



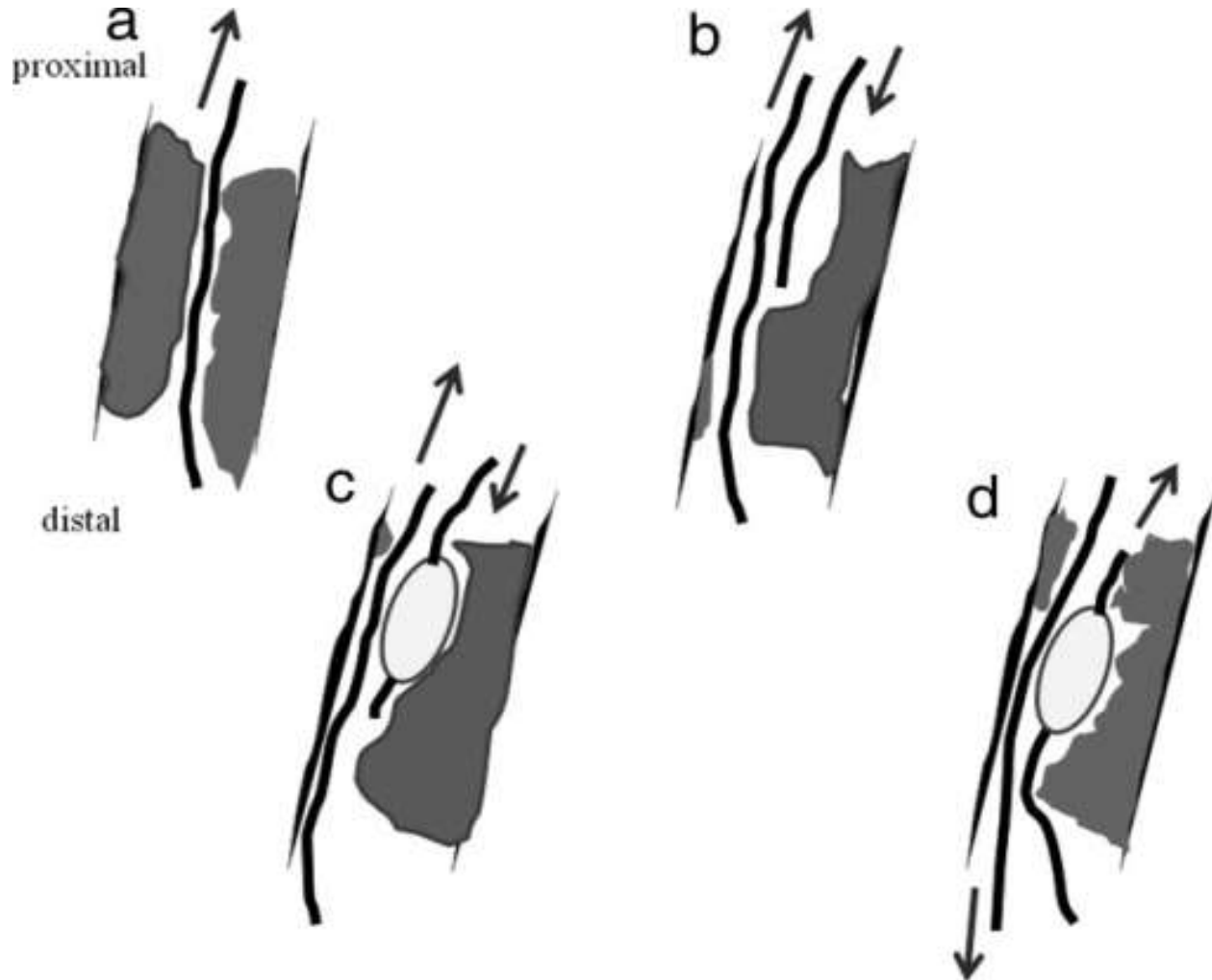
When the retrograde wire won't cross the lesion

Satoru Otsuji, MD.

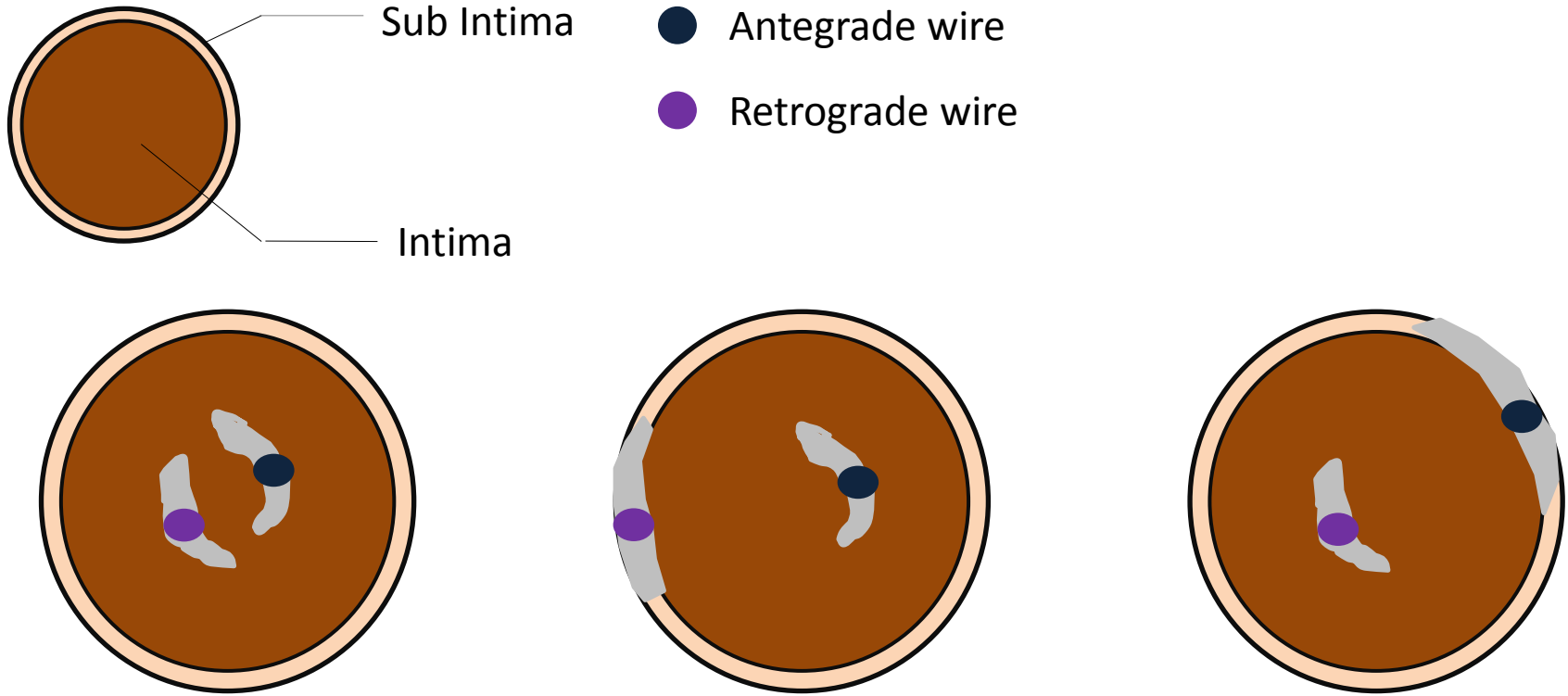


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Japan

Methods to cross CTO lesion

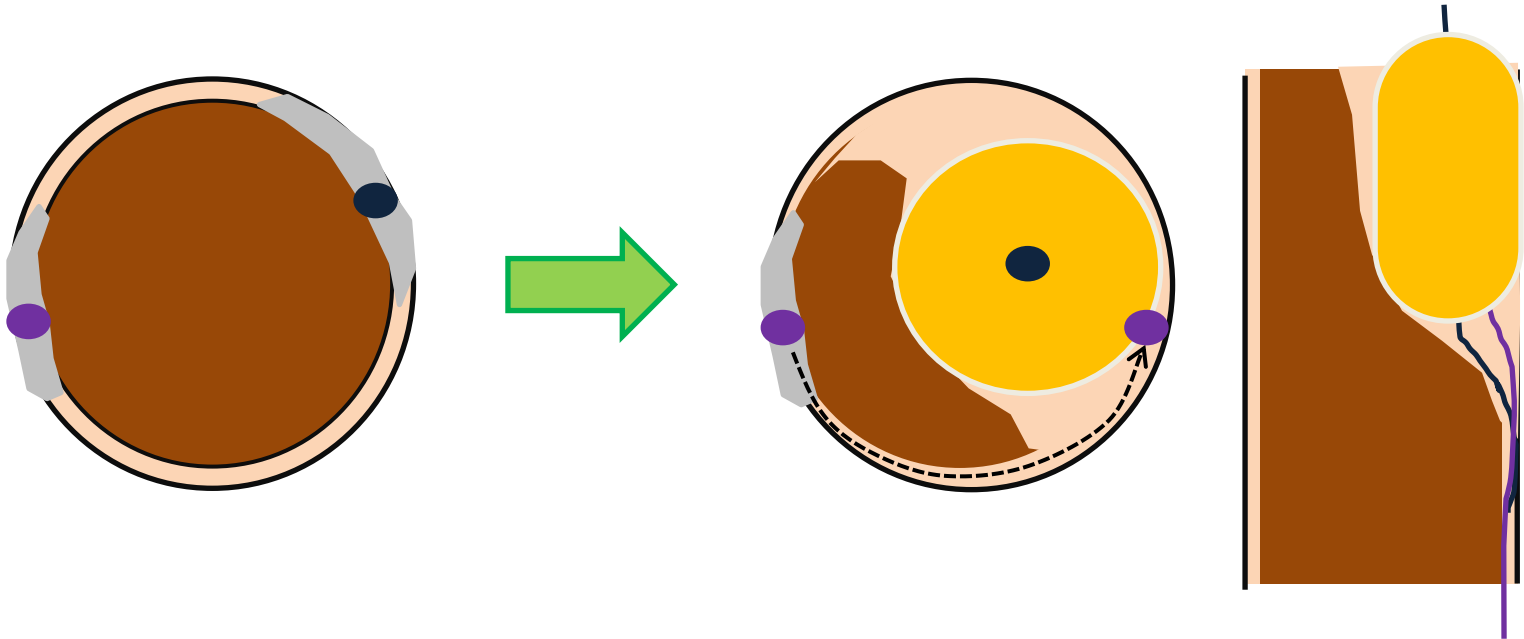


Limitation of kissing wire technique



Kissing wire technique is usually successful when both wires are in the intima. If each wire is in the **different layer** (one is in intima and the other is in subintima), it is **difficult** to connect each other.

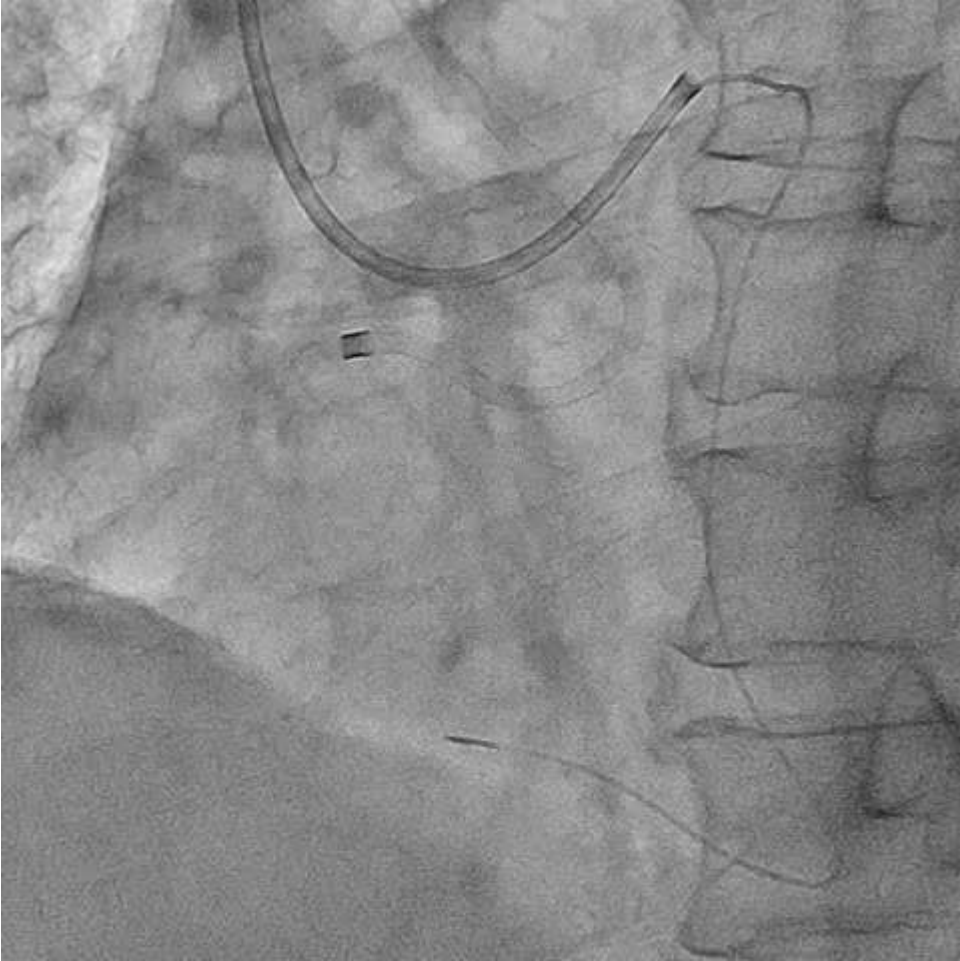
Method of classic reverse CART



- In the classic reverse CART, a retrograde wire was advanced first, including attempting at the retrograde direct crossing.
- Connection usually was made at the subintimal space.
- Making a large subintima via antegrade may create large hematoma and mandates multiple stenting.

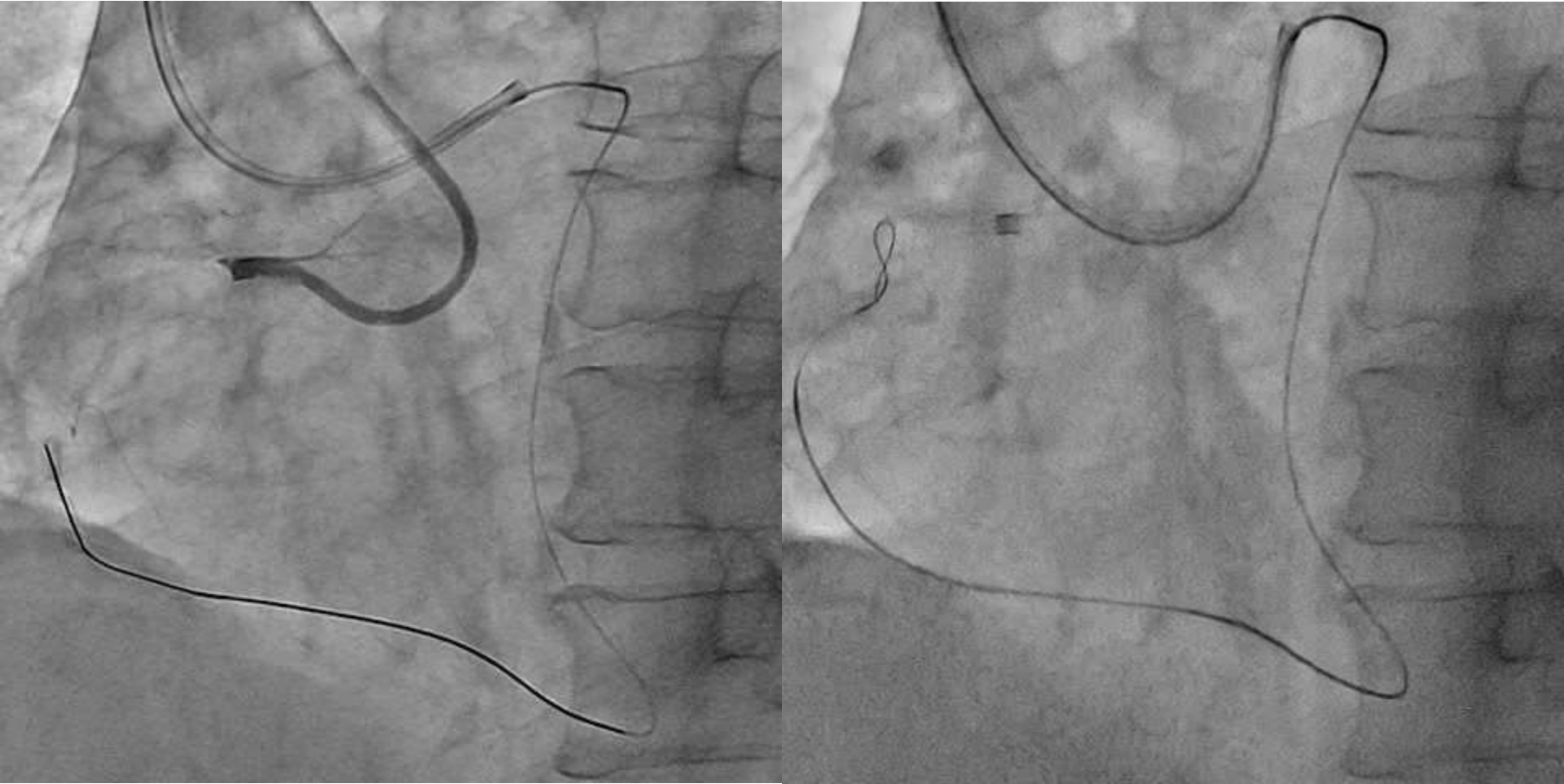


RCA CTO (Long, ambiguous vessel course)



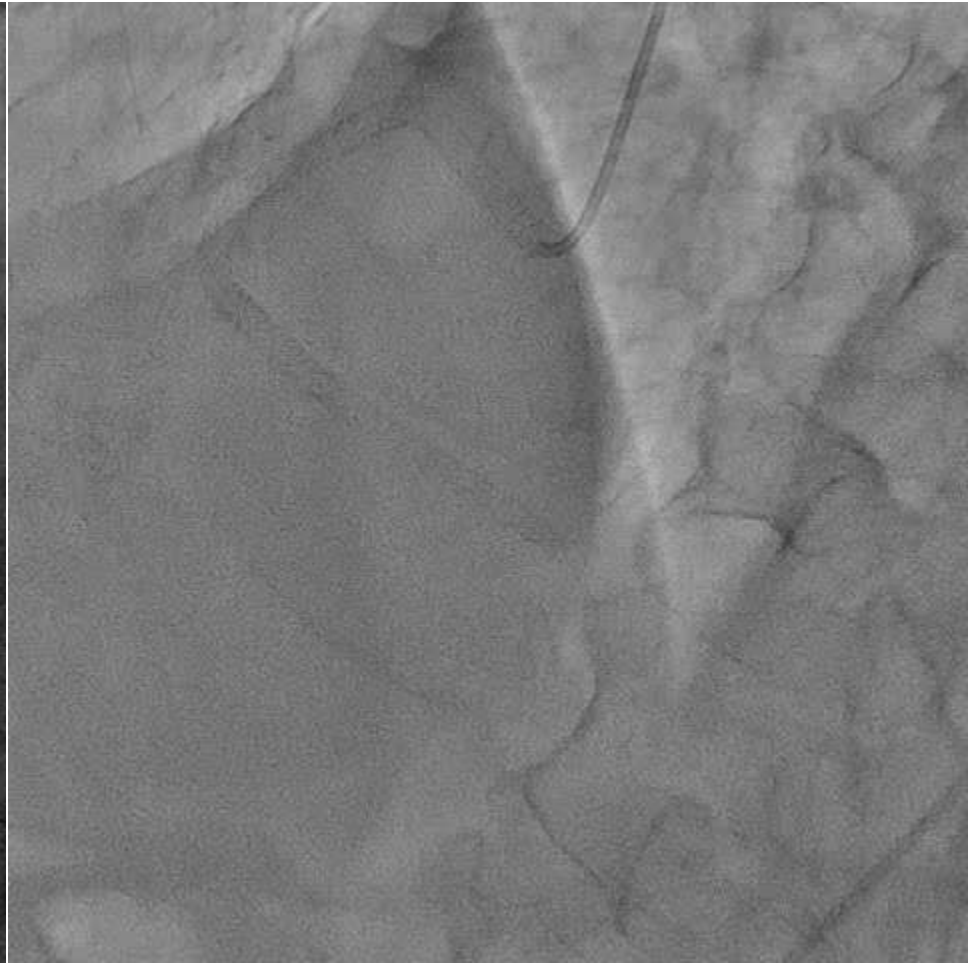
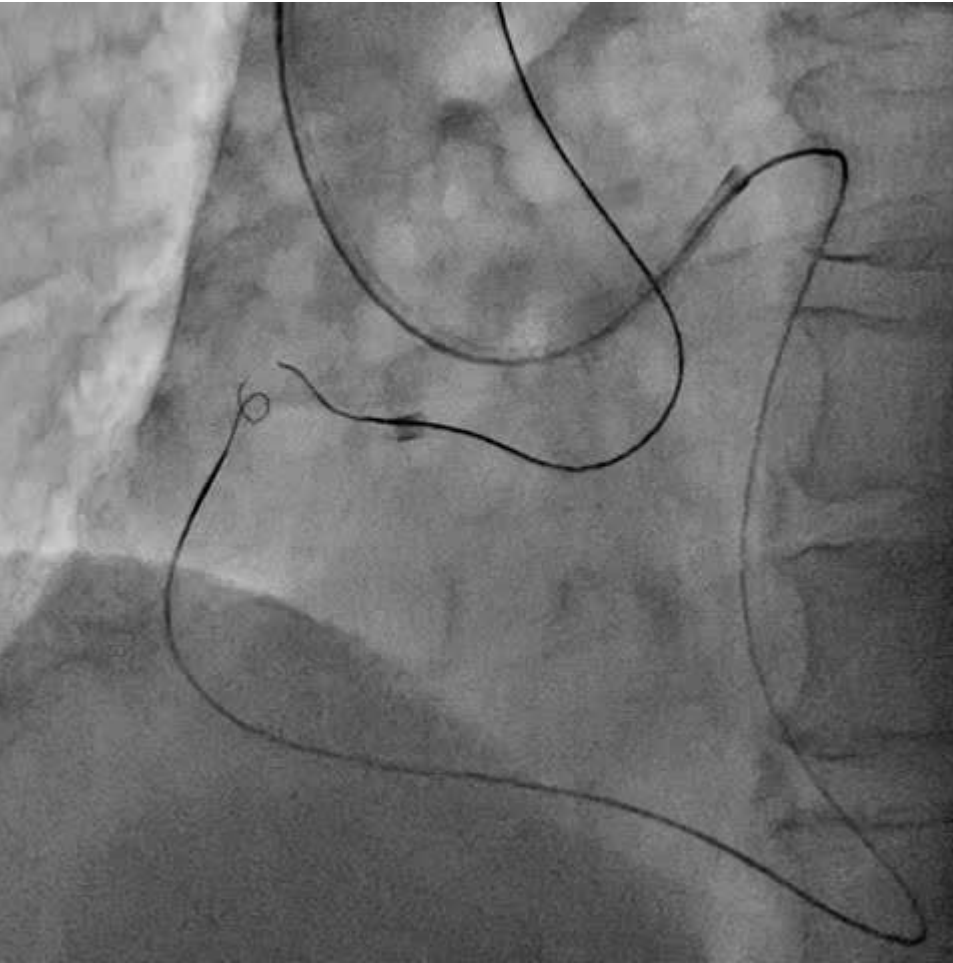


Retrograde wiring

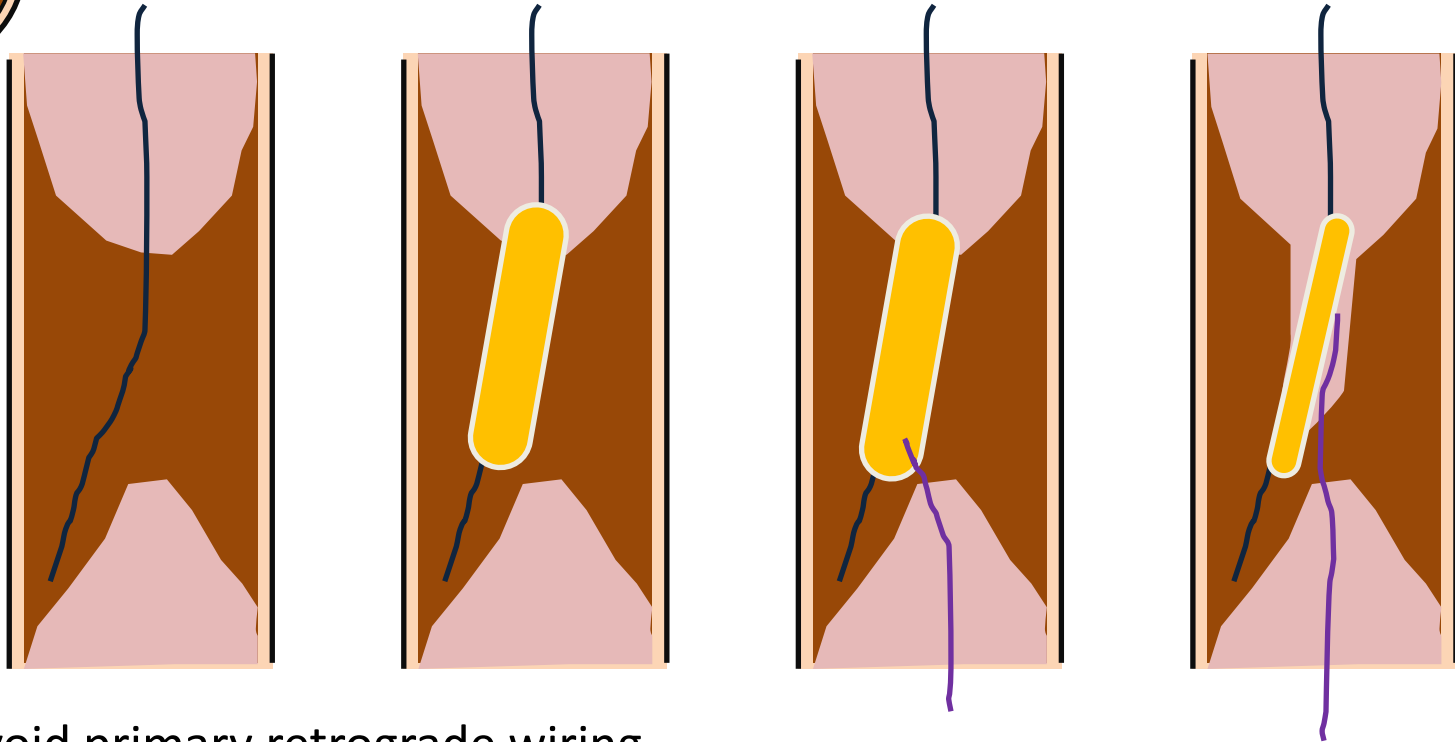
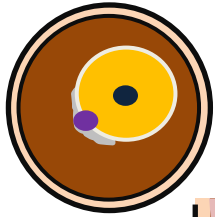




Antegrade knuckle and classic reverse CART



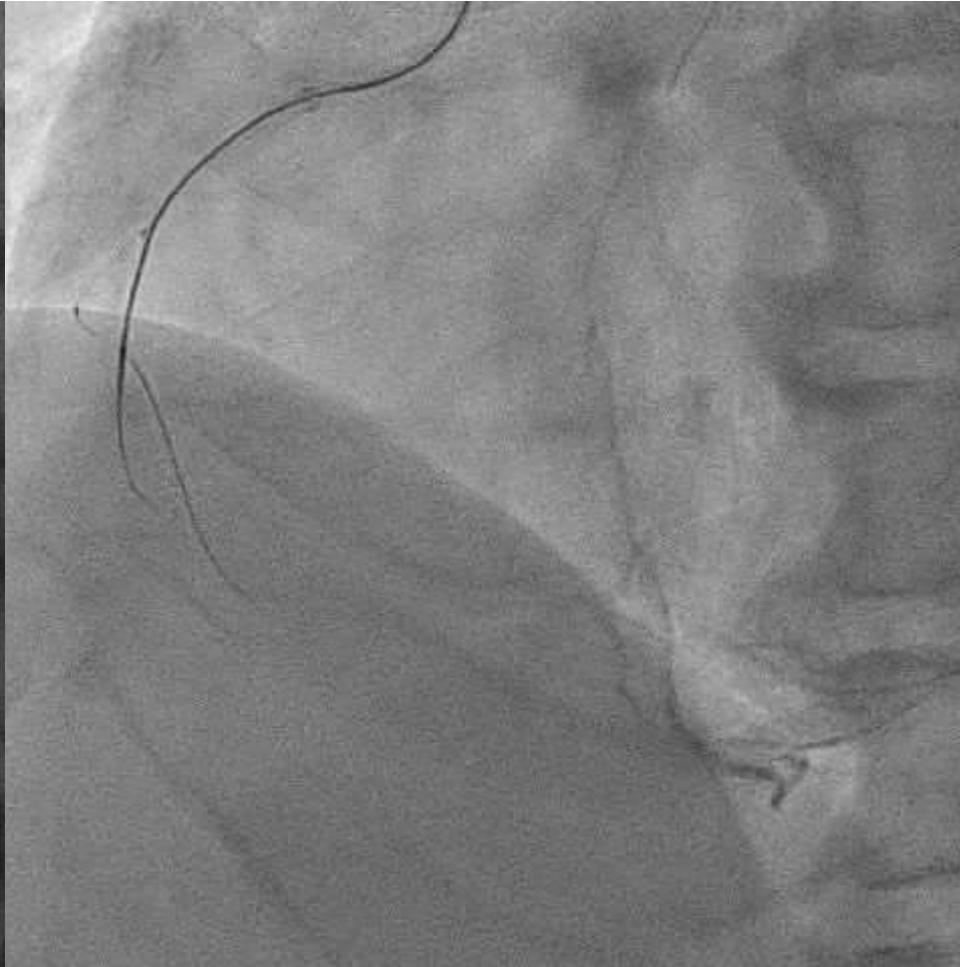
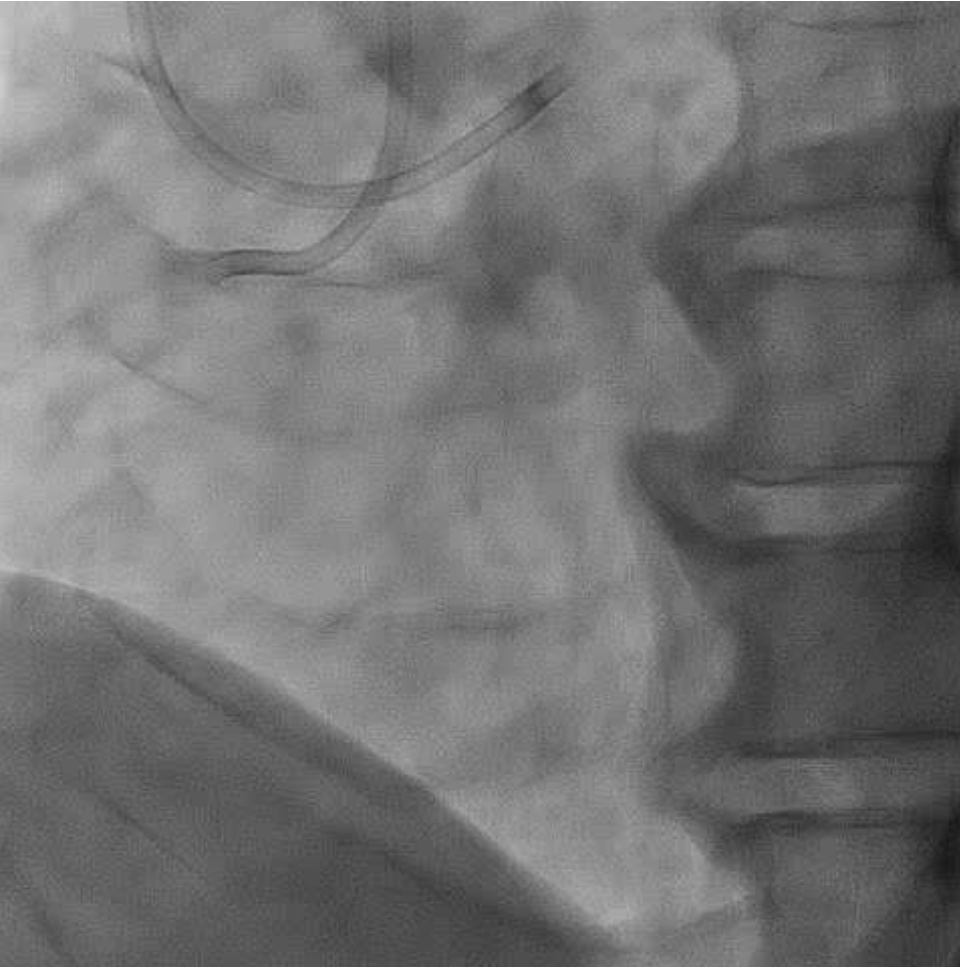
Concept of contemporary reverse CART



- Avoid primary retrograde wiring
- Antegrade preparation with small sized balloon within intima or the border between intima and subintima
- Connection was made within intima by using a retrograde stiff and torqueable GW



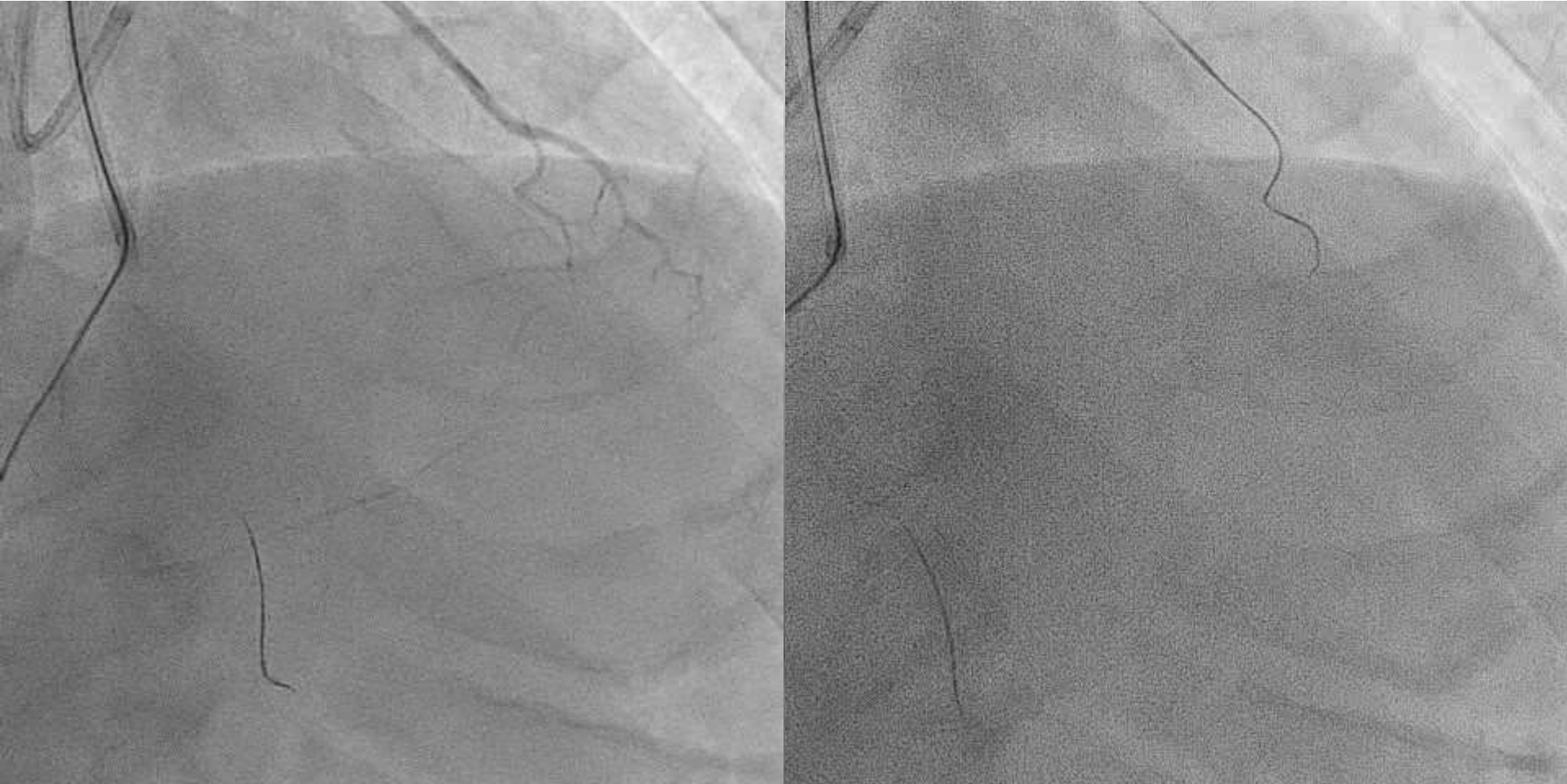
RCA CTO





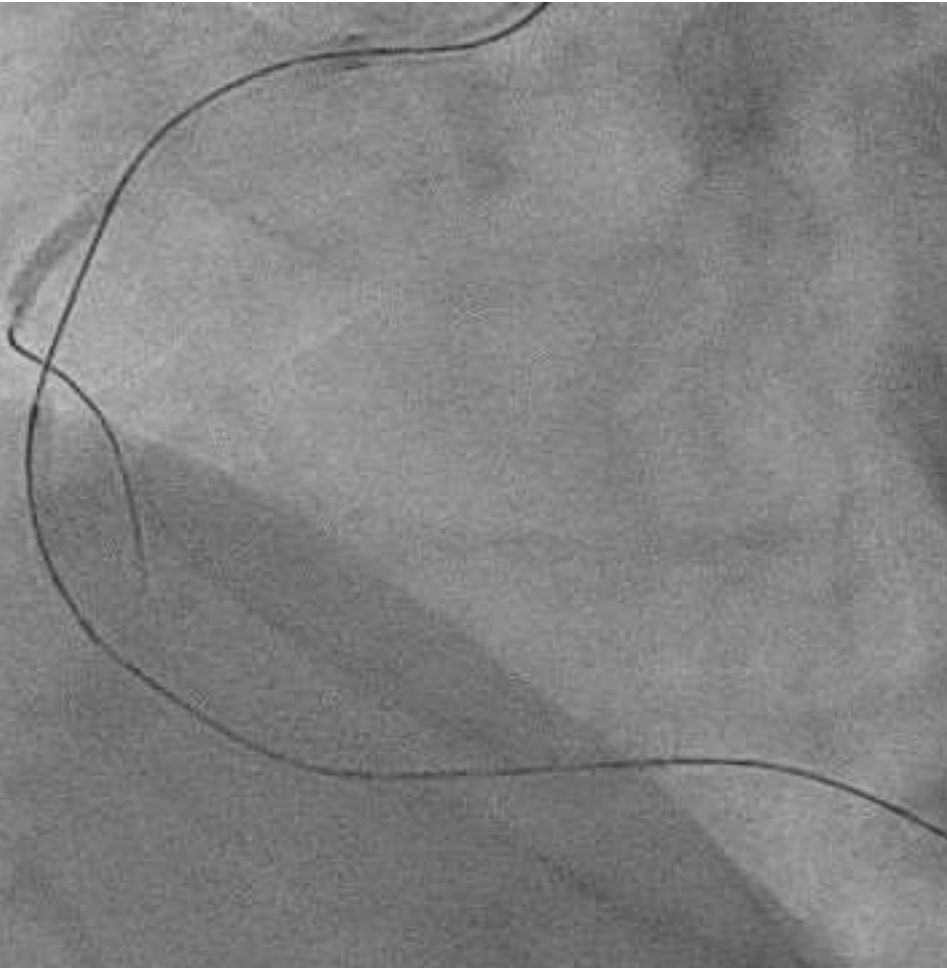
Retrograde approach

Channel crossing

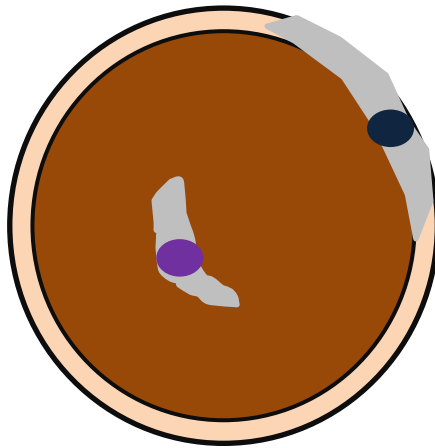




Contemporary reverse CART

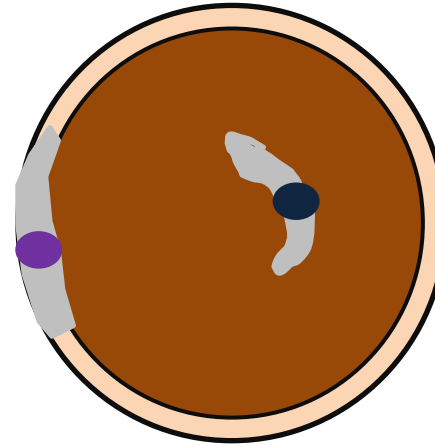
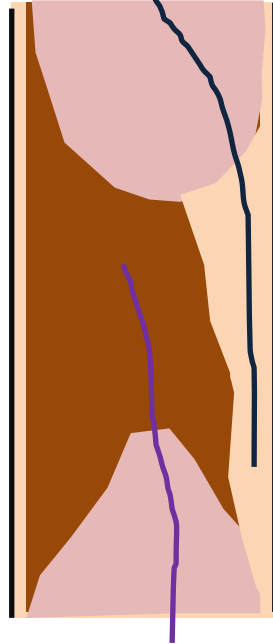


Two wires are in the different layers (Where to meet?)



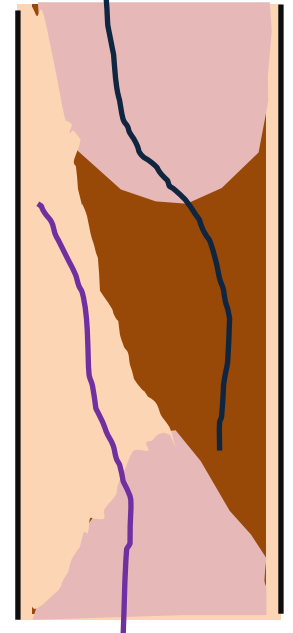
*Antegrade
subintima*

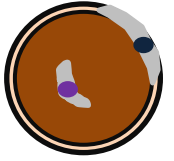
*Retrograde
Intima*



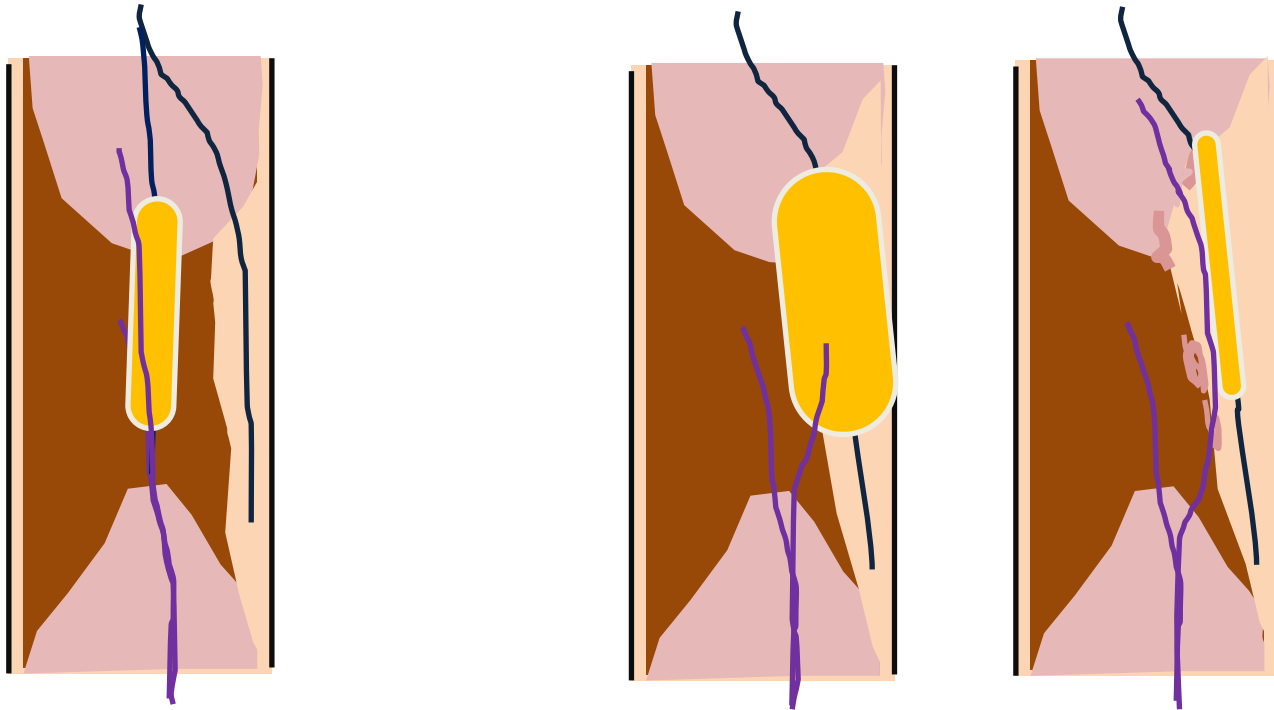
*Antegrade
Intima*

*Retrograde
Subintima*

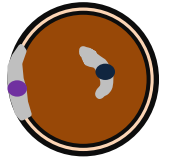




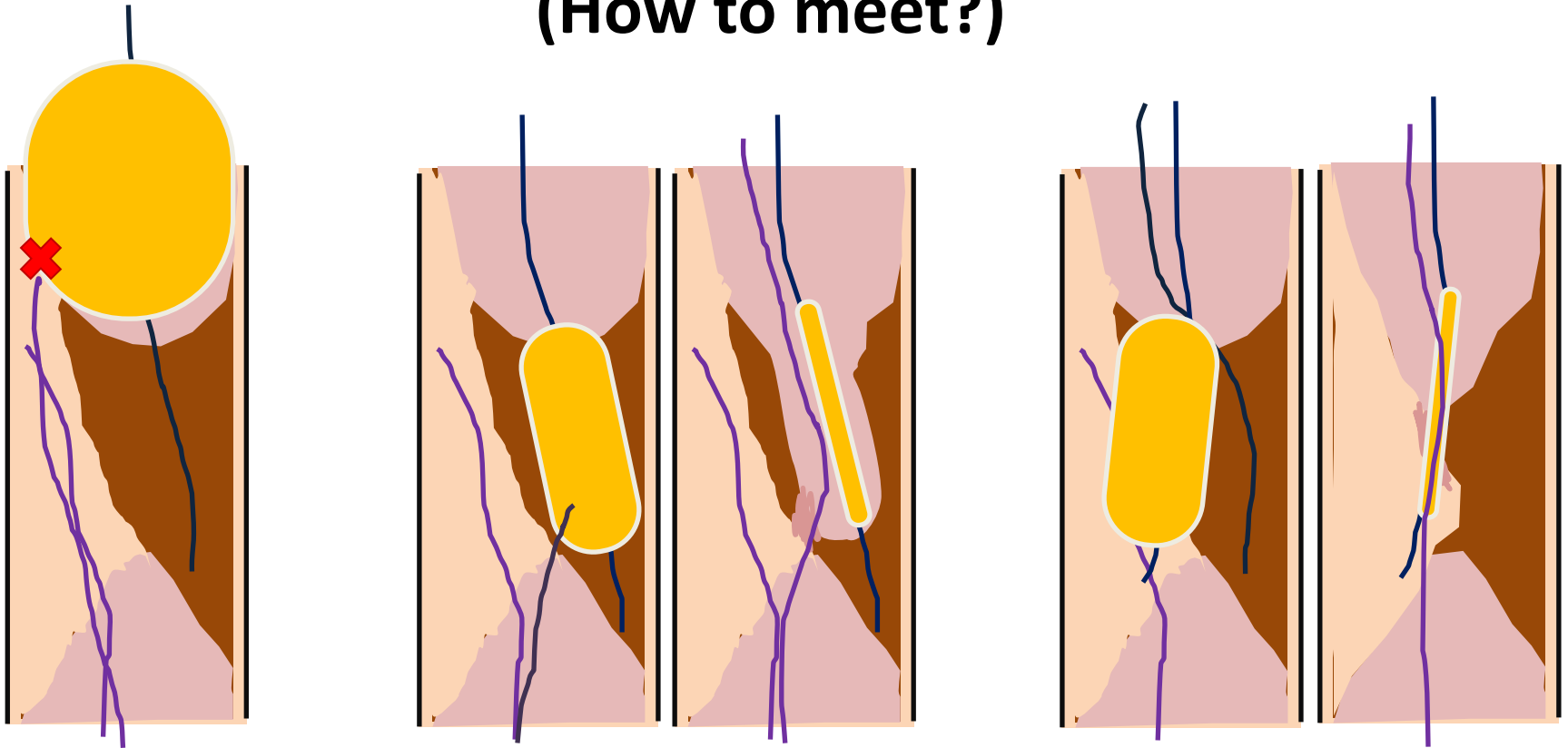
Antegrade subintima, retrograde intima (How to meet?)



- Direct retrograde cross is possible
- Antegrade parallel wiring and contemporary reverse CART
- Subintimal dilation and making a connection within subintimal space.



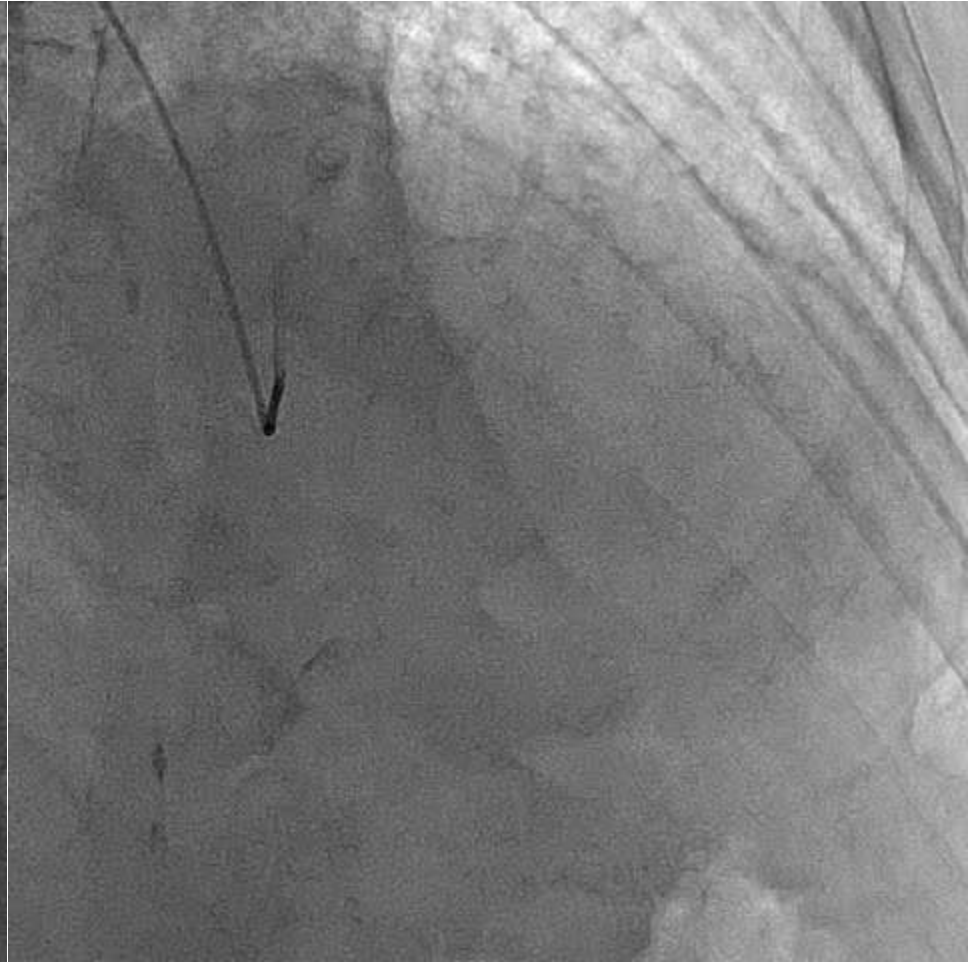
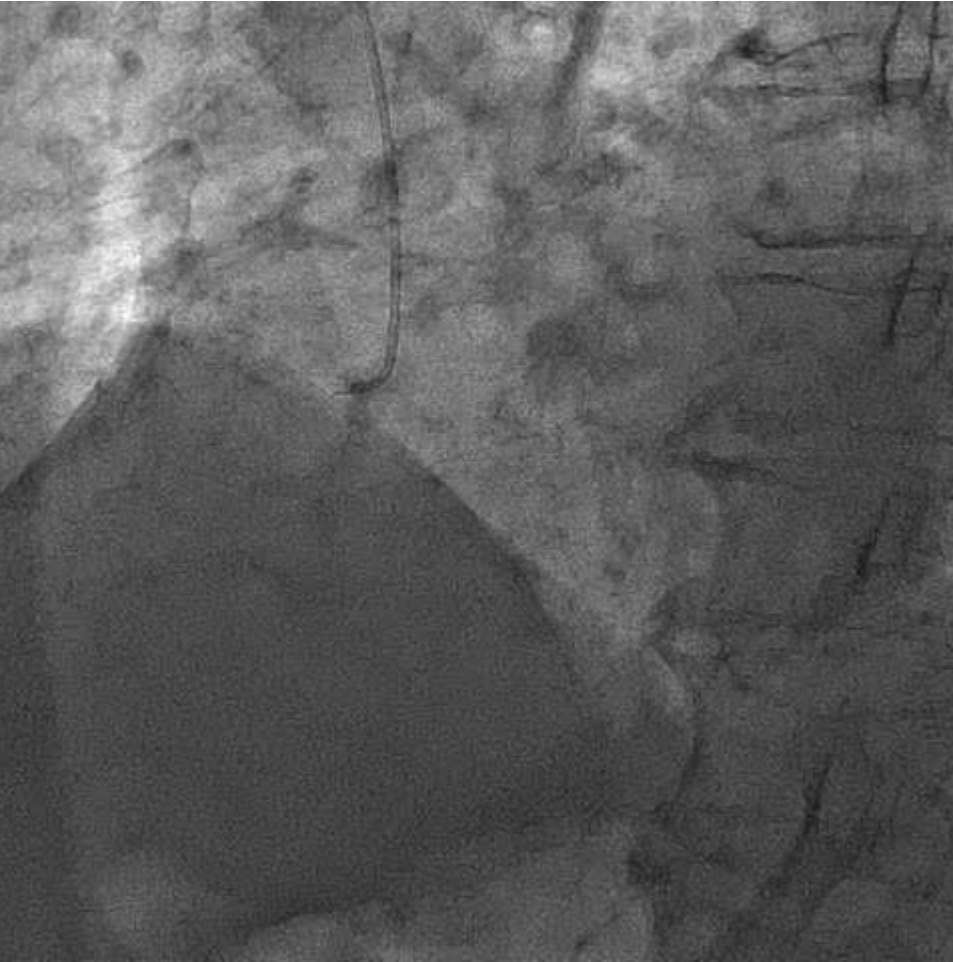
Retrograde subintima, antegrade intima (How to meet?)



- Proximal true lumen dilation usually unsuccessful
- True lumen dilation in the distal part and making a connection within intima
- Antegrade subintimal dilation at the distal point and making a connection within subintima

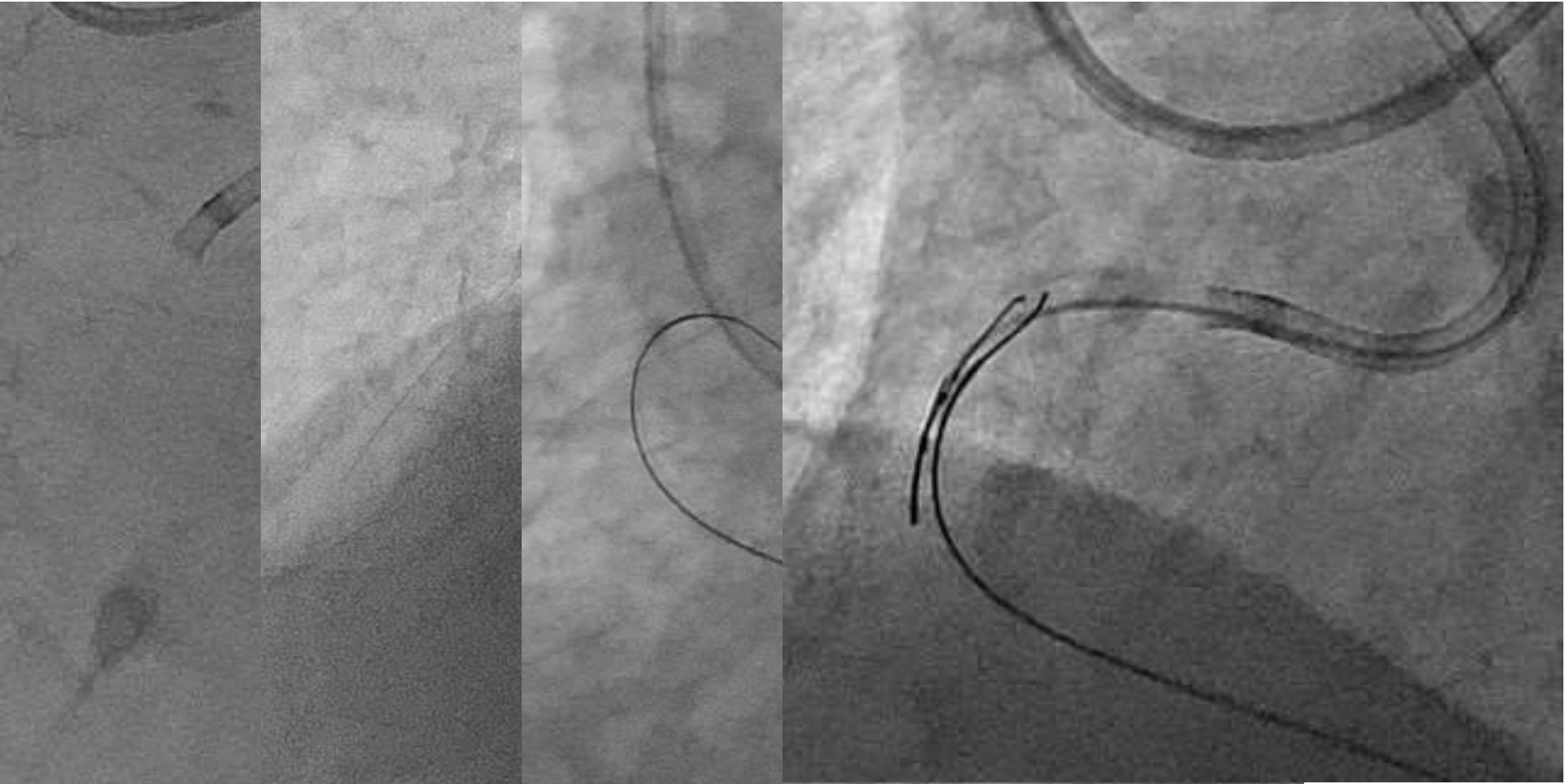


RCA CTO





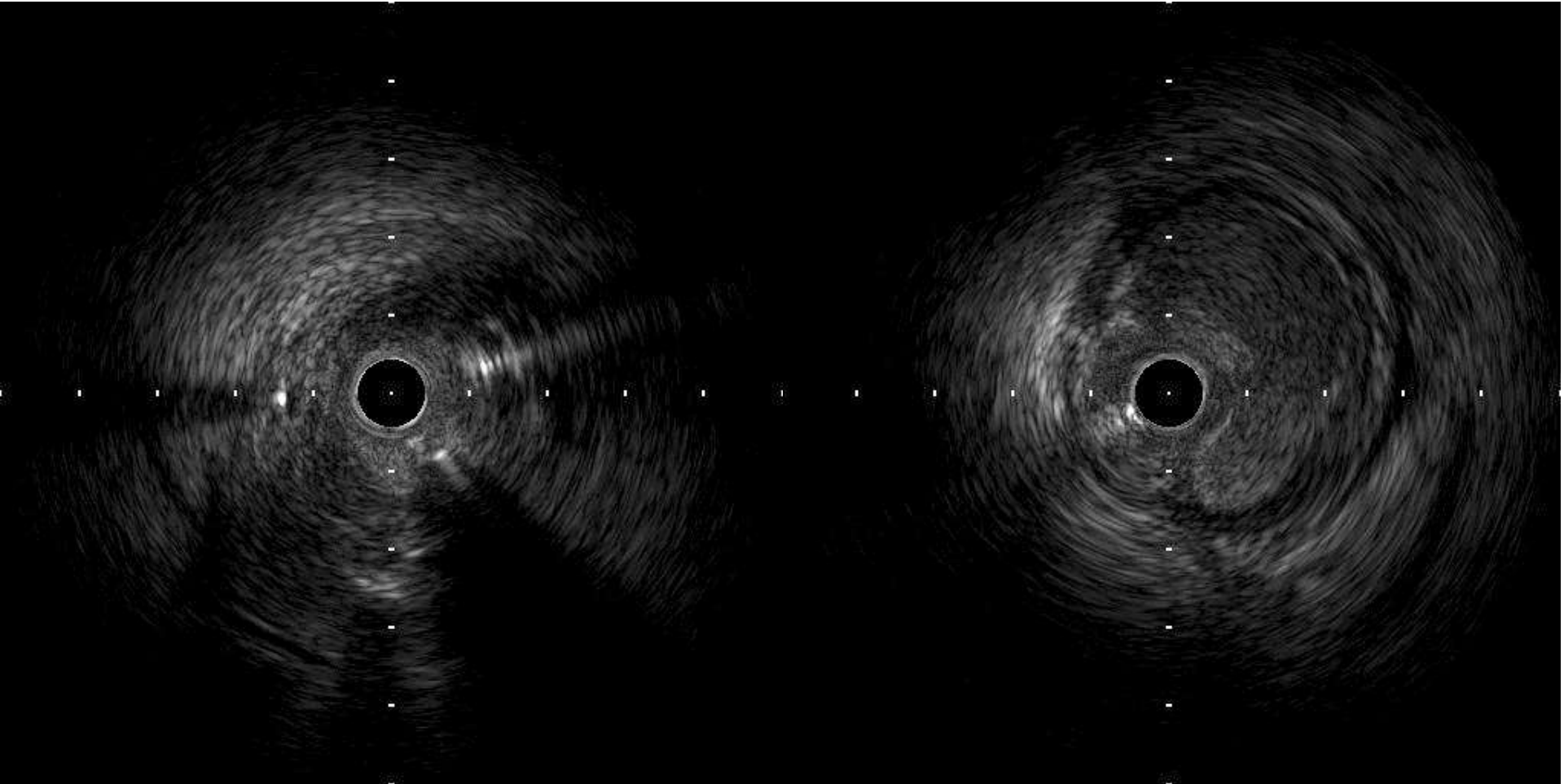
Procedure



Antegrade stiff wire was not able to manage curved segment. Failed retrograde direct crossing. Knuckle wire negotiate curved segment, then IVUS performed



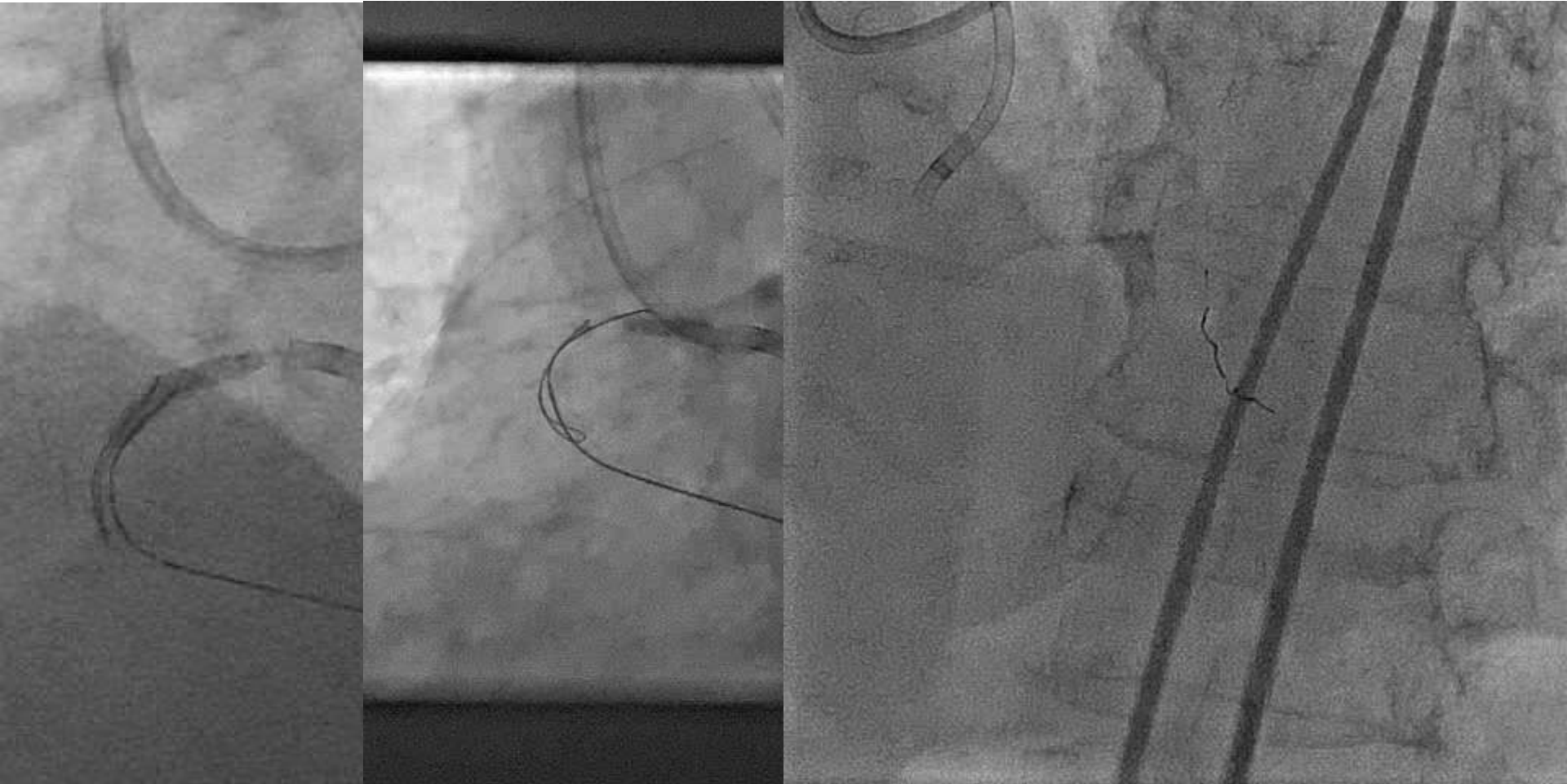
IVUS



Antegrade IVUS in true lumen. Retrograde wire in the intima at the distal part. Large hematoma in the proximal segment due to retrograde direct crossing attempt.

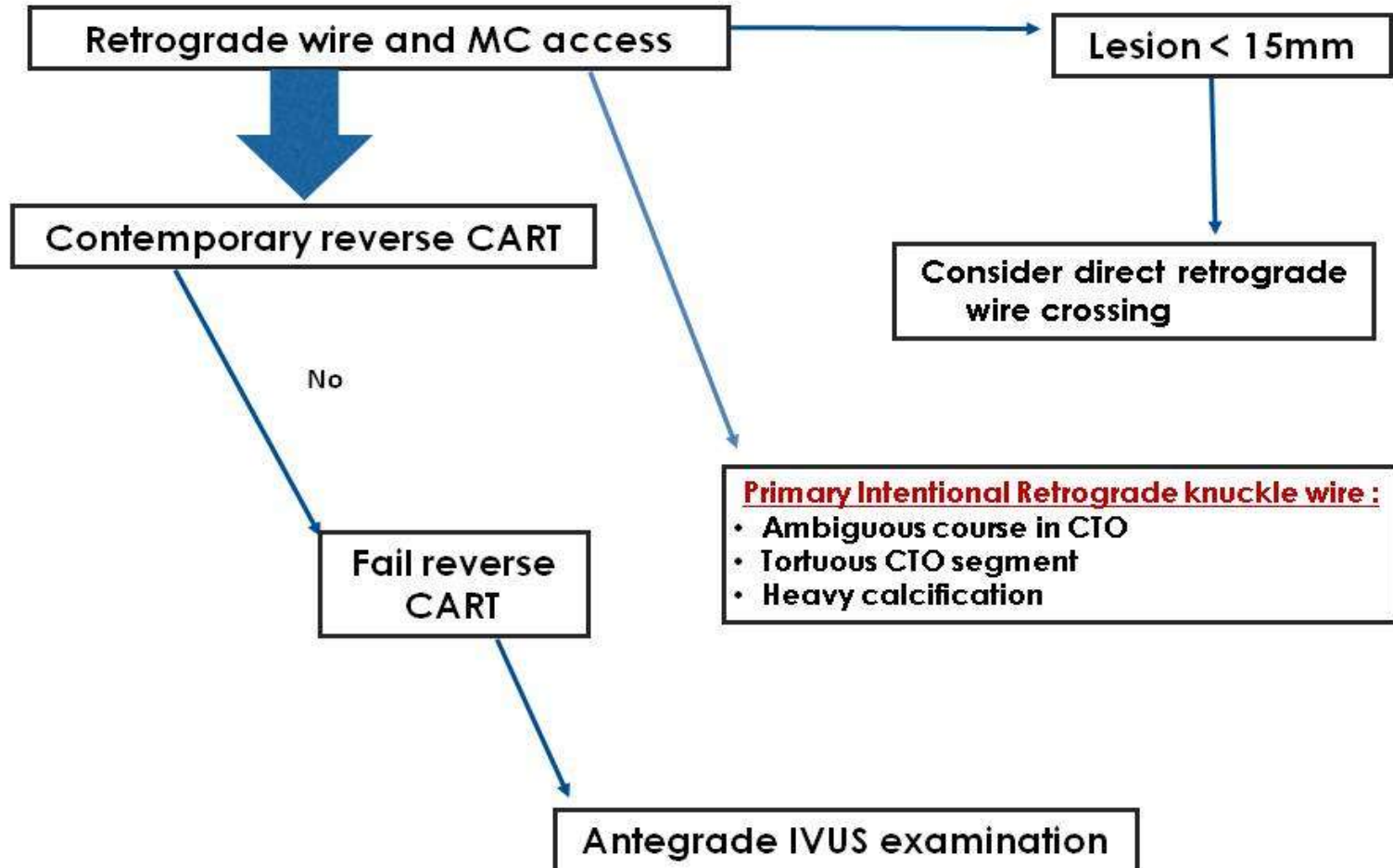


Successful connection



Making a connection at distal part by using UB 3

Algorithm for crossing CTO lesion





Message

There are four pattern of antegrade and retrograde guide wires' position in the CTO.

Small balloon dilation is adequate in intima and intima pattern.
Kissing wire via antegrade or retrograde sometimes successful.

In sub and sub pattern, sufficient sized balloon dilation is necessary to connect both wires. IVUS gives useful information for balloon sizing.



Message

In antegrade subintima and retrograde intima pattern, proximal point is the theoretically best position to connect. Small sized balloon dilation is adequate in case of straight segment.

In antegrade intima and retrograde sub intima pattern, the ideal position is distal end. Creation of subintimal space is necessary via antegrade for connection. Occasionally antegrade wire successful advances distal true lumen during antegrade preparation.