# Complex PCI – deliver to the undeliverable lesion

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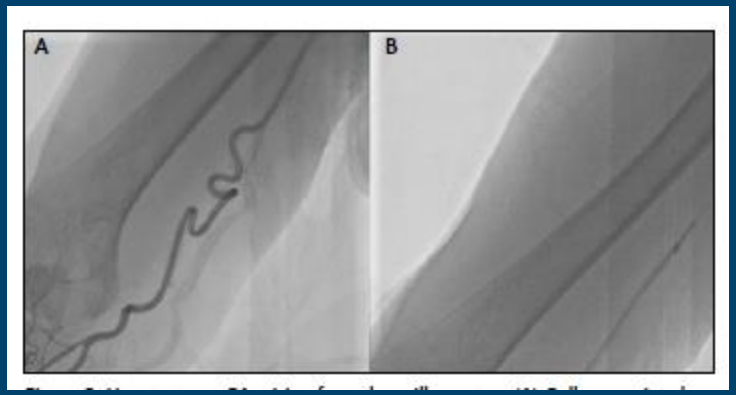
# Challenges for successful devices delivery

- 1/ Tortuous peripheral vessels
- 2/ Complex anatomy eg. dilated aortic root, abnormal coronary take-off
- 3/ Tortuous coronary arteries/ abrupt angle/ calcified vessels
- 4/ Complex lesion eg. CTO/ bifurcation lesion

# Solutions

- 1/ Tortuous peripheral vessels

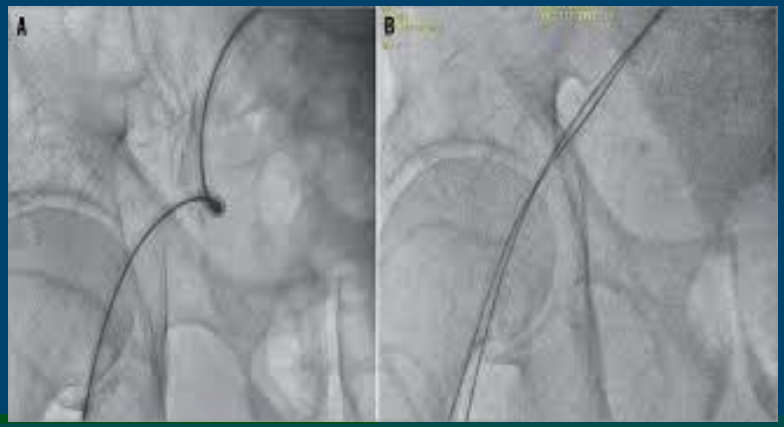



• 0.035-in hydrophilic coated nitinol guidewire or 0.014-in coronary guidewire

• Direct guide crossing or use diagnostic catheter to exchange for a more supportive 0.035-in guidewire

# Solutions

- 1/ Tortuous peripheral vessels



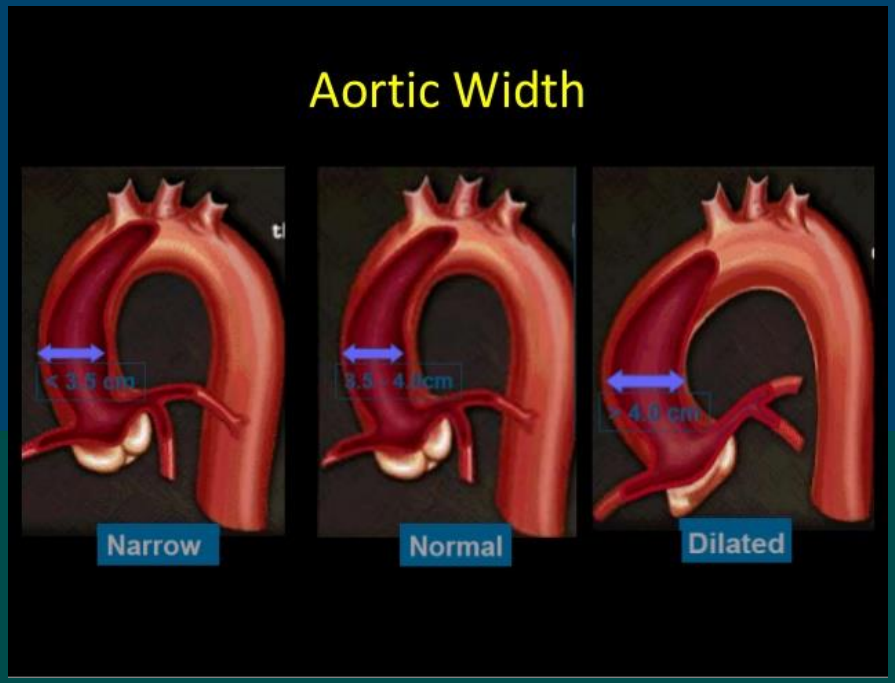

  - Long or metal sheaths to overcome friction generated from the tortuous guide

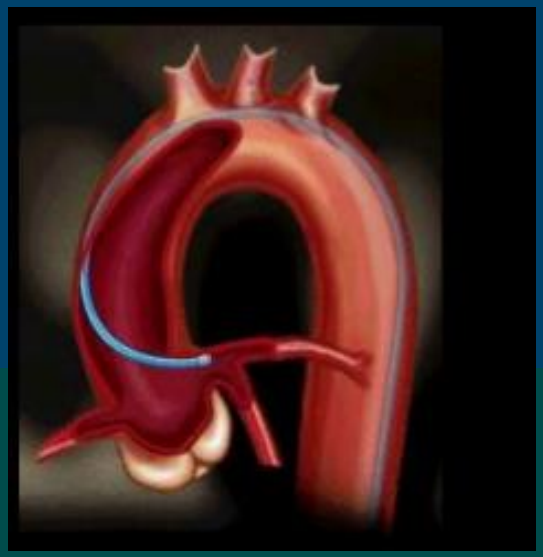
# Solutions

- 2/ Complex anatomy eg. dilated aortic root, abnormal coronary take-off
  - Select a guide according to size of aorta, location and orientation of the coronary artery

# Solutions

- 2/ Dilated aortic root



Choose a proper size guide according to the size of the aortic root so that the secondary curve is positioned against the opposite aortic wall or sinus valsava

# Solutions

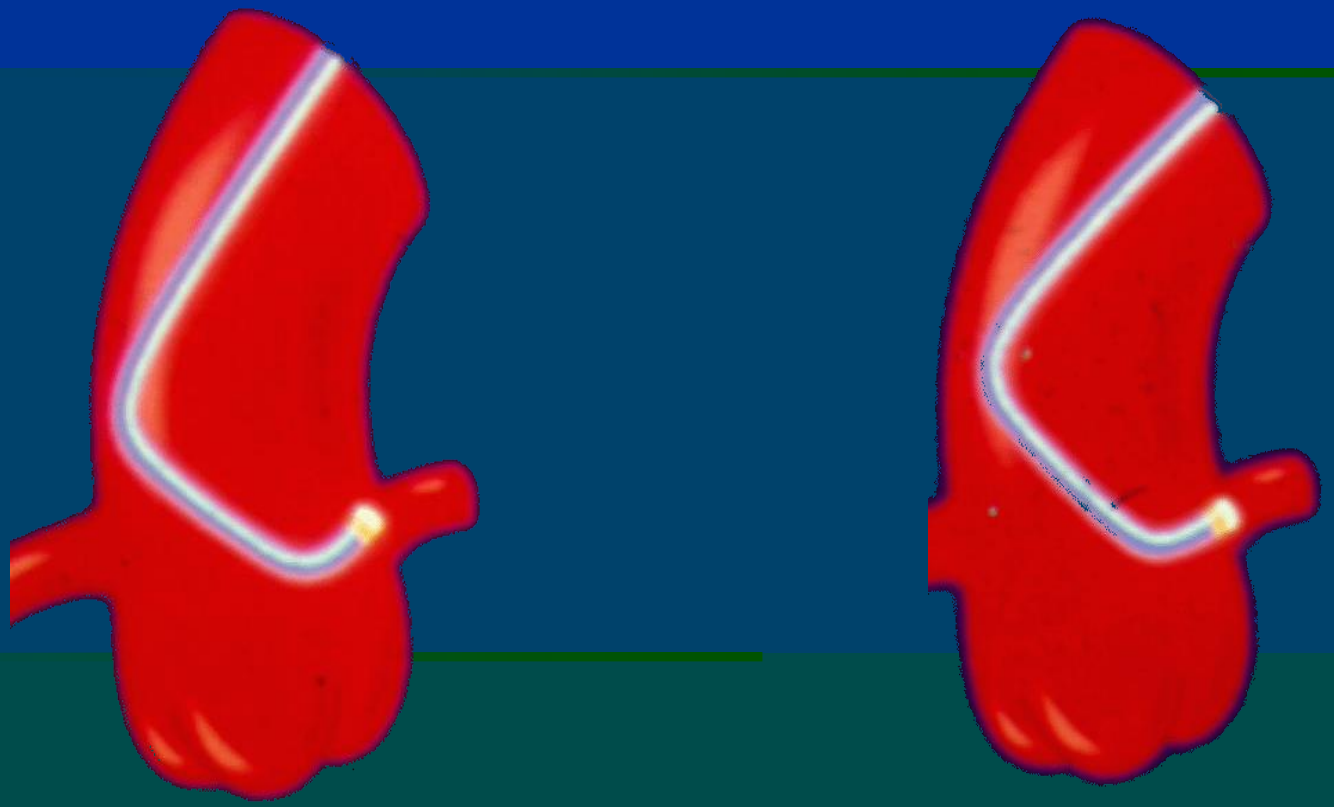
- 2/ Complex anatomy eg. dilated aortic root, abnormal coronary take-off

| Ostium location | Ostium orientation |
| --- | --- |
| • High | • Superior |
| • Low | • Horizontal |
| • Anterior | • Inferior |
| • Posterior | • Shepard's crook (for RCA) |

# Solutions

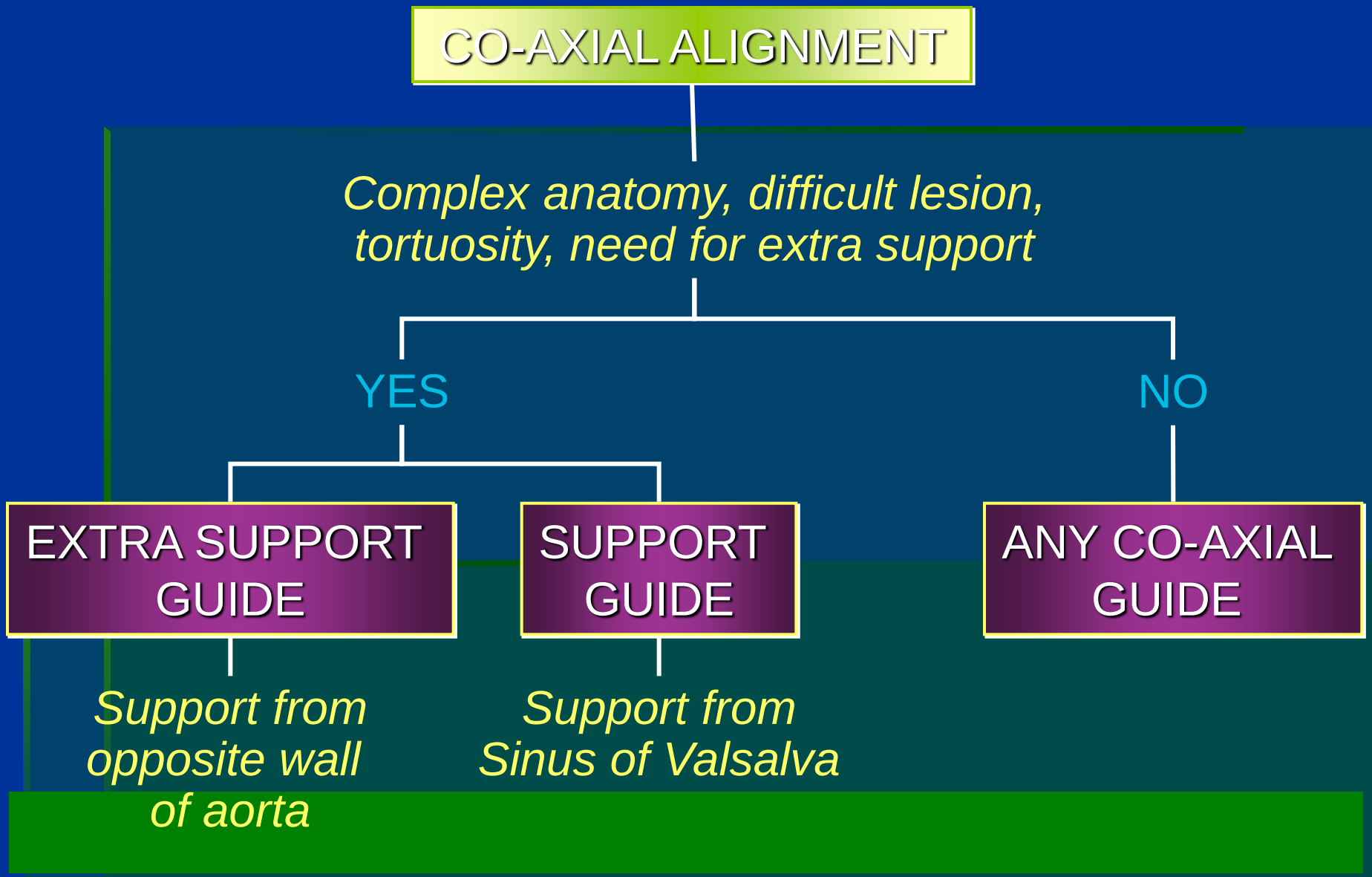
- 2/ Complex anatomy eg. dilated aortic root, abnormal coronary take-off
  - Guide should have coaxial alignment with the proximal segment to provide enough back up force

# Co-Axial Alignment

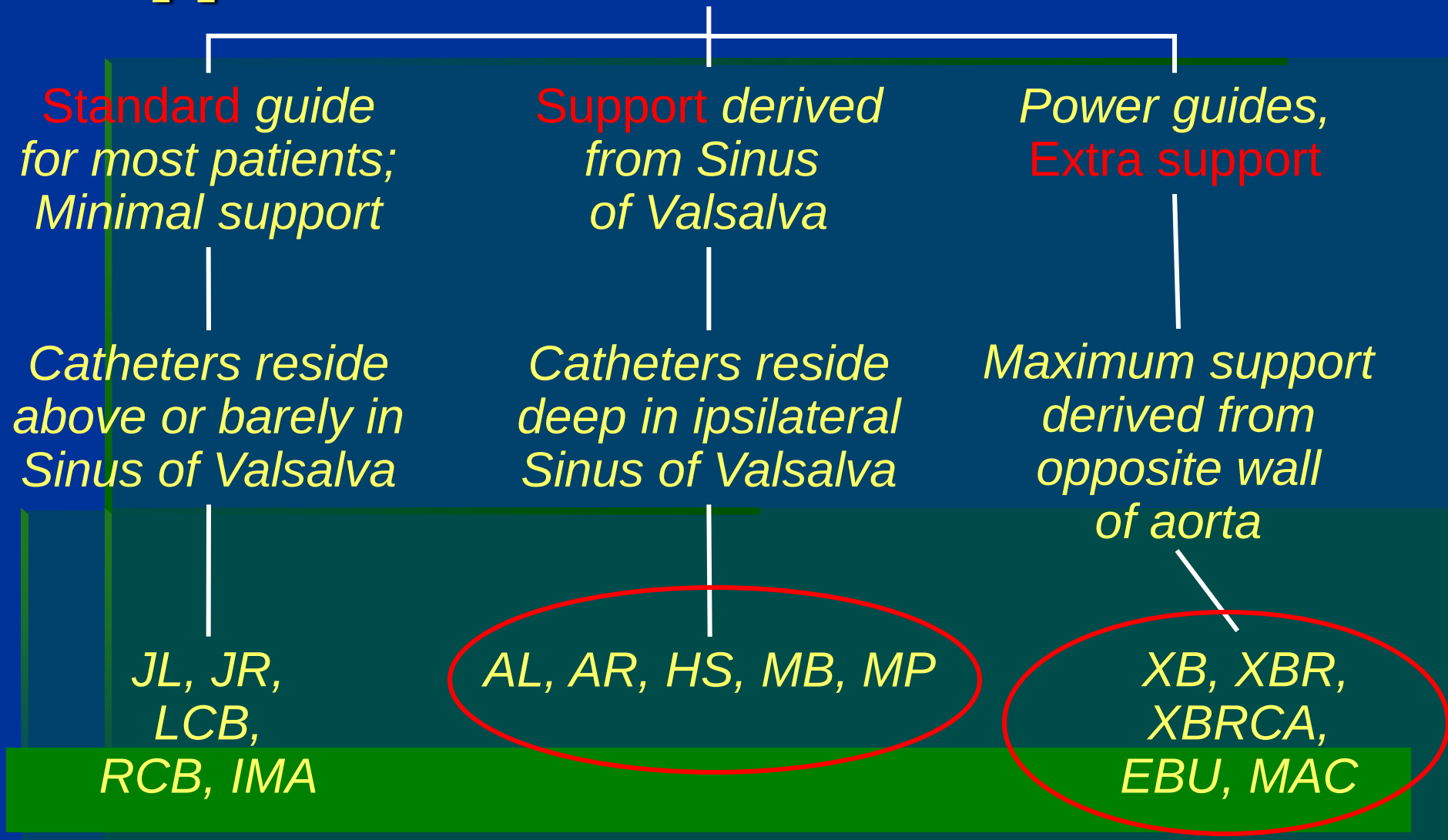


Non-Coaxial

Coaxial

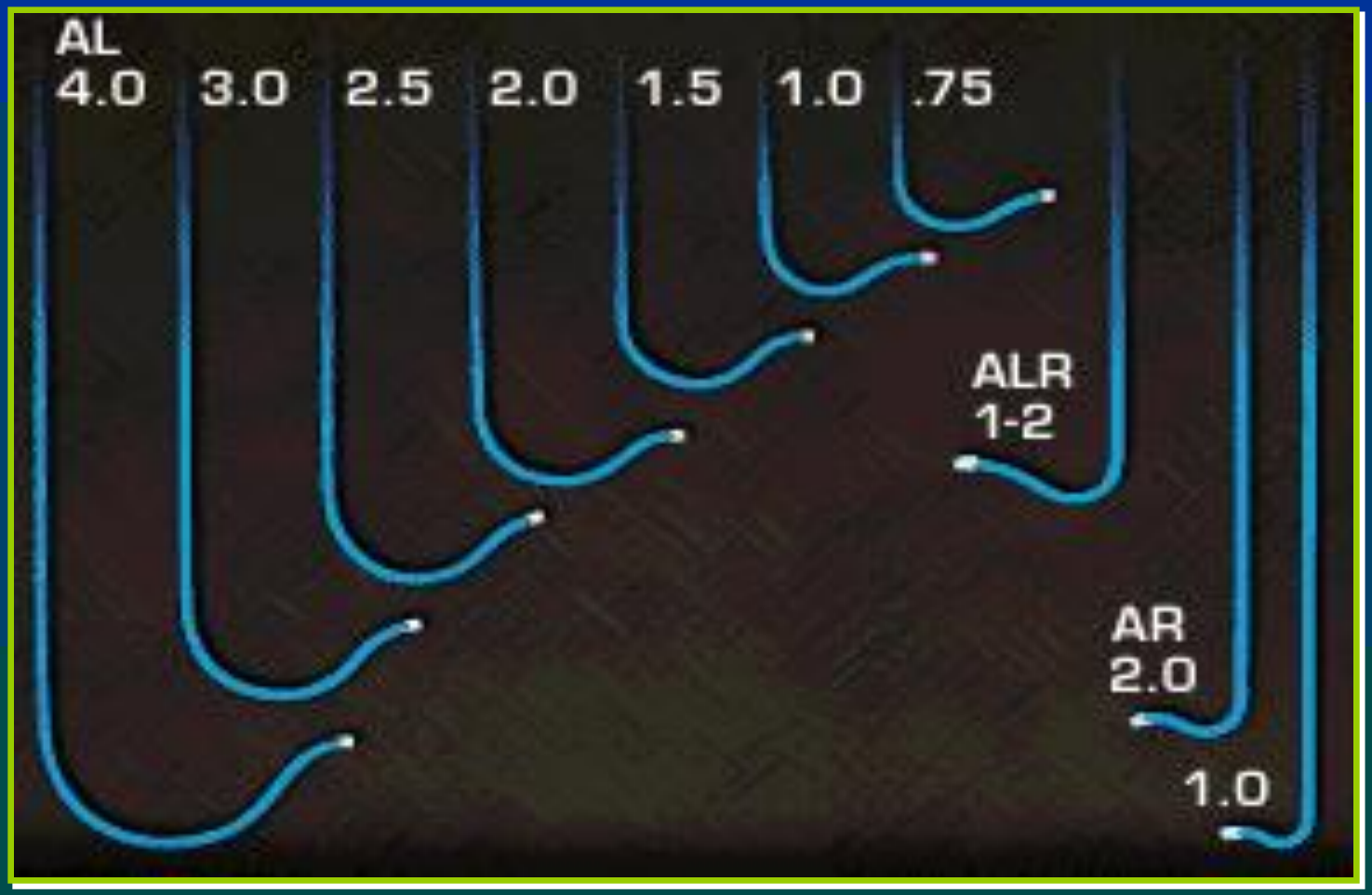

CO-AXIAL ALIGNMENT
Complex anatomy, difficult lesion, tortuosity, need for extra support
YES
NO
EXTRA SUPPORT GUIDE
SUPPORT GUIDE
ANY CO-AXIAL GUIDE
Support from opposite wall of aorta
Support from Sinus of Valsalva

# Guiding Catheter Selection and Support



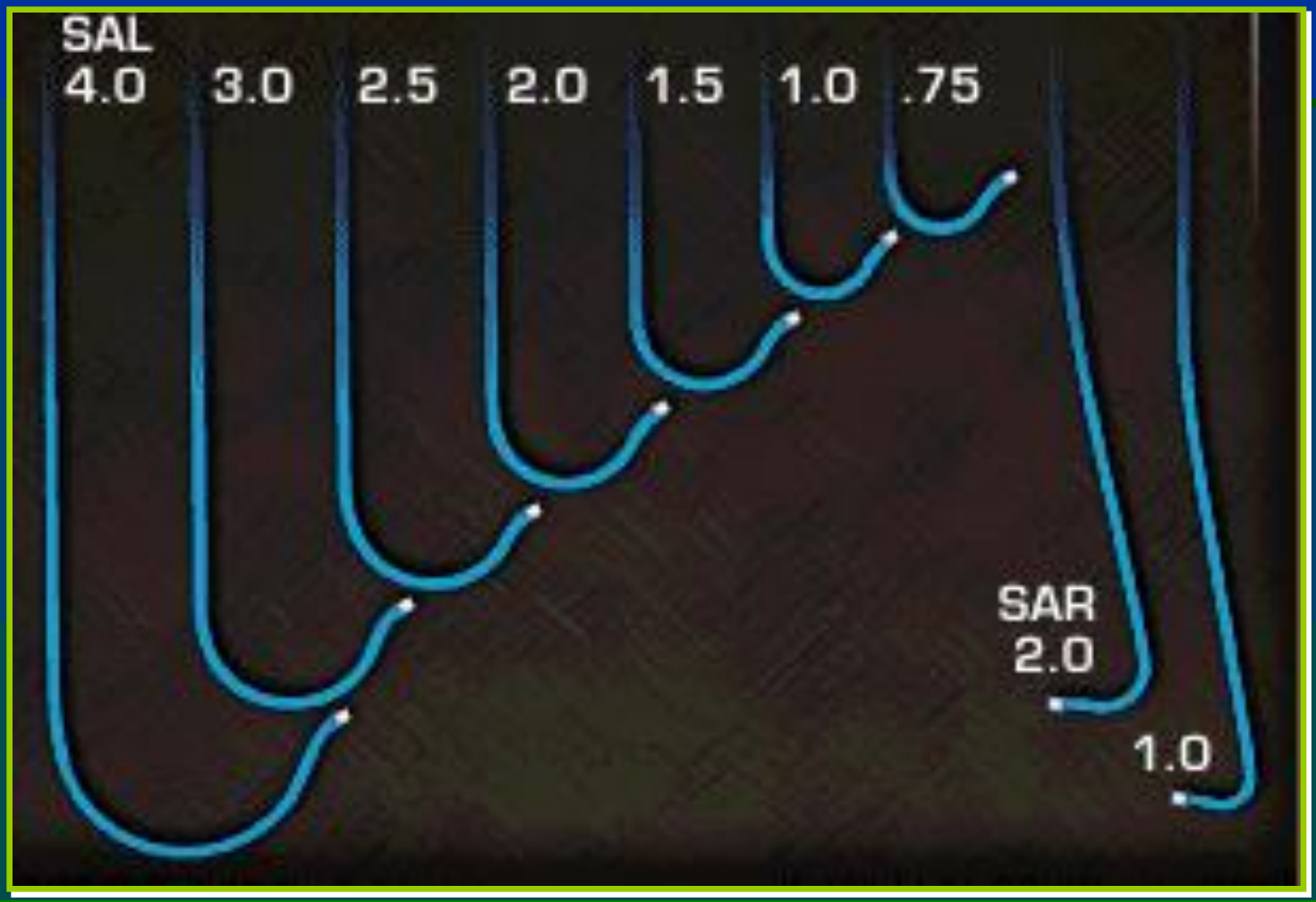
# SUPPORT GUIDE CATHETERS

# Amplatz Coronary Curves



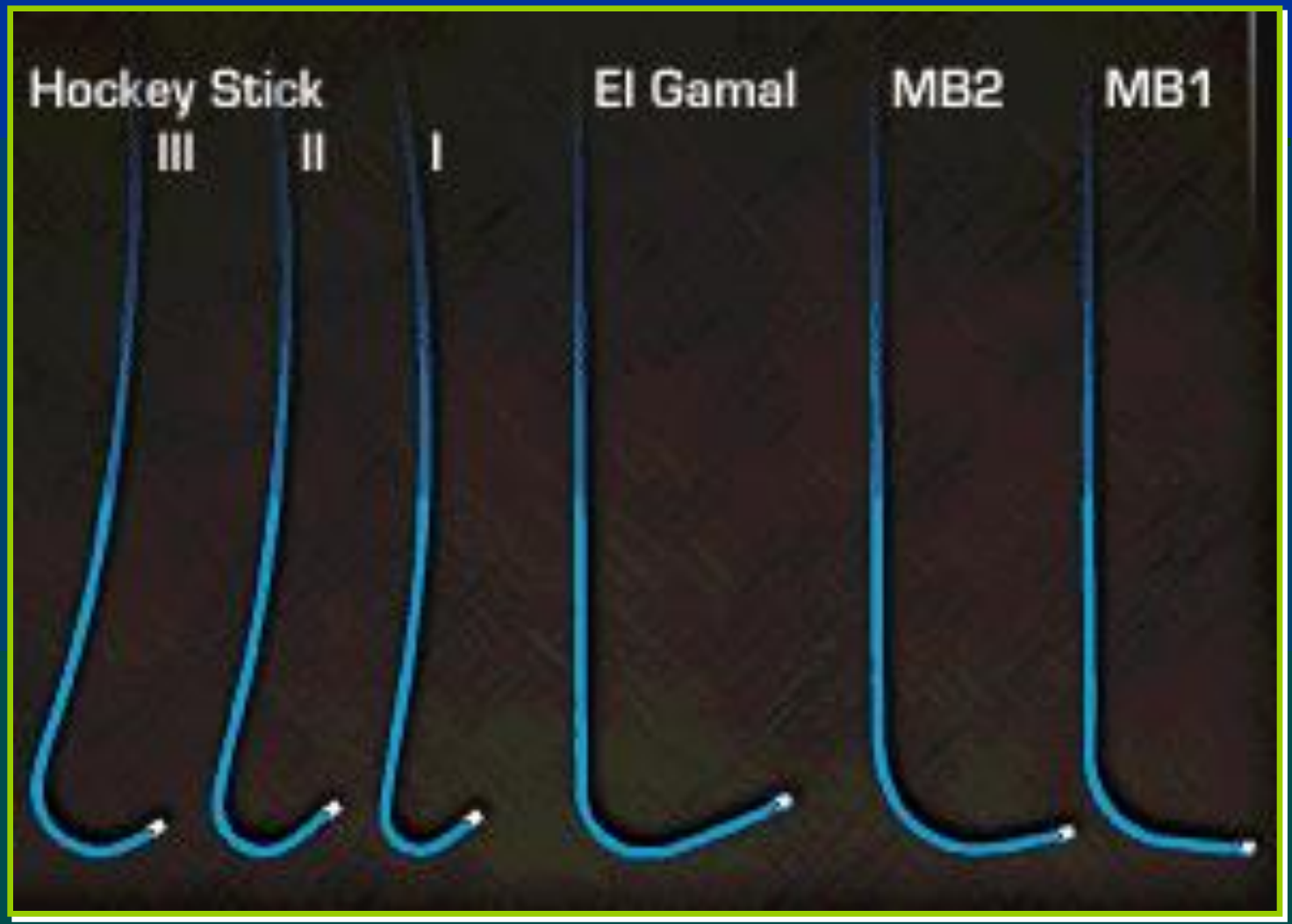

Short LM, separate origin of LAD and LCx,
high anterior RCA , Shepherd's Crook RCA

# Short Amplatz Curves




Small aortic root, low RCA ostium

# Multipurpose Curves

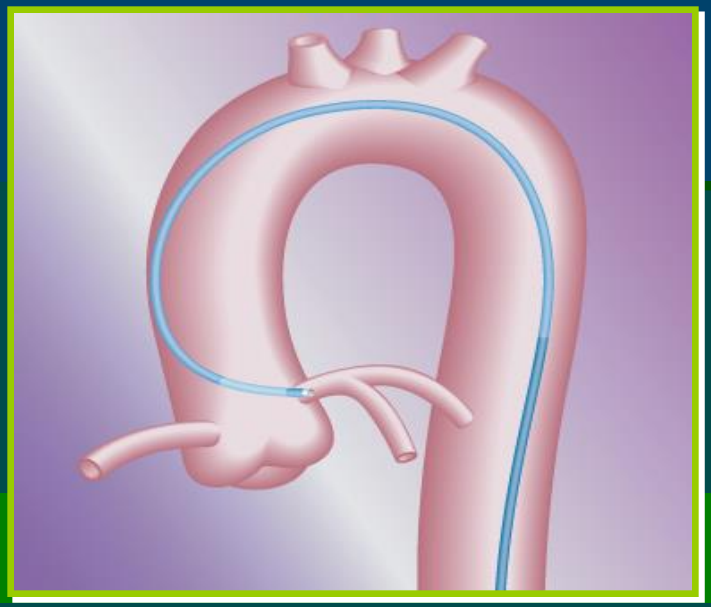



High take-off LM, inferior take off RCA, SVG to RCA

# EXTRA SUPPORT AND SPECIALTY GUIDE CATHETERS

# EBU (Extra Backup) Curves

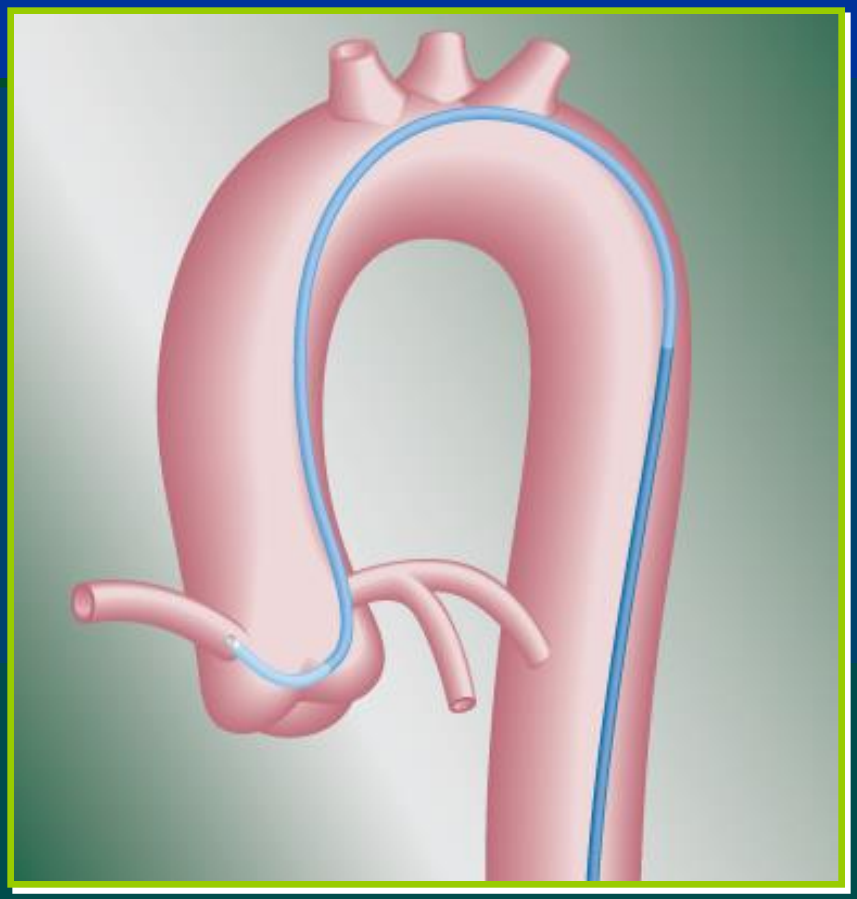
- Broad secondary curve braces against the contralateral wall for superior backup

| Judkins Left Catheter Used | EBU Curve Used |
|---|---|
| JL 3.5 | EBU 3.5 |
| JL 4.0 | EBU 3.75 will engage 2–3 mm into the ostium<br>EBU 4.0 will engage 3–5 mm into the ostium |
| JL 4.5 | EBU 4.5 |
| JL 5.0 | EBU 4.5 |

# MAC (Multi-Aortic Curve)

- Can be used in both left and right coronary arteries
- Mechanical support provided from aortic root & contralateral wall
- Femoral or radial access
- Superior / horizontal take off



# RBU (Right Backup)

- Works best for normal inferior takeoffs where a lot of backup is required
- Rests against the contralateral wall
- Will deep seat 10-12 mm into ostium

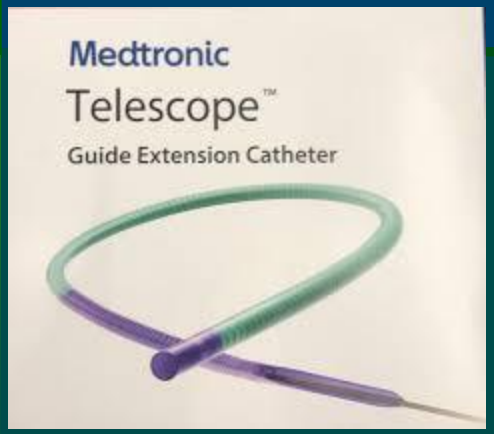
# ECR Right Coronary Backup Support

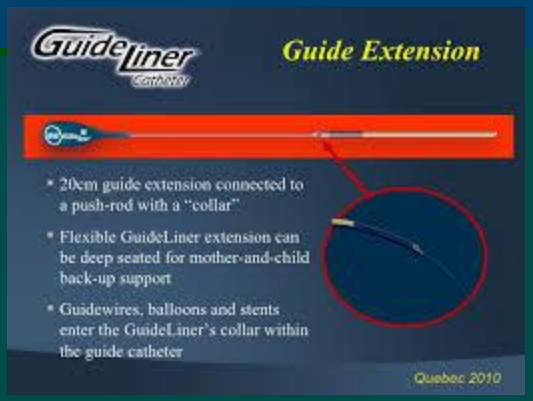
Provide coaxial seating for inferior take offs RCA

# Solutions

3/ Tortuous coronary arteries/ abrupt angle/ calcified vessels

- Increase support with guide extension catheter



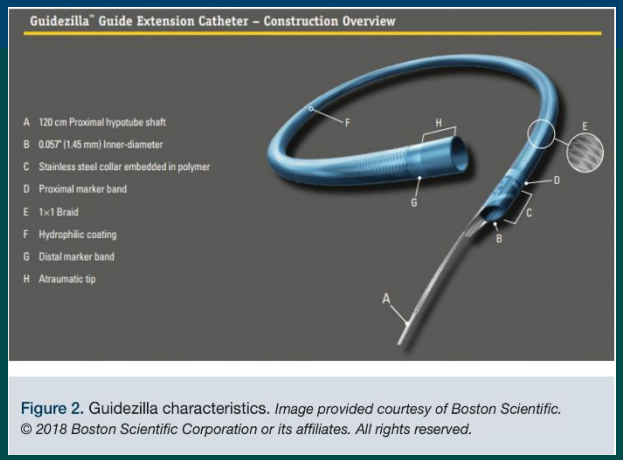
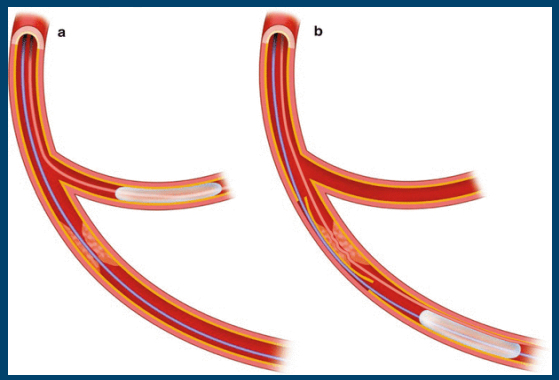




Figure 2. Guidezilla characteristics. *Image provided courtesy of Boston Scientific.*

# Solutions

3/ Tortuous coronary arteries/ abrupt angle/ calcified vessels

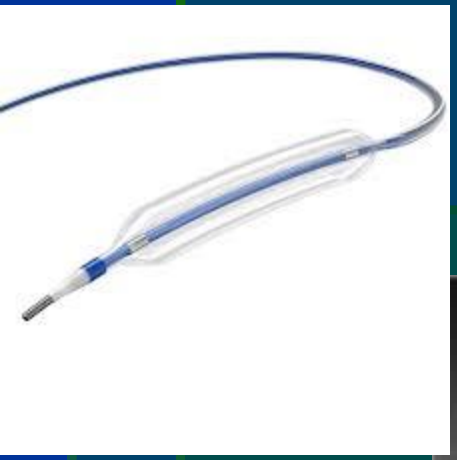


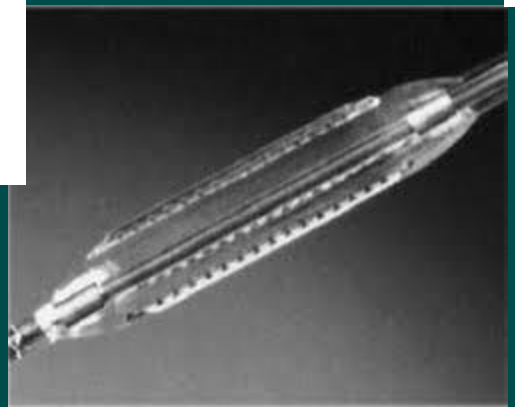

- Buddy wire
- Anchoring wire / balloon
- Use short/ small size / thin struts stents

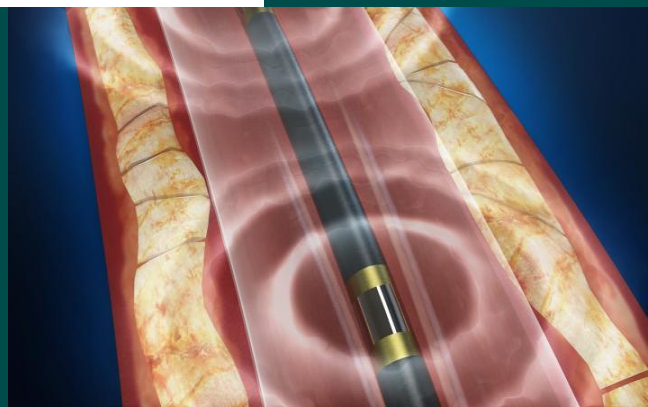
# Solutions

## 3/ Calcified vessels / lesions

Better preparation with NC balloon/ scoring balloon/ cutting balloon / shockwave balloon



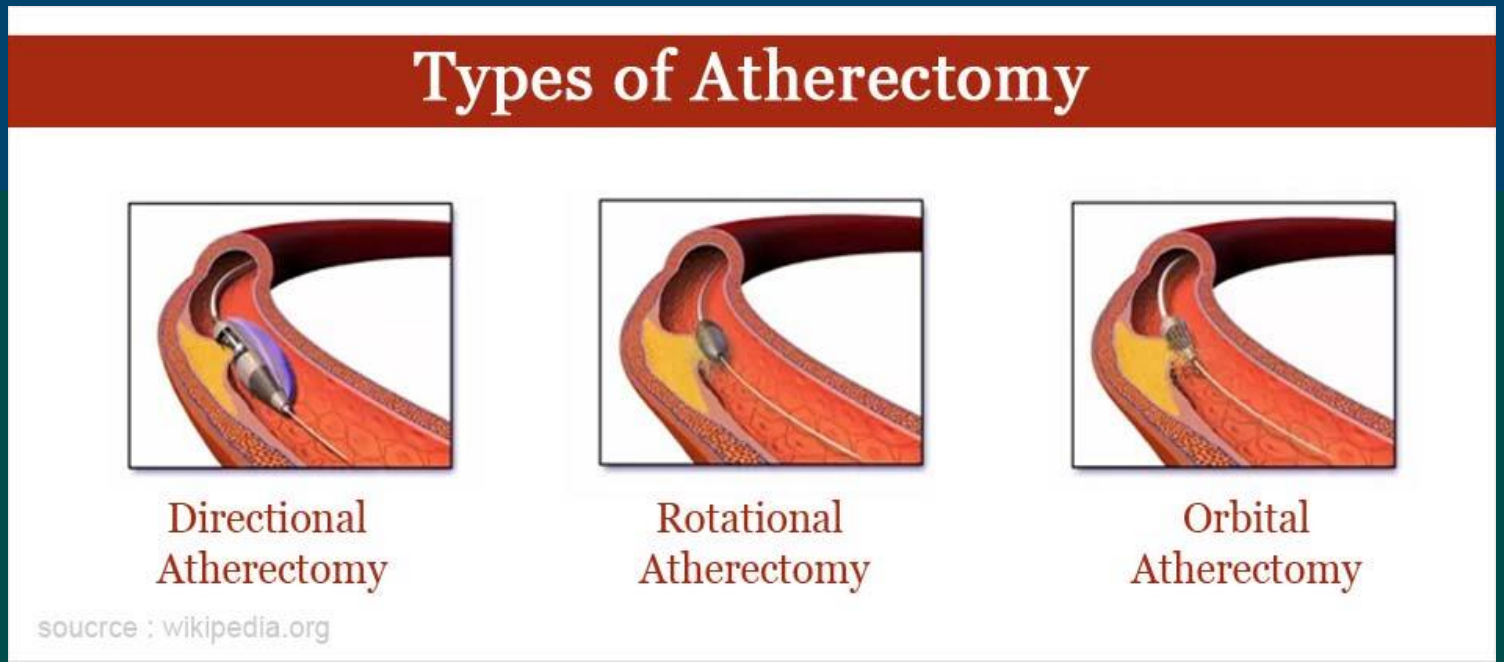




# Solutions

## 3/ Calcified vessels / lesions

Calcified vessels - Atherectomy



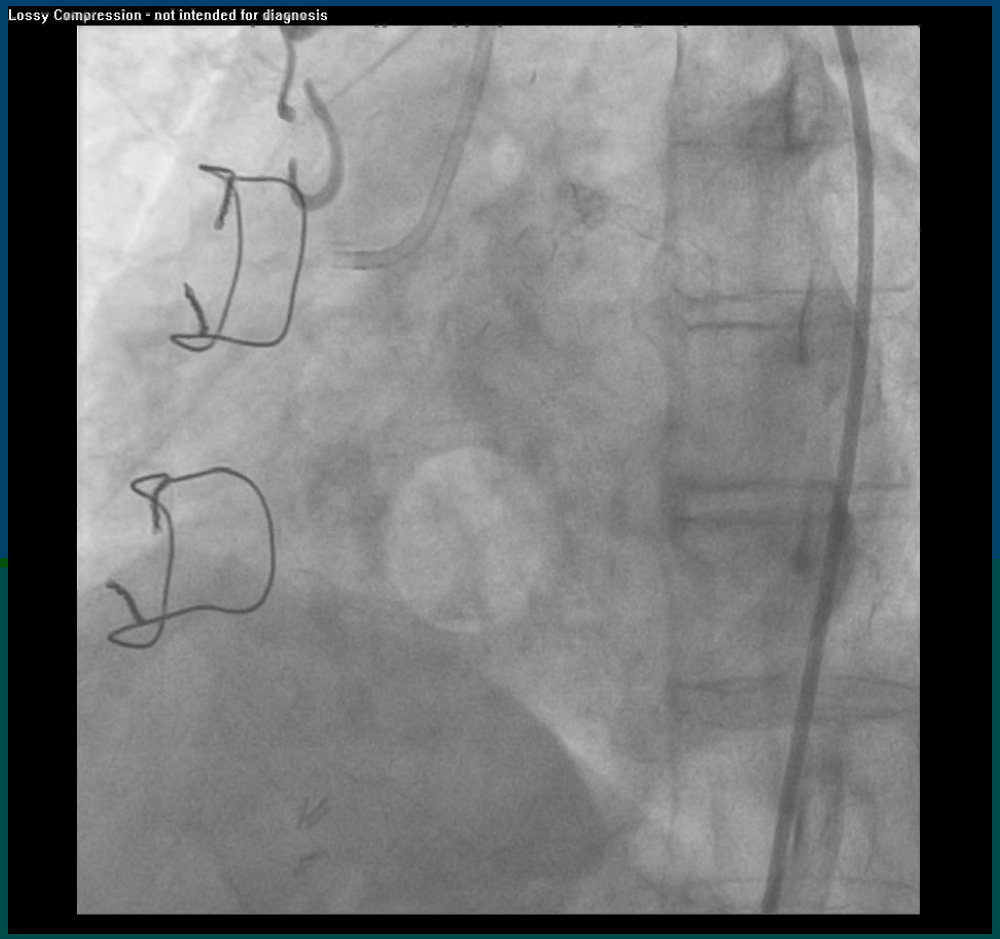
# Case

- 75M with CABG (LIMA to LAD, SVG to OM/ RCA/ D1) in 1993
- PCI to SVG OM and  LCx, failed PCI to RCA CTO

# Reattempt RCA CTO

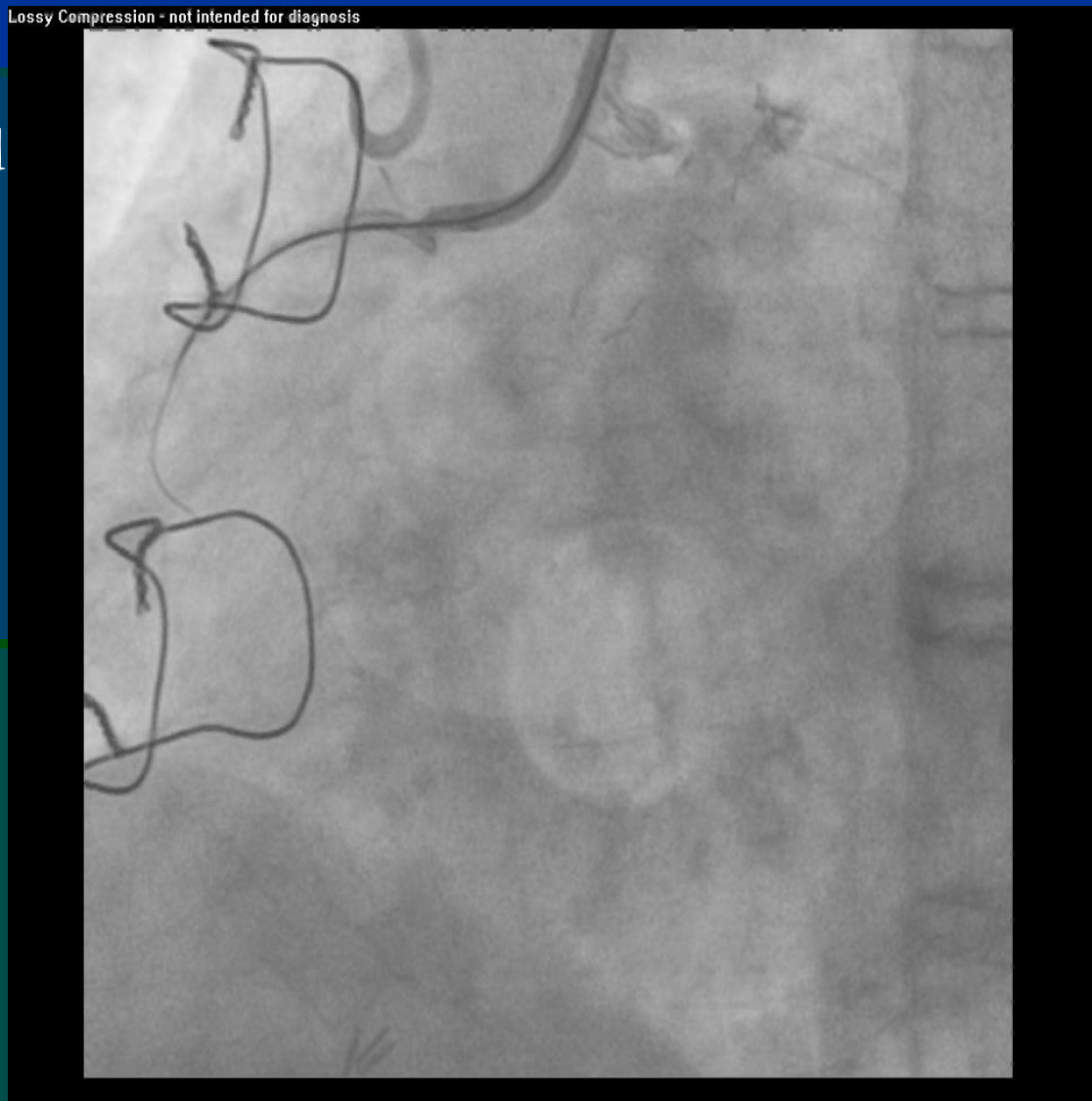
RCA : 7F JR4SH
LIMA : 7F IMA SH

- Mid RCA CTO with retrograde filling from LIMA/LAD/septal



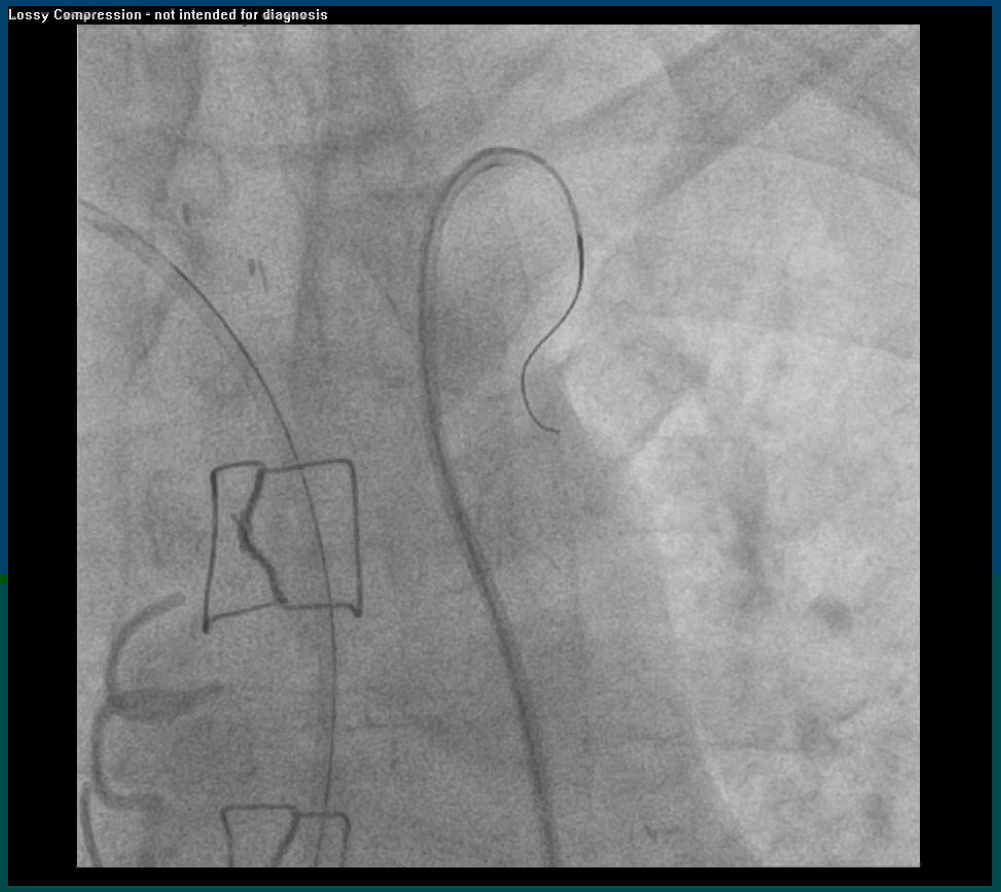
# Antegrade preparation

- RCA lesion was wired with Fielder XT supported by Corsair into RV branch



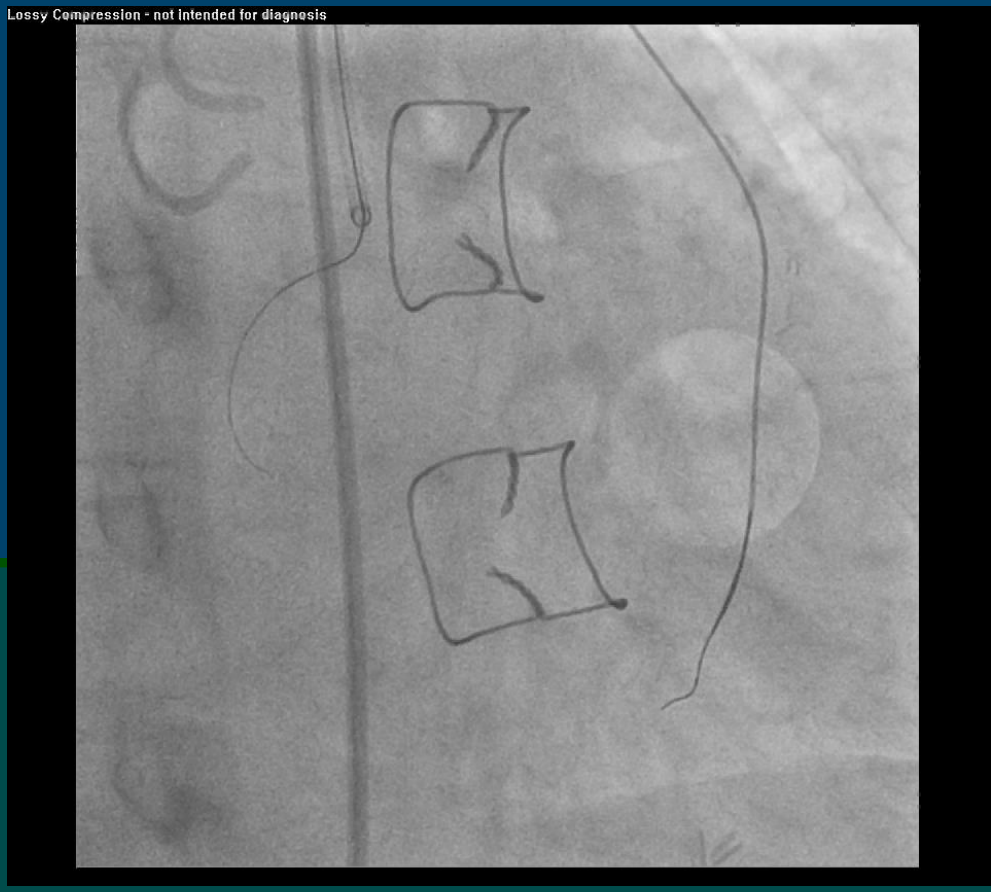
# Retrograde from LIMA

LIMA was wired
with Runthrough NS



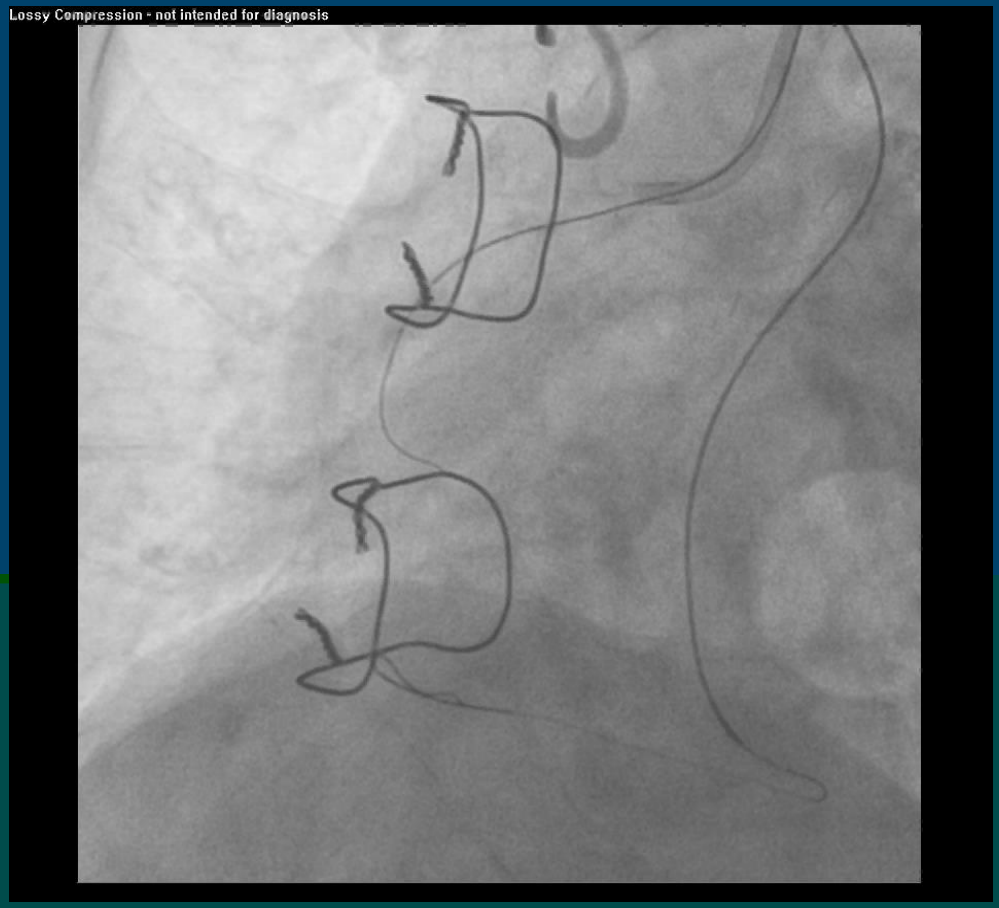
# Retrograde from LIMA

- Septal channel was wired with Sion wire supported by 150cm Corsair



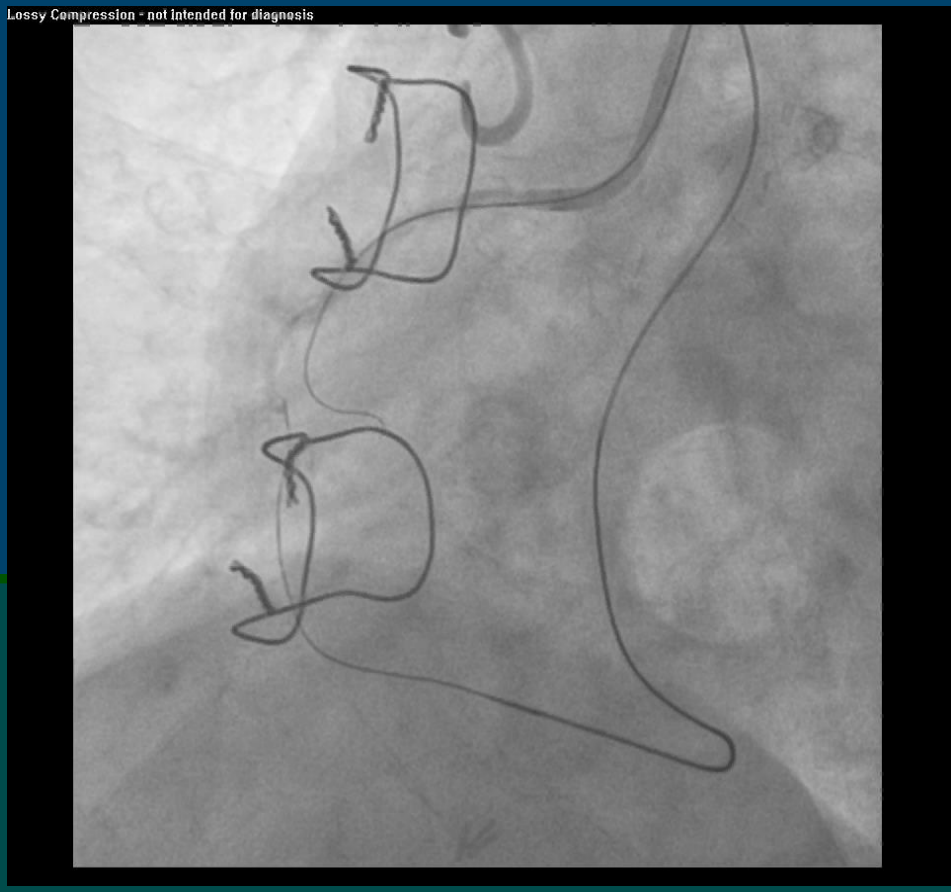
# Retrograde from LIMA

- Sion wire was exchanged to Fielder XTR wire



# Retrograde from LIMA

- Corsair was advance to distal RCA and GW was changed to Gaia 2nd
- Gaia 2nd was advanced into CTO body
- Retrograde GW and corsair were found to have insufficient  length



# Retrograde wire escalation

- The retrograde IMA guide was further deep seated into LIMA to create more length

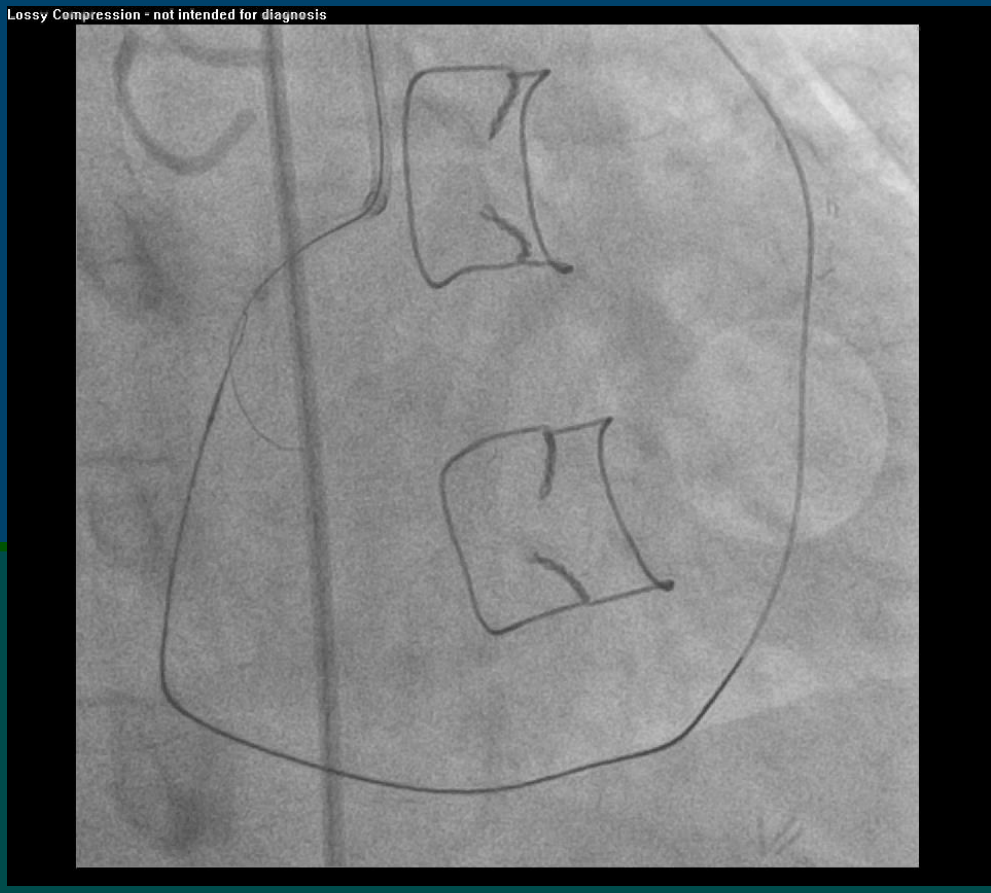
- However the retrograde GW was still not long enough to reach the antegrade grade

# Retrograde wire escalation

A guide extension catheter was inserted into antegrade guide

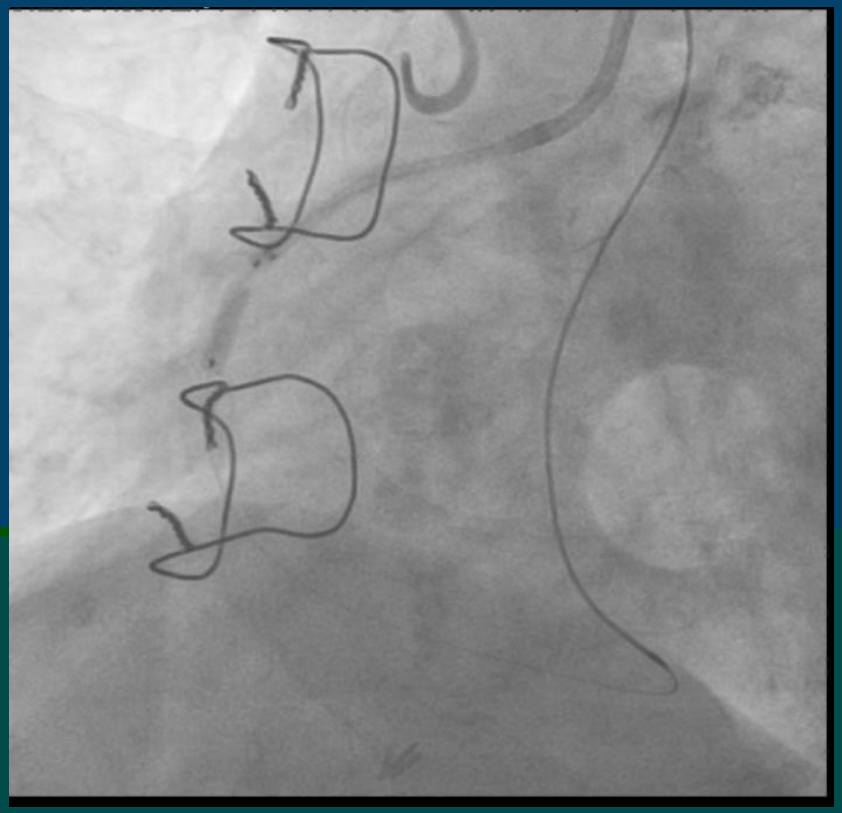
Retrograde Gaia 2nd succussfully advancd into guide extension catheter, followed by the Corsair

Externalized with RG3



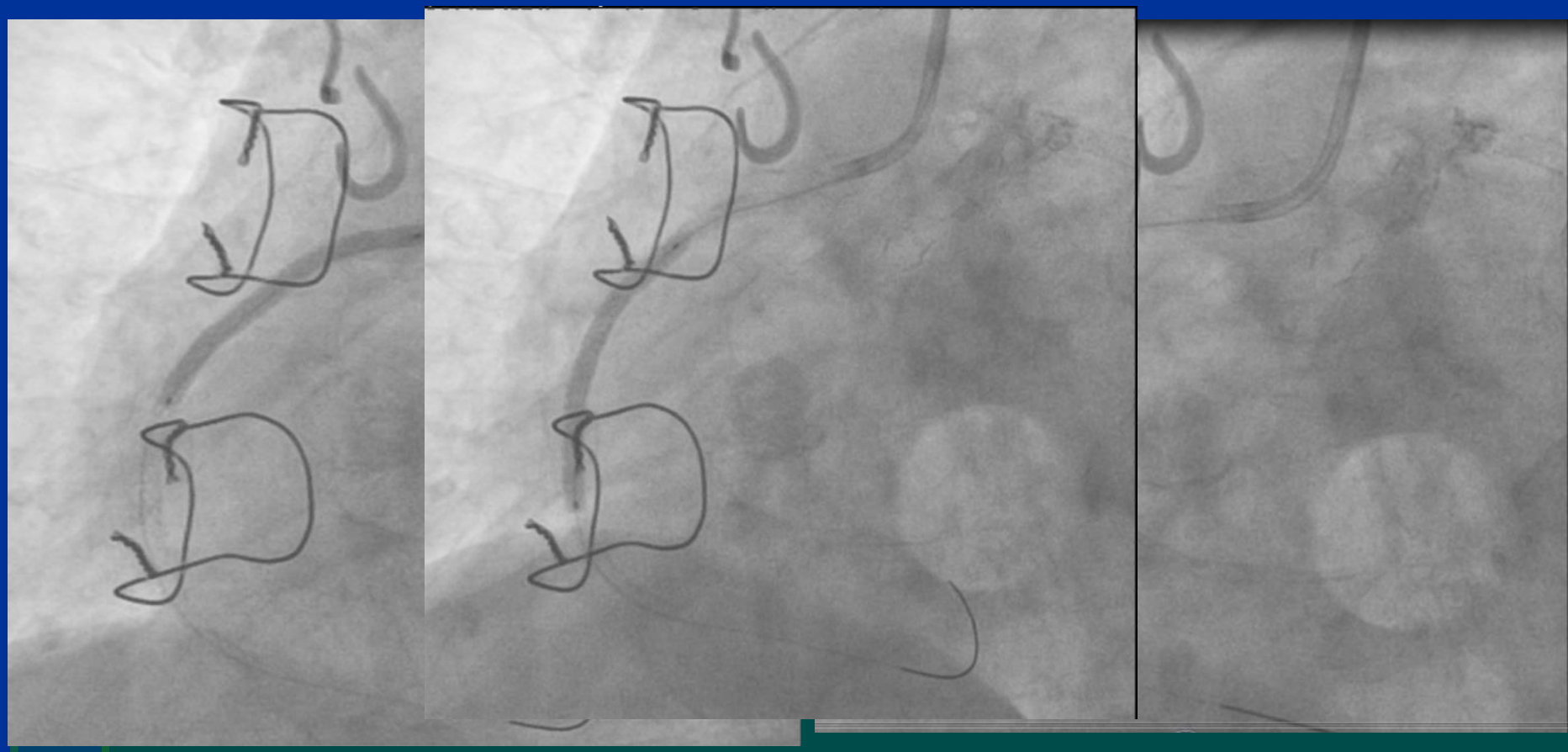
# Fail to deliver stent

- Unable to deliver stent into RCA despite multiple dilatation with 1.25/2.0/3.0 semicompliant balloon / cutting balloon / OPN balloon



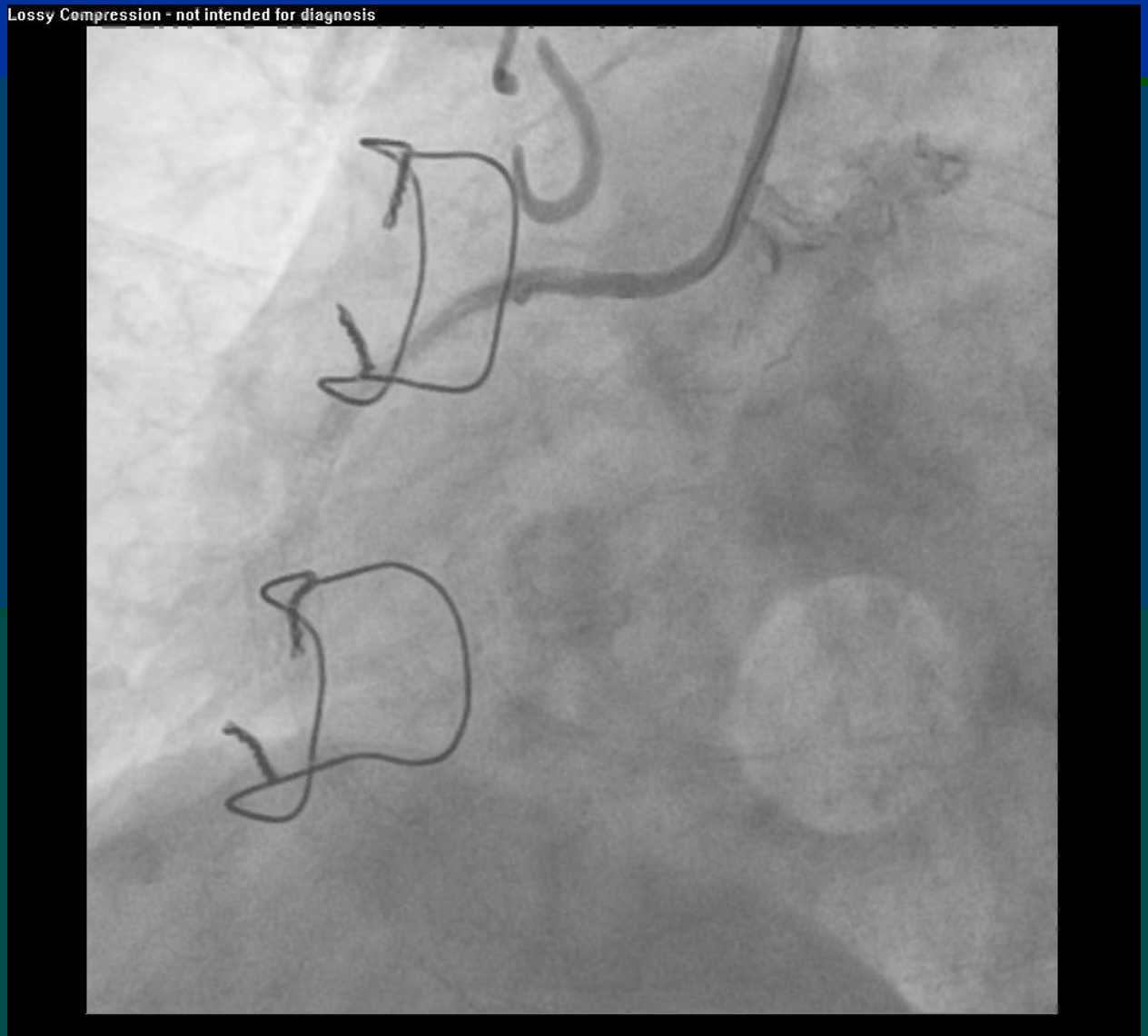
# Rotatonal atherectomy

- RCA was wired with rotawire and then modified with Rotablator (1.75burr)



Stented with 3 x thin strut second generation DES
then post dilated with 3.25 / 15 NC balloon

# Final angiogram



# Thank you