LCX-CTO via ipsilateral collateral with a single guide

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Case presentation

A 77-years old gentlman with history of coronary artery disease

PCI of the proximal LCX 20 years ago

NSTEMI six months ago with PCI of the LAD and PCI of an InStent Restenosis of the proximal LCX

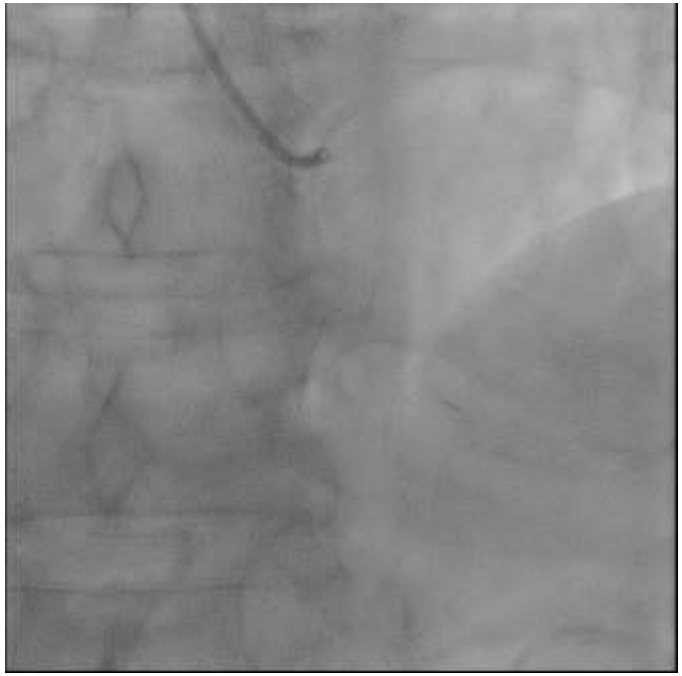
Known CTO of the mid LCX with a failed recanalization antegrad from other colleagues twice

Arterial hypertension and dyslipidemia

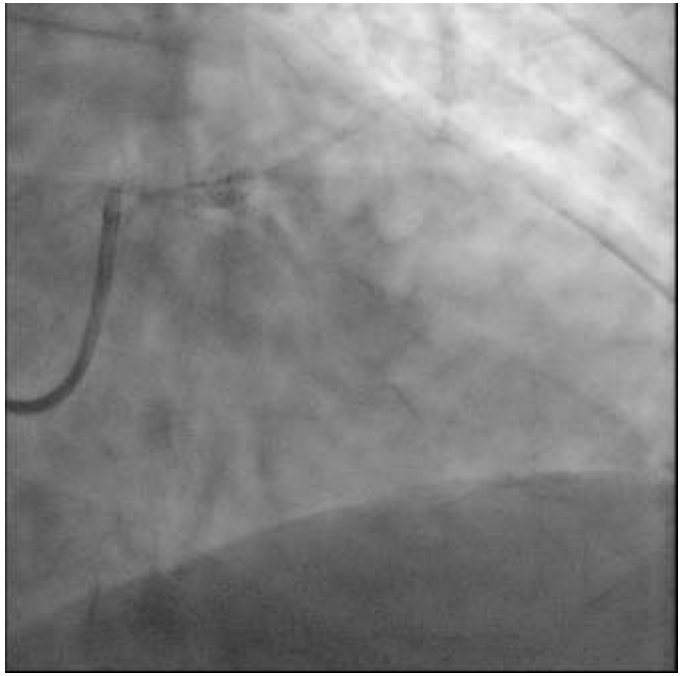
Echocardiography showed a preserved LVEF 60%

Refered to a third recanalization attempt of the LCX because of angina persistance

Coronary angiogram

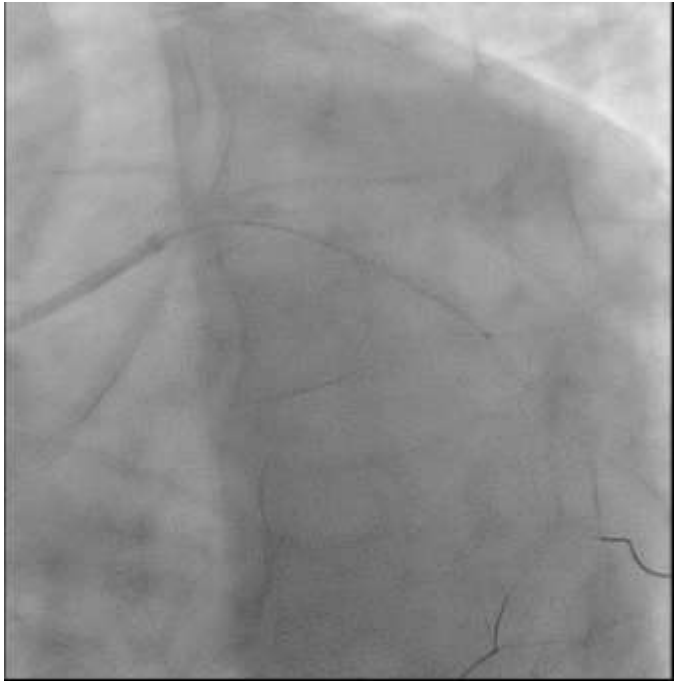


Small RCA without lesion

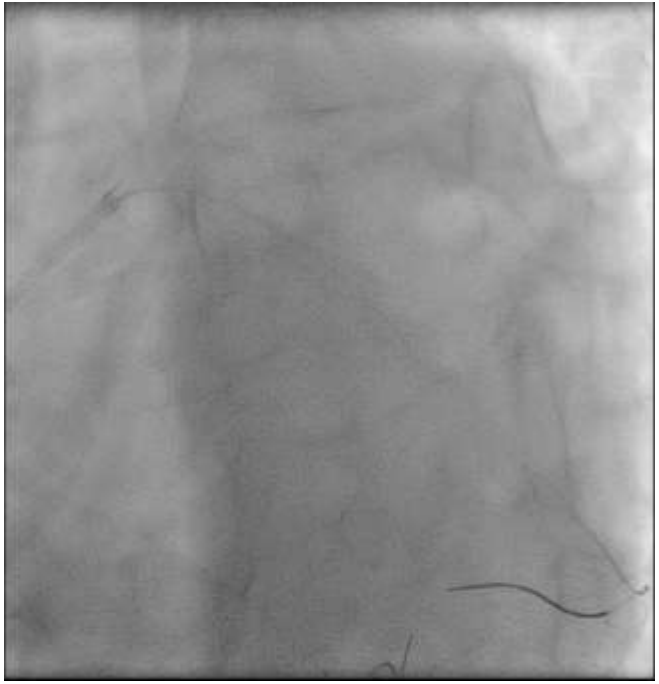


Left system before PCI LAD, LCX

PCI of the proximal LCX six months ago

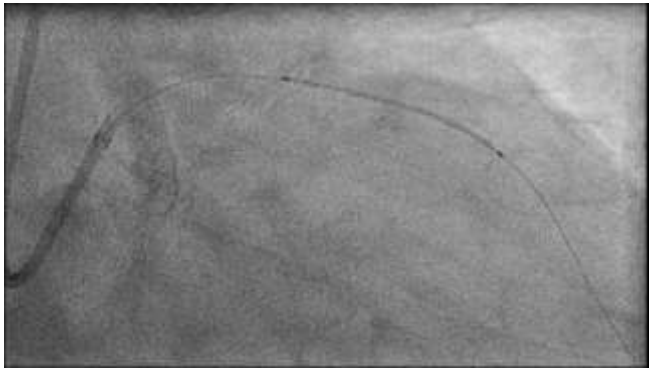


InStent Restenosis LCX

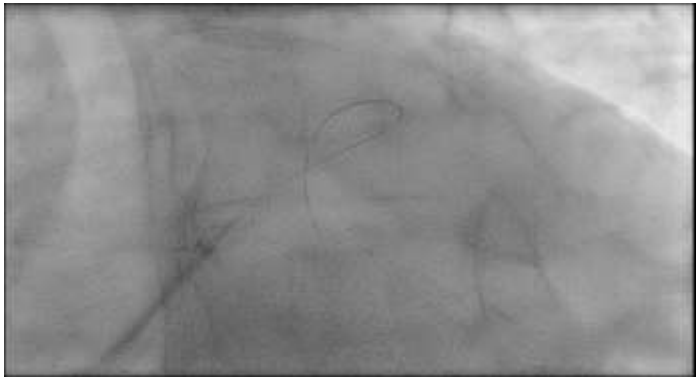


After Stenting, failed first attempt to recanilize the mid LCX

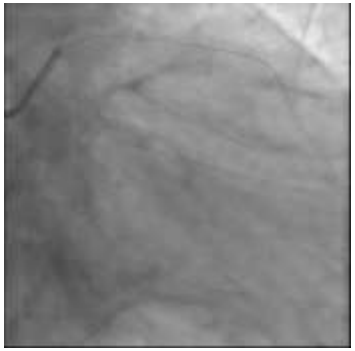
PCI of the LAD, second attempt CTO LCX

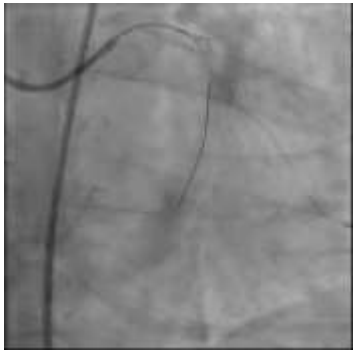


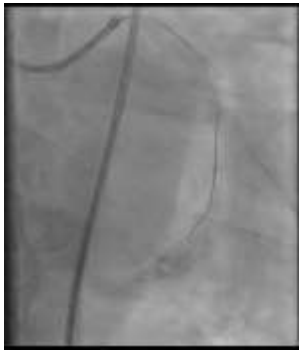
Stent in the LAD

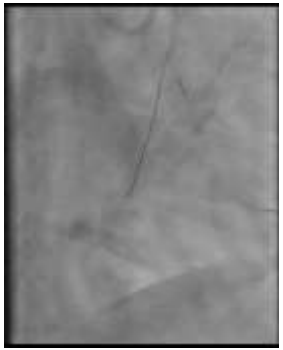


Result after stent in the LAD



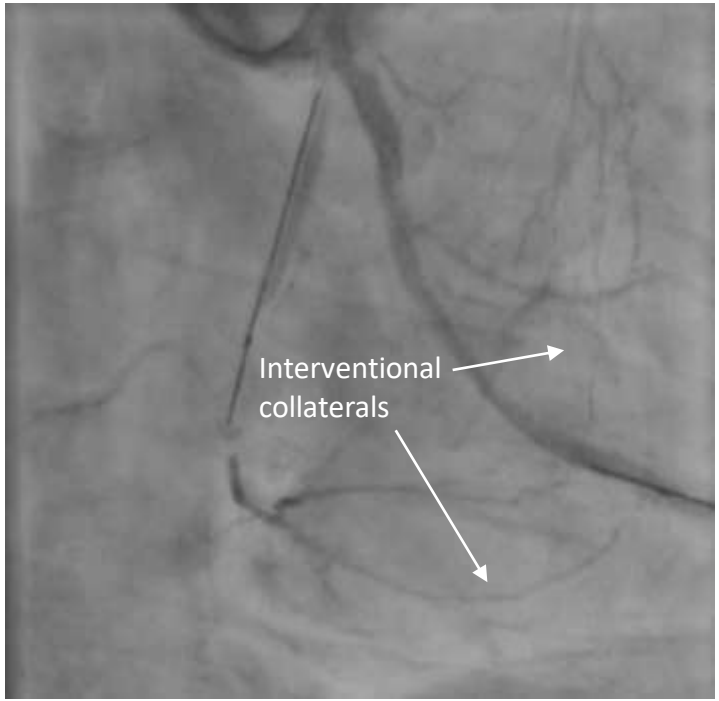


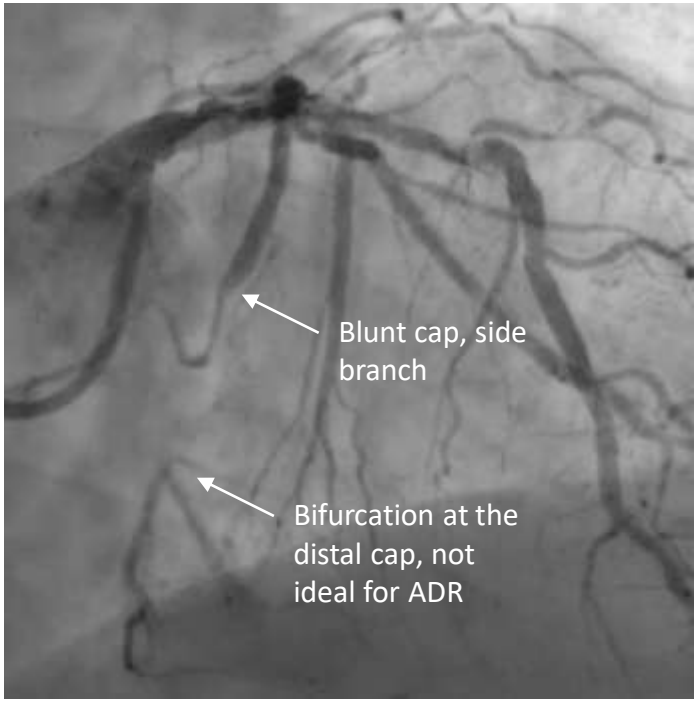




Failed second antegrade attempt of the CTO of the mid LCX

Assessment of the CTO

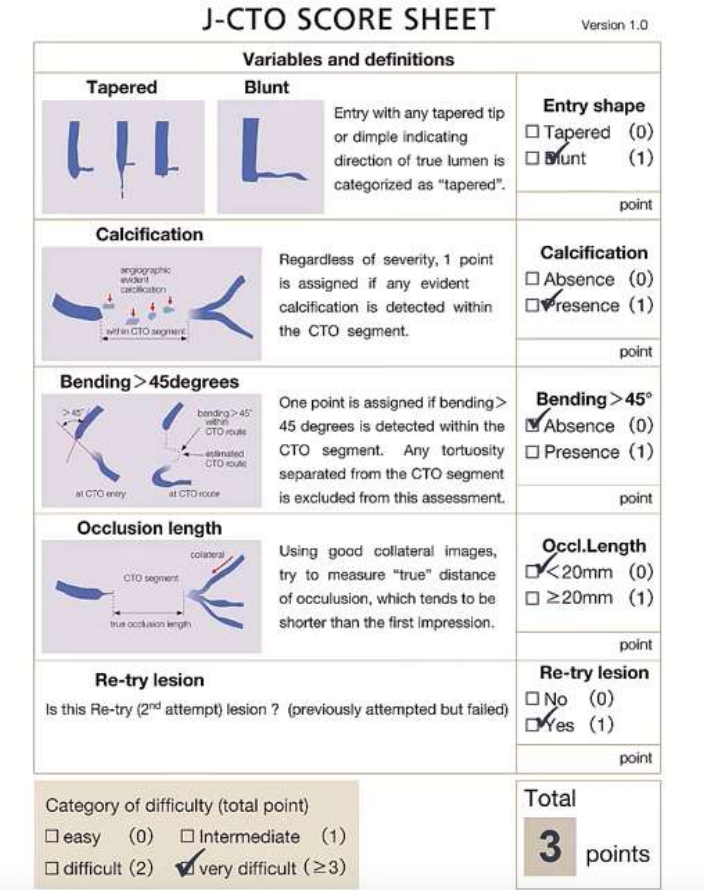




J-CTO score

Assessment:
- Blunt cap, side branch
- Calcifications
- No bending
- Short lesion 15 mm
- Retry

→ J-CTO Score 3


J-CTO SCORE SHEET Version 1.0

Variables and definitions	
Tapered **Blunt** Entry with any tapered tip or dimple indicating direction of true lumen is categorized as "tapered".	**Entry shape** ☐ Tapered (0) ☐ Blunt (1) point
Calcification Regardless of severity, 1 point is assigned if any evident calcification is detected within the CTO segment.	**Calcification** ☐ Absence (0) ☐ Presence (1) point
Bending > 45degrees One point is assigned if bending > 45 degrees is detected within the CTO segment. Any tortuosity separated from the CTO segment is excluded from this assessment.	**Bending > 45°** ☐ Absence (0) ☐ Presence (1) point
Occlusion length Using good collateral images, try to measure "true" distance of occulusion, which tends to be shorter than the first impression.	**Occl.Length** ☐ <20mm (0) ☐ ≥20mm (1) point
Re-try lesion Is this Re-try (2nd attempt) lesion ? (previously attempted but failed)	**Re-try lesion** ☐ No (0) ☐ Yes (1) point

Category of difficulty (total point)
☐ easy (0) ☐ Intermediate (1)
☐ difficult (2) ☐ very difficult (≥3)

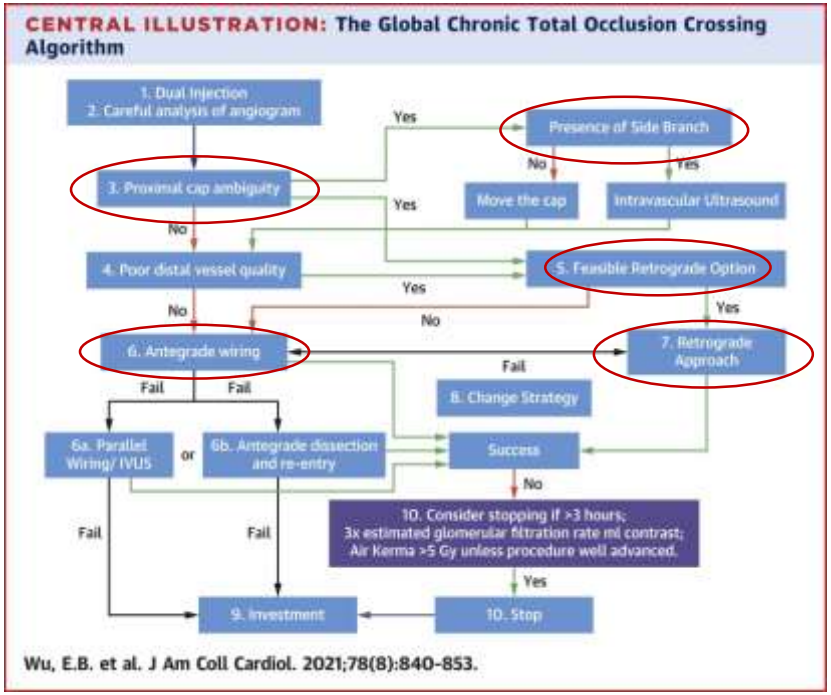
Total 3 points

Retrograde approach

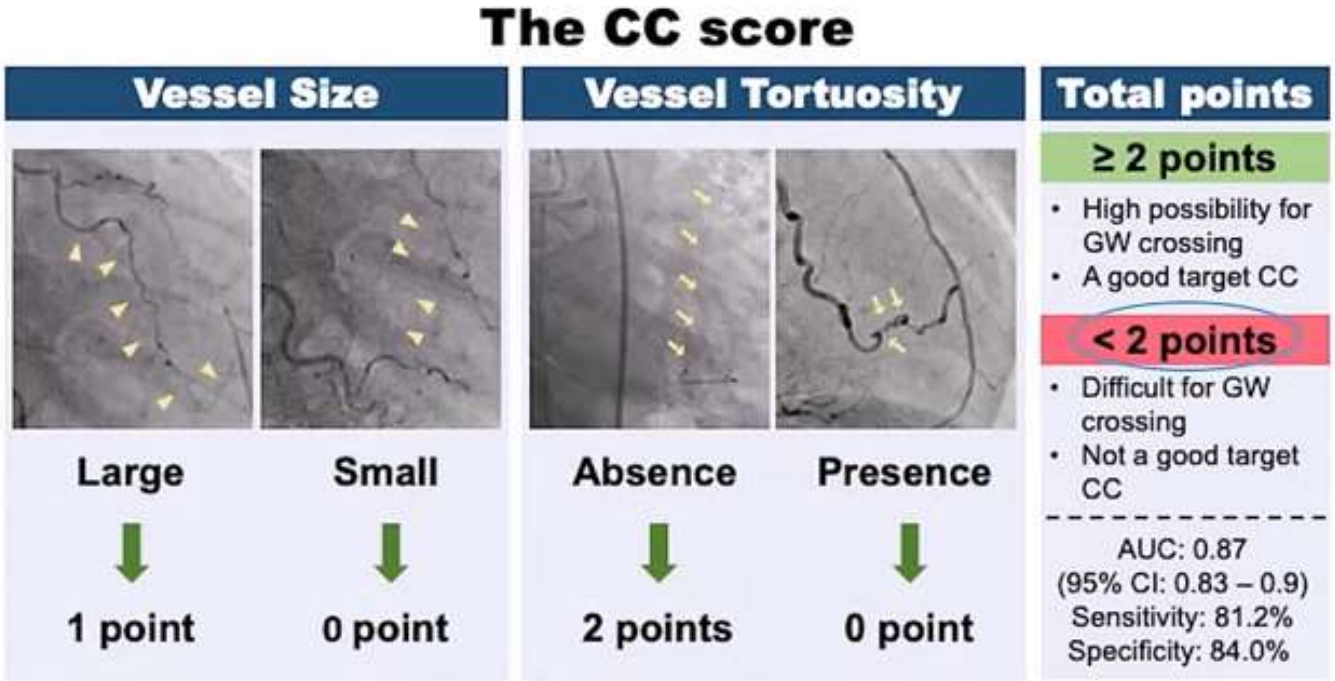
- Setting:

Double Radial access EBU 4,0 7F
JR 4,0 6F for the right coronary artery but not needed (no collaterals)

→ Primary retrograde via septal channel



Assess the possibility of collateral crossing



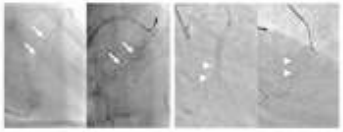
Small collateral with some tortuosity → <2 points! difficult

Hao-Yun Chang et al, Am J Cardiol 2024 Jan 1:210:93-99

Assess the possibility of collateral crossing

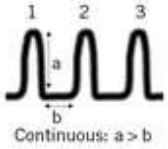
J-Channel score

A **CC Vessel size**
- Large (CC2)
- Small (CC0 or CC1)

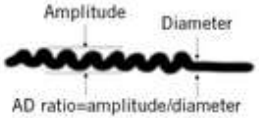


B **Reverse bend**
- None: <90°
- Yes: ≥90°

C **Continuous bends**
- None: ≤2
- Yes: ≥3



D **Corkscrew**
- None
- Yes: continous bends ≥3 with AD ratio ≤2



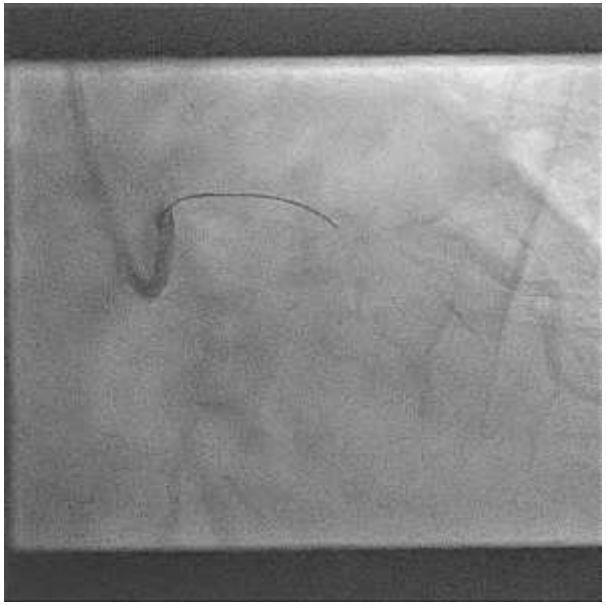
	Septal	Non-septal
CC Vessel size: *Small*	2	3
Reverse bend: *Yes*	1	1
Continuous bends: *Yes*	1	0
Corkscrew: *Yes*	0	1
Total score	2	

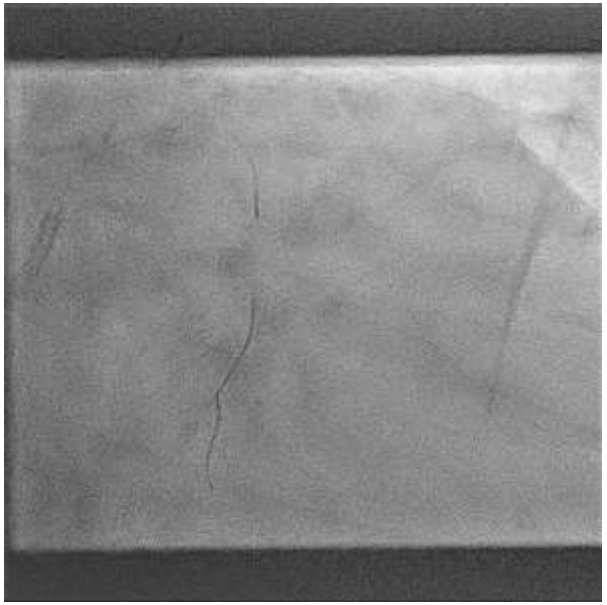
Category of difficulty (total score)
- **Easy: 0**
- **Intermediate: 1-2**
- **Difficult: ≥3**

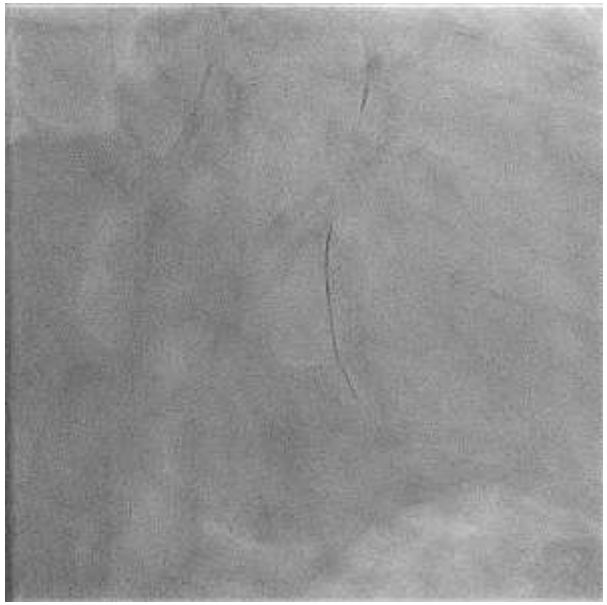
How to use:
1st Classify CC into type of CC
2nd Sum up numbers of vertical frame as type of CC
3rd Estimate difficulty

Wataru Nagamatsu et al, EuroIntervention 2020 Apr 3;15(18):e1624-e1632

Septal crossing

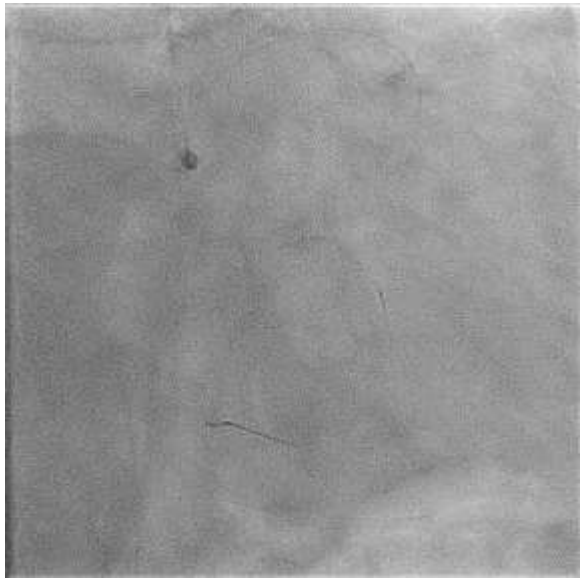


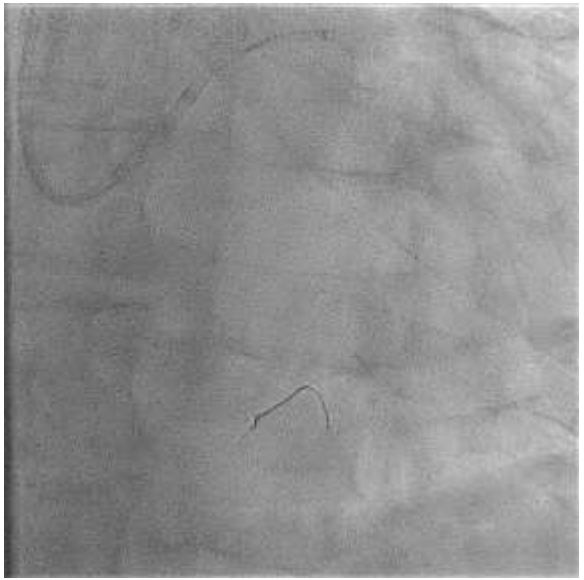


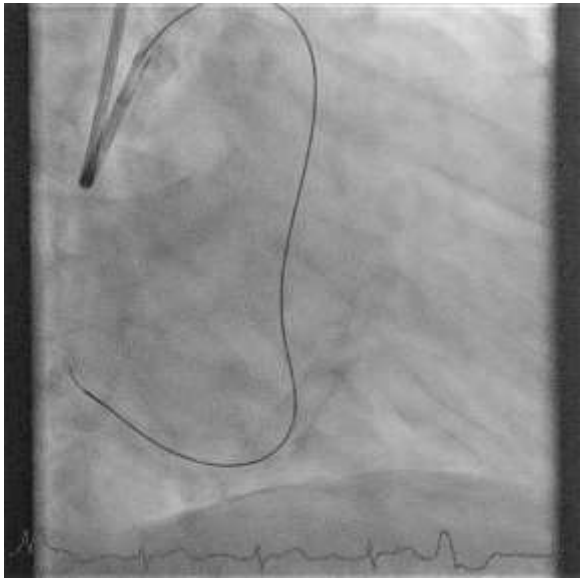


Regular Sion, Caravel 150 cm microcatheter, surfing, crossing

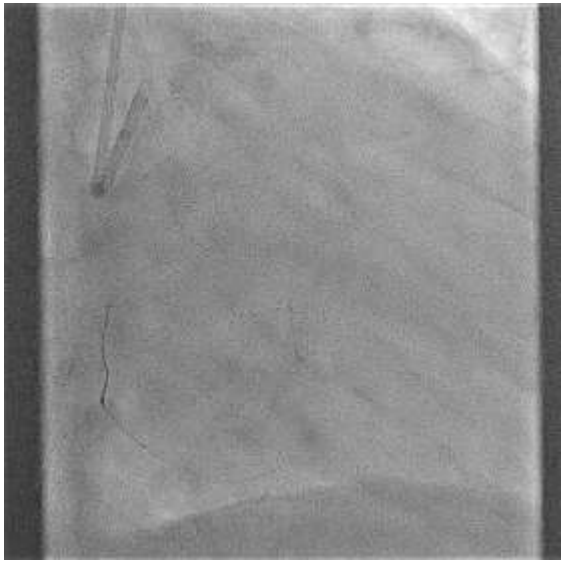
Microcatheter could not advance → Guidezilla



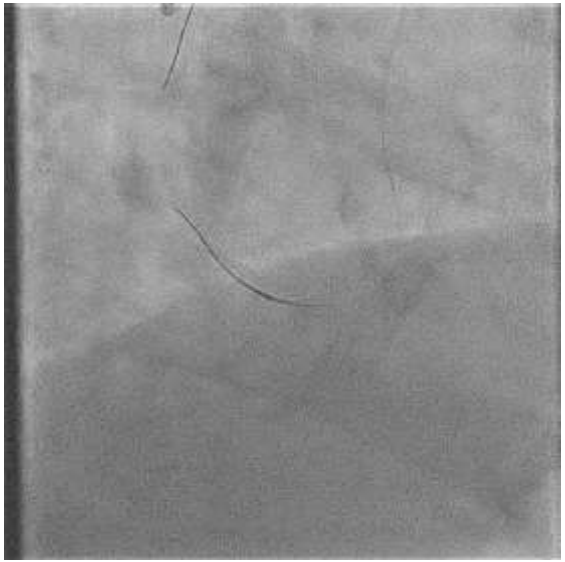




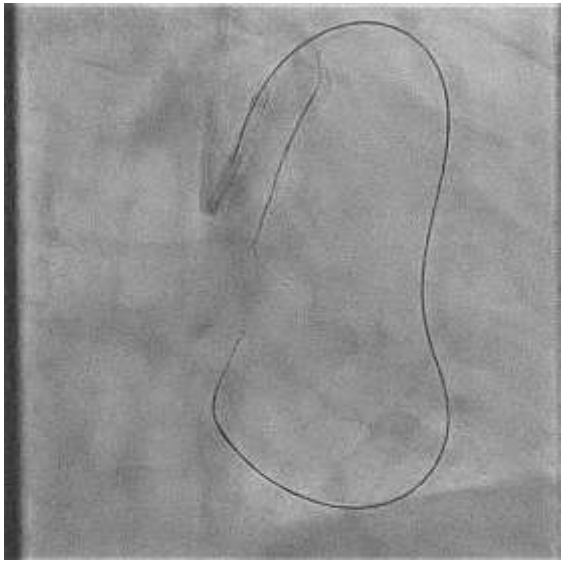
Retrograde Wire Escalation



Fielder XT failed

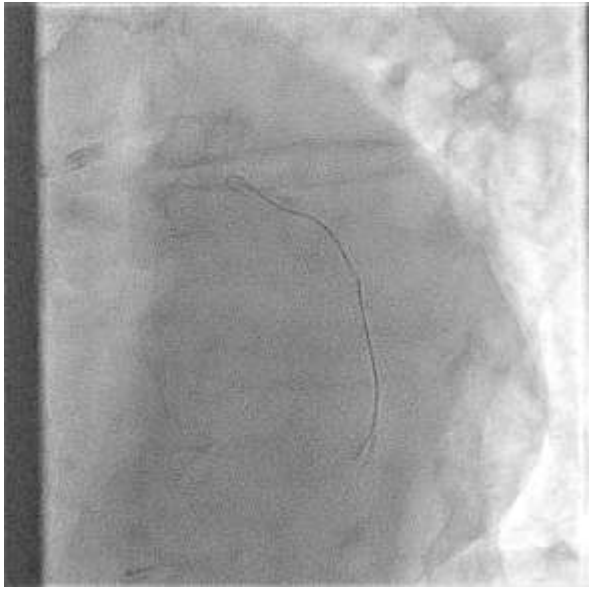


Prepare antegrade, Gladius EX failed

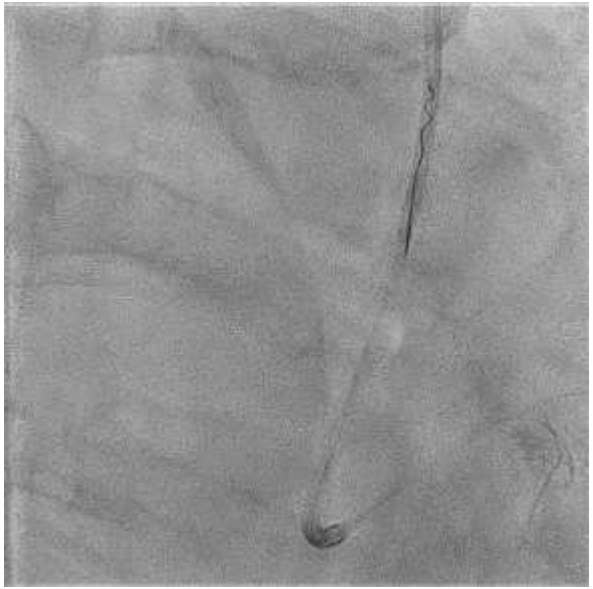


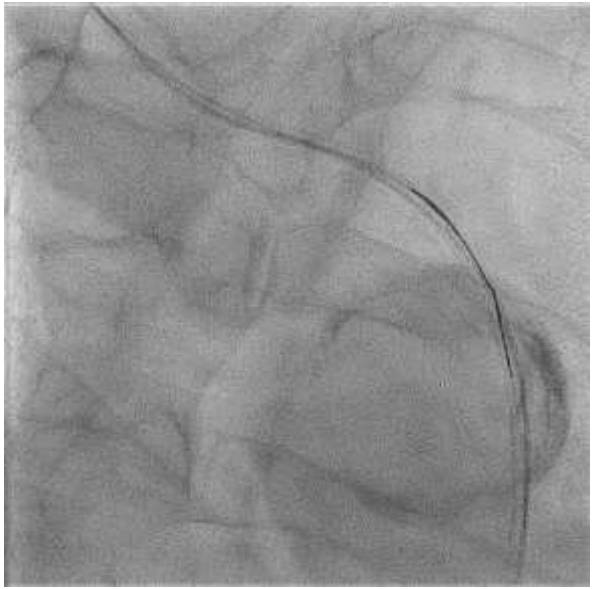
Confianza true to true crossing

Connection made, MC could not advance further



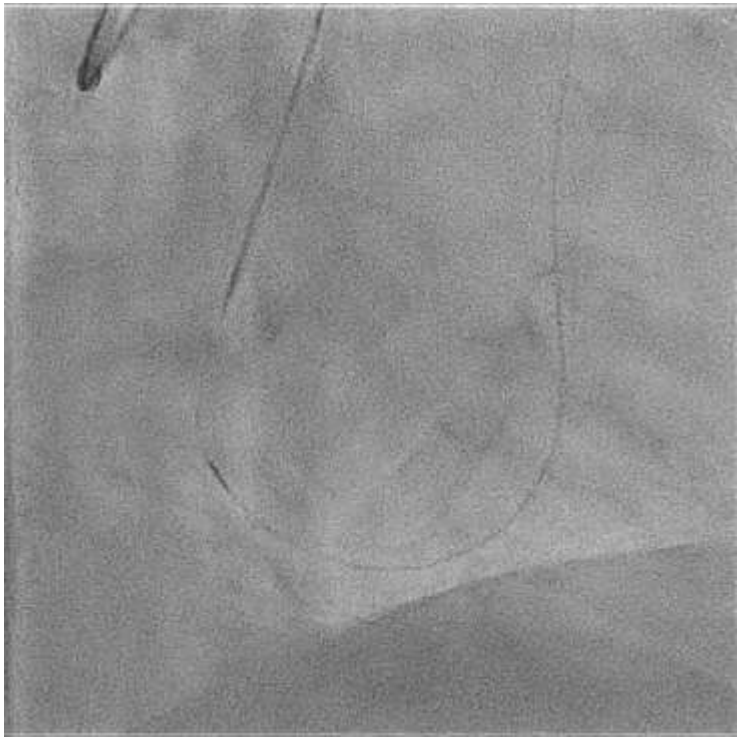
Workhorse wire into the antegrade guide, the microcatheter could not follow because of the stent struts



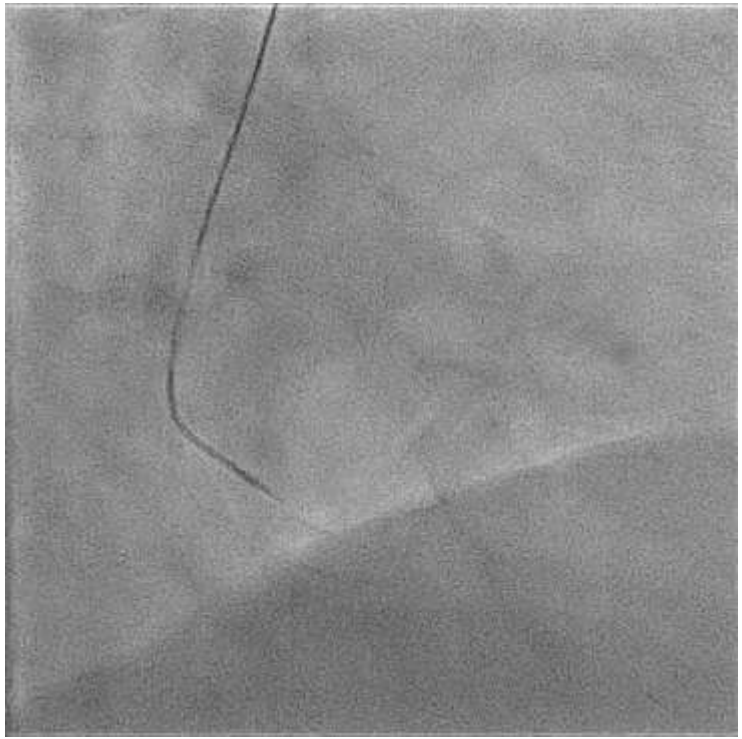


Decide to not externalize and do a tip-in with one guide, first with Finecross 130 cm but given the poor support change to Corsair Pro 135 cm

Retrograde microcatheter removed, continue antegrade

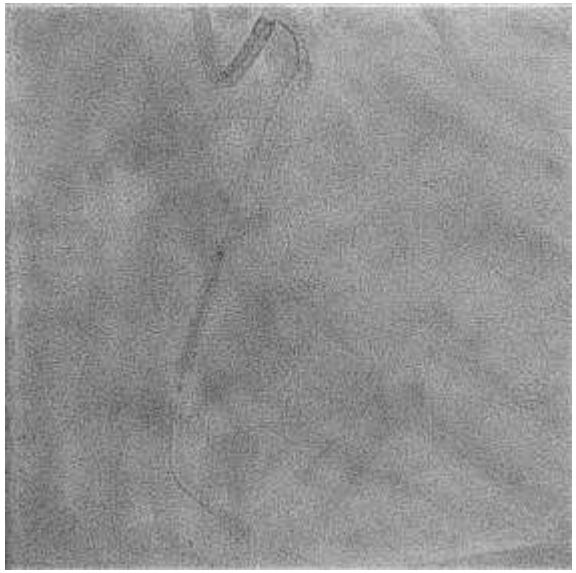


Antegrade Corsair Pro crossed

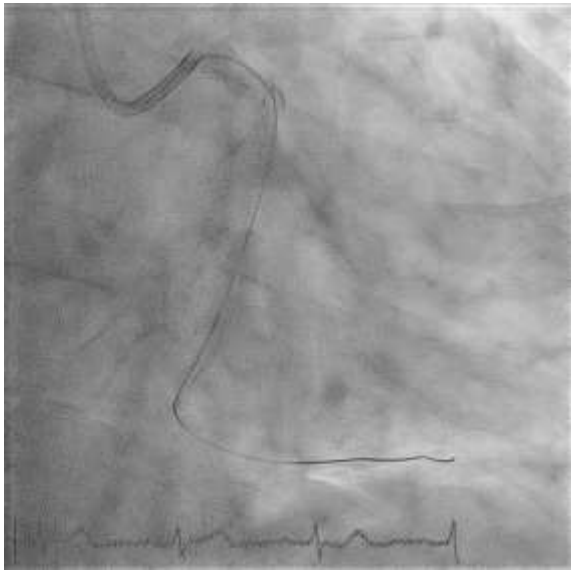


Caravel removed after eliminate septal injury

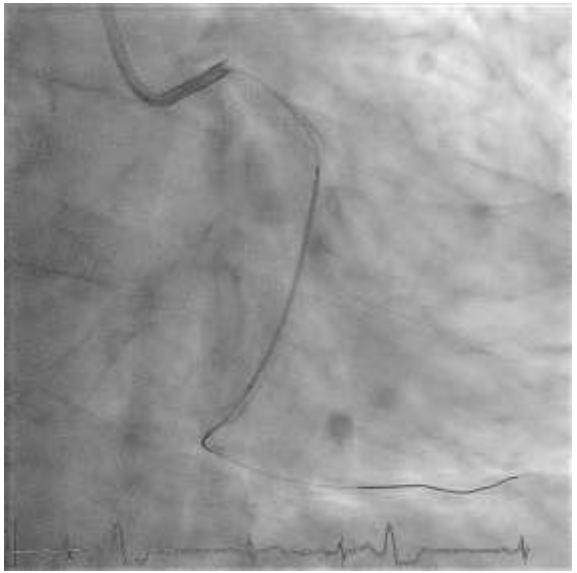
Predilation and Stenting



Stent mid segment 2,5/20 mm Promus

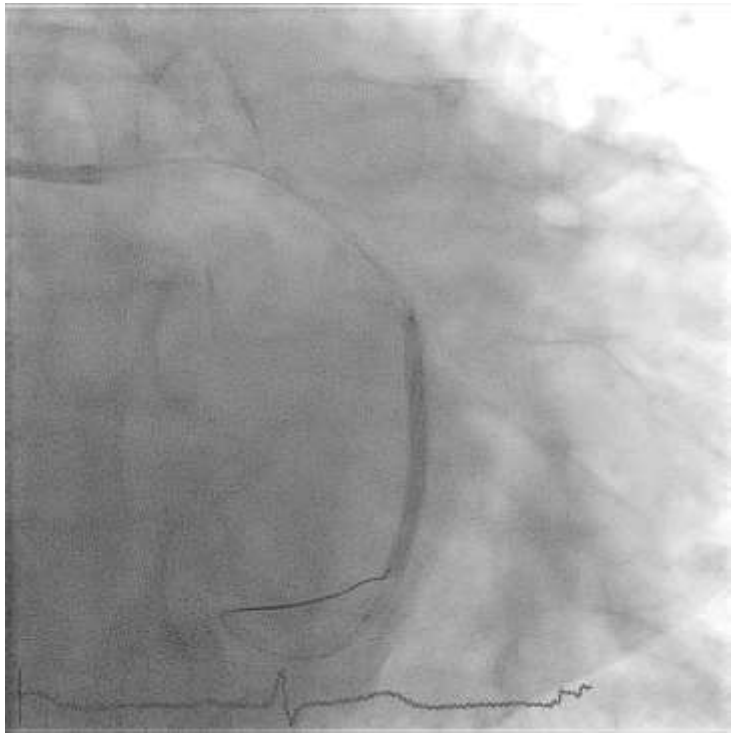


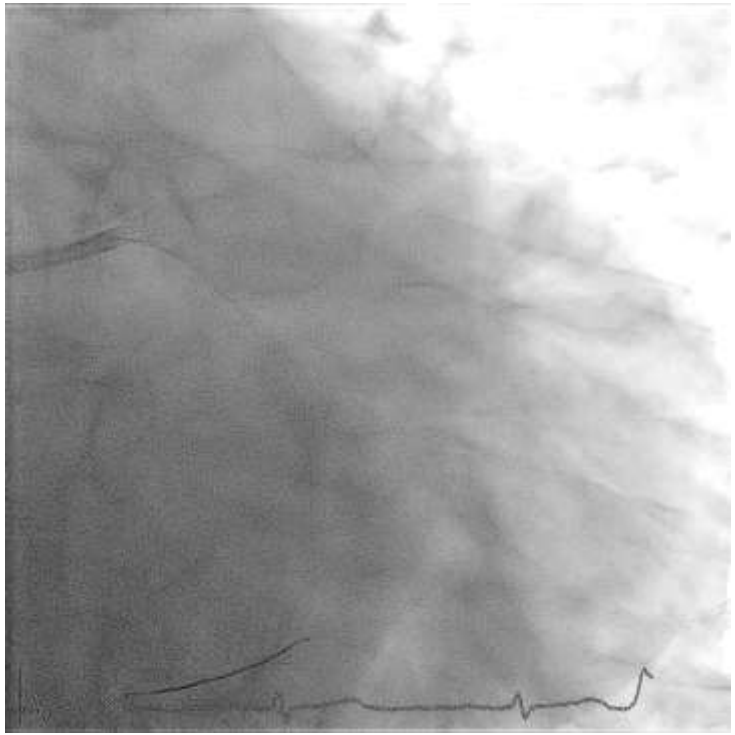
TIMI III flow



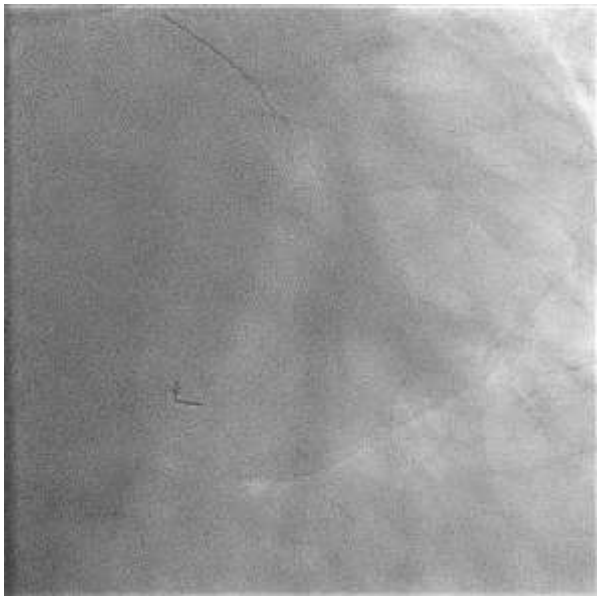
Stent proximal 2,5/38 mm Promus

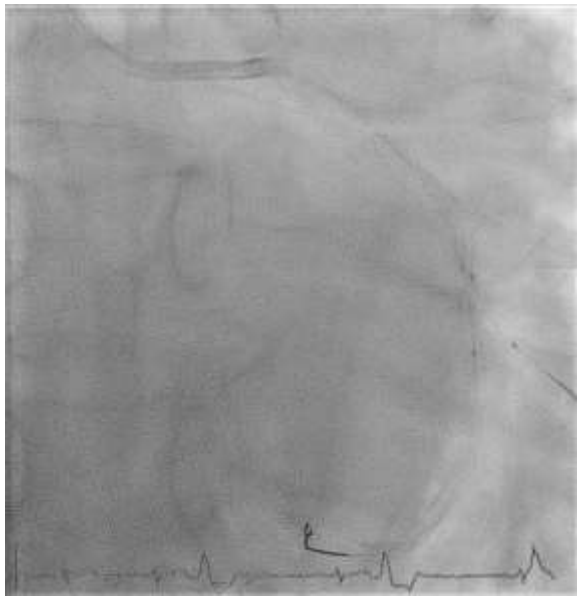
Ostial lesion of the OM

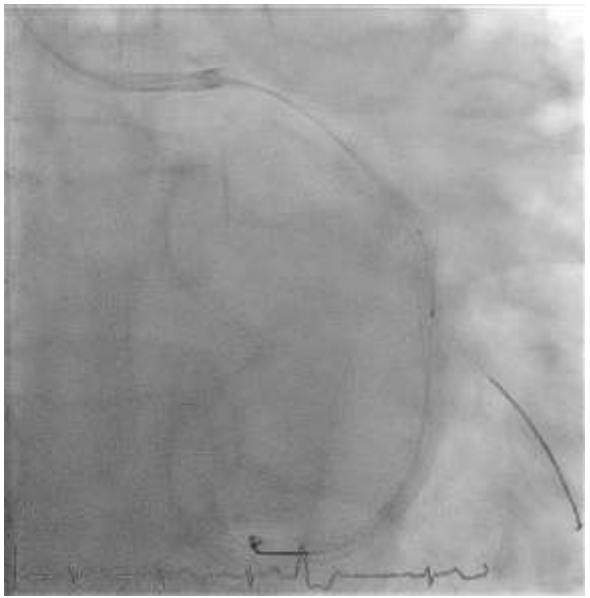




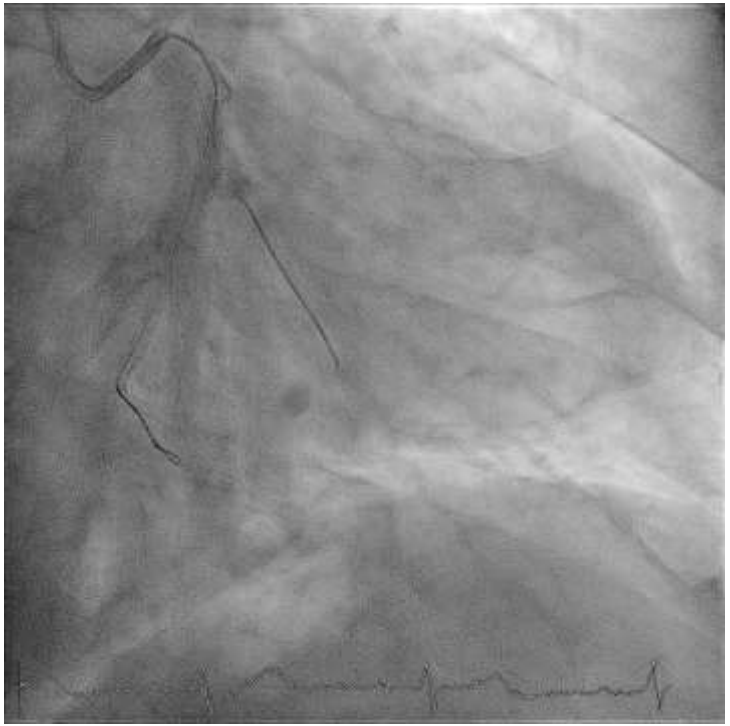
Rewireing, Kissiong and POT

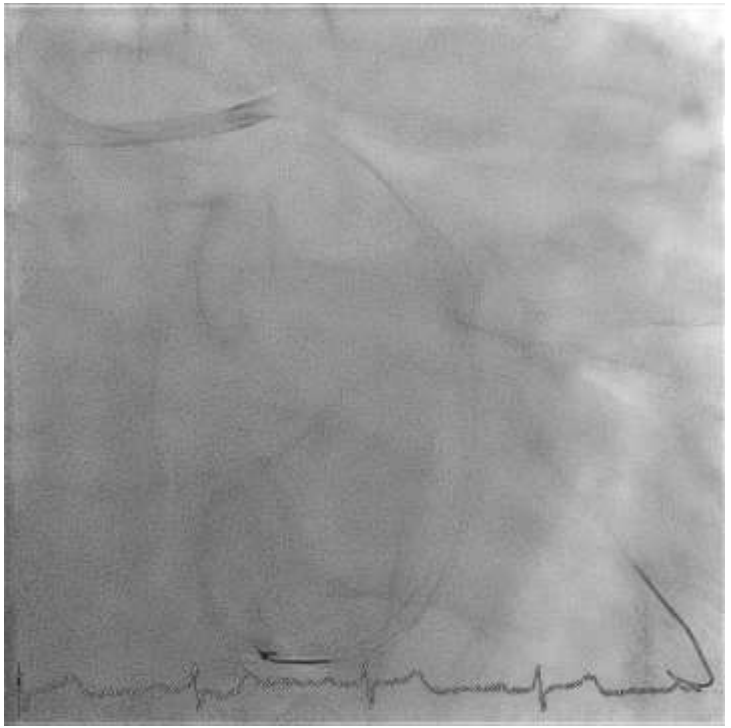






Final result





Conclusions

- Retrograde approach for CTOs with blunt cap increases the success
- Assessment of the likehood of crossing the collaterals with J-Channel or CC scores to predicte the success and minimize the risk of perforation
- Retrograde via ipsilateral collateral could be done with a single guide and radial access 7F
- Avoid an externalization if retrograde via ipsilateral collateral to minimize strain on collaterals
- Tip-In technique if the retrograde wire crosses but the microcatheter not, especially if stent struts to avoid entrapment
- Strong support with a large guide catheter and guide extension
- Try crossing true to true retrograde if the lesion is short

Thank you