Retry vs. First Try: What is Different to Succeed

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Disclosure Statement of Financial Interest

Within the past 12 months, I or my spouse/partner have had a financial interest/arrangement or affiliation with the organization(s) listed below.

Affiliation/Financial Relationship	Company
Consulting Fees/Honoraria	Medtronic, Boston Scientific, Asahi Intecc

Why do we fail CTO PCI?

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- Run out of time
- Radiation dose thresholds reached
- Contrast limits reached
- A significant complications occurs

So we need strategies to manage these things from the beginning of the case

Why do we fail?

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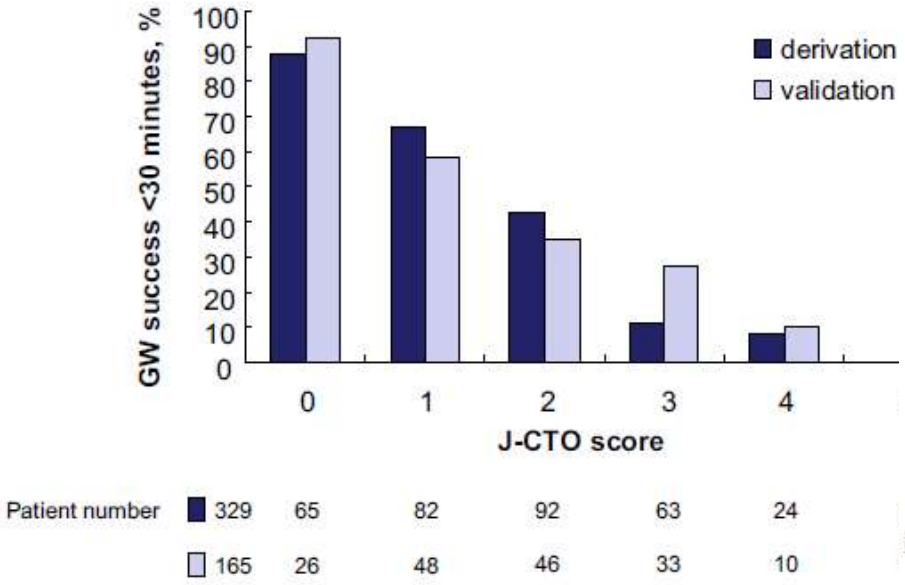
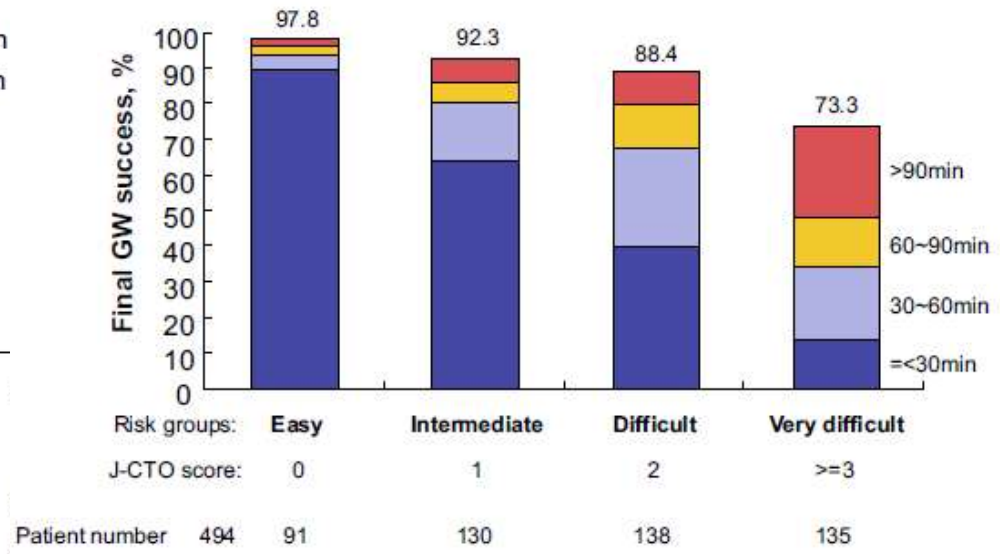
Lesion Length >20 mm | Calcification | >45 bend | Blunt stump | Prior Failure





Failure primarily linked to lesion complexity

Morino et al. JACC CI 2011;4:213-21

Why do we fail?

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Crossing Strategy Success by J-CTO Score (UK Hybrid Registry)

As lesion complexity increases success rates fall and the need for Dissection re-entry (antegrade *or* retrograde) increases

Wilson WM, et al. Heart 2016

What can we change?

- Approach
- Equipment
- Adjunctive Imaging
- Operator
- CTO substrate

We need to understand the mode of failure in order to understand and plan what needs to be changed for the next procedure

Modes of Failure

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Antegrade failure modes:

- Failure to penetrate a resistant proximal cap
- Ambiguity of proximal cap or CTO course leading to failure of wire passage
- Wire crosses cap/lesion but equipment won't follow
- Subintimal wire passage and failure to re-enter

For ADR

- Loss of distal visualization due to compressive sub-intimal haematoma.

Modes of Failure

Retrograde failure modes:

- Failure to cross CC with wire
- Failure to cross CC with microcatheter
- Failure to complete reverse CART
- Failure of wire externalization

CTCA should be considered in previously failed cases

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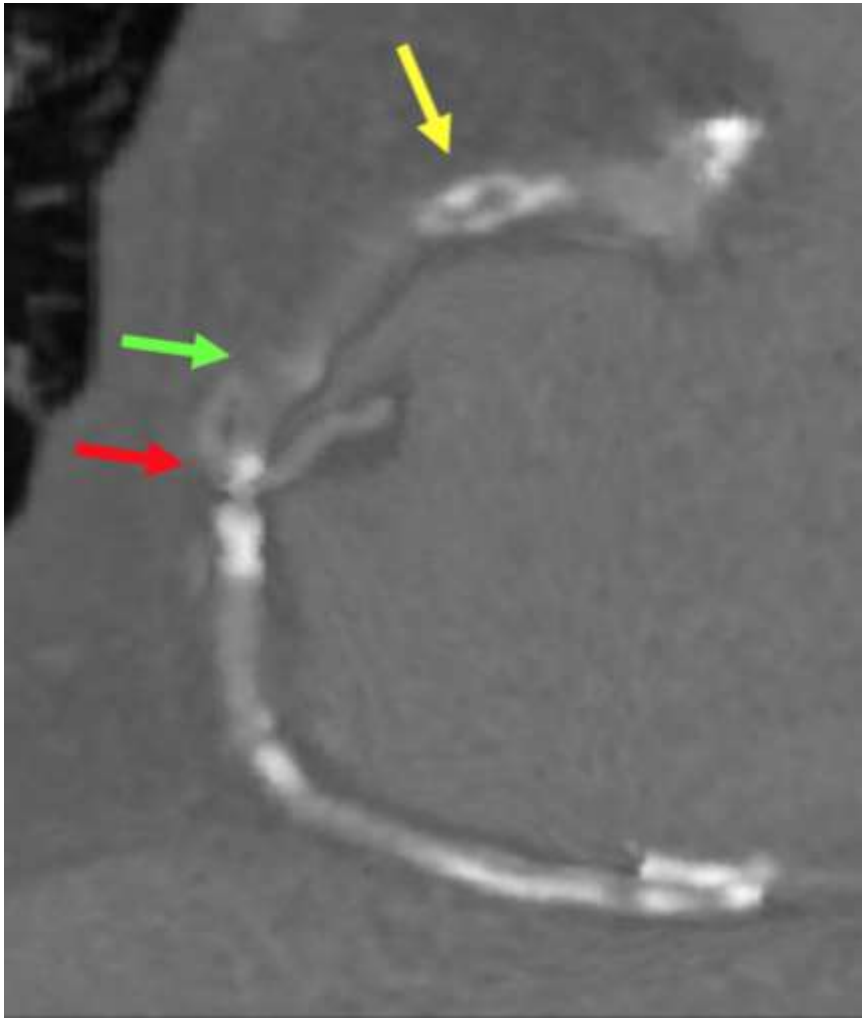
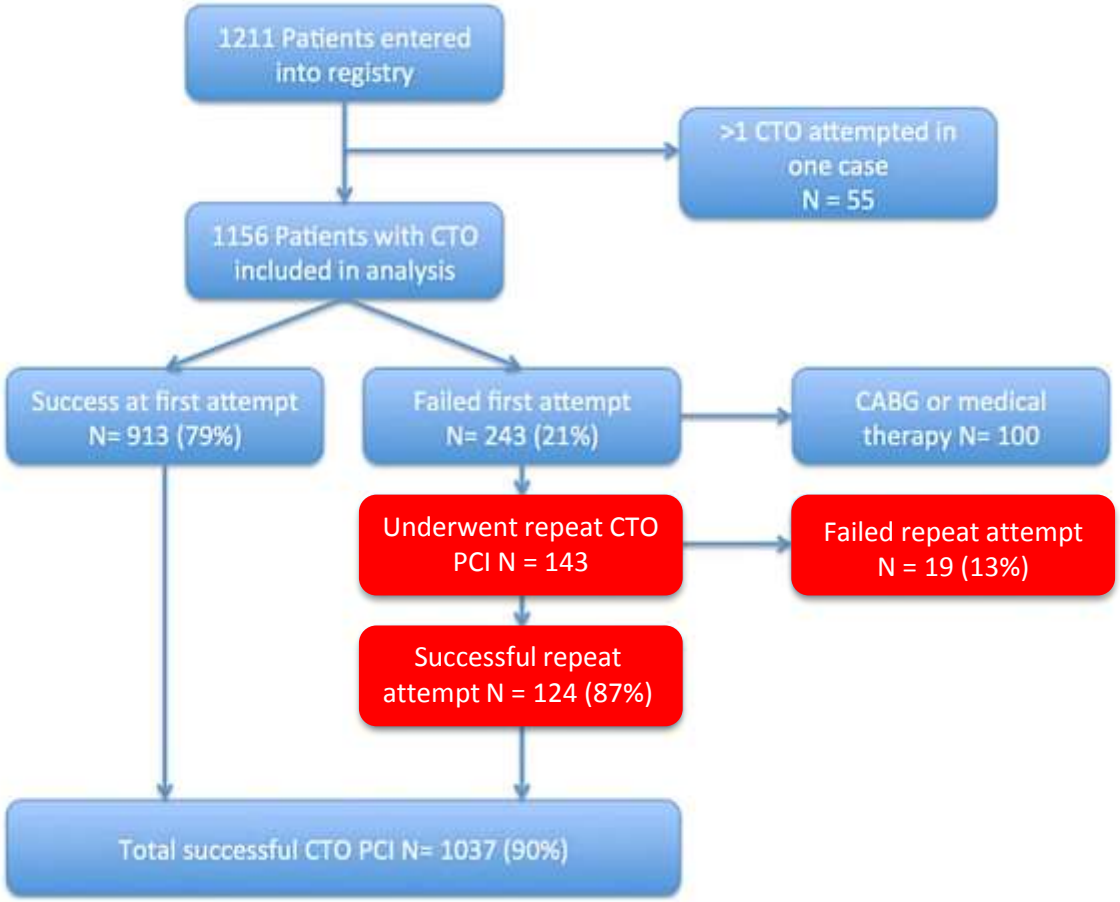
Preprocedural CCTA provides information which may not be apparent on angiogram:

- vessel course in the occluded segment
- calcification
- lesion length
- stump morphology
- presence of side branches
- post CABG anatomy



Investment PCI or Pre-plasty



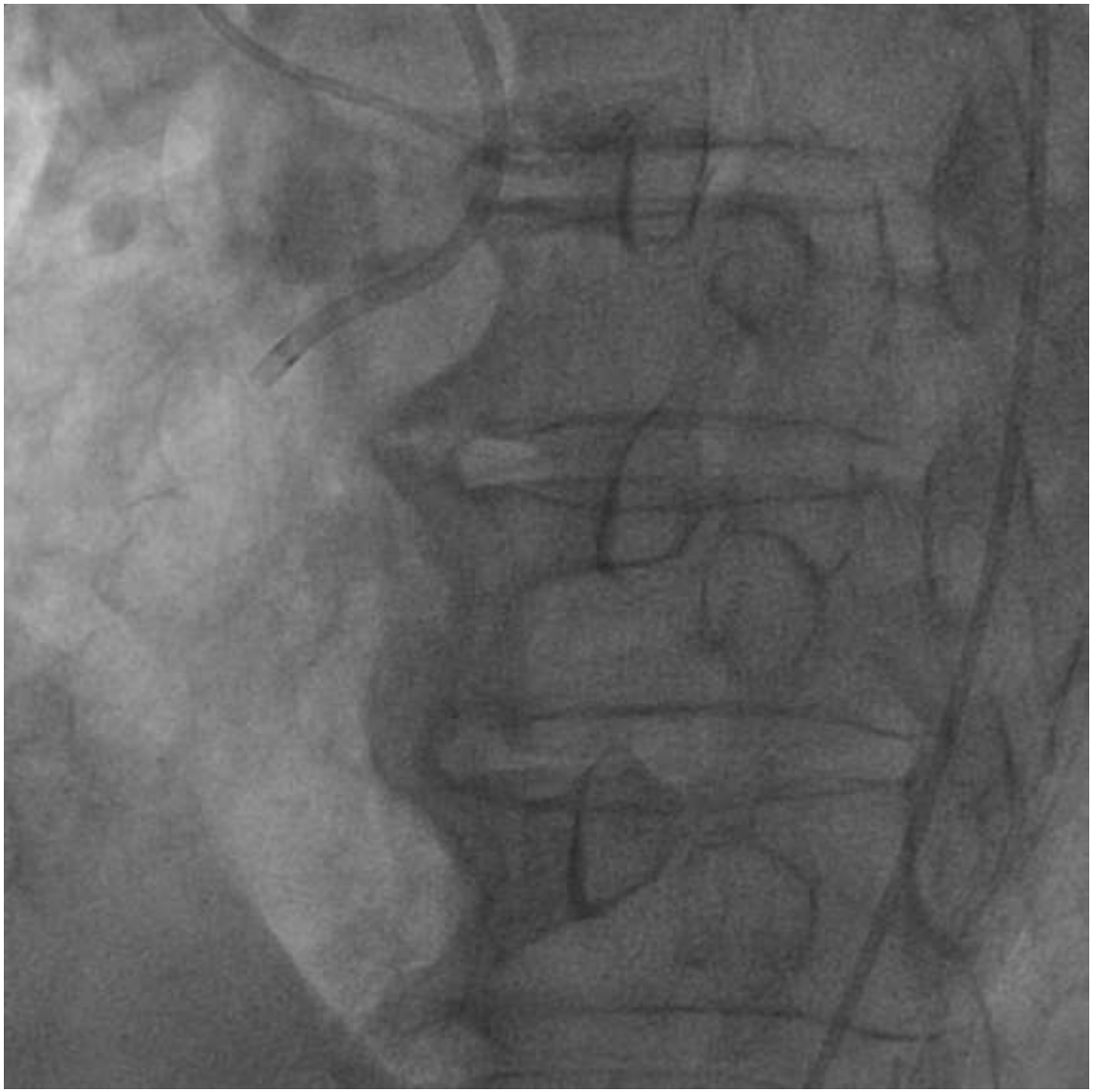
Data from the UK Hybrid Registry

- A repeat CTO PCI attempt was successful in 87% of cases
- Lesion modification (investment procedure) was performed in 62%)
- Prior investment was associated with greater success (96% vs 71%)

Wilson WM, et al. Heart 2016

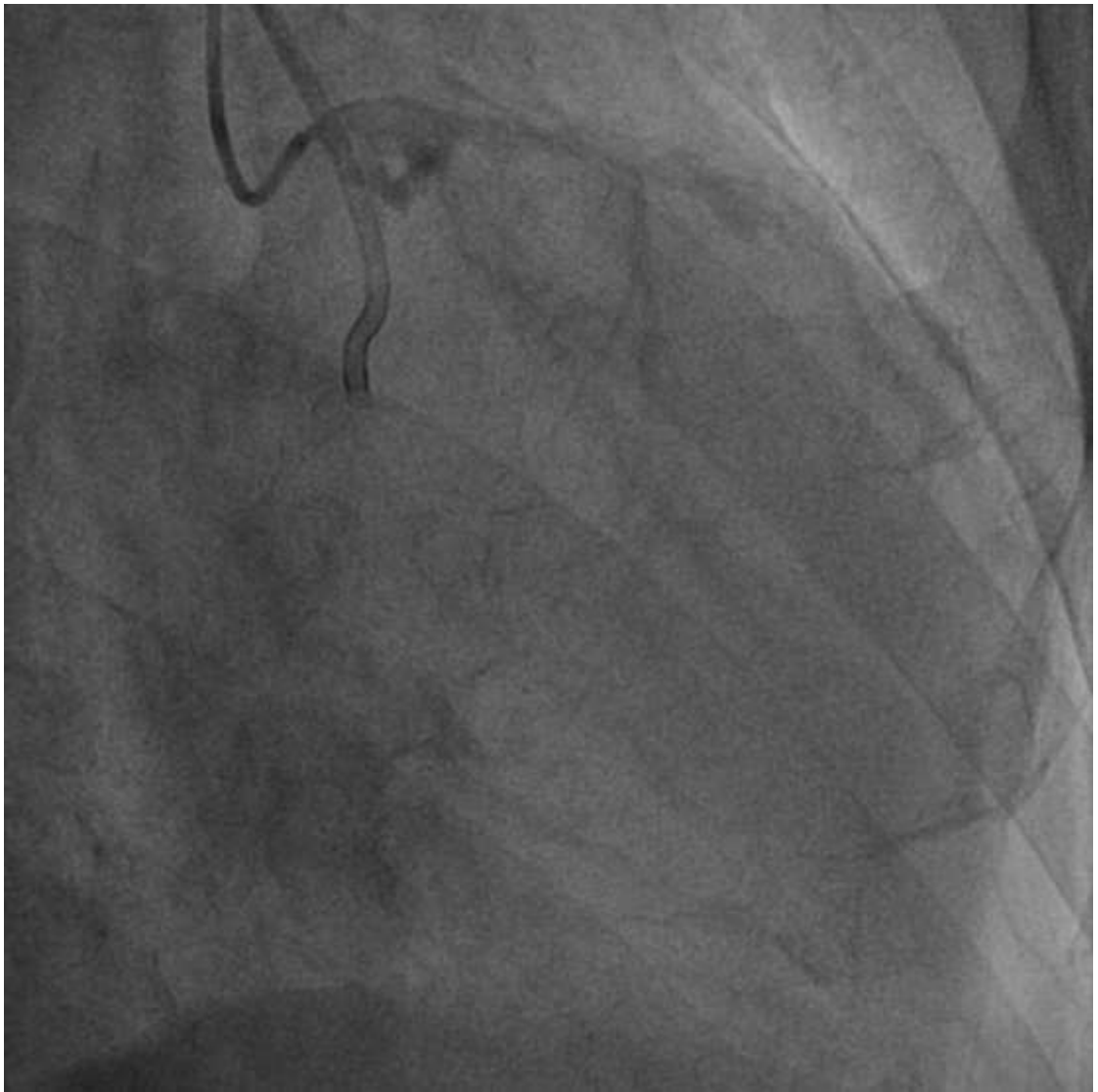
Case 1

- 73 year old male with limiting angina
- CTO of proximal RCA
- Unambiguous blunt proximal cap
- Lesion length >20 mm
- Calcification
- Good quality distal vessel



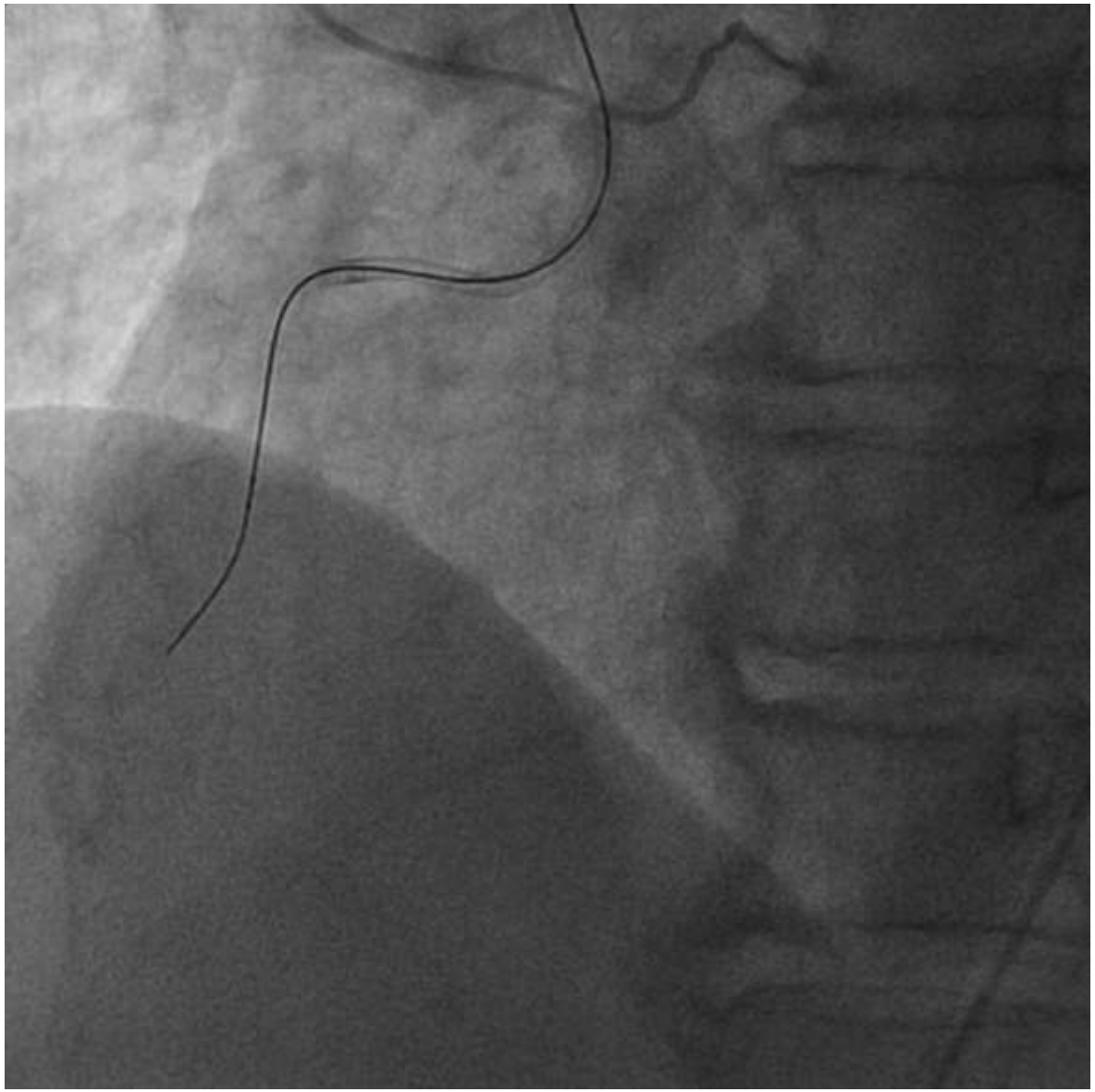
Case 1

- 73 year old male with limiting angina
- CTO of proximal RCA
- Unambiguous blunt proximal cap
- Lesion length >20 mm
- Calcification
- Good quality distal vessel
- Interventional collaterals present



Case 1

- Initial AWE strategy
- Antegrade Conquest Pro wire in wrong place
- Retrograde attempt unsuccessful
- Balloon angioplasty performed at the proximal cap
- Procedure abandoned



Case 1

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What did we learn from the first procedure?

- Mode of antegrade failure was a stiff penetration wire exiting the vessel
- Mode of retrograde failure was failure to cross CC
- JCTO score is now 4 which means highly likely to need a dissection re-entry technique
- Patient tolerated the procedure poorly and received a substantial radiation skin dose (4.5 Gy) which means need a strategy that maximises success and minimises time.

Case 1

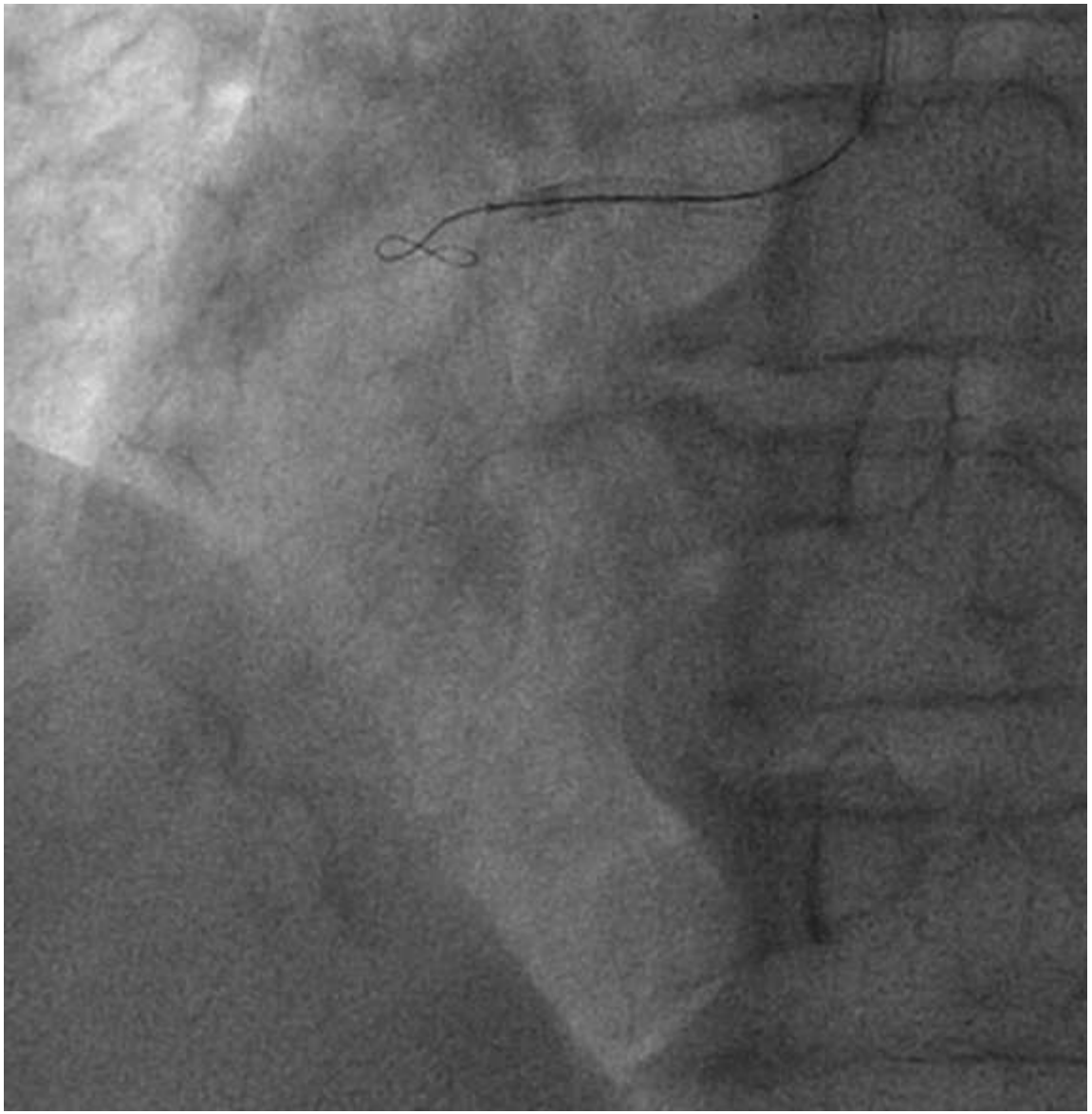
What did we change from the first procedure?

- Approach changed to primary ADR strategy with retrograde as the bail out strategy
- Experienced operator with ADR and retrograde skills

Case 1

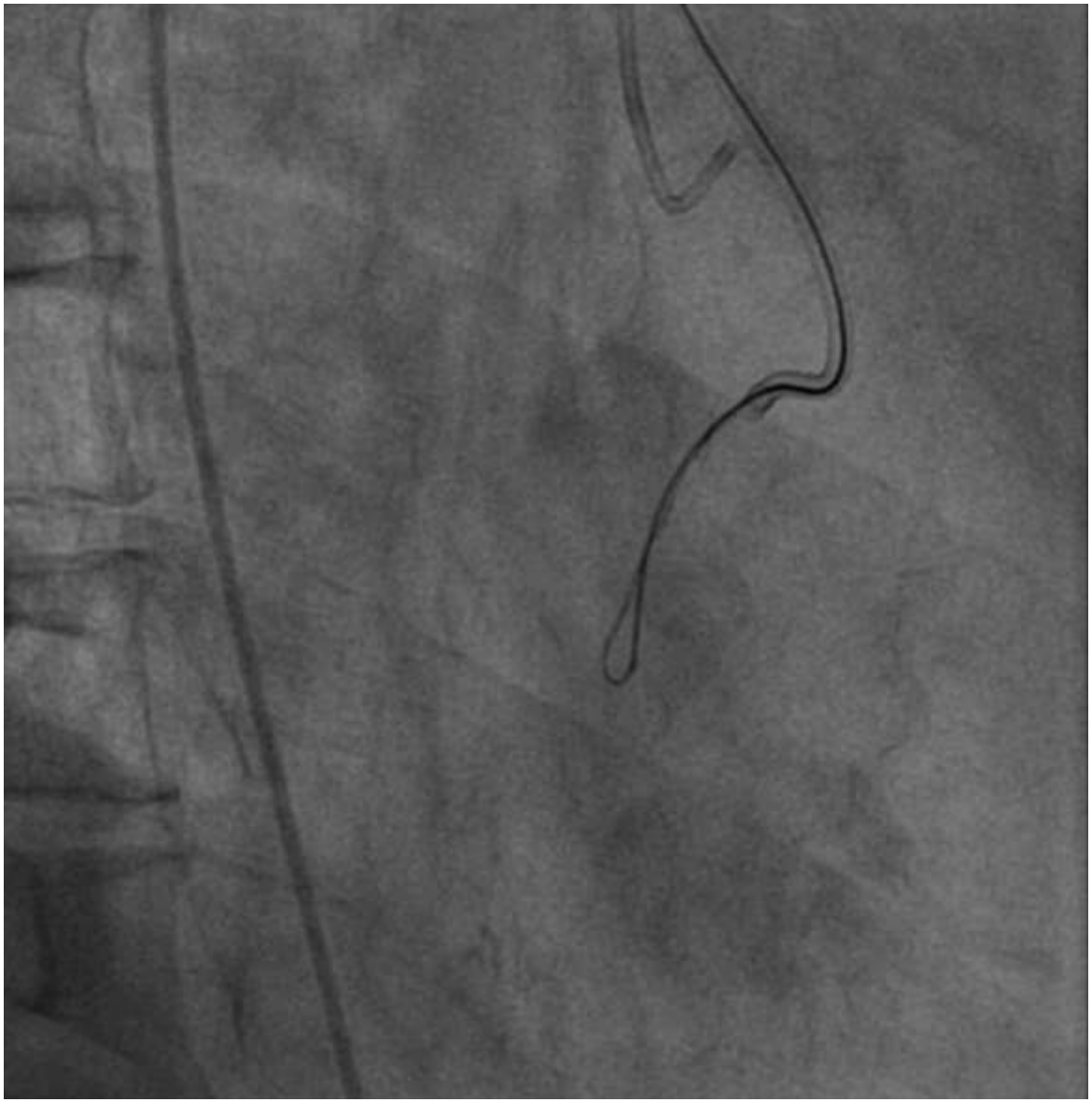
Repeat procedure 3 months Later

- Primary ADR strategy
- CrossBoss and knuckle with Fielder XT-A



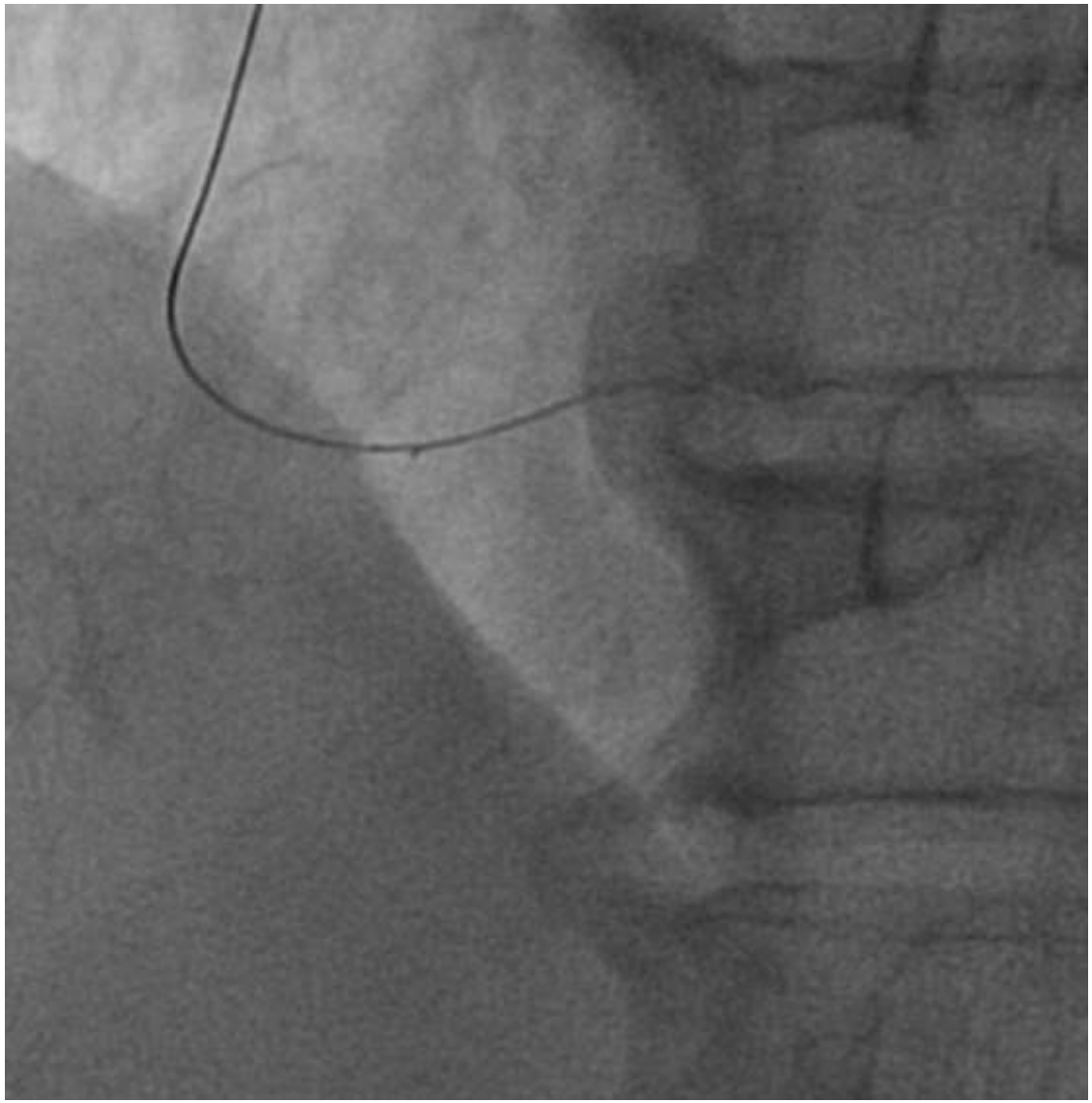
Case 1

- Knuckle advanced
- RAO view checked



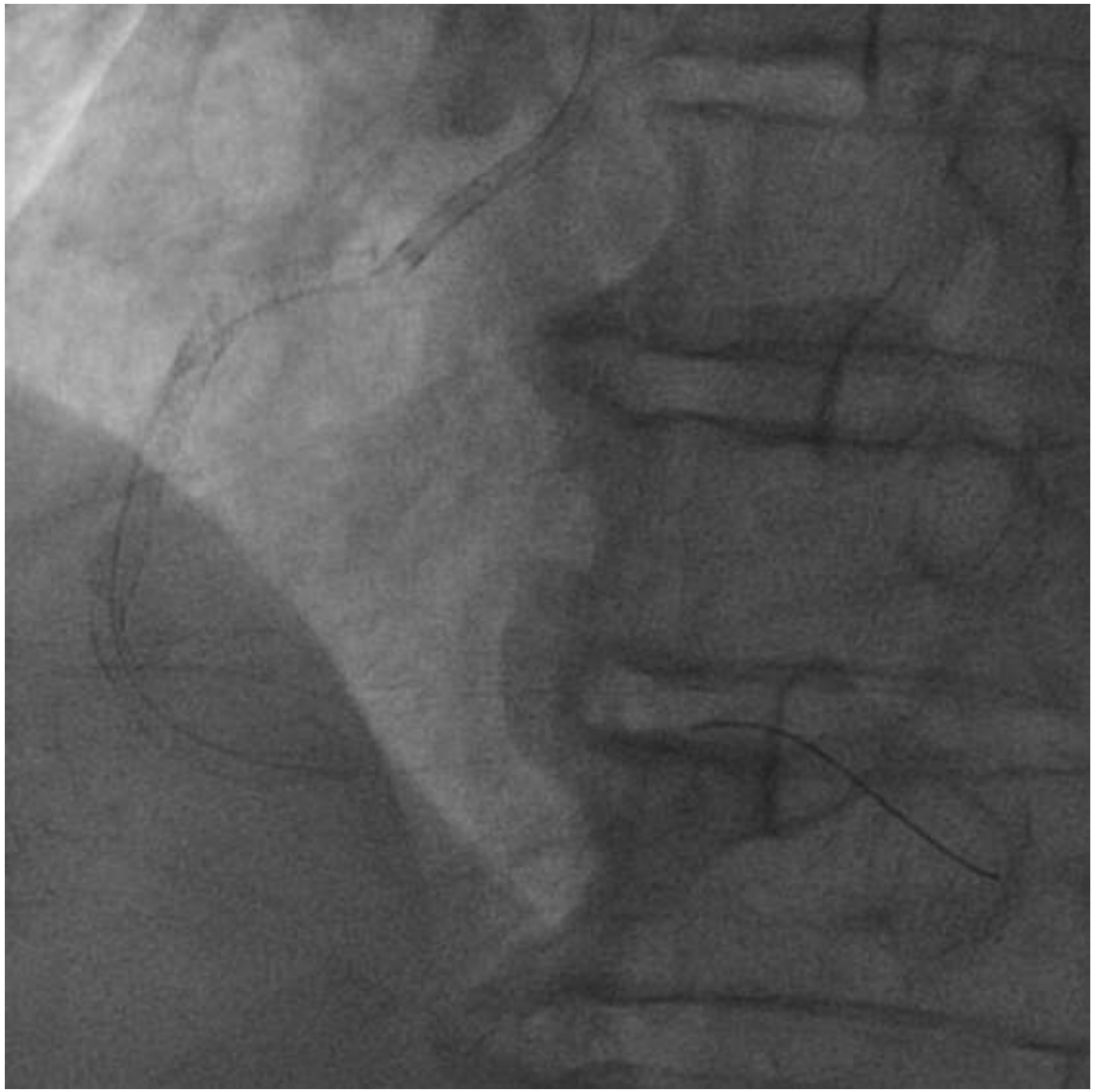
Case 1

- Knuckle advanced around corner
- CrossBoss into re-entry zone
- Exchange for Stingray over Miracle 12
- Stick and swap with Pilot 200



Case 1

Final result



Conclusions

- We need to understand the mode of failure
- Adjunctive imaging CTCA / IVUS may help you understand and plan the case
- Investment procedures may be useful – think about what you can do to maximise the chance of success for the next procedure before abandoning the case.