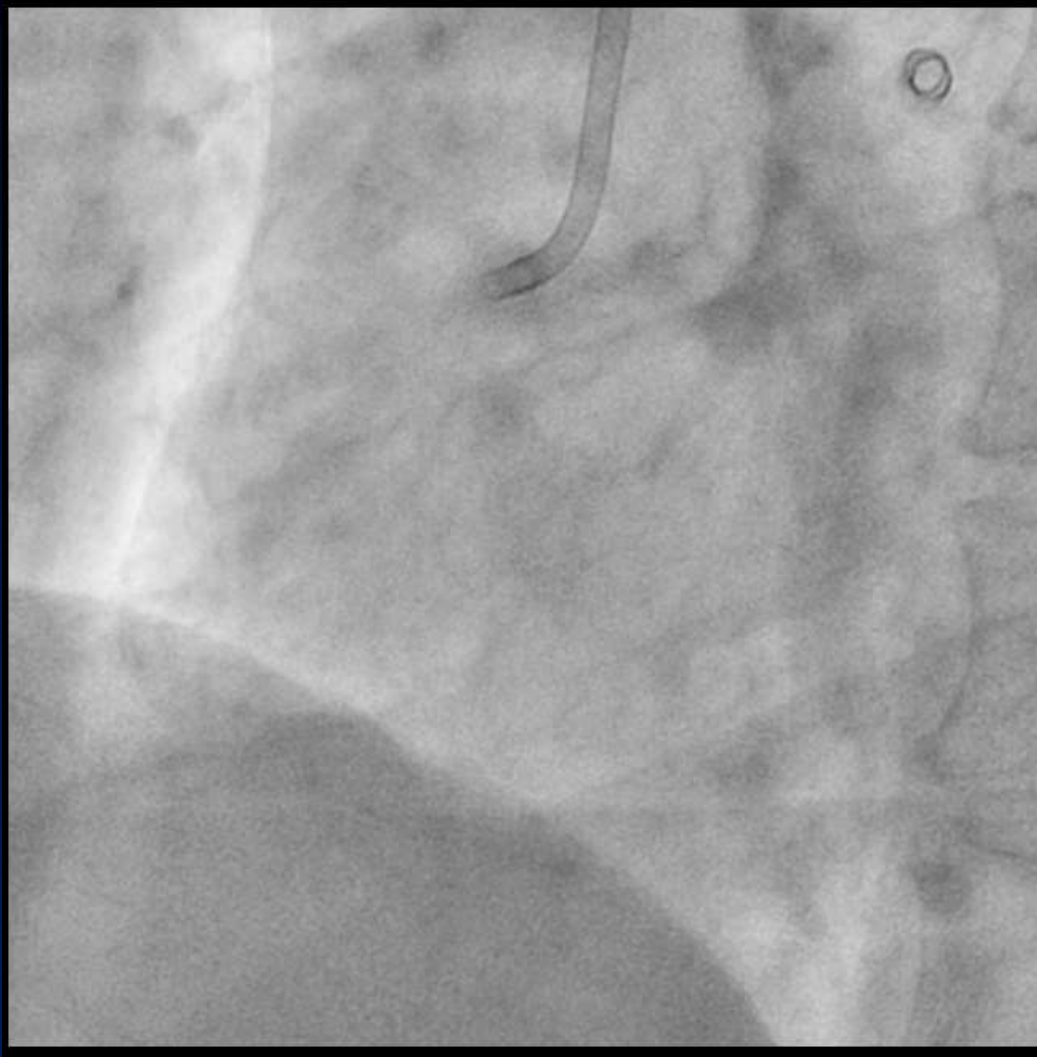


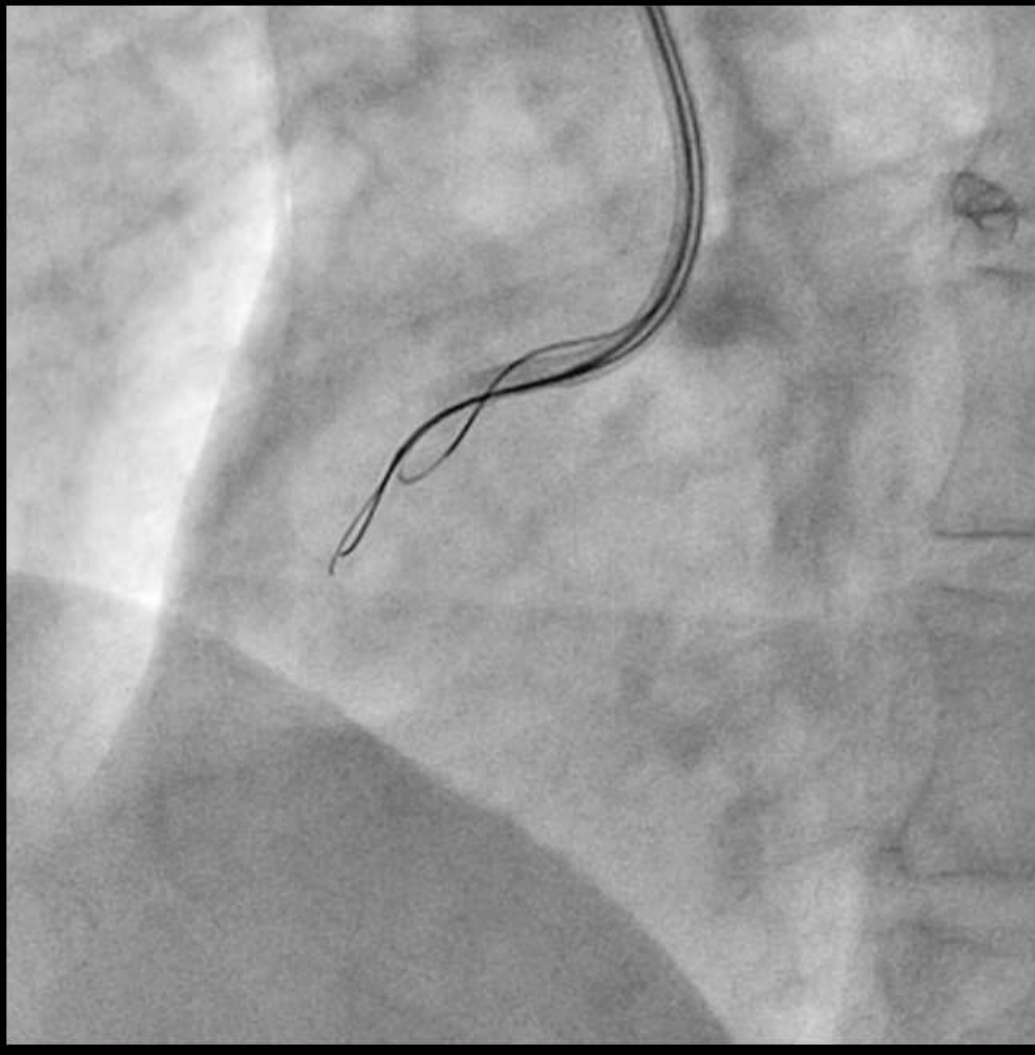
Contemporary Reverse CART with GAIA

- GAIA enables the intentional retrograde wire direction control.
- However once the retrograde dissection is created, the precise control become difficult even if GAIA is used.
- Before retrograde wiring with GAIA, antegrade preparation should be recommended to facilitate reverse CART.
- In short CTOs
- In long CTOs

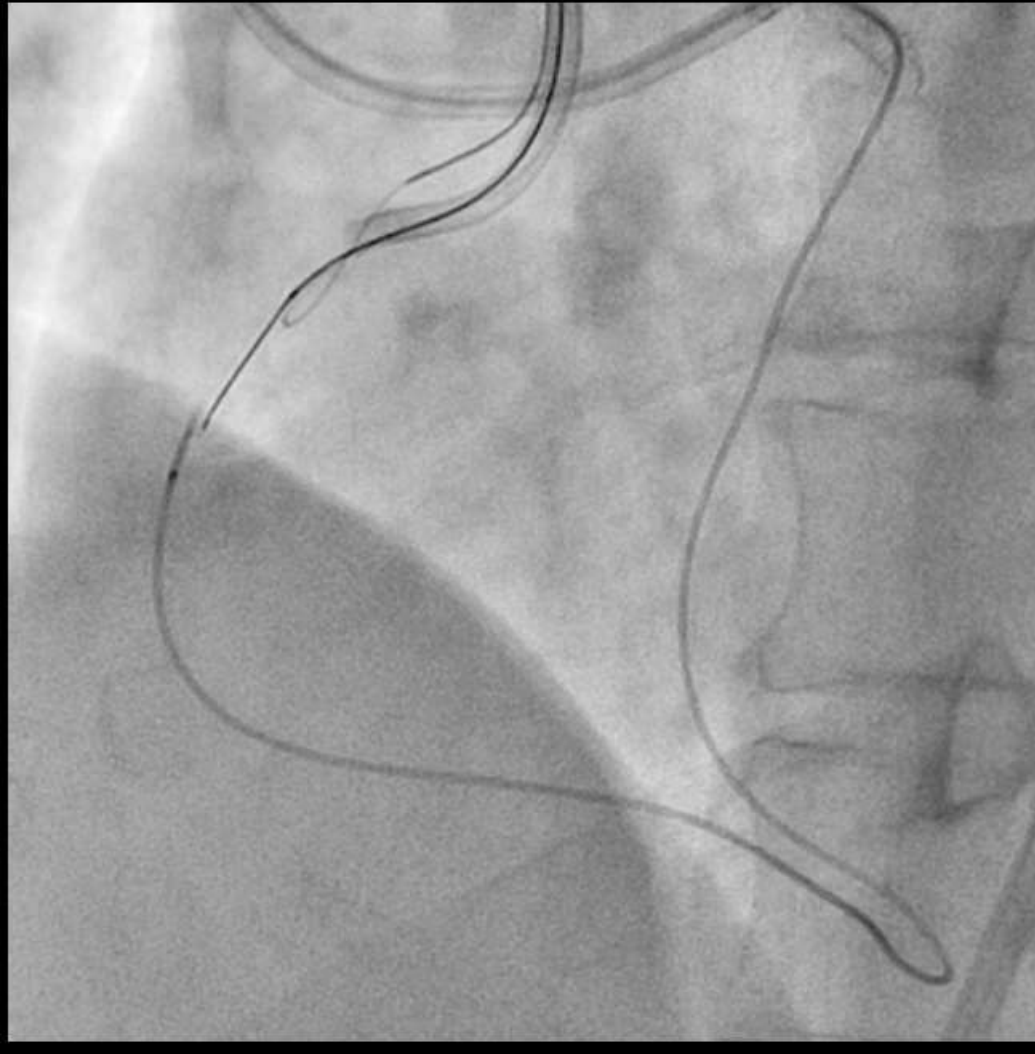


RCA CTO

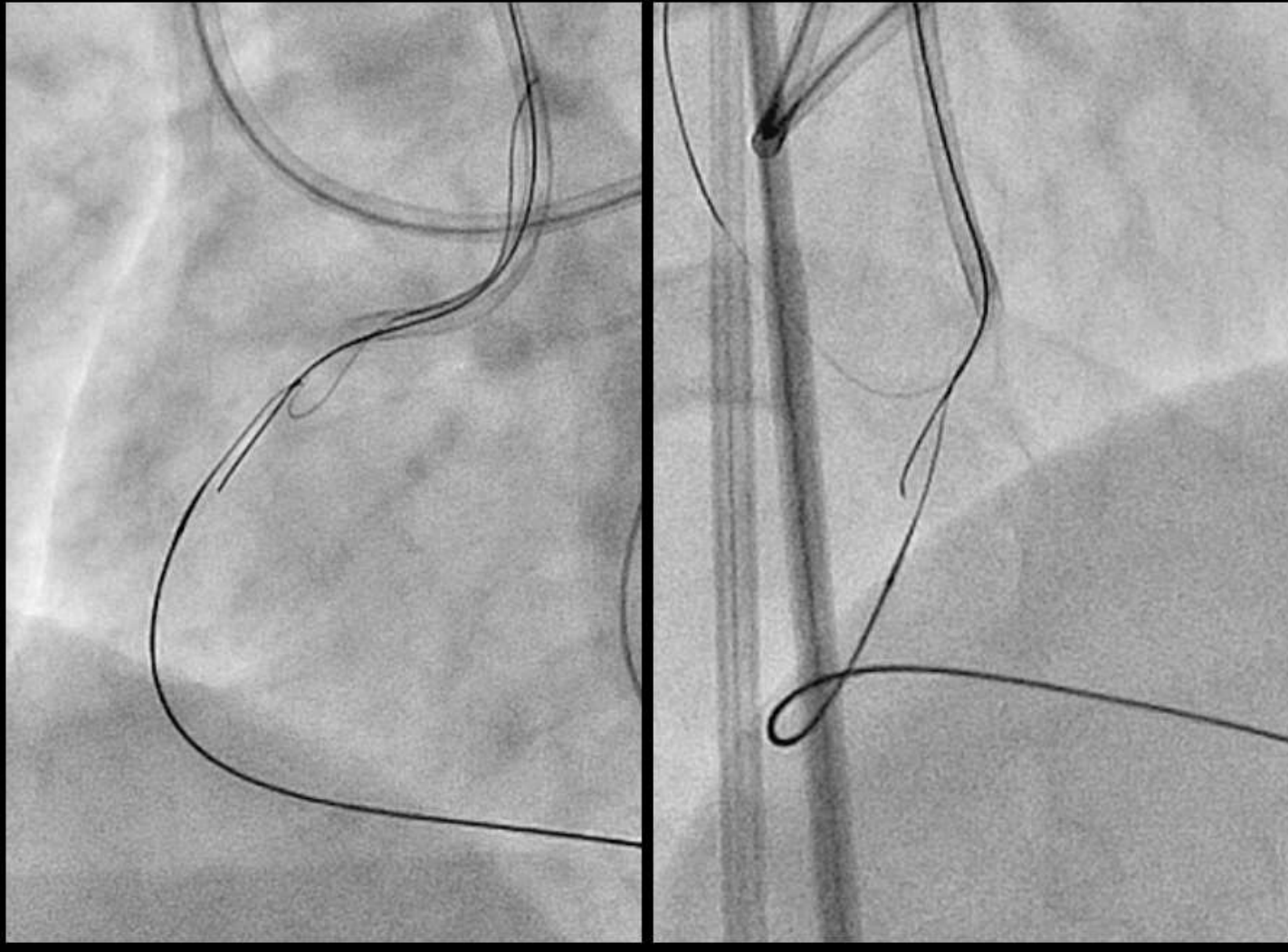




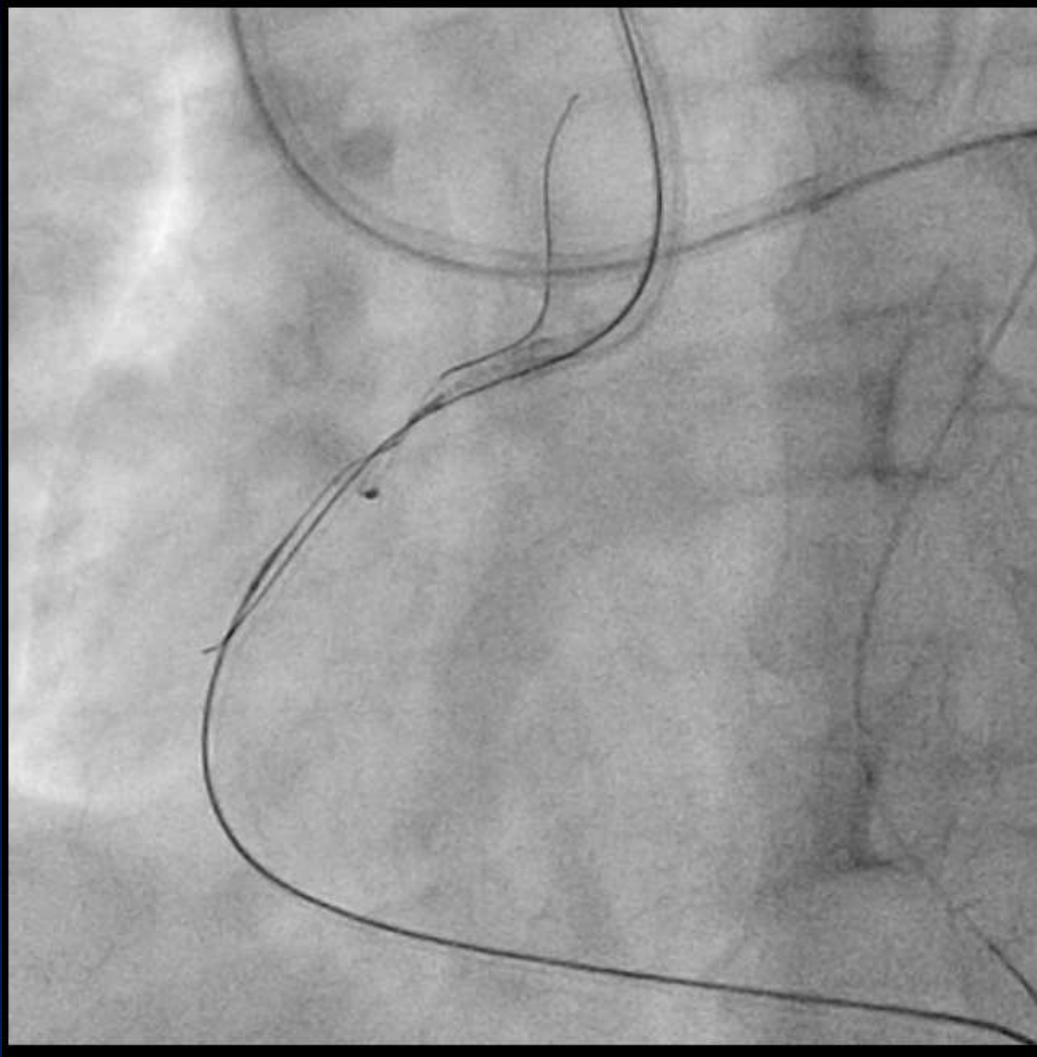
Failed parallel wiring



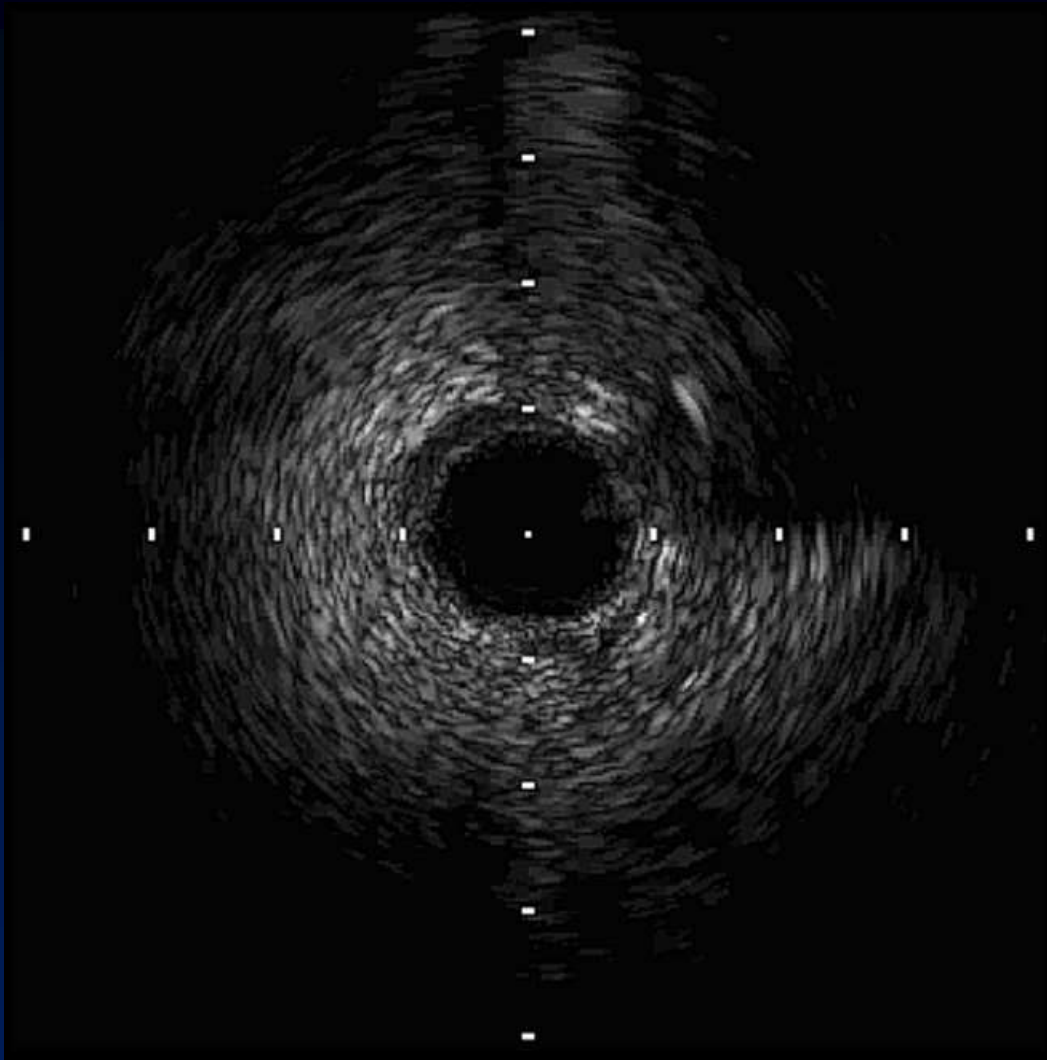
Difficult for reverse CART because of short occlusion



Attempt at retrograde direct wire crossing by GAIA 2nd



IVUS examination



IVUS examination



Successful Manipulation of GASTAG 2nd by GAIA 2nd



Final angiogram



Contemporary Reverse CART with GAIA

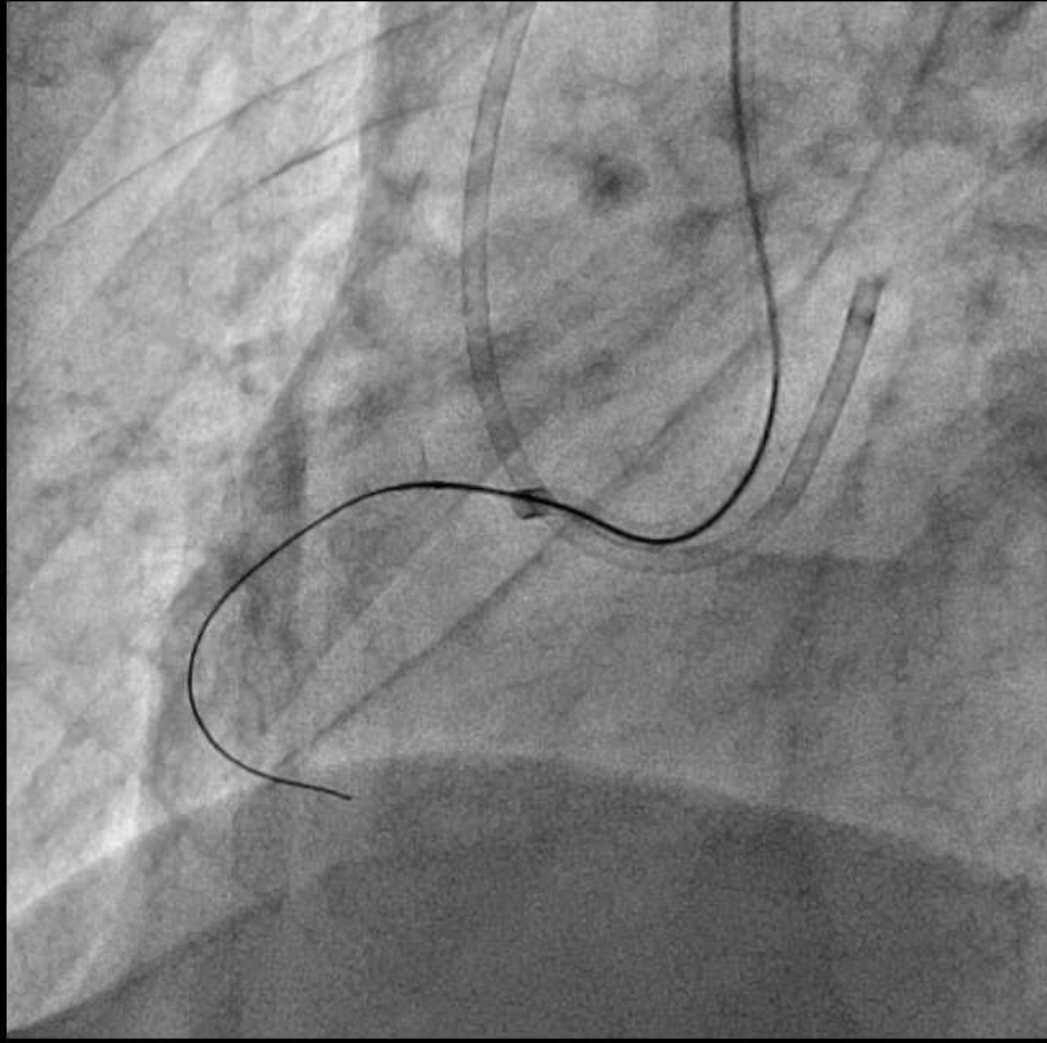
- GAIA enables the intentional retrograde wire direction control.
- However once the retrograde dissection is created, the precise control become difficult even if GAIA is used.
- Before retrograde wiring with GAIA, antegrade preparation should be recommended to facilitate reverse CART.
- In short CTOs, the direct retrograde wire crossing still works well with GAIA w/wo IVUS.
- In long CTOs

RCA Otial CTO

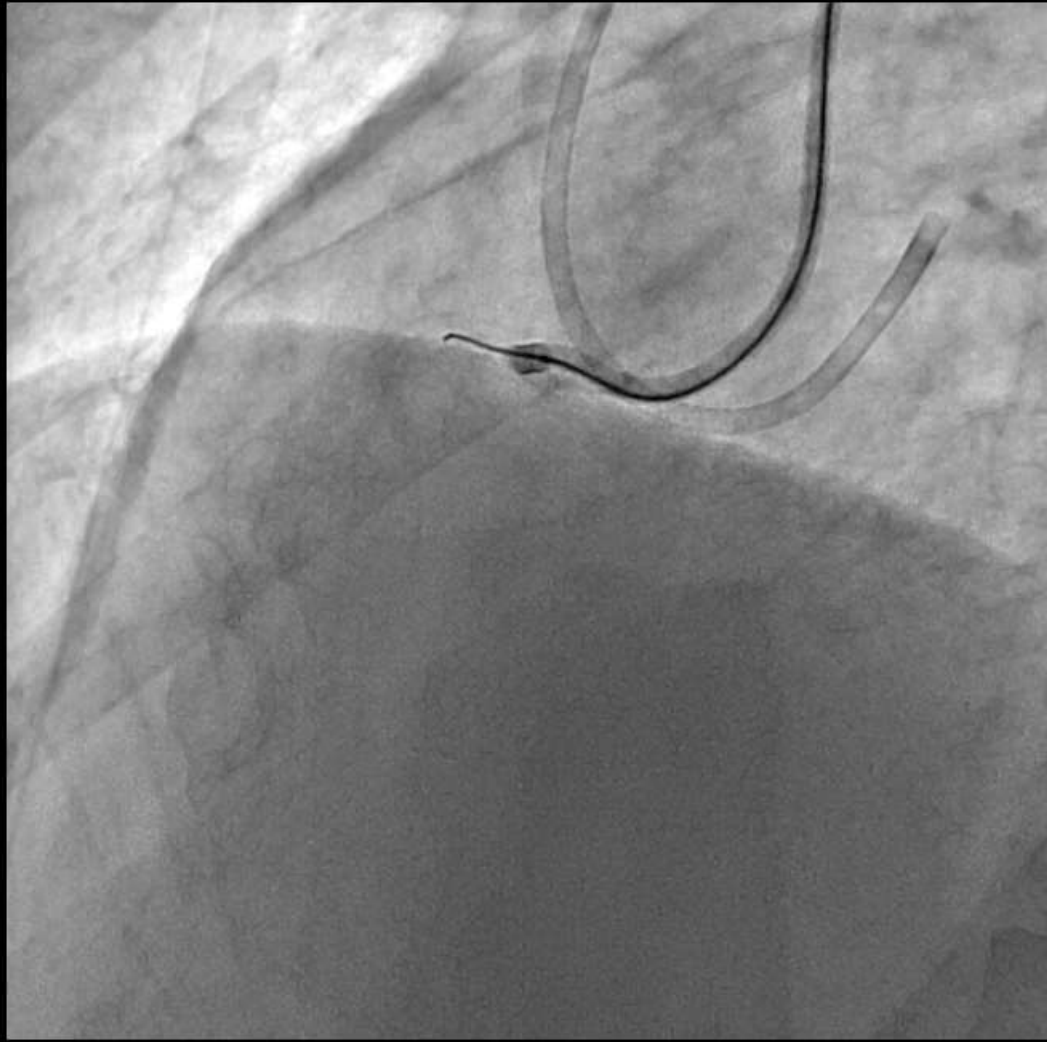




Antegrade wiring using GAIA 2nd



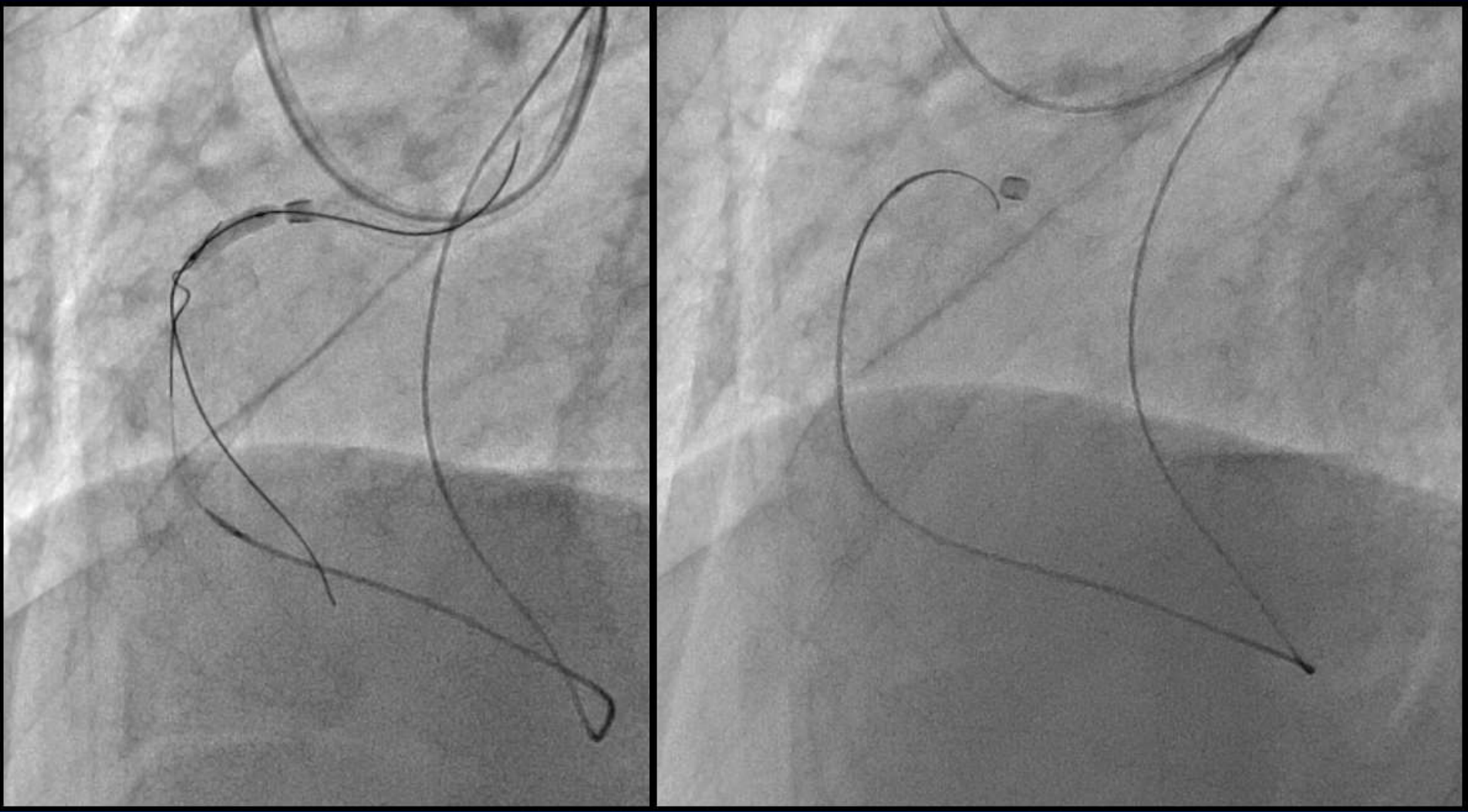
Antegrade wiring using GAIA 2nd



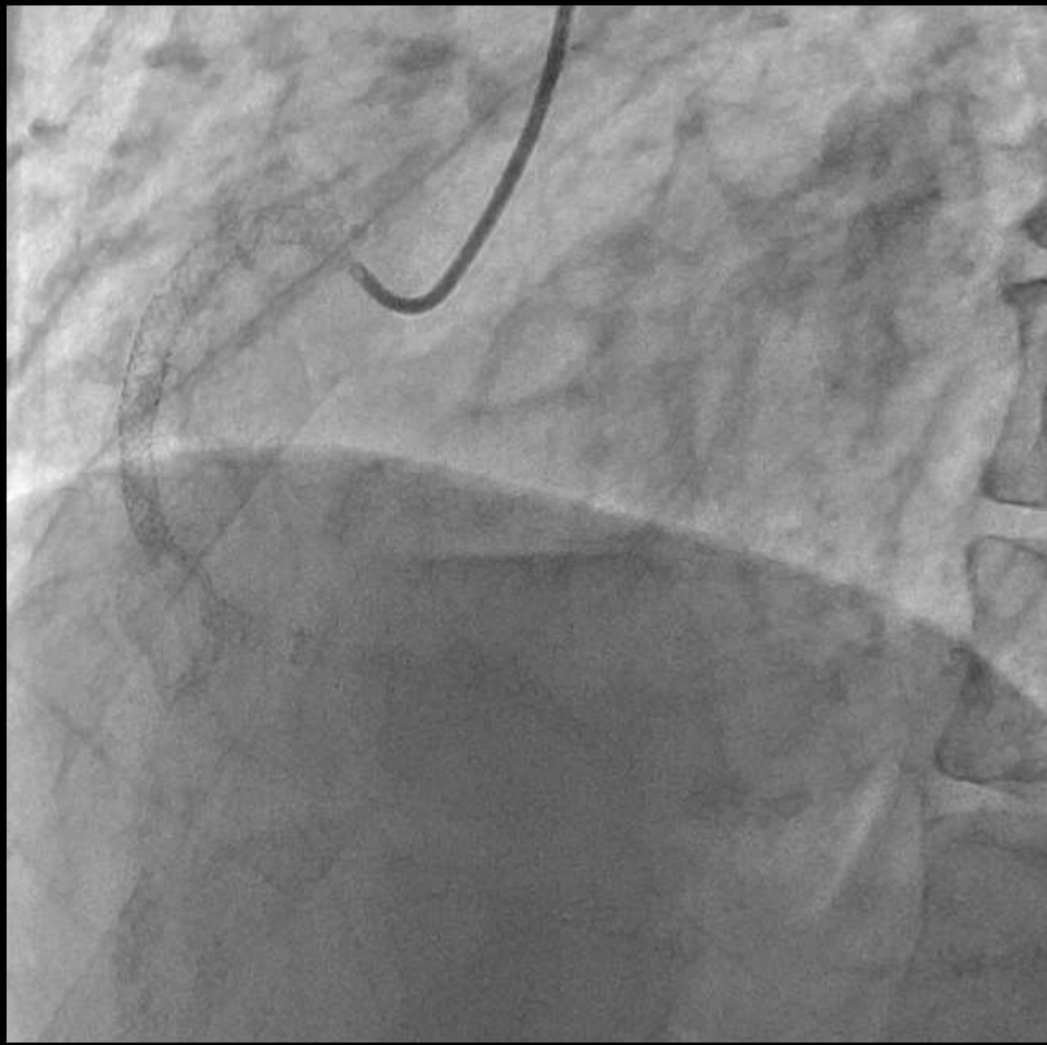
Type 1 perforation



**Antegrade wiring was stopped and retrograde wiring
was started.**



Retrograde wiring using SION black



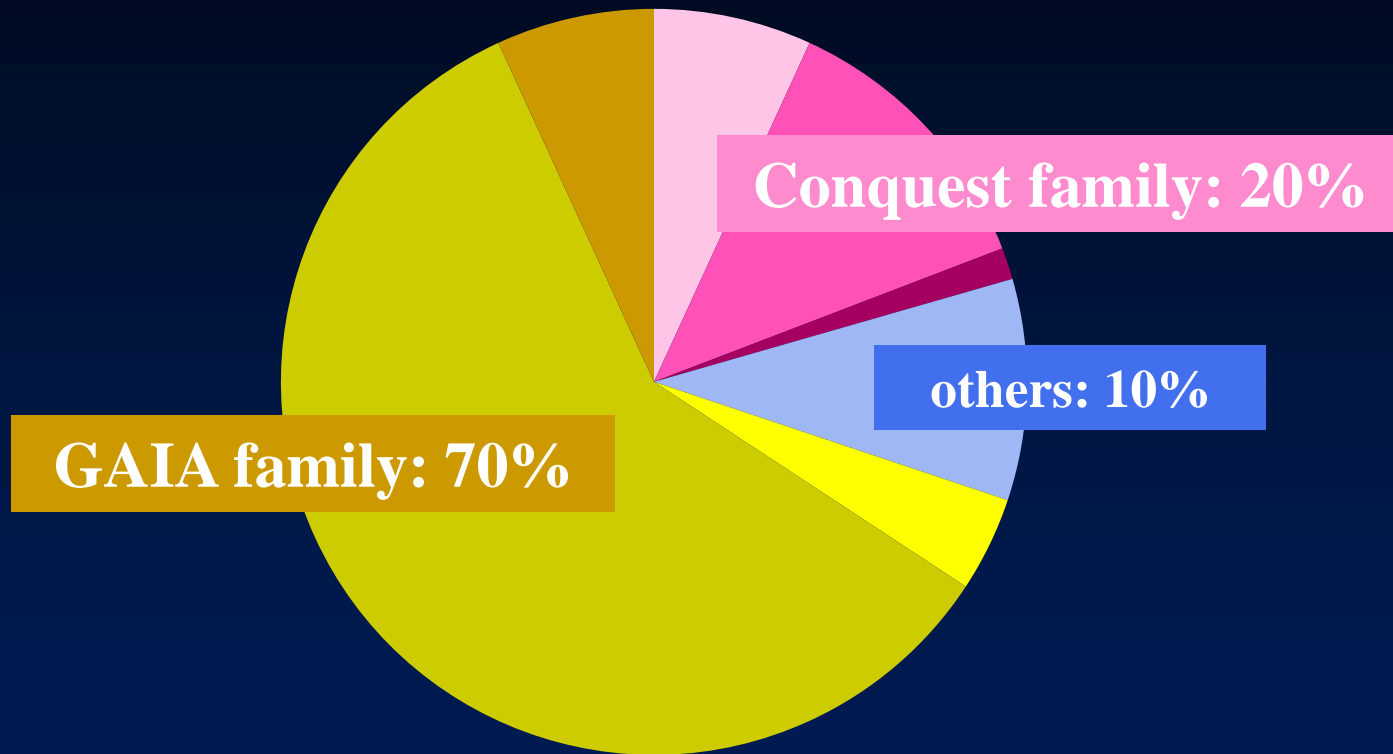
Final angiogram



Contemporary Reverse CART with GAIA

- GAIA enables the intentional retrograde wire direction control.
- However once the retrograde dissection is created, the precise control become difficult even if GAIA is used.
- Before retrograde wiring with GAIA, antegrade preparation should be recommended to facilitate reverse CART.
- In short CTOs, the direct retrograde wire crossing still works well with GAIA w/wo IVUS.
- In long CTOs with unknown vessel trajectory, antegrade preparation must be done carefully to avoid vessel perforation.
- Also the use of other non-tapered (hydrophilic) wires than GAIA should be considered to stay inside the vessel.

Wire used for CTO crossing in Retrograde Approach 2013



 Conquest 9

 Conquest 12

 Conquest 8-20

 GAIA 1st

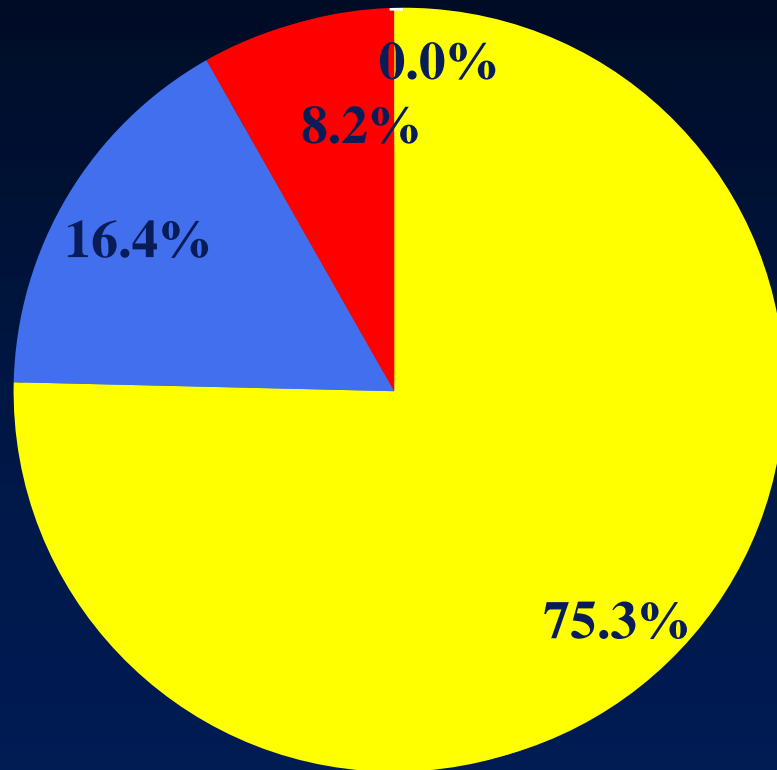
 GAIA 2nd

 GAIA 3rd

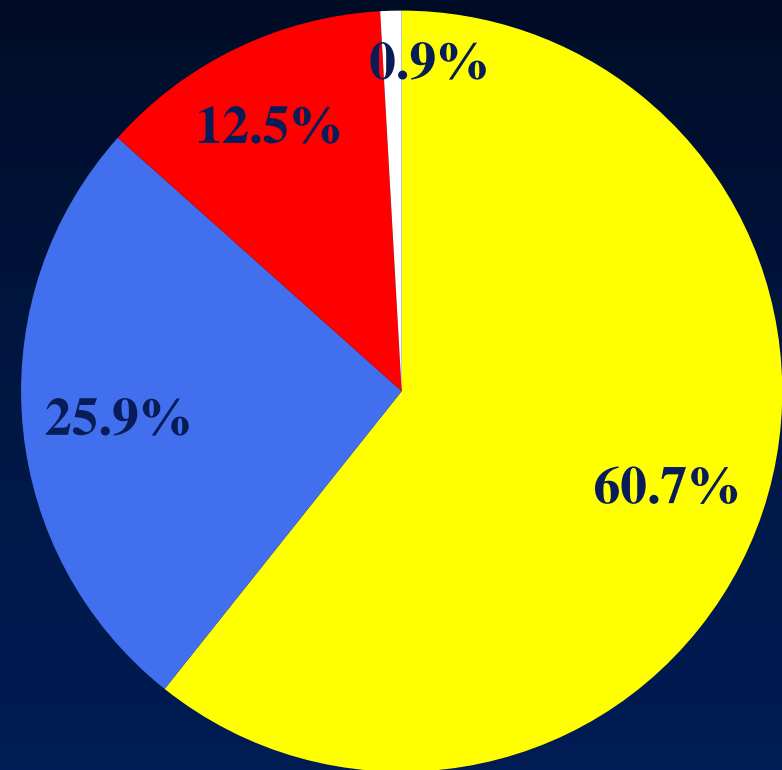
 others

Change in CTO crossing strategy



My Personal Summit Registry 2012



Retrograde Summit Registry 2013



 Reverse CART
 Retrograde direct crossing

 Traditional CART
 Kissing wire



Nuts and Bolts of Reverse CART

- If you have GAIA family, start antegrade preparation before retrograde GAIA wiring in general.
- Antegrade ballooning position should be close to distal end of CTO, however be careful antegrade wire position not to make damage beyond the occlusion.
- In short CTOs, still the direct retrograde wire crossing may be attempted w/wo IVUS.
- In long CTOs, antegrade preparation must be done carefully to avoid vessel perforation by using non-tapered (hydrophilic) wires. Also retrograde GAIA should not be used if a long distance (>20mm) remains to antegrade balloon.



16th CTO Club



June 19-20, 2015, Nagoya, Japan

www.cct.gr.jp/ctoclub