UNIVERSITY OF BIRMINGHAM

INSTITUTE OF CARDIOVASCULAR SCIENCES

University Hospitals Birmingham NHS Foundation Trust

Troubleshooting the CTO PCI

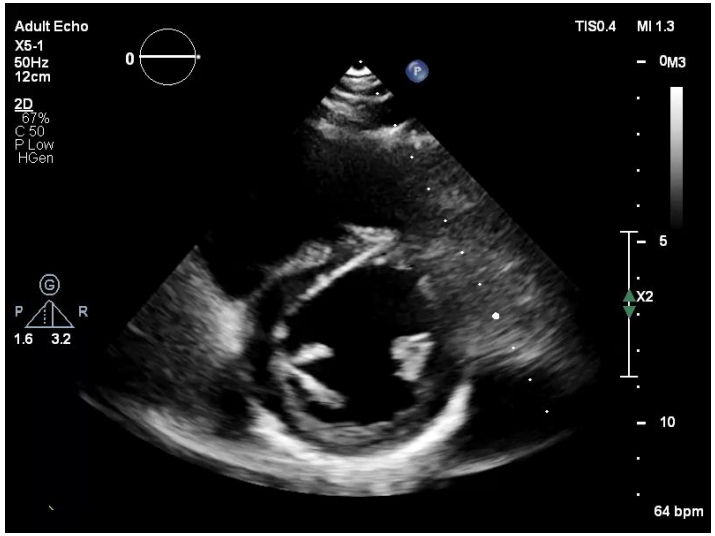
Sohail Q. Khan

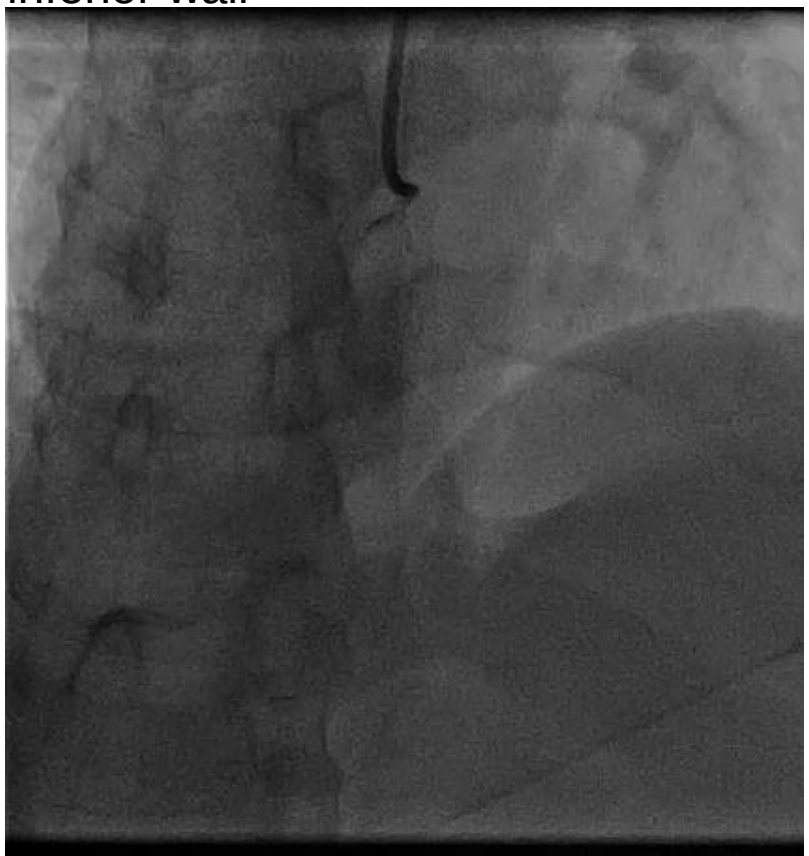
Consultant Interventional Cardiologist

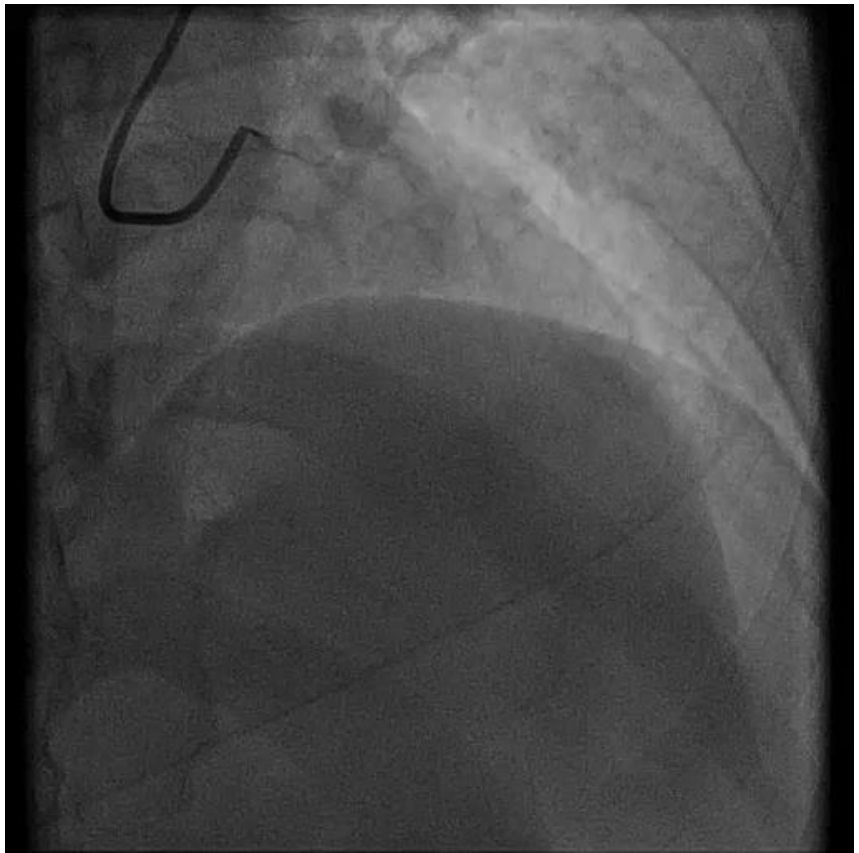
Queen Elizabeth Hospital

Birmingham, UK

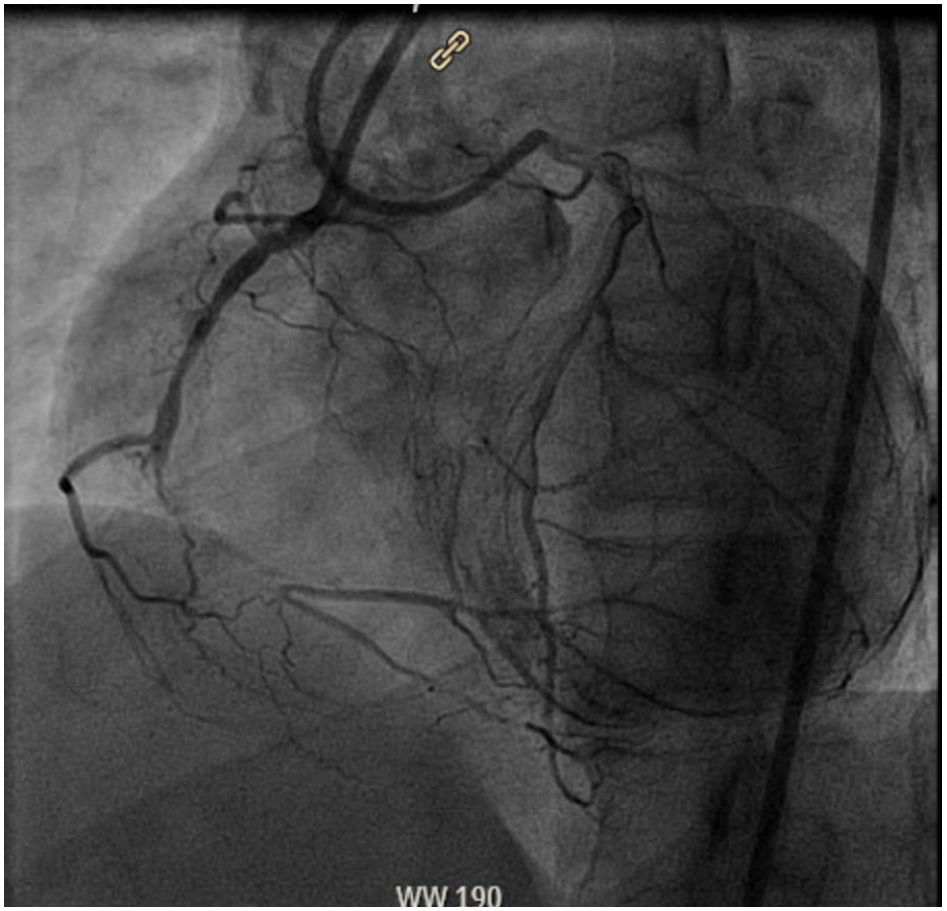
- 44 male with chest pain
- Coronary CT angiogram: Severe disease mid RCA
- Coronary angiogram : CTO RCA ,Mild disease left system
- Echo : EF 50%,Infero-septal hypokinesia
- Angina CCS II despite 2 anti-anginals
- Myocardial Perfusion Scan: Ischemia in inferior wall







Assessment of the CTO

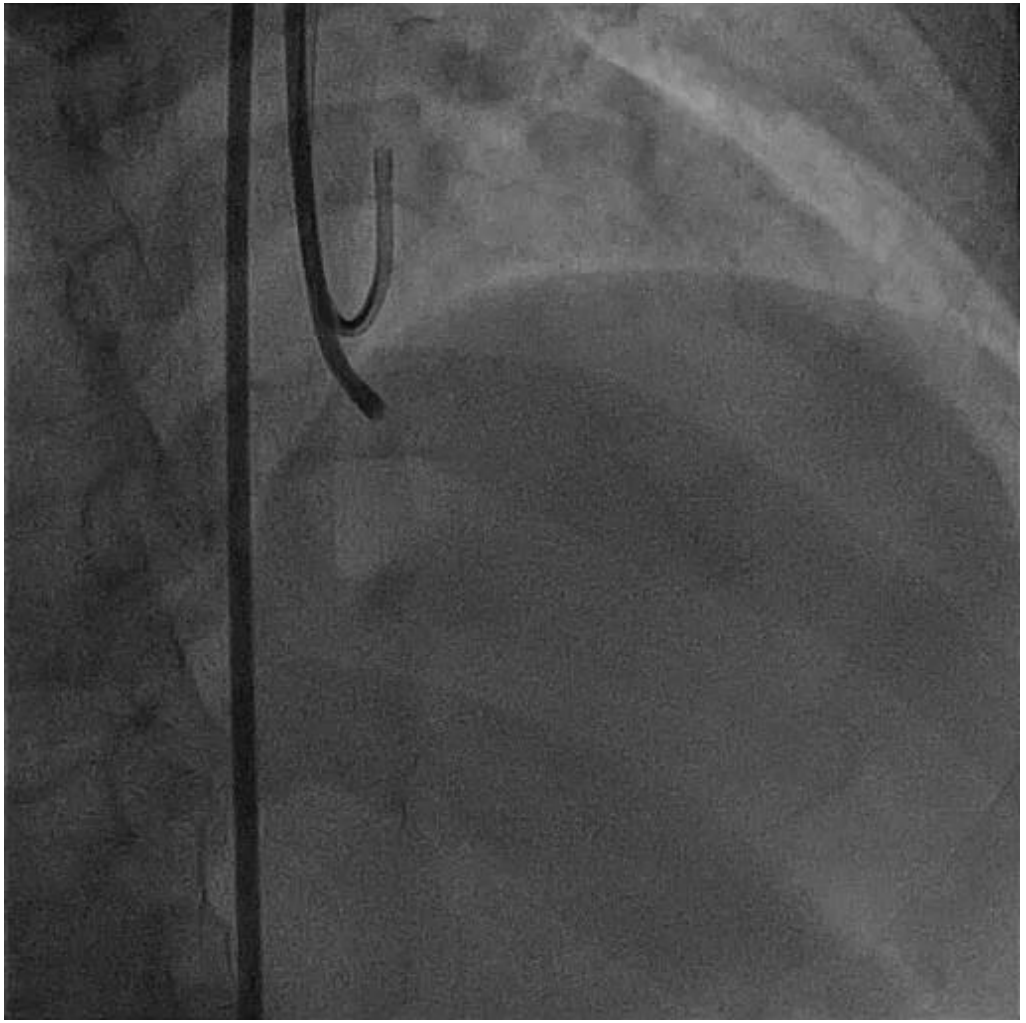


J-CTO Score 3

- Blunt proximal cap: Y
- Calcification: Y
- Bending > 45 degree:N
- Occlusion length >20 mm: Y
- Re-entry: N

CTO Planning

Proximal cap	Ambigious as multiple branches
Length	20 mm
Distal vessel	Bifurcation
Collaterals	Septals



Plan

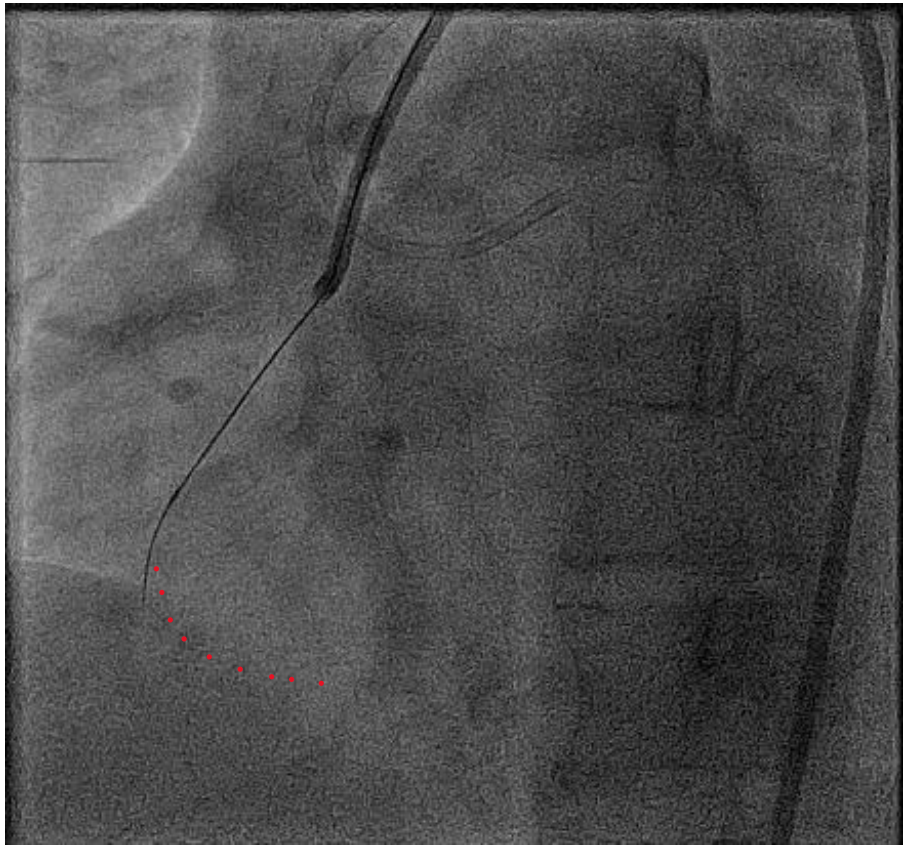
1 Antegrade

2 Retrograde via septals

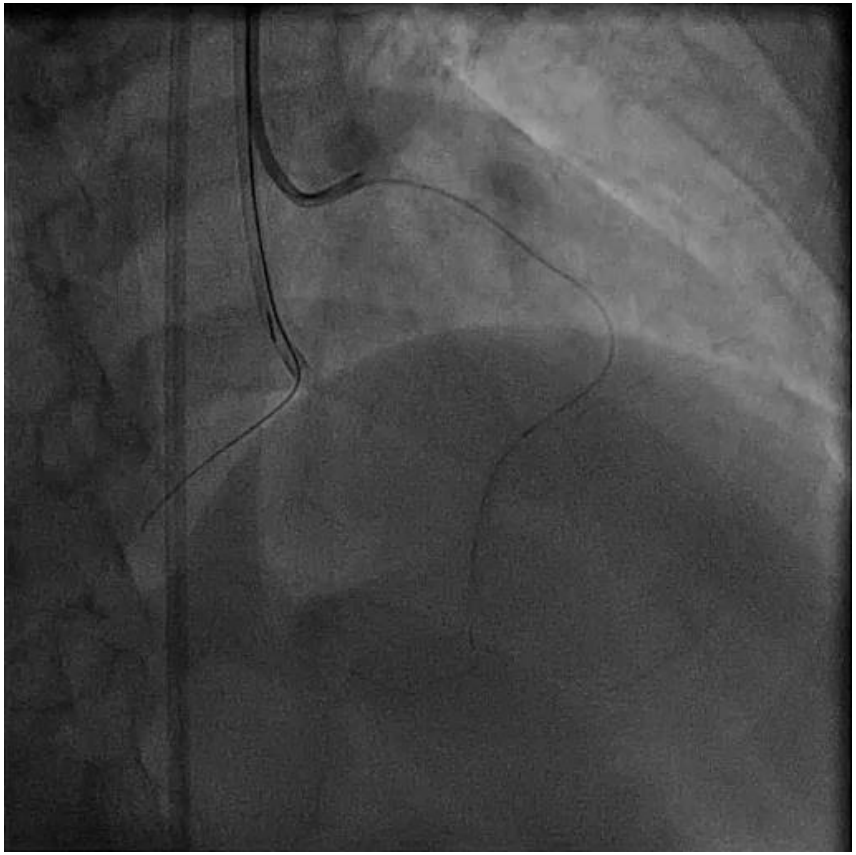
3 Antegrade dissection re-entry using stingray balloon

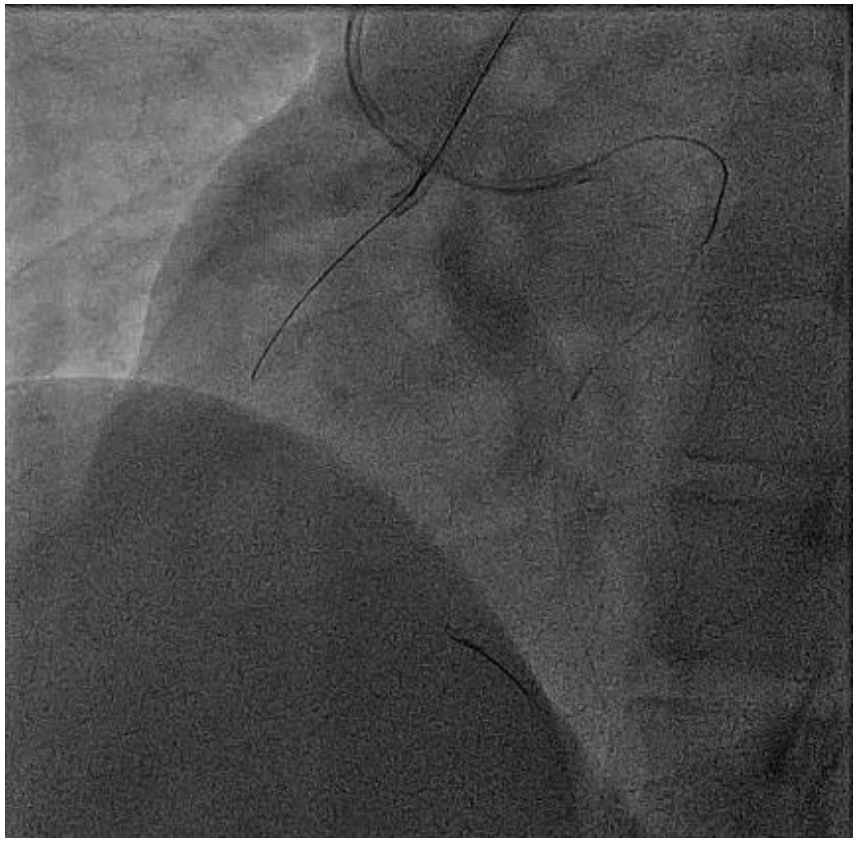
1st attempt CTO set up

- LRA 6F, VL 4.0
- RFA 8F (US guided)
- 8F JR4
- Fielder XT
- Caravel MC
- Wire kept prolapsing in marginal



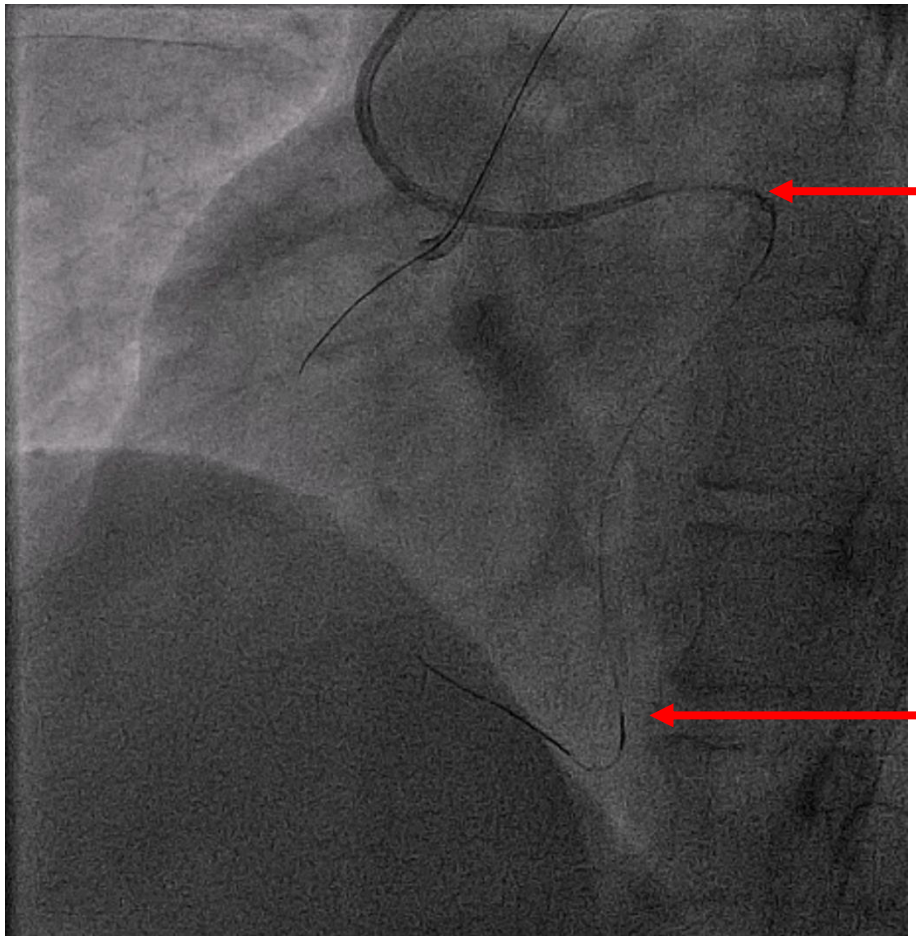
Retrograde wiring





Sion blue wire,MAMBA Flex 150 MC- unable to advance through septals

Troubleshooting MC advancement



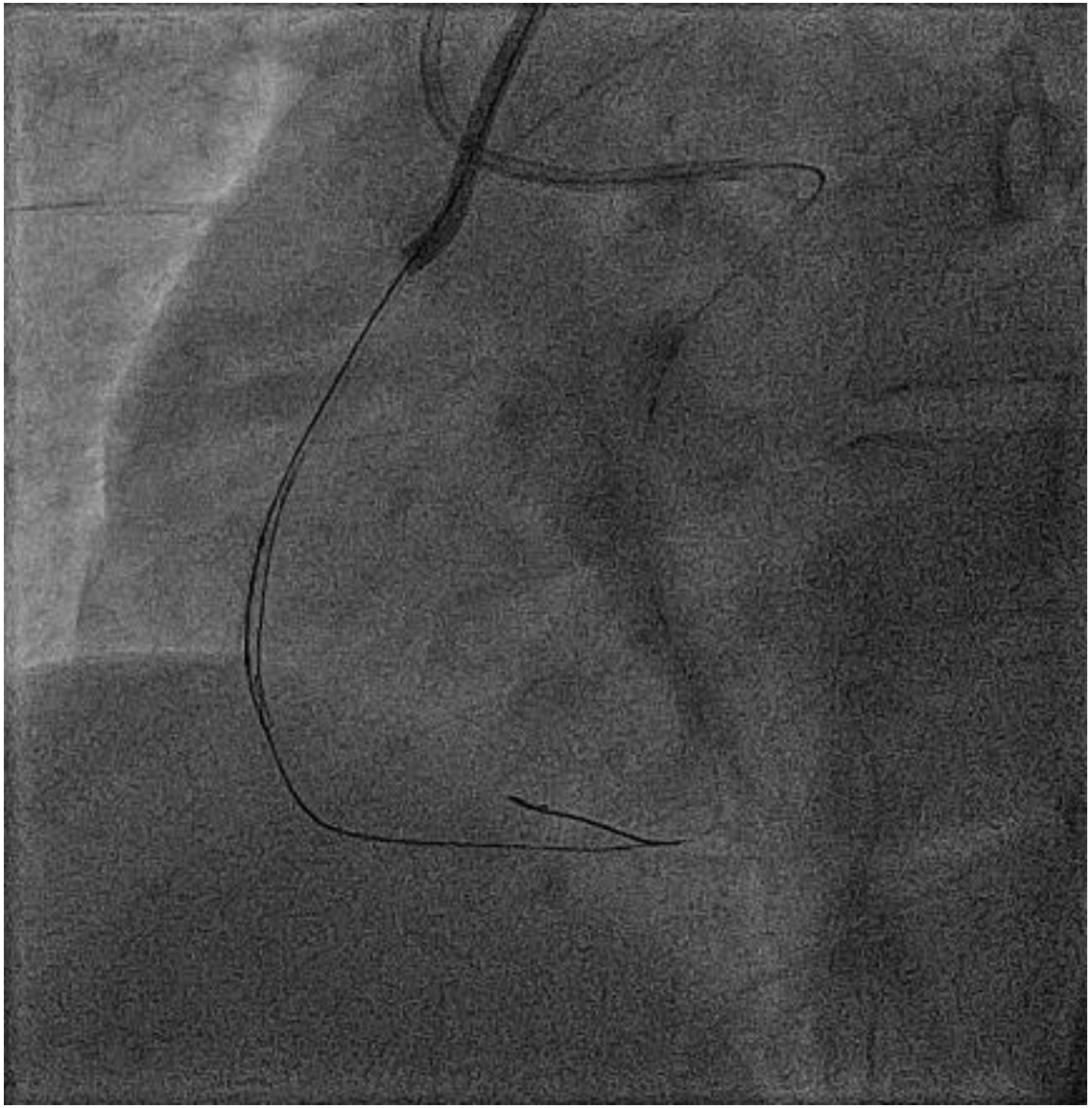
6F Guide extension

Tried
Corsair Pro 150
Fine cross

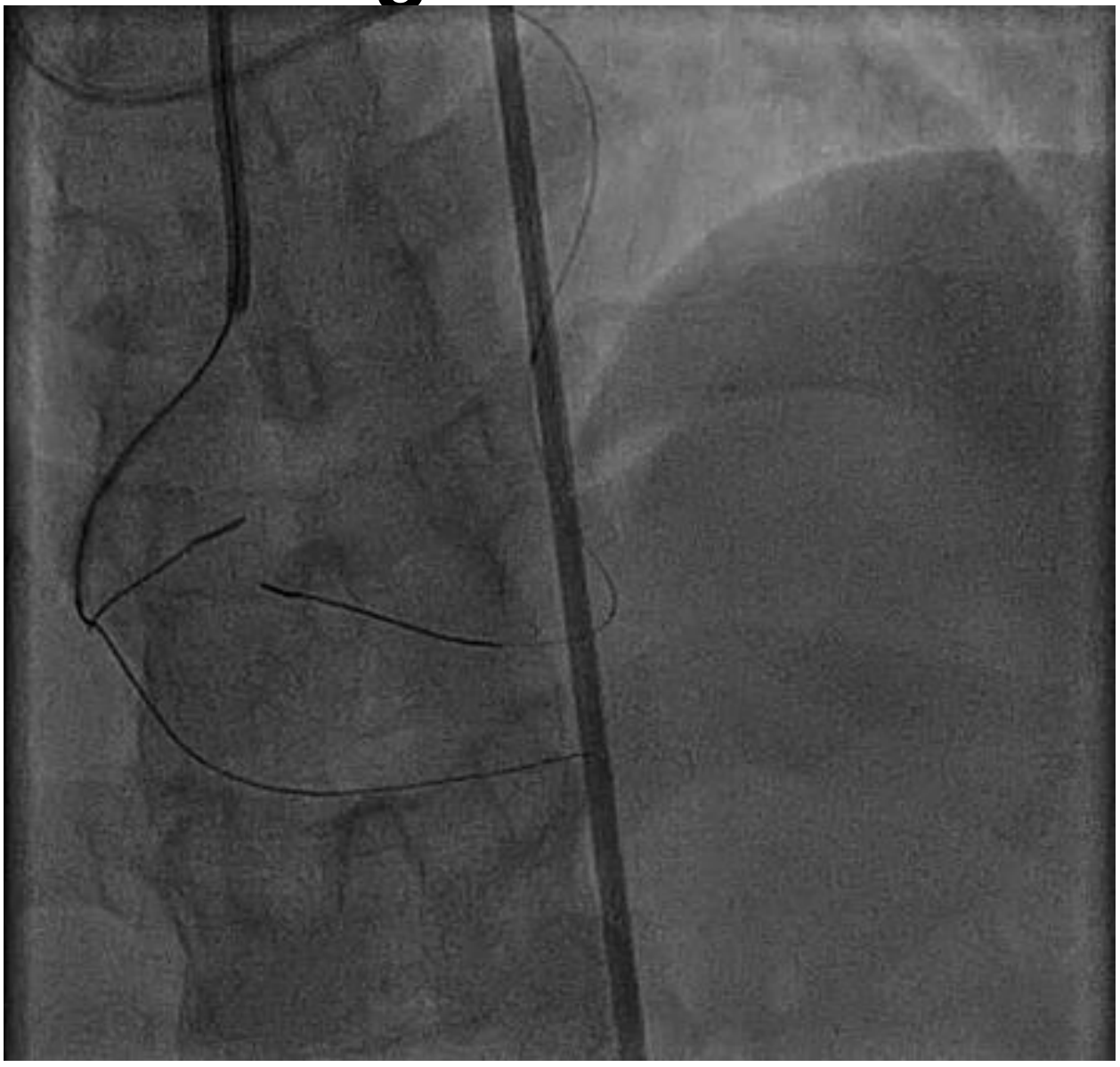
Small balloons to dilate the septals not available

Switched back to antegrade

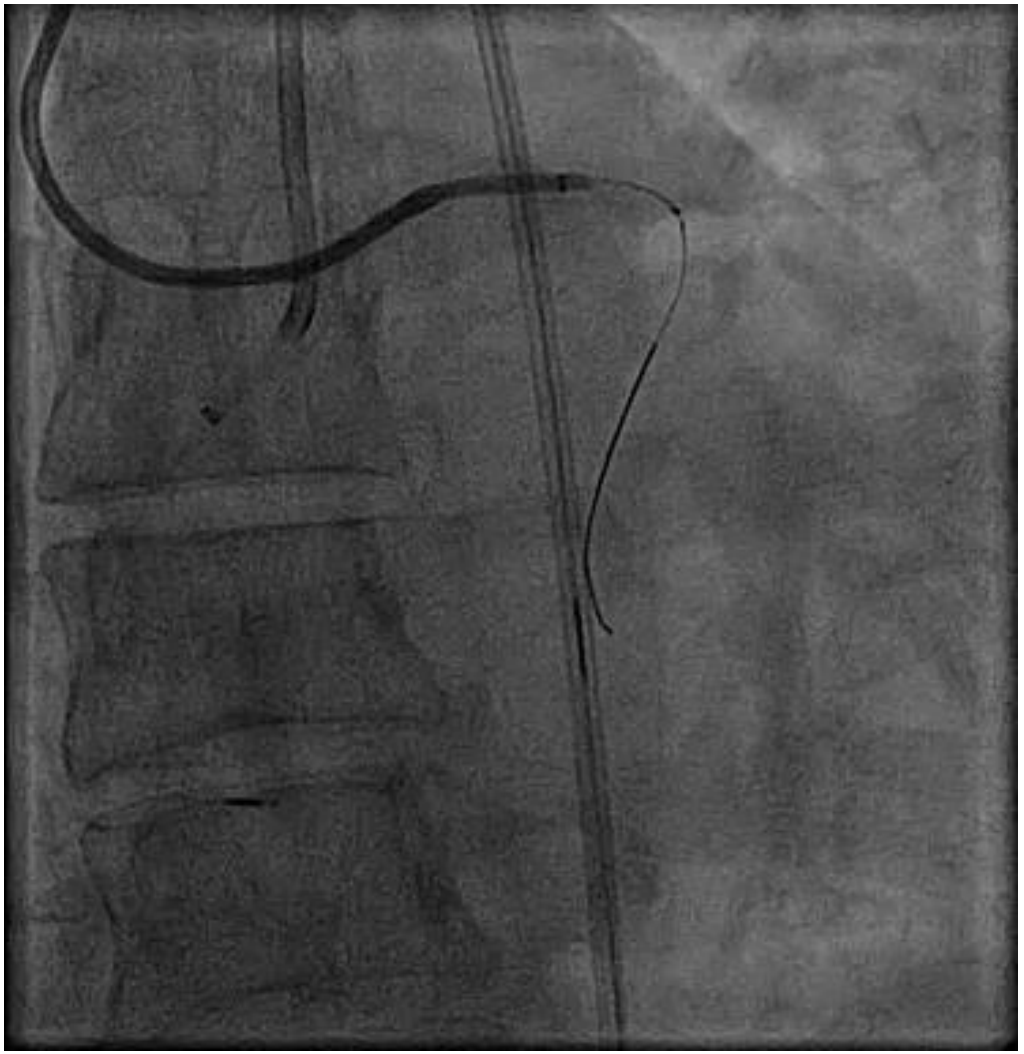
- 2.5 mm balloon in the marginal
- Gladius MG knucked in the sub-intimal space



MC advanced and Gladius exchanged for Miracle 6

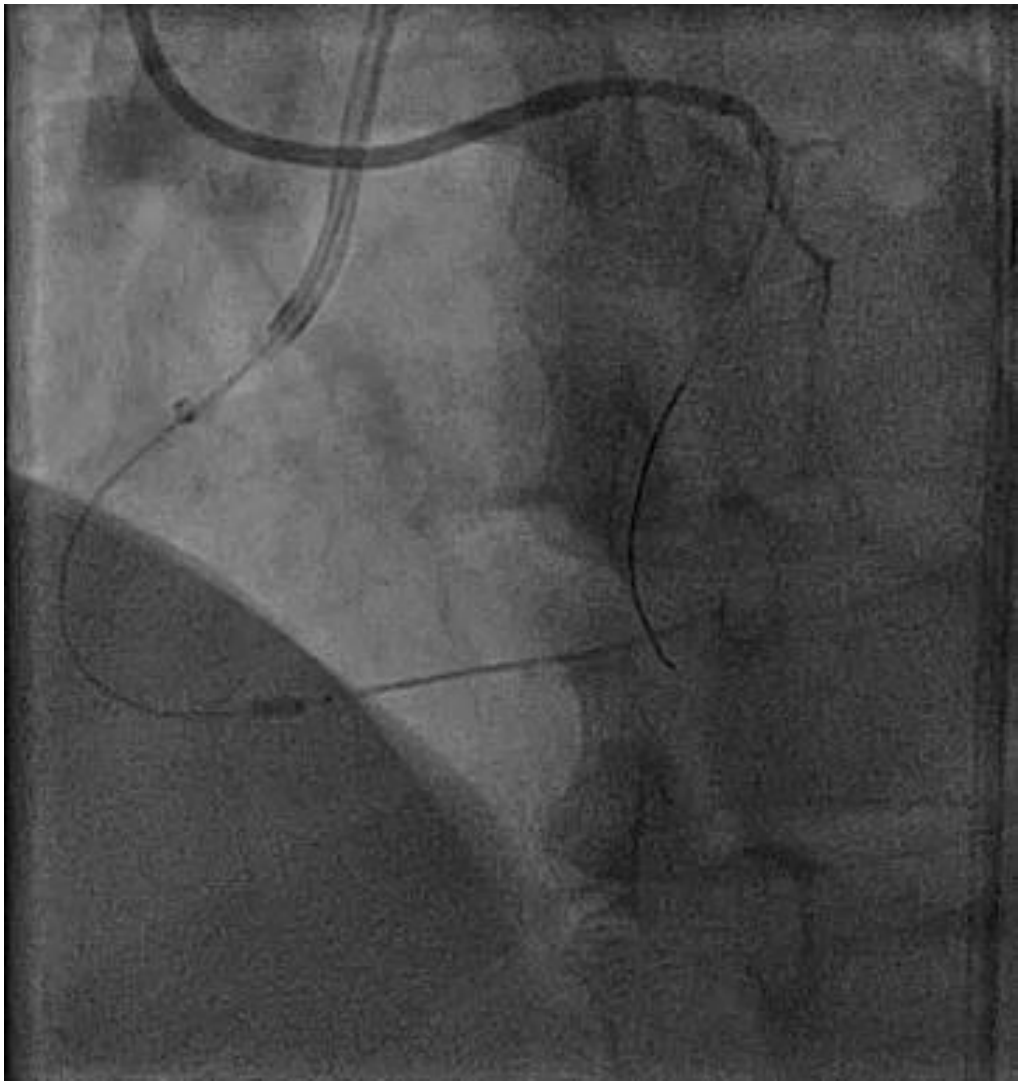


Stingray advanced

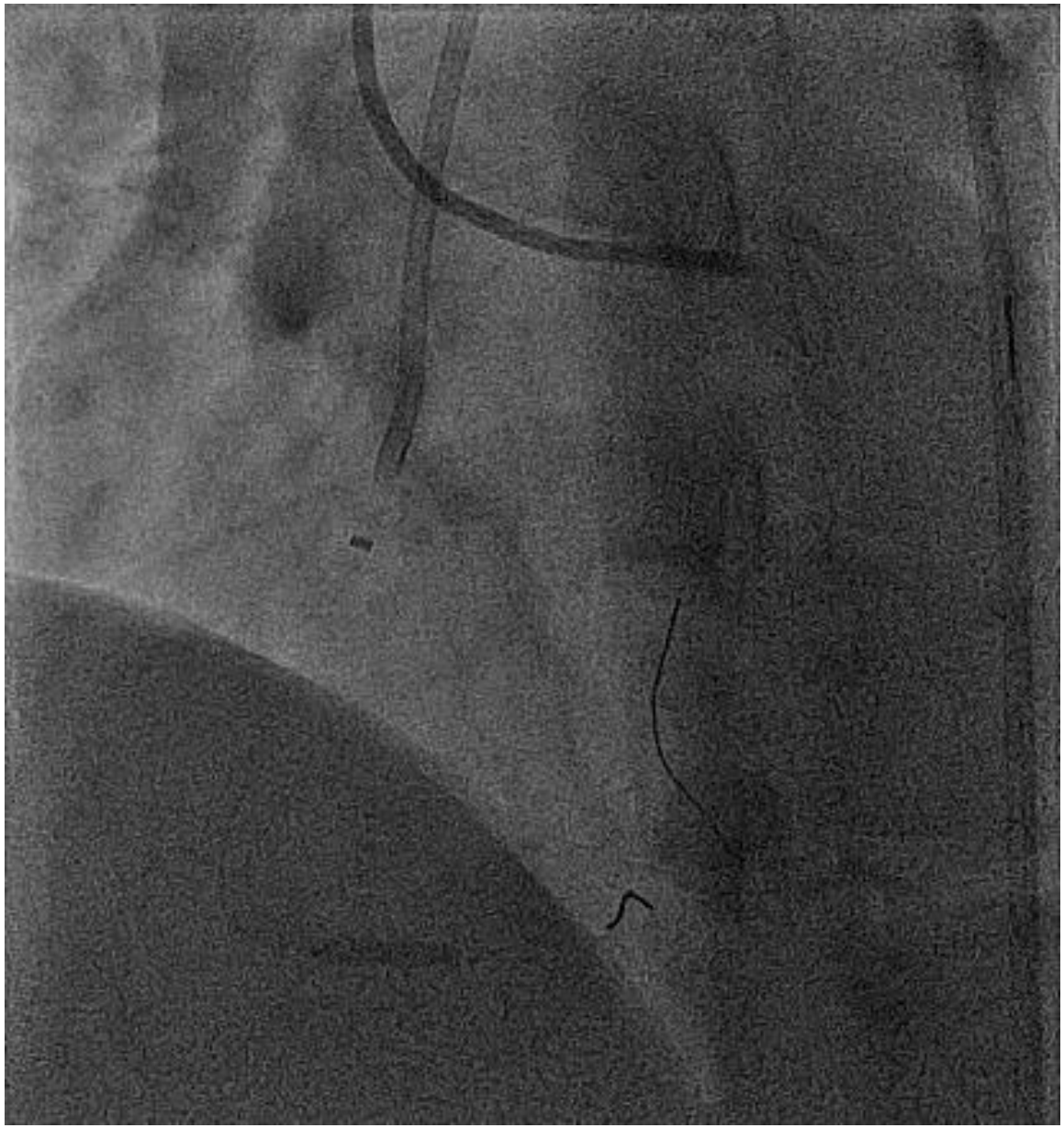


Attempted re-entry

- 8F Trapliner advanced
- Stingray balloon
- Puncture with Hornet 14
- Gladius MG wire
- Despite use of trapliner very large sub-intimal space created
- Attempted STRAW but unable to access true lumen

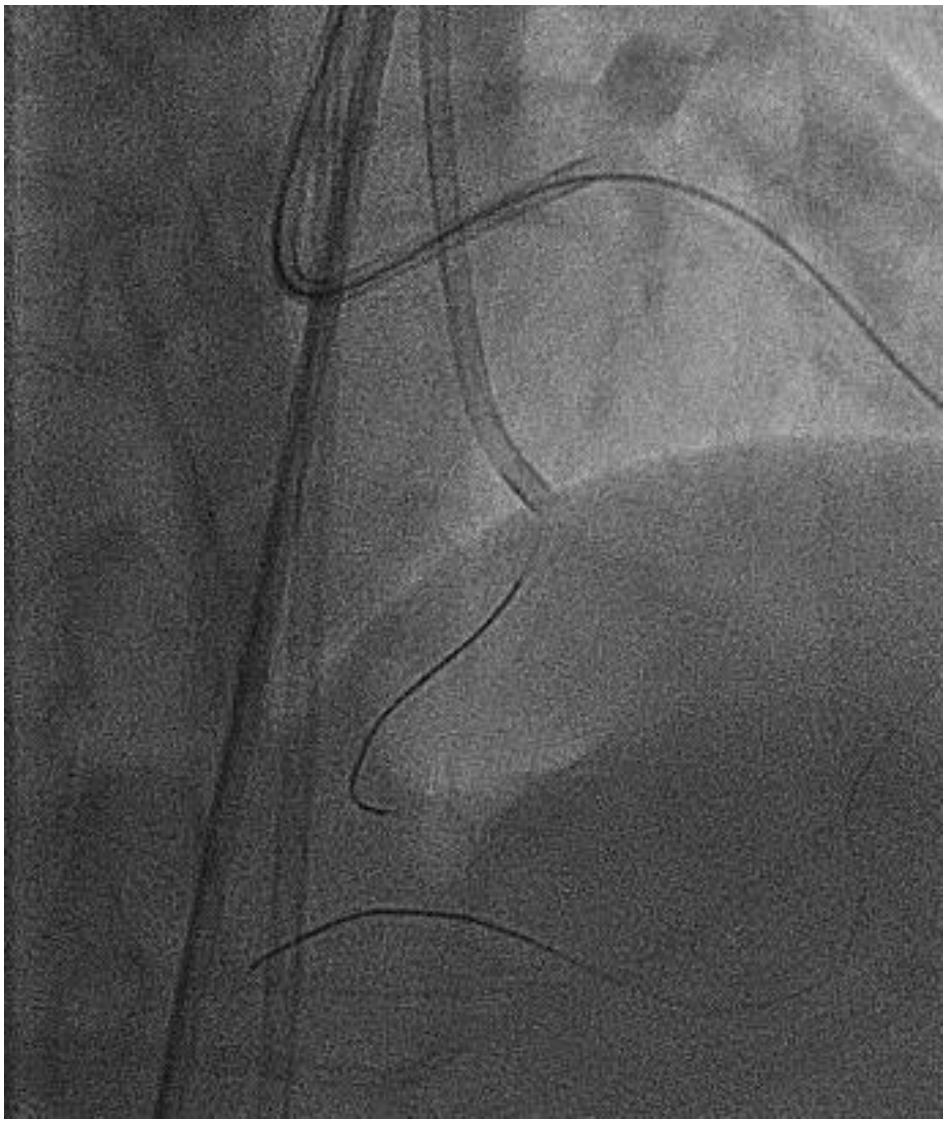


3.0x15 mm balloon investment procedure

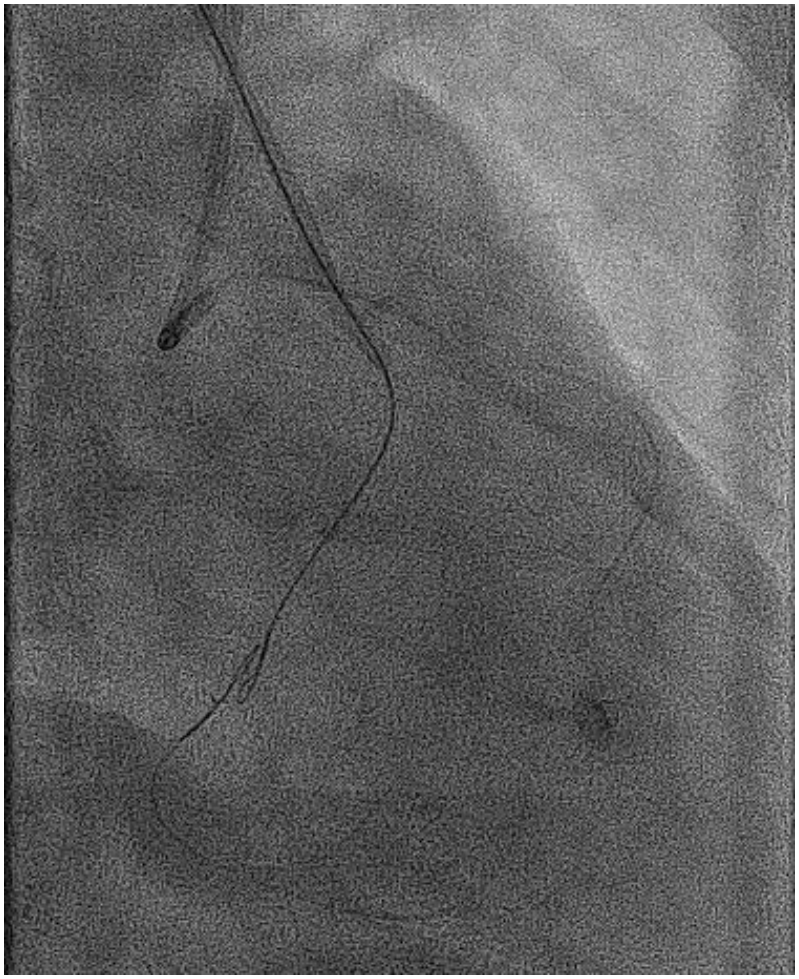


2nd attempt after 2 months

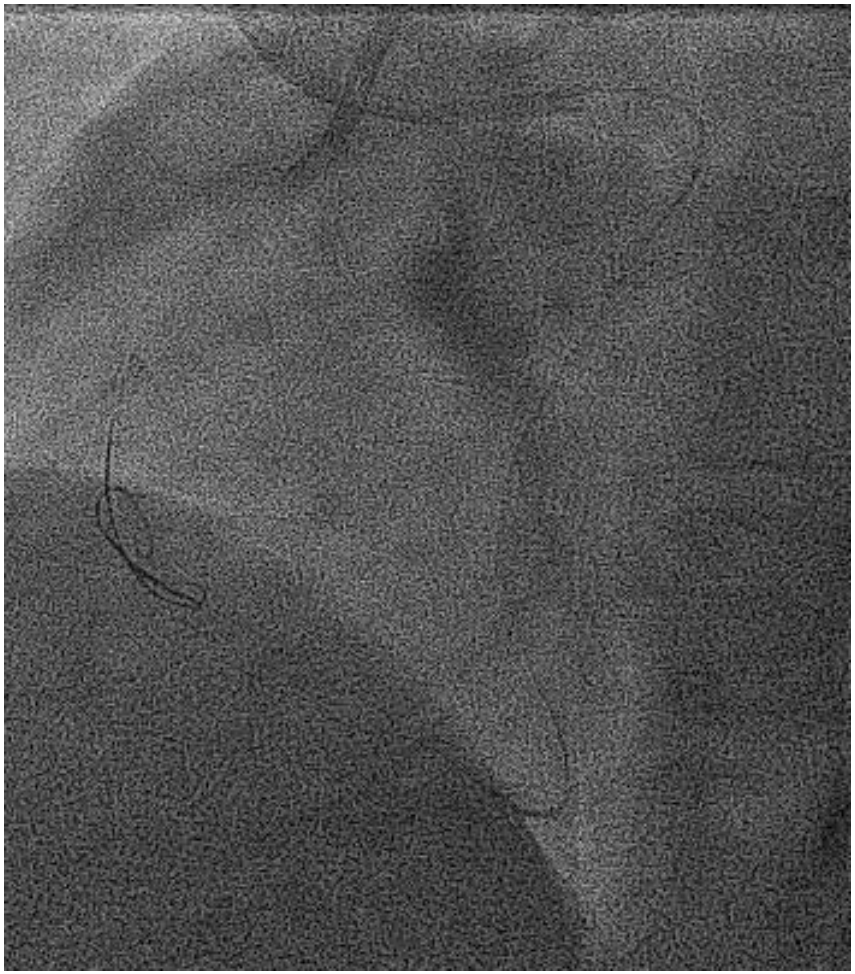
- Bi-femoral access
- 8F JR4,7F VL 3.5
- Retrograde approach
- Sion for septal surfing
- Caravel 150 MC
- Distal cap punctured with Gaia
- Retro knucking with Gladius



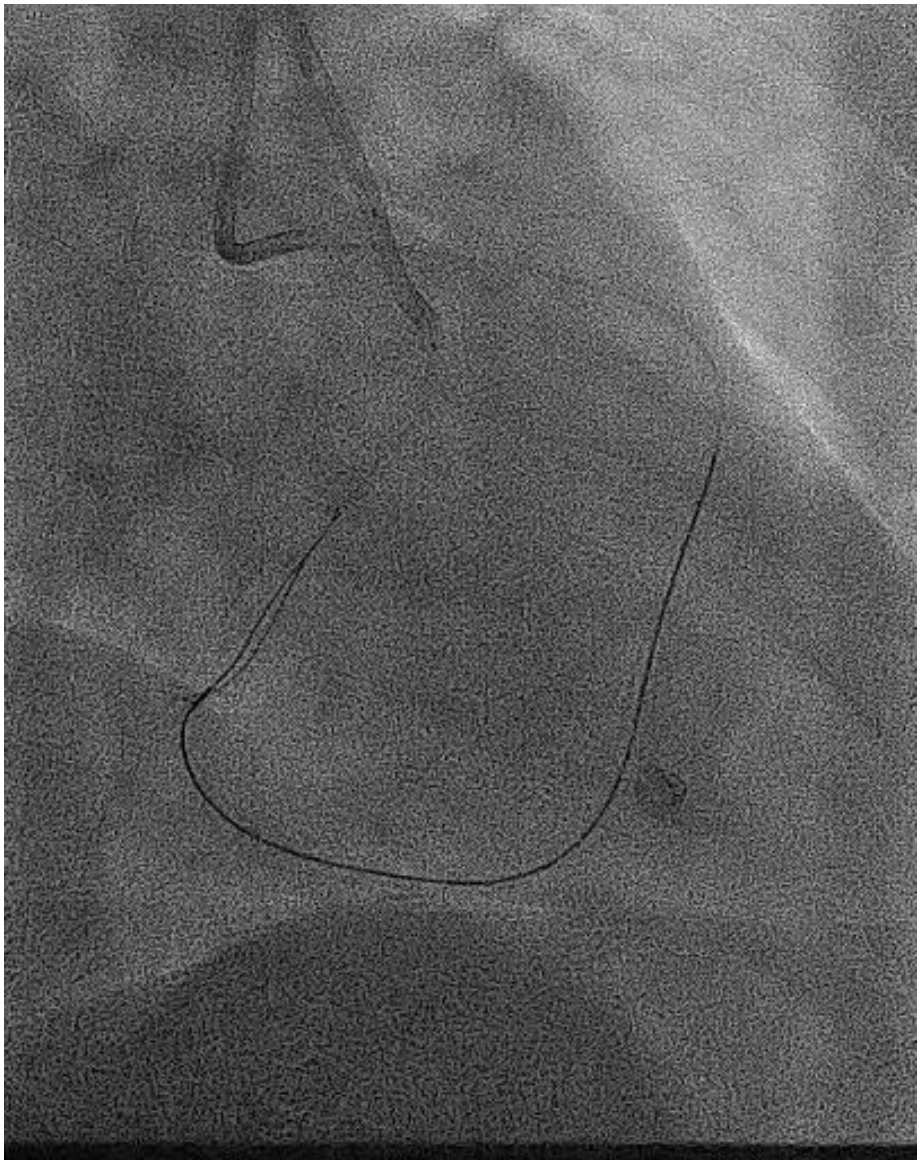
Antegrade knuckling and R-CART



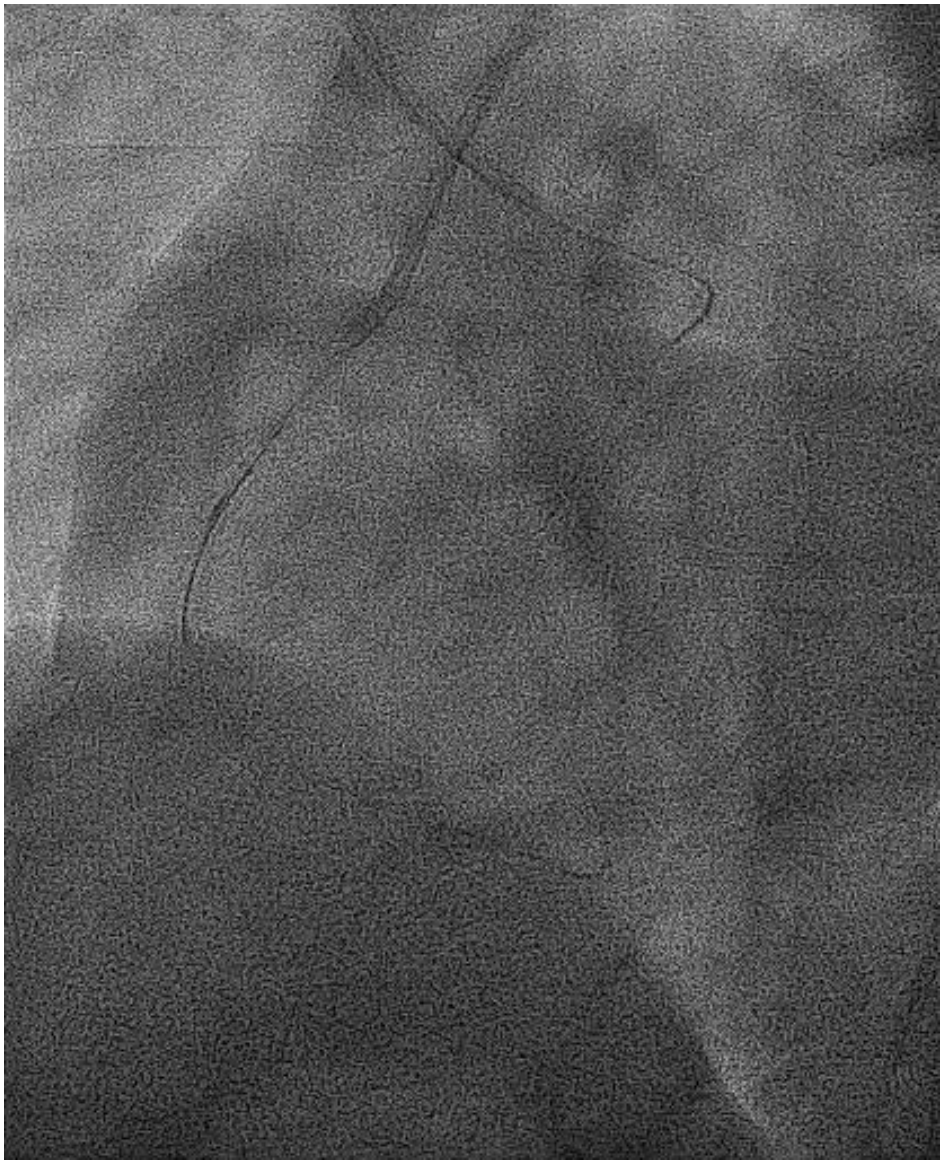
Caravel MC,Gaia 2 to puncture the proximal cap and Gladius MG to knuckle



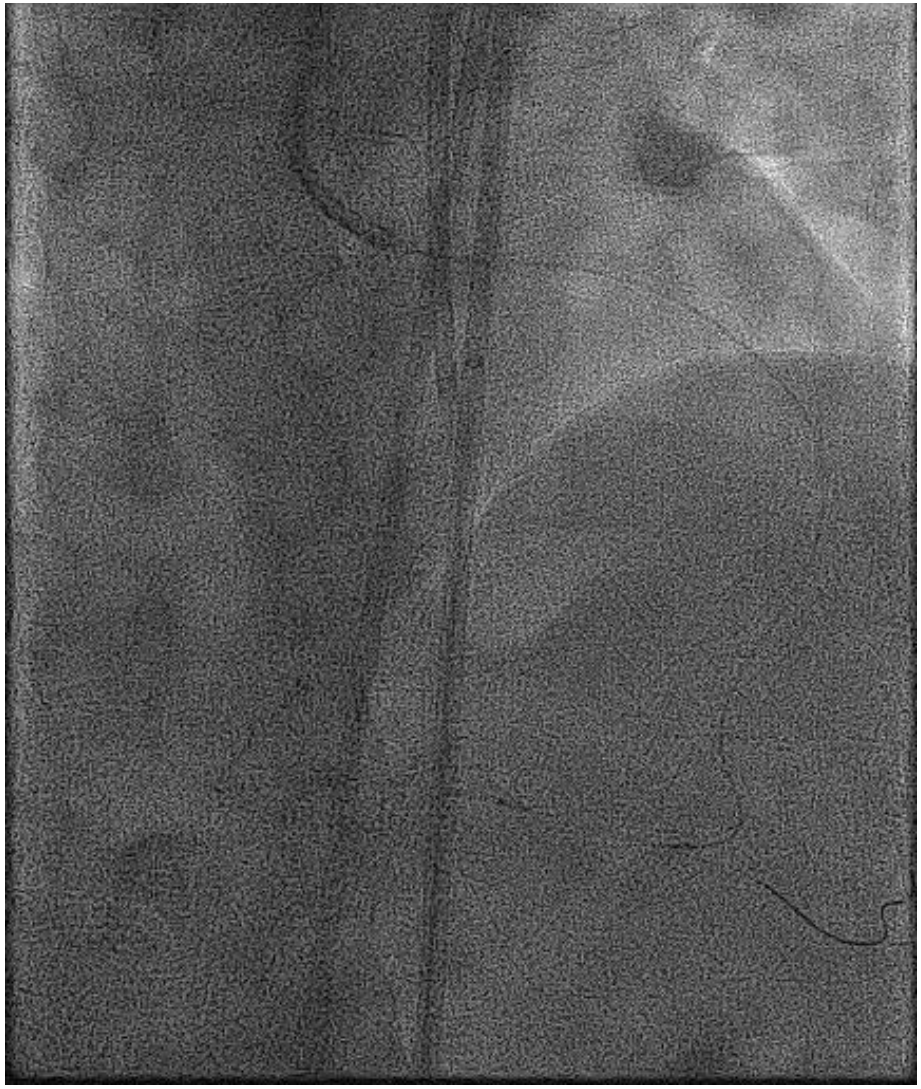
3.0 mm balloon over antegrade wire for R-CART



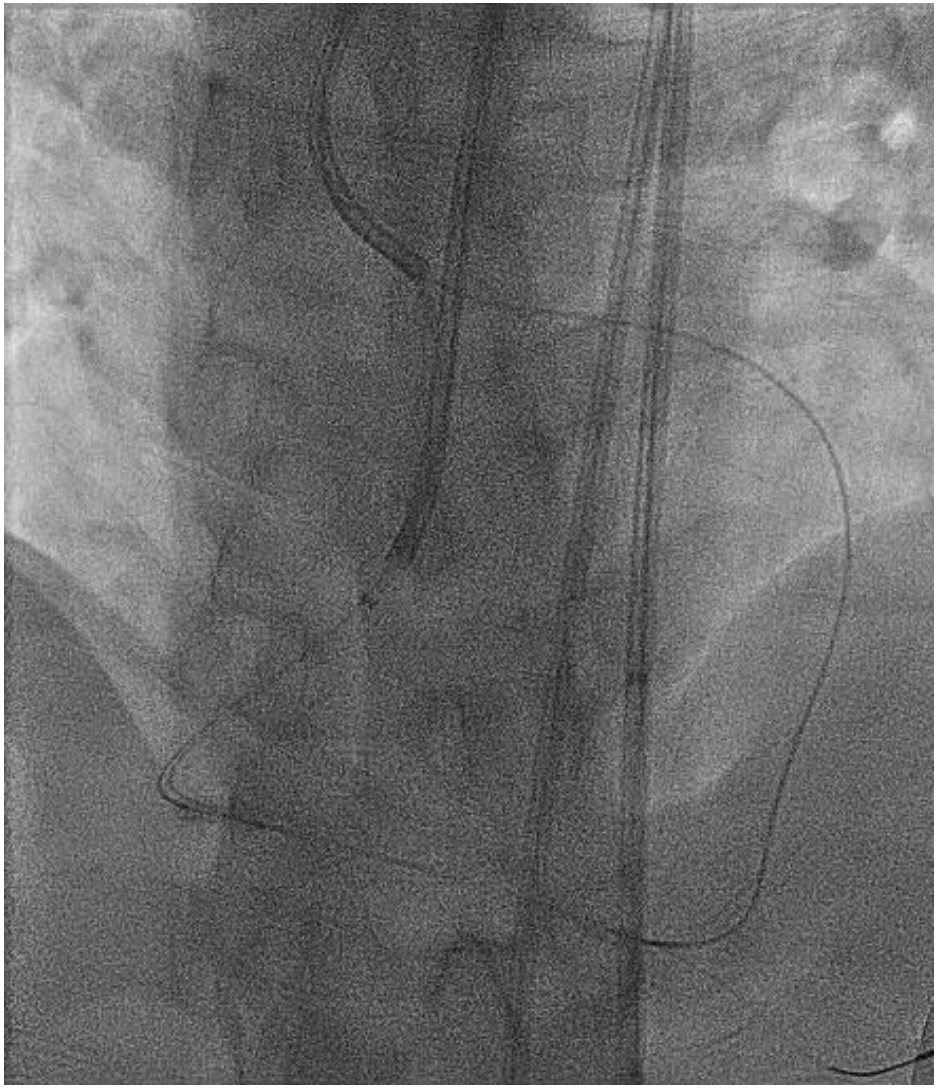
Retrograde wire balloon trapped in antegrade guide extension, MC followed



RG3 Externalization



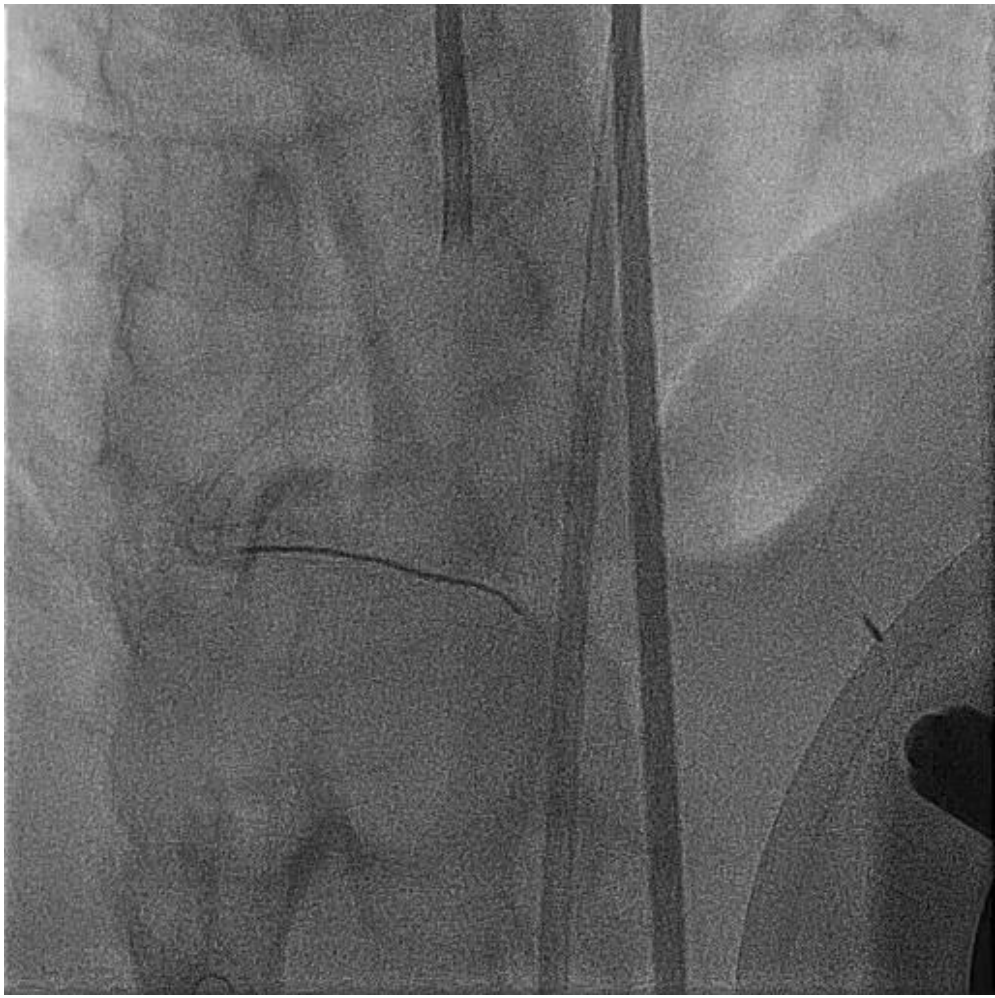
Sasuke over RG3 to secure the PLV



Predilatation with 2.0 balloon

Final result

- IVUS showed wire in true lumen
- Three overlapping stents
- Post dilated with 3.75mm NC



Learning points

- Failure of retrograde microcatheter advancement is a frequently faced problem in CTO PCI and should be dealt with a troubleshooting algorithm
- Side BASE can be considered if there is a branch at the proximal cap (Moving the cap)