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Adjuvant techniques in complex coronary anatomy cases

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Rationale for adjuvant techniques

- After the SYNTAX study, **two different issues** in interventional cardiology have been made clear:
 - In complex angiographic situations
 - we must be very careful („Heart team approach“)
 - but we can master them
- This could be one of the reasons why interventionalists are pushing harder to the limits in complex cases

Increased risk of complications

Rationale for adjuvant techniques

Complex coronary anatomy:

- Long and calcified lesions
- Severe tortuosity
- Angles more than 90°
- No guide catheter support (due to complicated ostium engagement or problems of access site)
- CTOs

Increased risk of complications

Rationale for adjuvant techniques in Russia

- New PCI centers (widening of the net)
- Number of PCIs increasing (~30 000 a year)
- More complex procedures
- More difficult patients (age, frailty, comorbidities, CABG in med history)

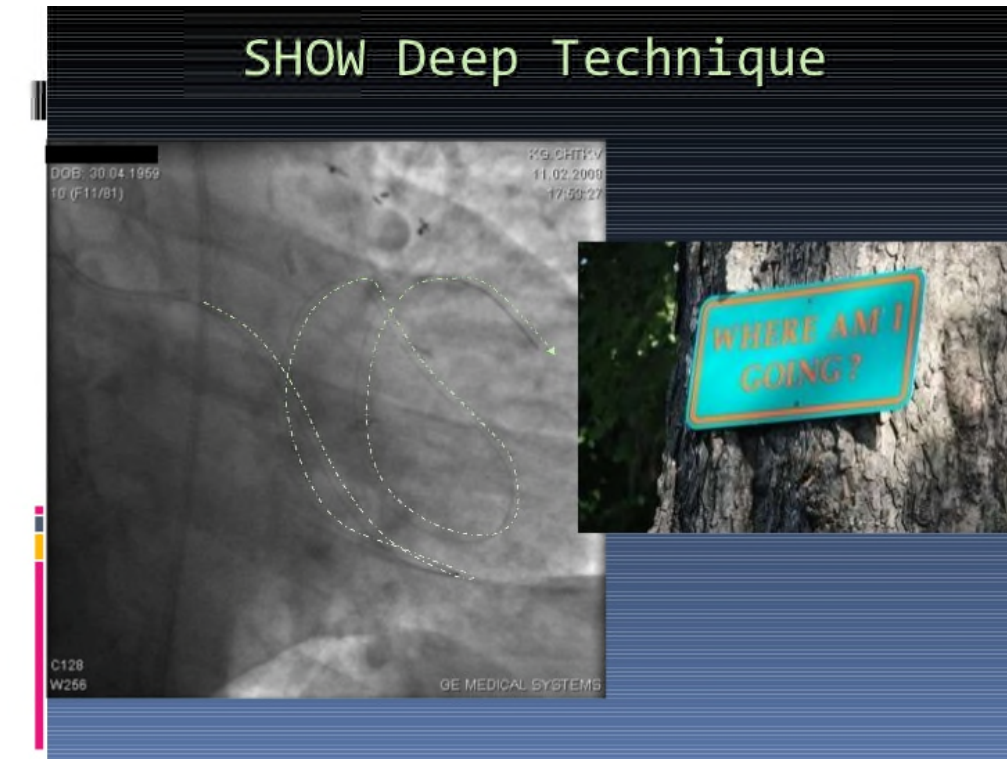
Increased risk of complications

Rationale for adjuvant techniques



We need support, to finish the procedure

What can we do to increase support in cases with complex anatomy?



Soft Hydrophilic Wire Deep Technique

What can we do to increase support in cases with complex anatomy?

Soft Hydrophilic Wire Deep Technique
or deep wire penetration

4 main questions:

1. Why?

2. What?

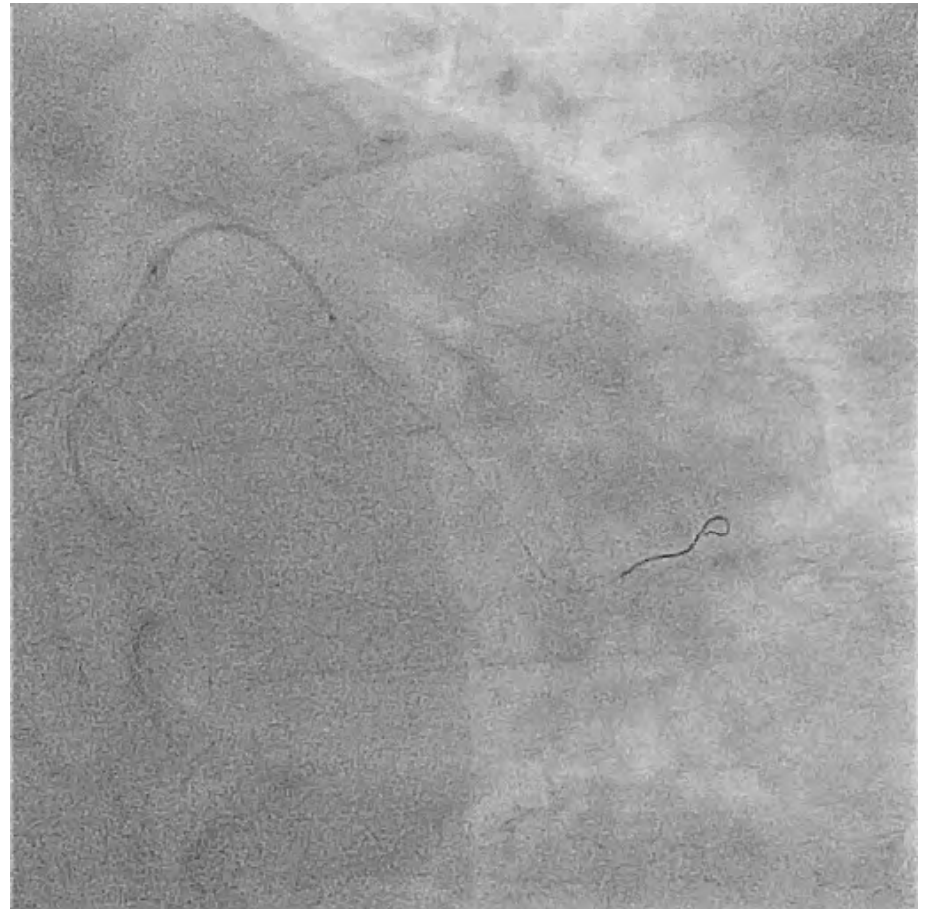
3. How?

4. When?

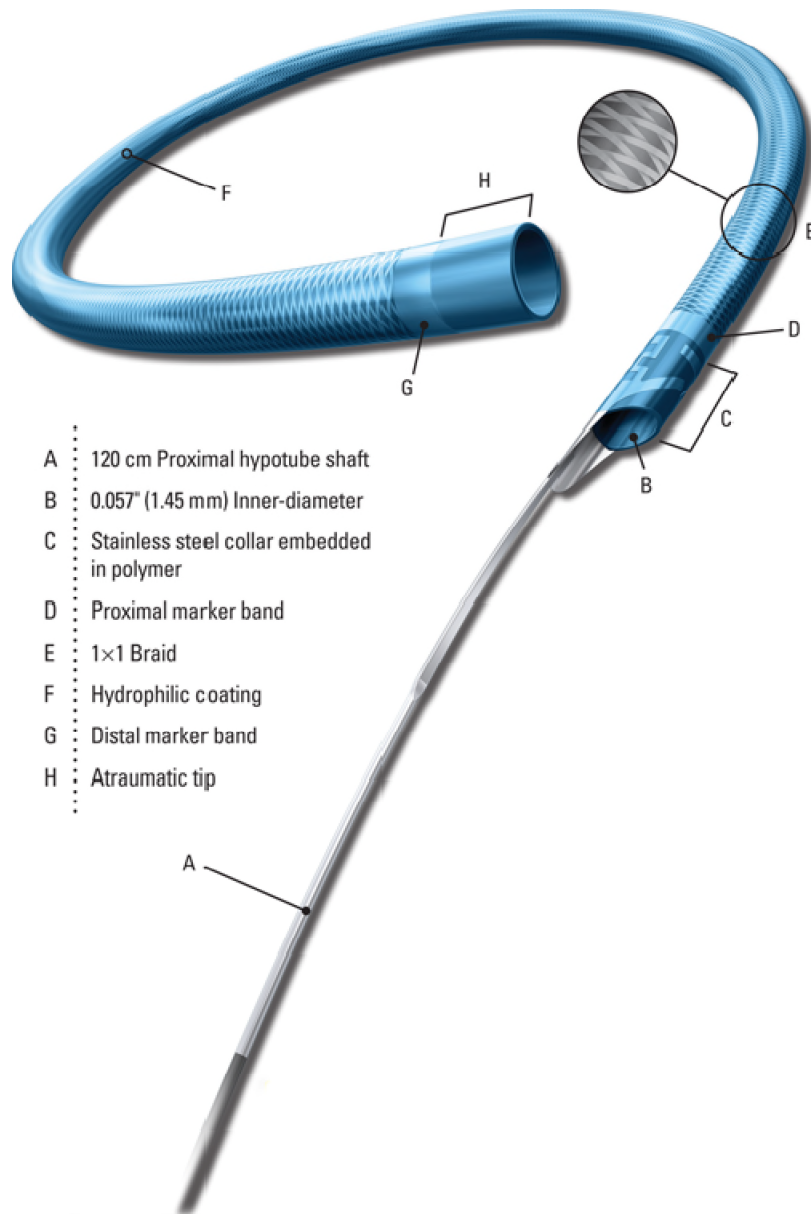


Why?

- Easy to use
- No need for additional devices
- Can be performed ad hoc
- Reproducible
- Great support



Telescopic devices



Guidezilla™ - 5F guide extension catheter is intended to be used in conjunction with guide catheters to access discrete regions of the coronary and/or peripheral vasculature, and to facilitate placement of interventional devices. Length – 25 cm



Telescopic devices

Pros&Cons



Pros:

- Great support
- Same guide wire
- Fast
- Reproducible
- Can be used in ACS

Cons:

- Risk of dissections
- Fail to cross
- Can't be used in vessels < 2,5mm
- Must be performed by experienced operator
- Price
- No chance to use BVS

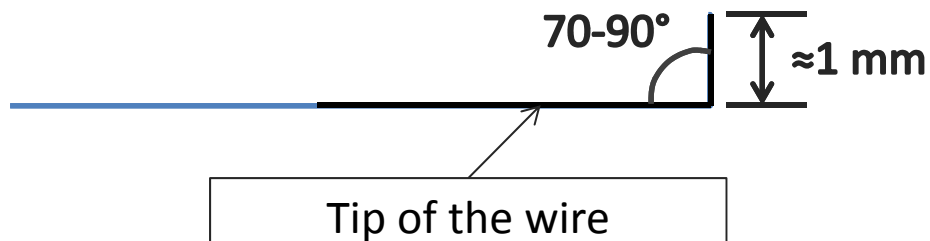
What?

- All soft hydrophilic wires can be used
- In selective cases non hydrophilic wires can be used as well
- Can be used in combination with other devices

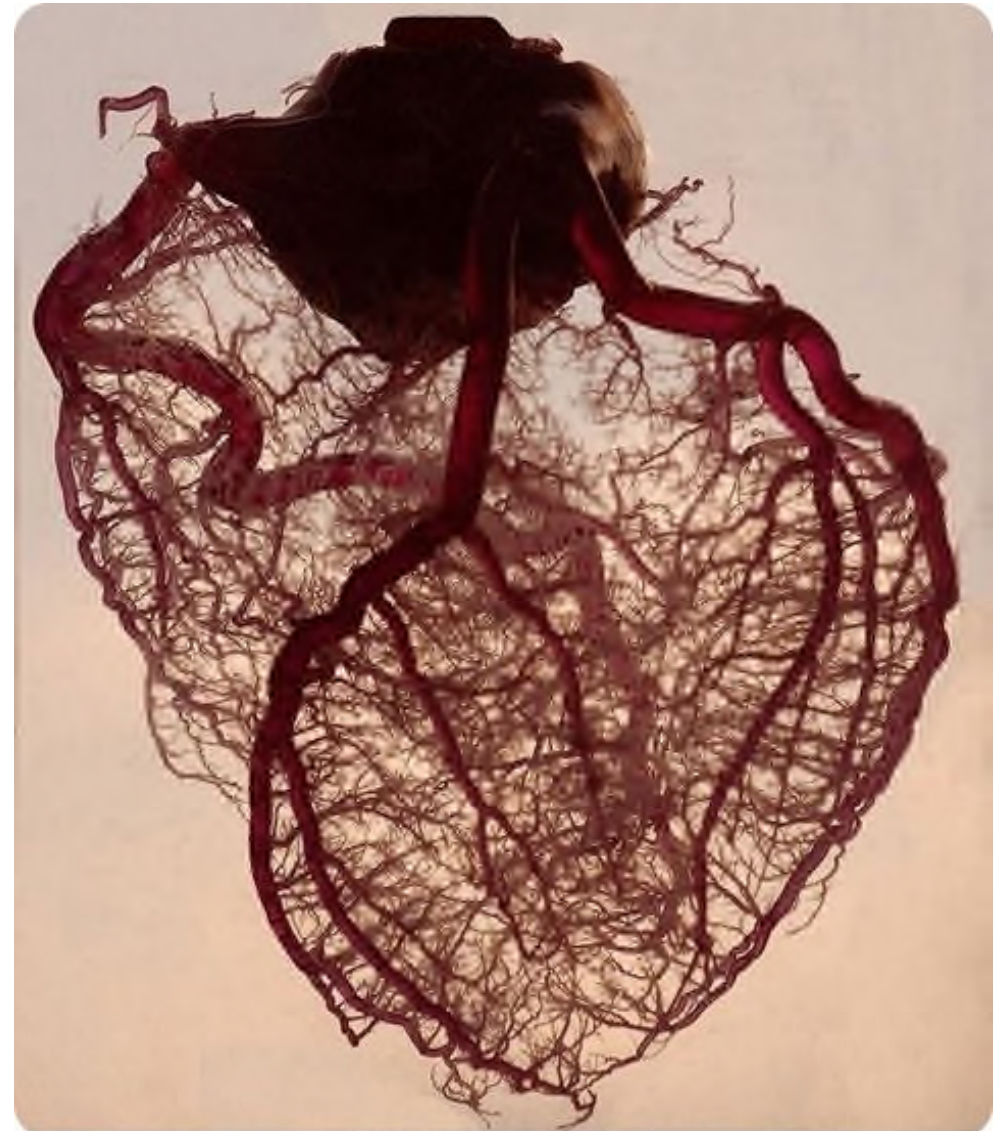


How?

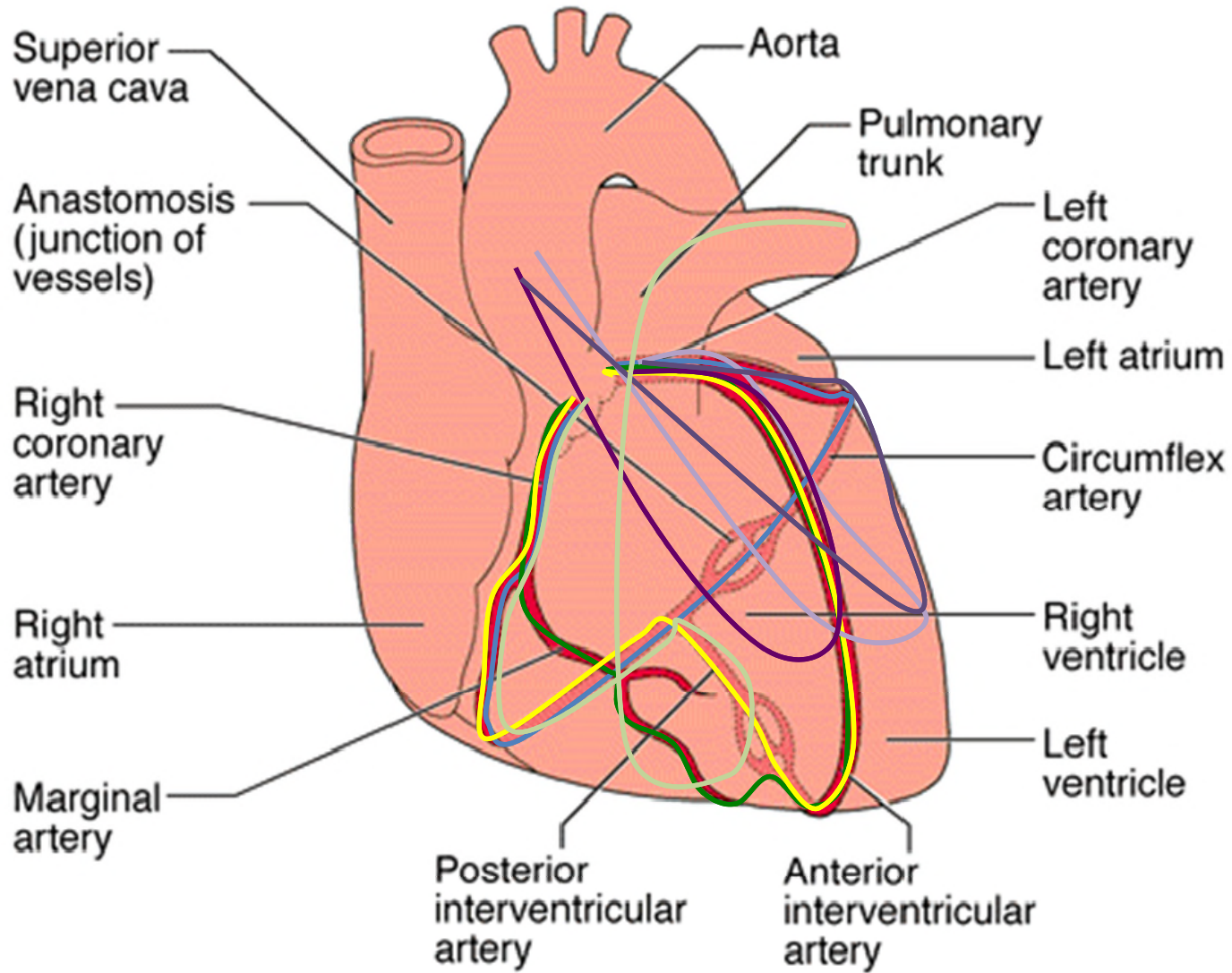
- Tip:



- Wire goes through vessel-vessel or vessel-cavity anastomosis in diastole
- How to penetrate: fast rotation with small purposive movement
- **NB! Don't push the wire – high risk of perforation!**

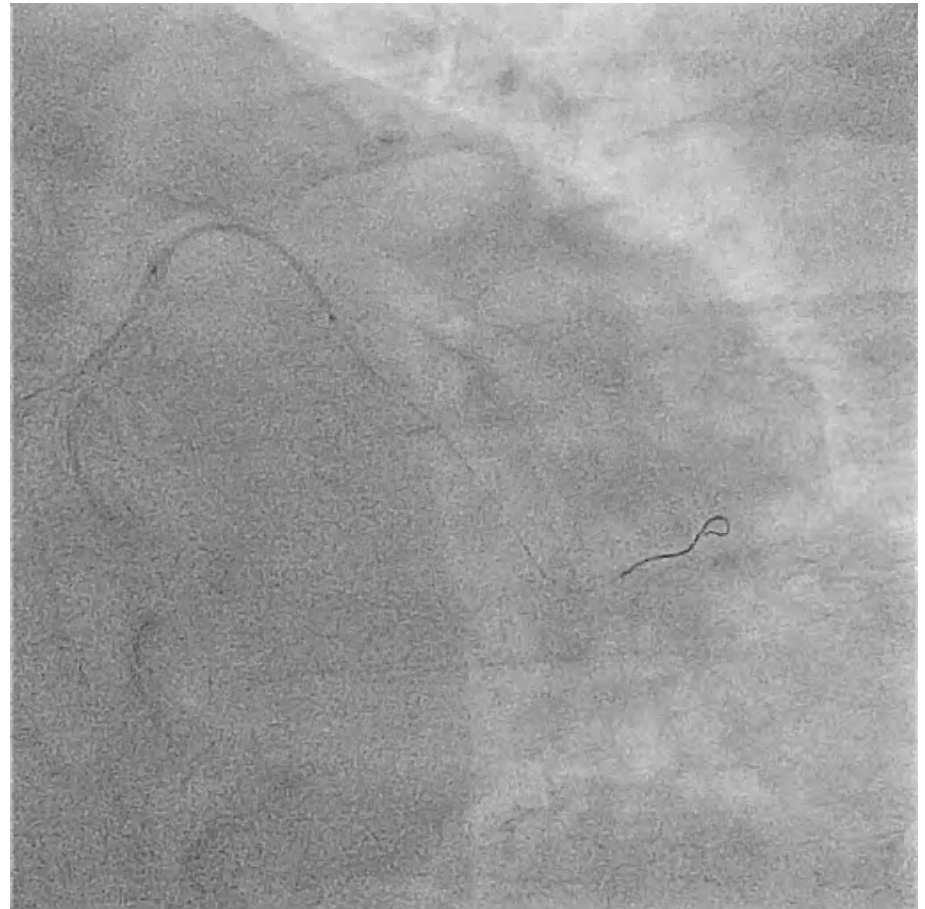


How?



When?

- Guiding catheter is unstable in the ostium
- Balloon or stent fail to cross
- Especially in cases of coronary dissections after dilatation, when its impossible to find true lumen with the buddy wire



When?

Pros&Cons

Pros:

- Best support
- Same guide wire
- Fast
- Safe
- Reproducible
- Still can use telescopic devices or other technics for substantial support
- Price

Cons:

- Can't be performed in ACS
- Arrhythmias
- Must be performed by experienced operator

Aim of the study

To evaluate efficacy and safety of different adjuvant techniques (such as deep wire penetration, telescopic devices, rotational atherectomy) in patients with complex coronary anatomy. And to stratify the decision making process in patients with tortuous, calcified and long lesions

Inclusion criteria

1. Long lesions >70% (more than 20 mm), severe tortuosity, calcified plaques or proximal Ca++ in distally diseased artery, CTO
2. Patients with angina or silent ischemia and documented ischemia
3. Patients who are eligible for coronary stenting
4. And when CABG is not an option (High risk patients with comorbidities or patients after CABG, when re-CABG can't be done)

Exclusion criteria

1. History of bleeding diathesis or coagulopathy
2. ST-elevation acute myocardial infarction requiring primary stenting (in case of deep wire penetration)
3. Contraindication to aspirin, clopidogrel or other commercial antiplatelet agent
4. Reference vessel size less than 2.5 mm by visual estimation (in case of telescopic devices)
5. Non-cardiac co-morbid conditions are present with limited life expectancy or that may result in protocol non-compliance

Angiographic characteristics

	Deep wire penetration (n=388)	Telescopic devices (n=51)	Rotational atherectomy (n=53)
LM	-	-	3
LAD/DB	98	6	31
LCX/MB	151	25	11
RCA	163	20	14
CTO	96	13	5
Prior CABG	46	17	22
SYNTAX score	21,1	23,4	31,2
Multiple techniques used in one case	20	16	12

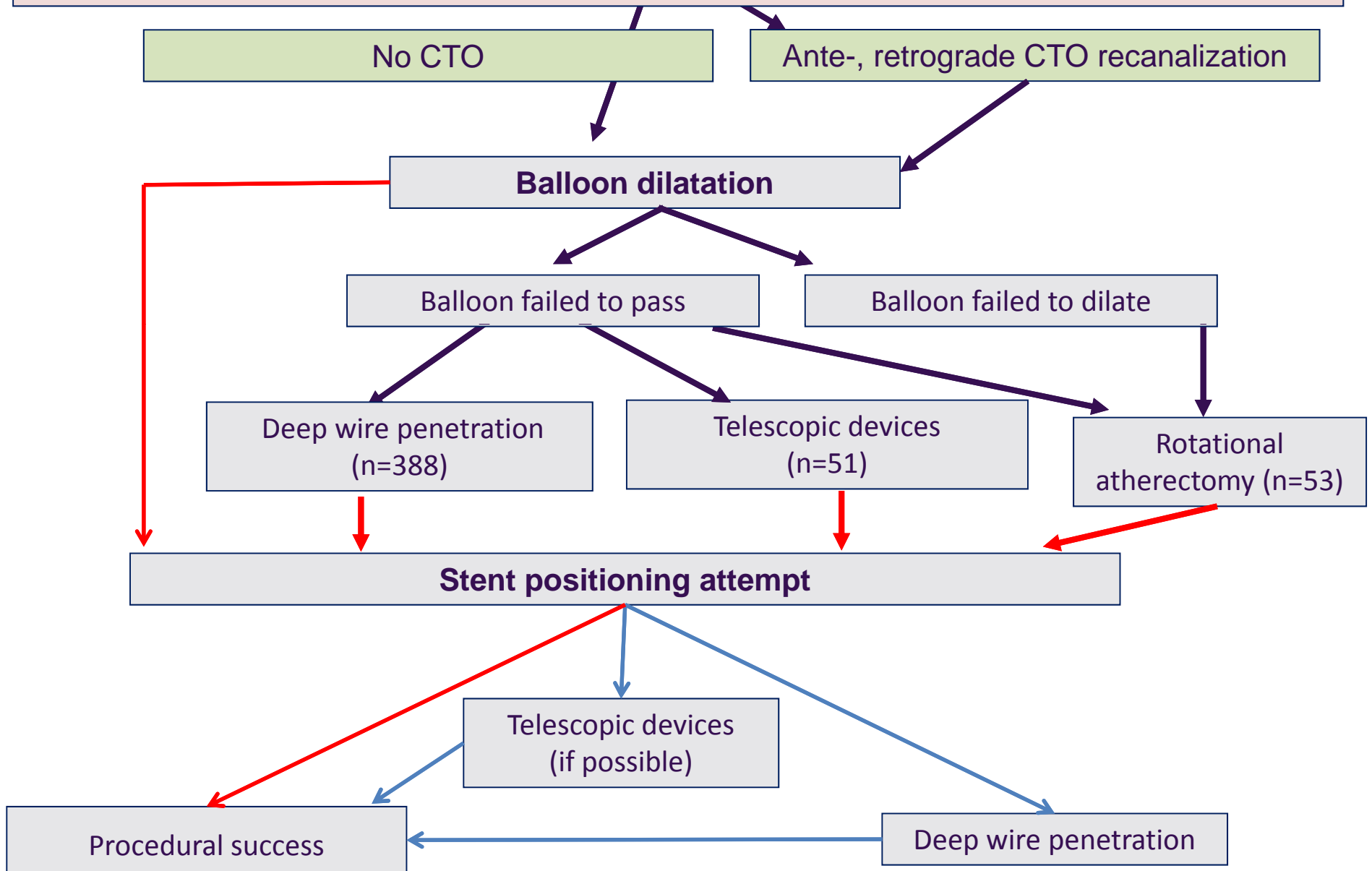
Procedure success in complex coronary anatomy

	Conventional PCI (2010-2013)	With adjuvant techniques (after 2014)
Procedure success (incl. CTOs)	85 %	97 %
In CTOs	74 %	86,7%
Mean contrast media volume	210±140 ml	120±90 ml
Fluoroscopy time	35±21 min	20±18 min
Number of wires used	3,2	1,8

Complications

	PCI (n=461)
Wire perforation	3 (0,7%)
Cardiac tamponade	0
Collateral injury	3 (0,7%)
In-hospital death	0
In-hospital MI	2 (0,4%)
Significant restenosis after rotablation @ 1y fu (n=53)	1 (1,8%)

461 Patients with complex coronary anatomy (total n=2100 PCIs in 2015-16)

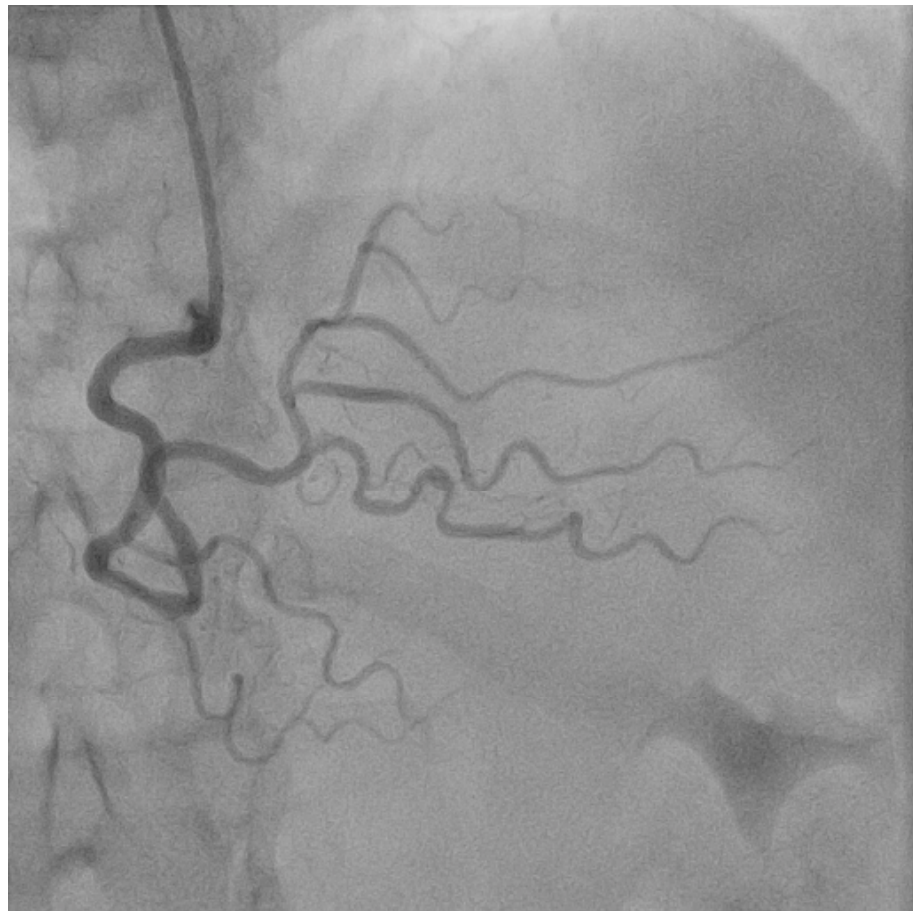


70 yo female patient,
Stable angina 3-4 class, Long history of Hypertension,
BP up to 200/120 mm Hg

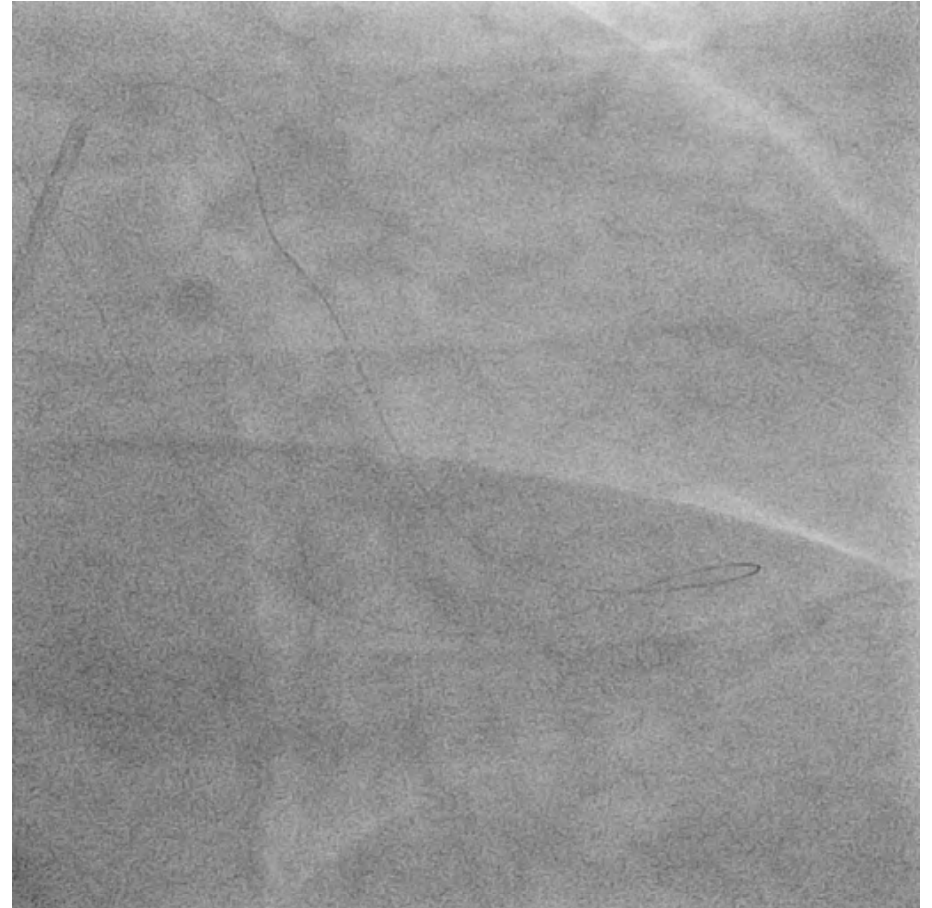
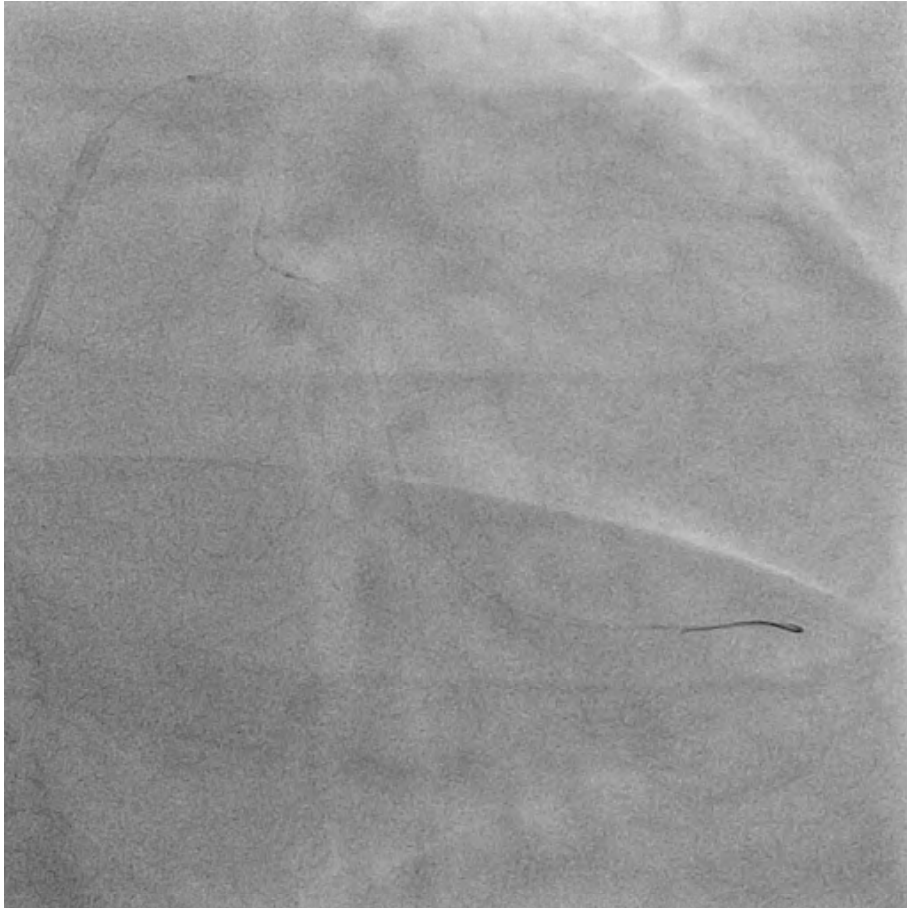


Long and tortuous lesions in RCA and LCx

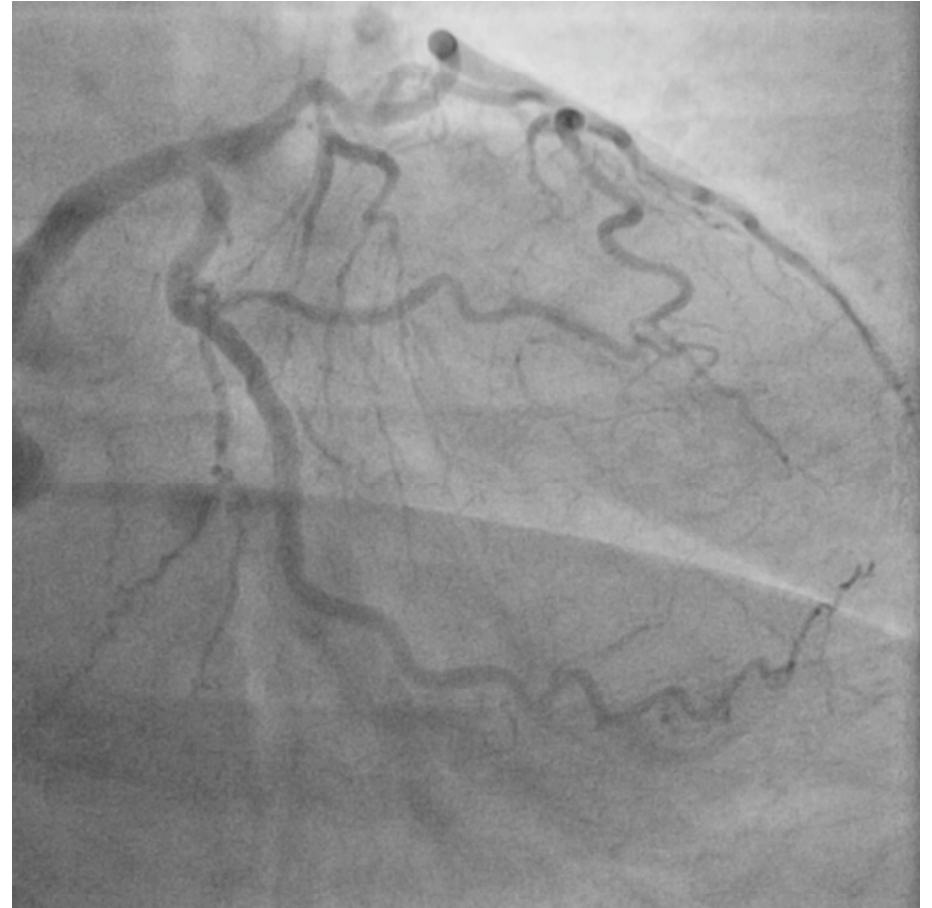
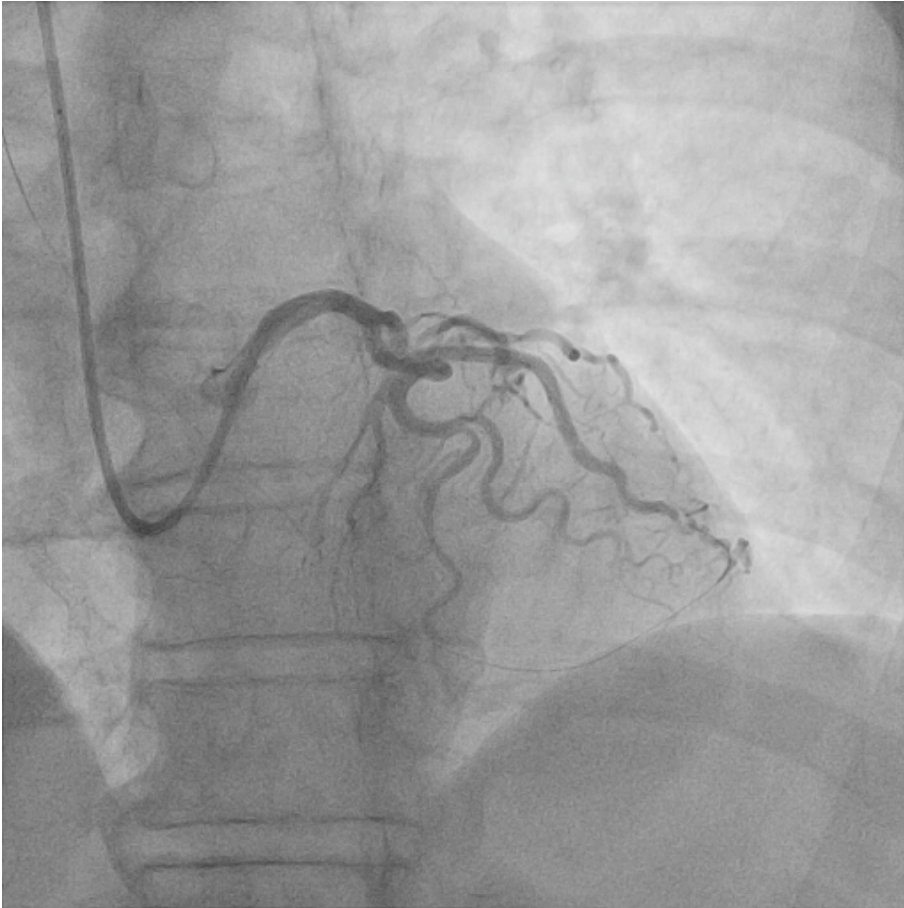
Result



Deep wire penetration



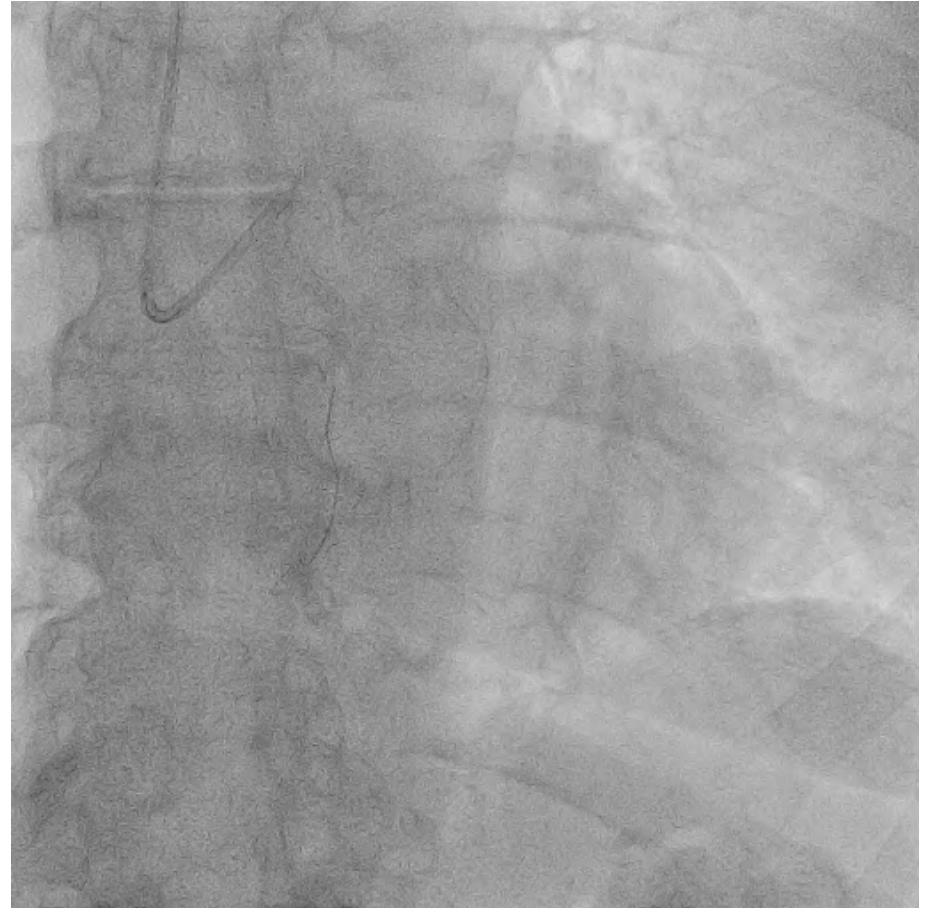
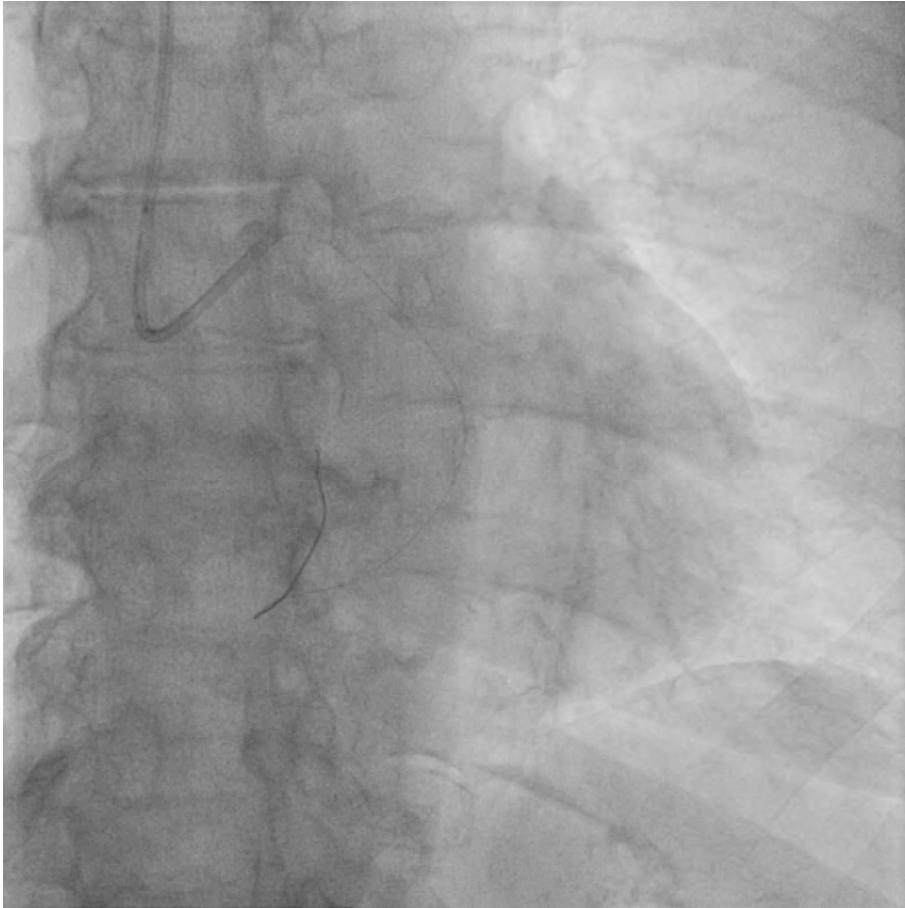
Result



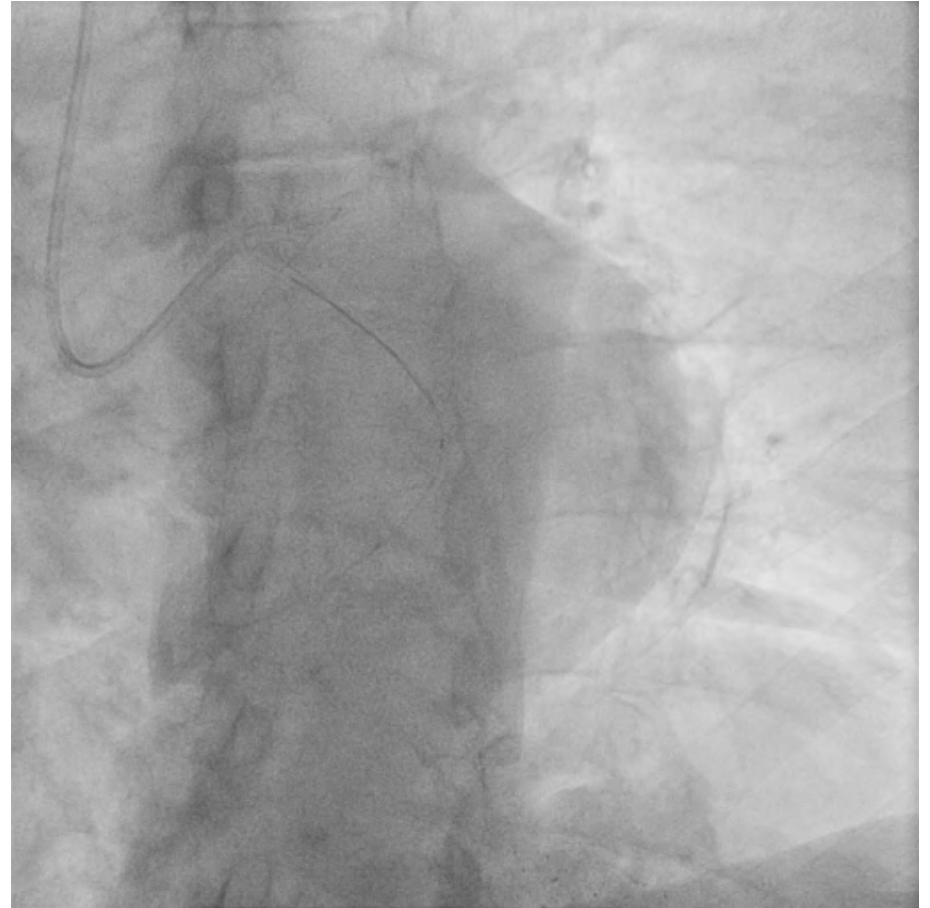
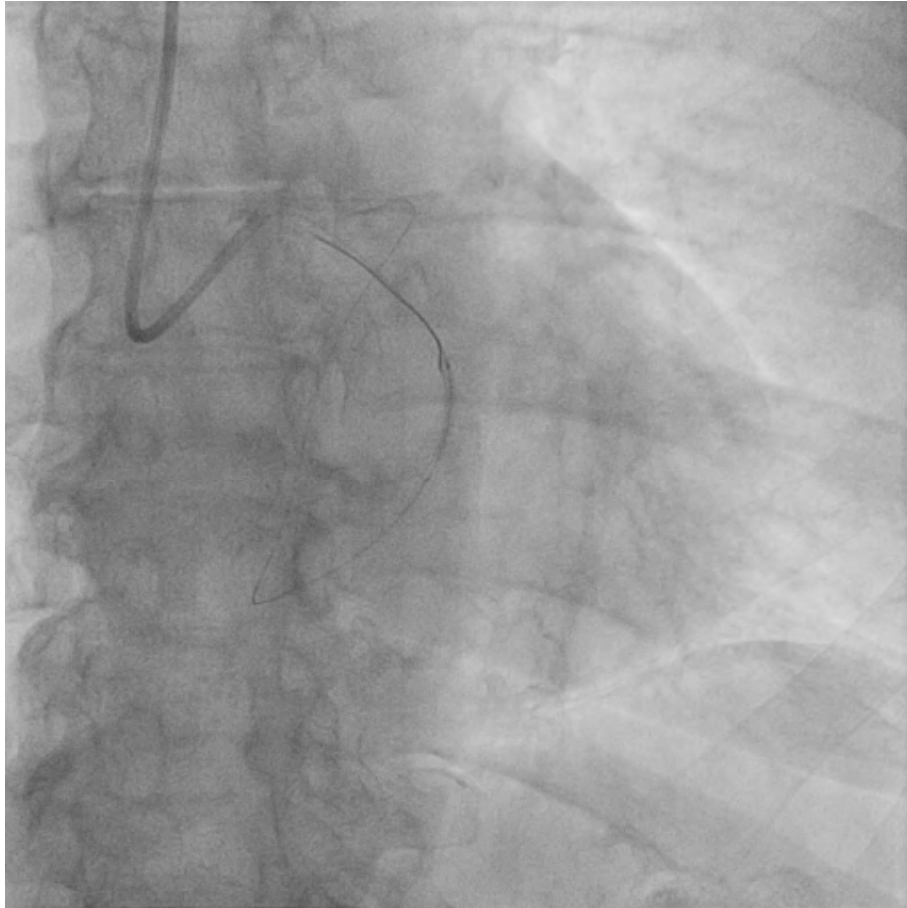
67 yo female patient,
Stable angina class 3,
Long history of hypertension



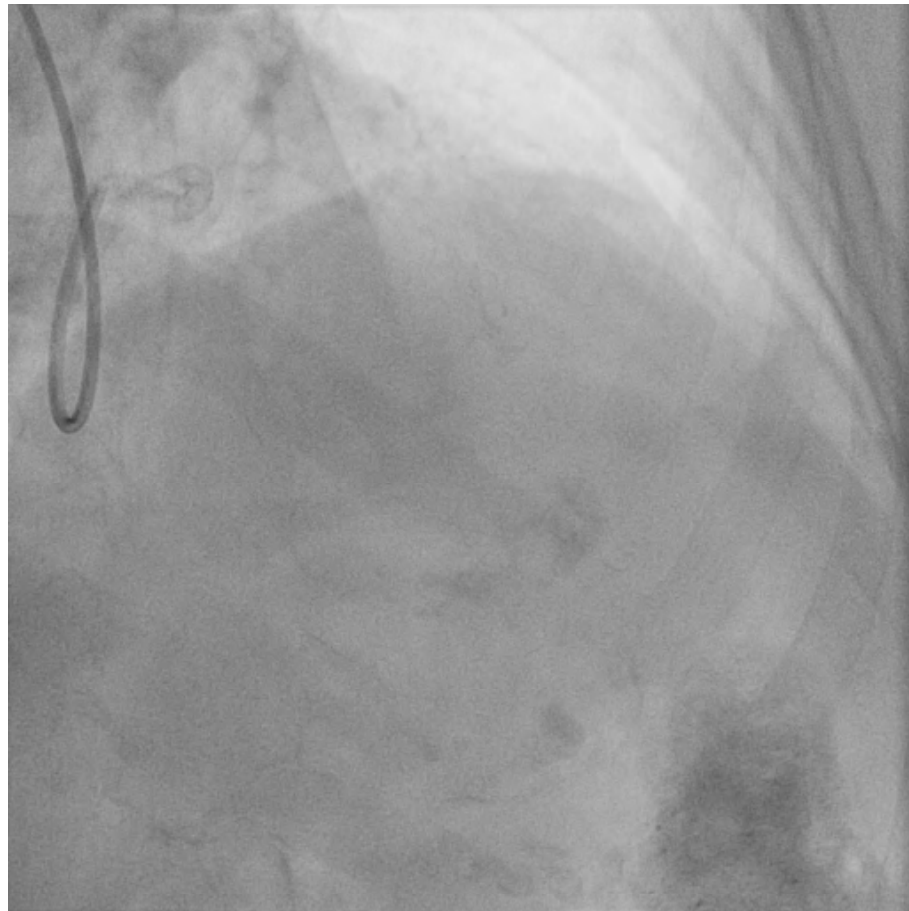
Deep wire penetration



Deep wire penetration



Result



Take home message

- In patients with long and calcified lesions when balloon fails to cross or dilate use of rotational atherectomy is safe and associated with higher procedural success rate, the restenosis rate at 1y fu is low
- Use of deep wire penetration technique and telescopic devices is safe and allows to improve support during balloon or stent delivering and positioning
- Adjuvant techniques improve success rate of PCIs in complex coronary anatomy cases, at the same time reducing the fluorotime and contrast media volume