



北京朝阳医院  
BEIJING CHAO-YANG HOSPITAL

# A case of CTO case by treatment of drug coated balloon following ADR assisted Stingray balloon

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## General information

Male, 48 years old

## Chief complaint

Intermittent chest pain lasting for 15 years

## Present illness

The patients felt chest pain following the defecation about 15 years ago.

The pain present as crushing, severe and unchanged by the treatment of nitroglycerin;

The patients was diagnosis as "AMI" and received primary PCI;

The similar symptoms reoccurred about 8 months ago;

The angiology indicated the chronic lesion in the distal segment of previous stents and failed to treat by the PCI about 6 months ago before admission;

### Coronary Risk factors

Diabetes mellitus presented for 1 year without medication;  
Hyperlipidemia lasting for 15 years with treatment of rosuvastatin 10mg per night and ezetimibe 10mg per night;  
Smoking 2 packs/day lasting for 20 years, and quit for 8 years.

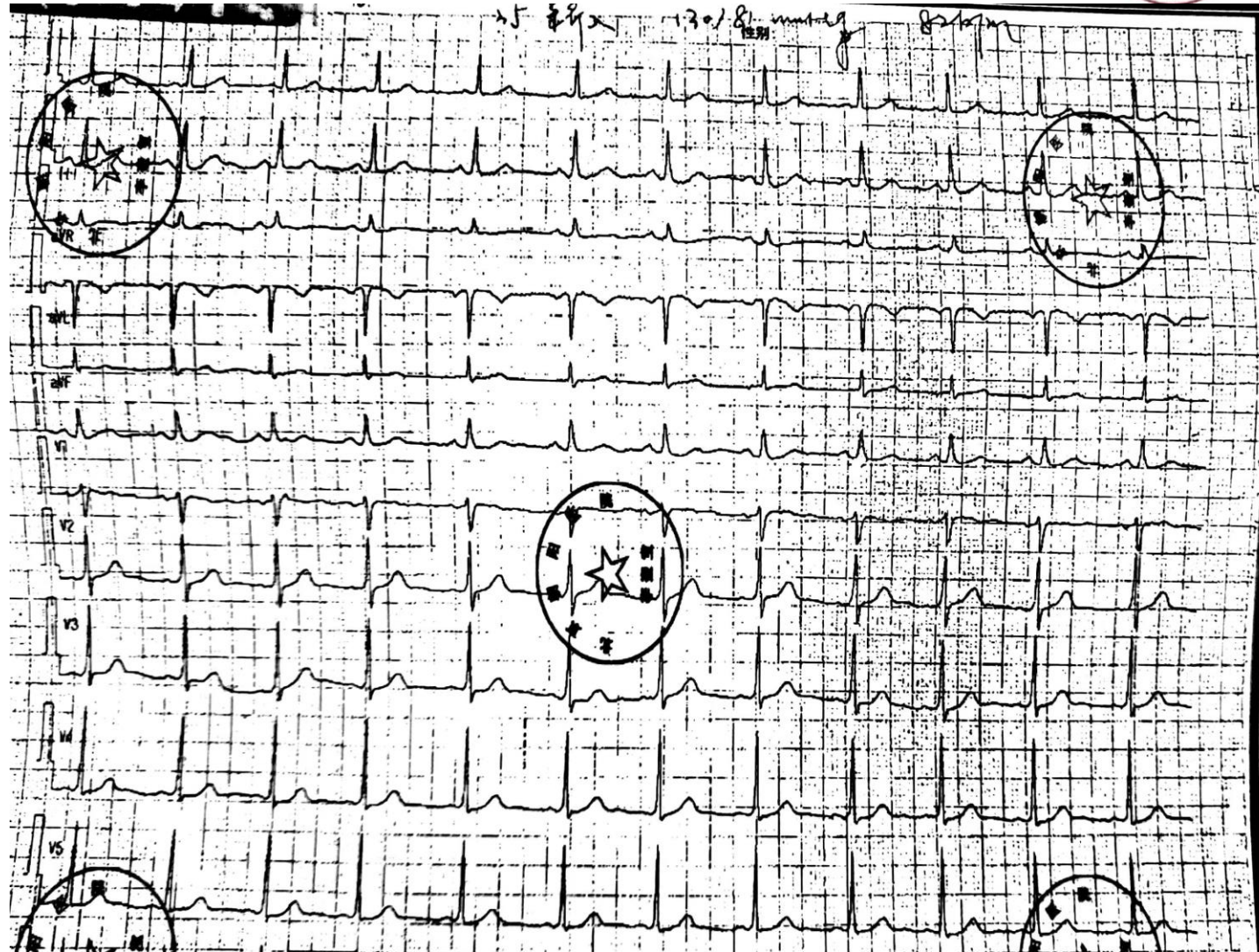
### Family history

Patients admits a family history of coronary artery disease associated with his two parents;

### Vital signs and cardiac

Temp 36.5°C, HR 57bpm, Resp 20bpm, BP 139/81mmHg  
The apical impulse on heart palpation is located in the left border of cardiac dullness in the midclavicular line. Heart auscultation reveals rhythm is regular, normal S1 and S2.

- Echocardiogram (2-26) : LVEF 69%, normal systolic function;
- Blood routine test: WBC  $6.63 \times 10^9/L$  ; N% 70.9% ; HGB 140g/L; PLT  $215 \times 10^9/L$ ;
- Liver and renal fuction: LDL: **1.09**mmol/L; TG: 1.97 mmol/L; AST: 14U/L; ALT: 14 U/L; Cr: 71.5 mmol/L; K : 4.0 mmol/L;
- cTnl: **0.00** ng/mL
- BNP: **<100pg/ml**

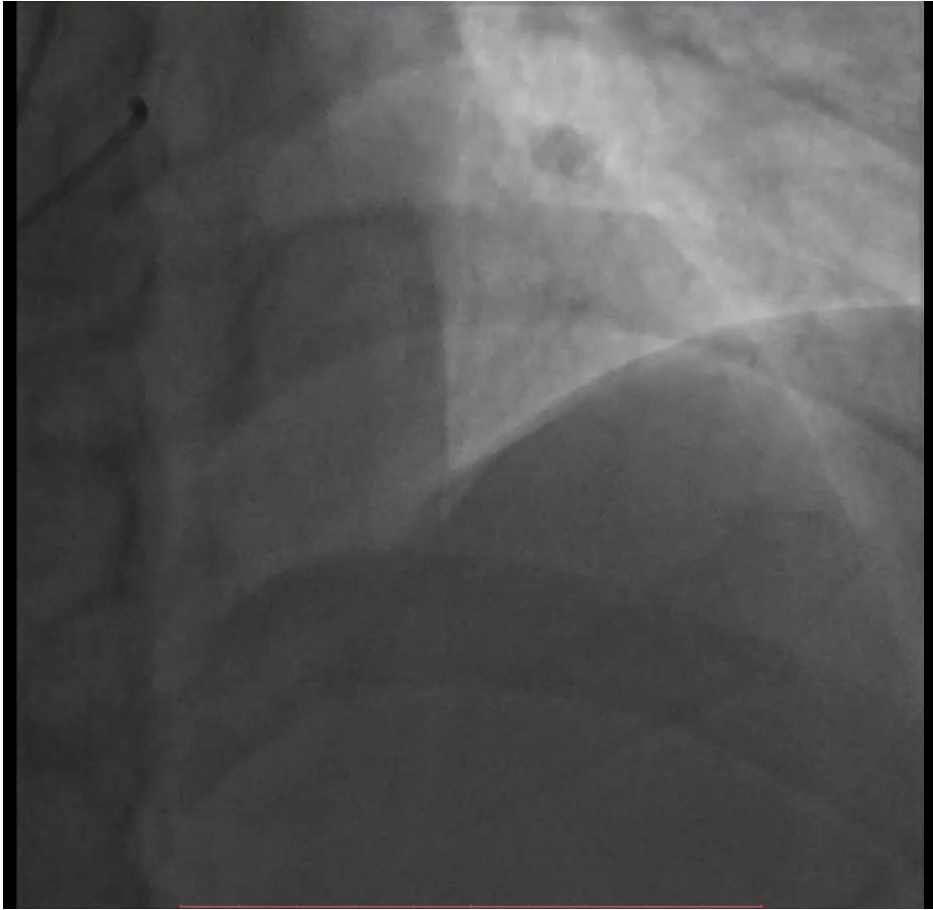


No significant abnormal ST-segment changes



**Stable angina**  
**Coroary artery disease**  
**prior myocardial infaction**  
**Hyperlipidemia**  
**2 type Diabetes Mellitus**



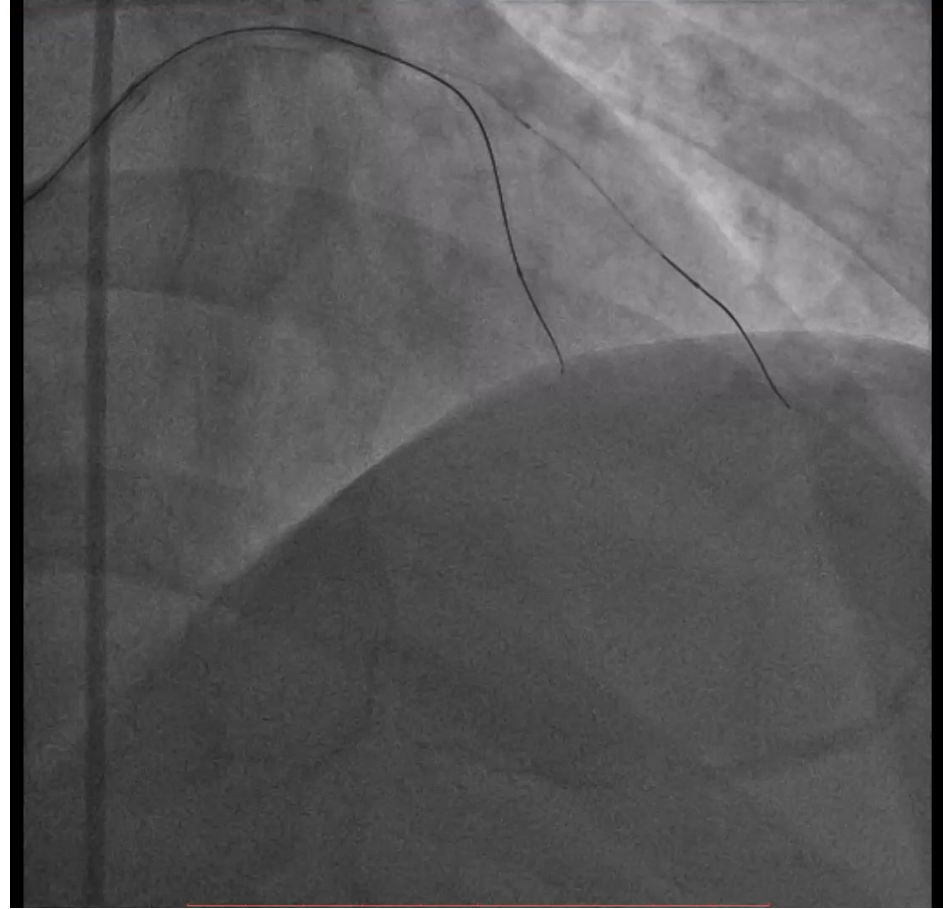
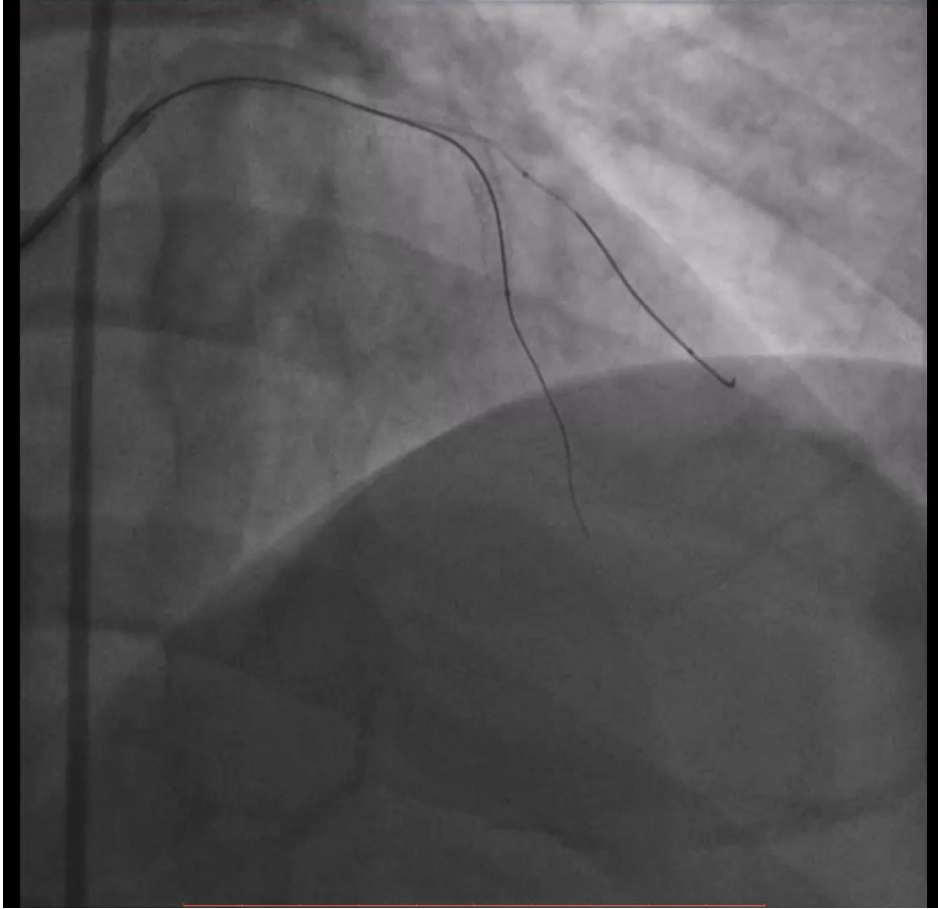


There is stents implanted in the proximal-middle of LAD

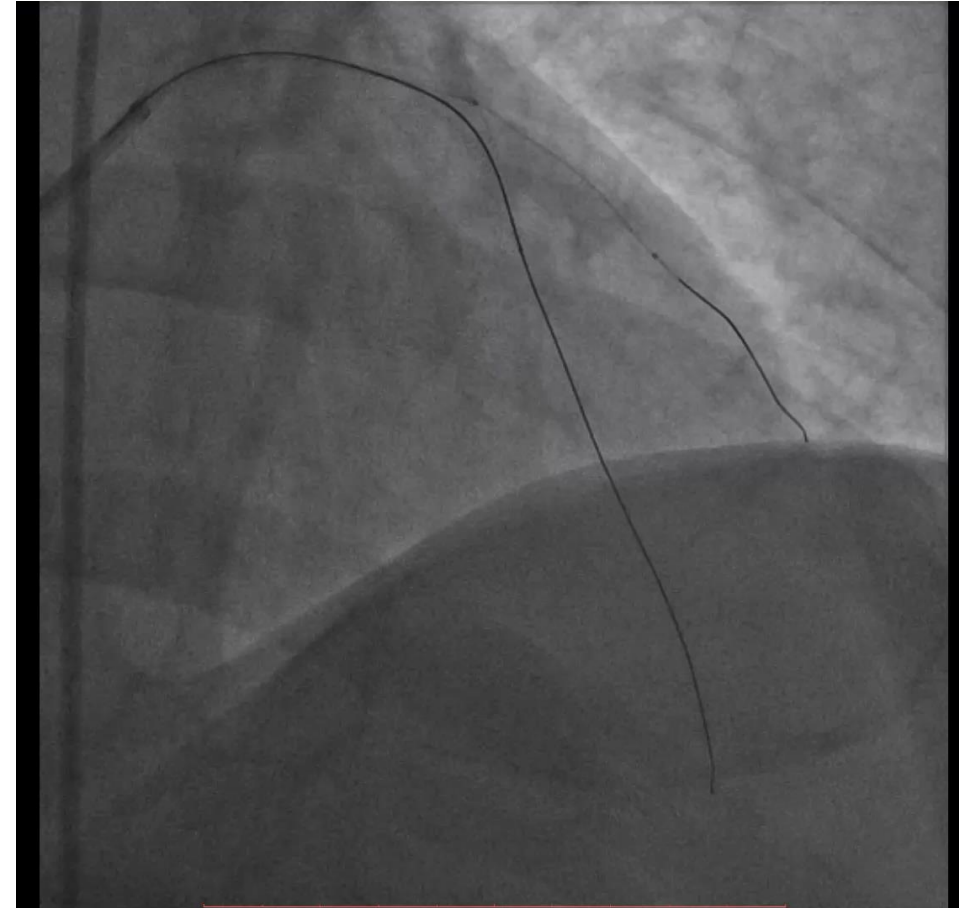
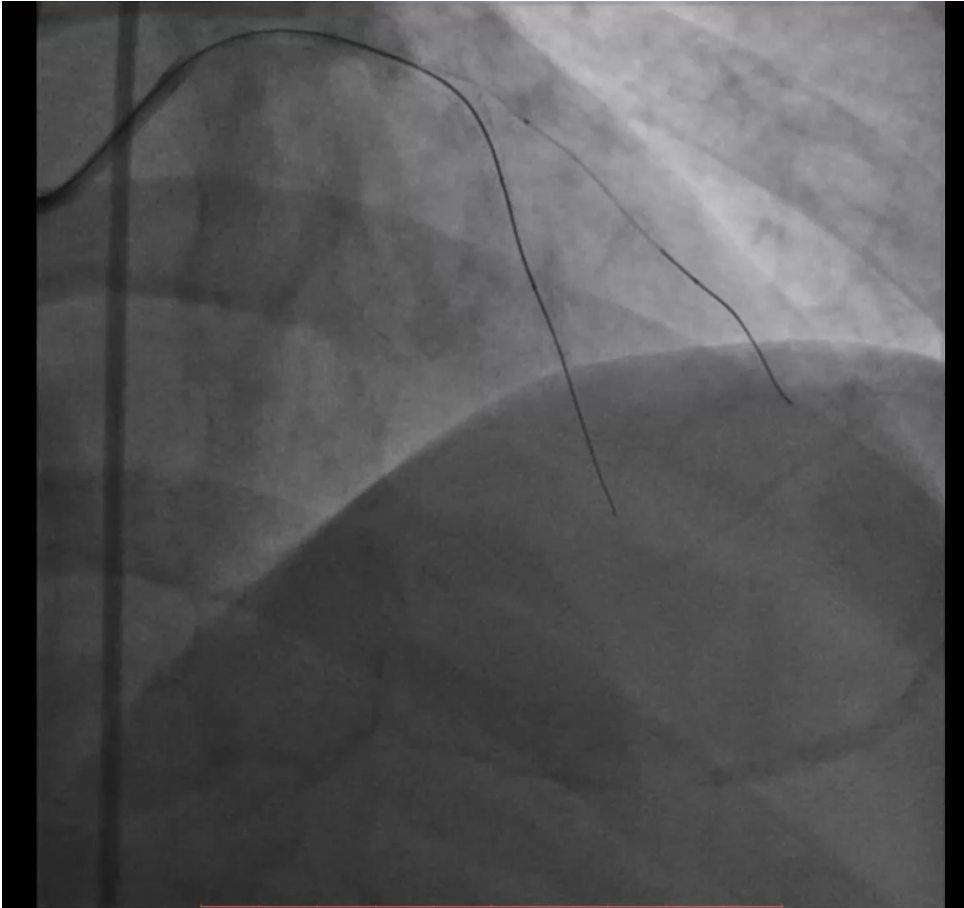
PCI six months ago



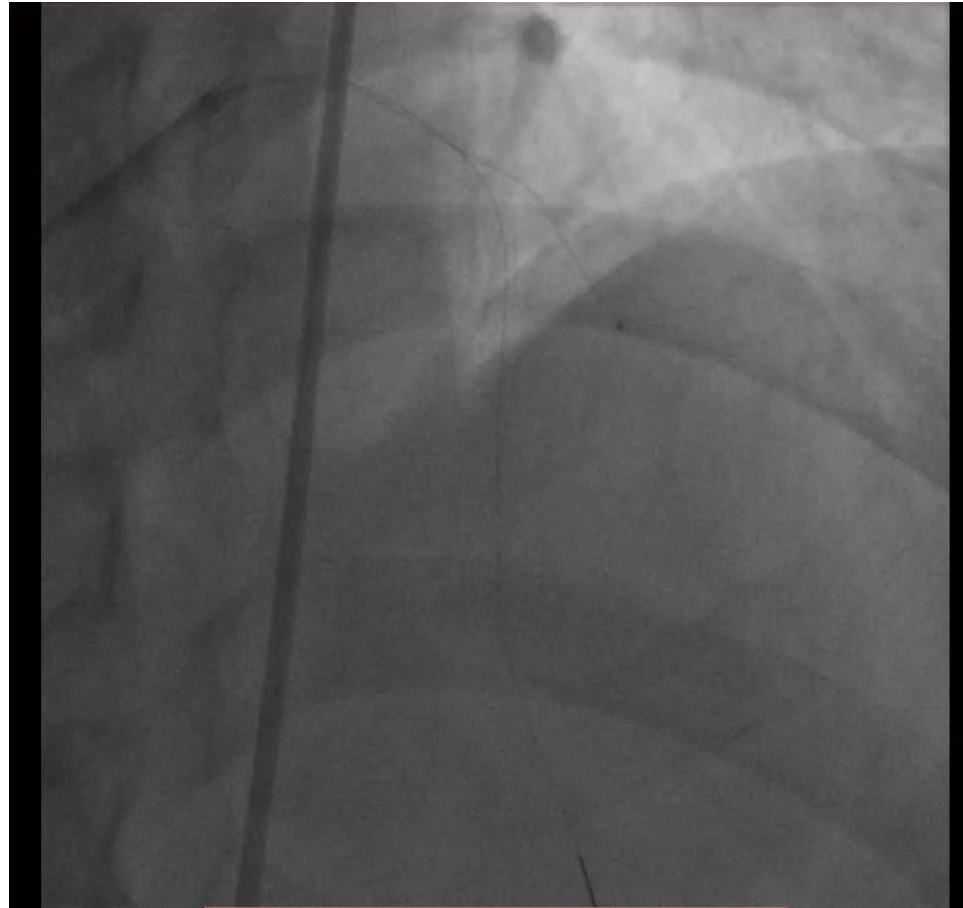
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- Conquest Pro Wire finally penetrated into the distal true lumen of LAD confirmed by the reverse microcatheter
- Followingly, the 1.5mm balloon was used for dilating the CTO lesion;

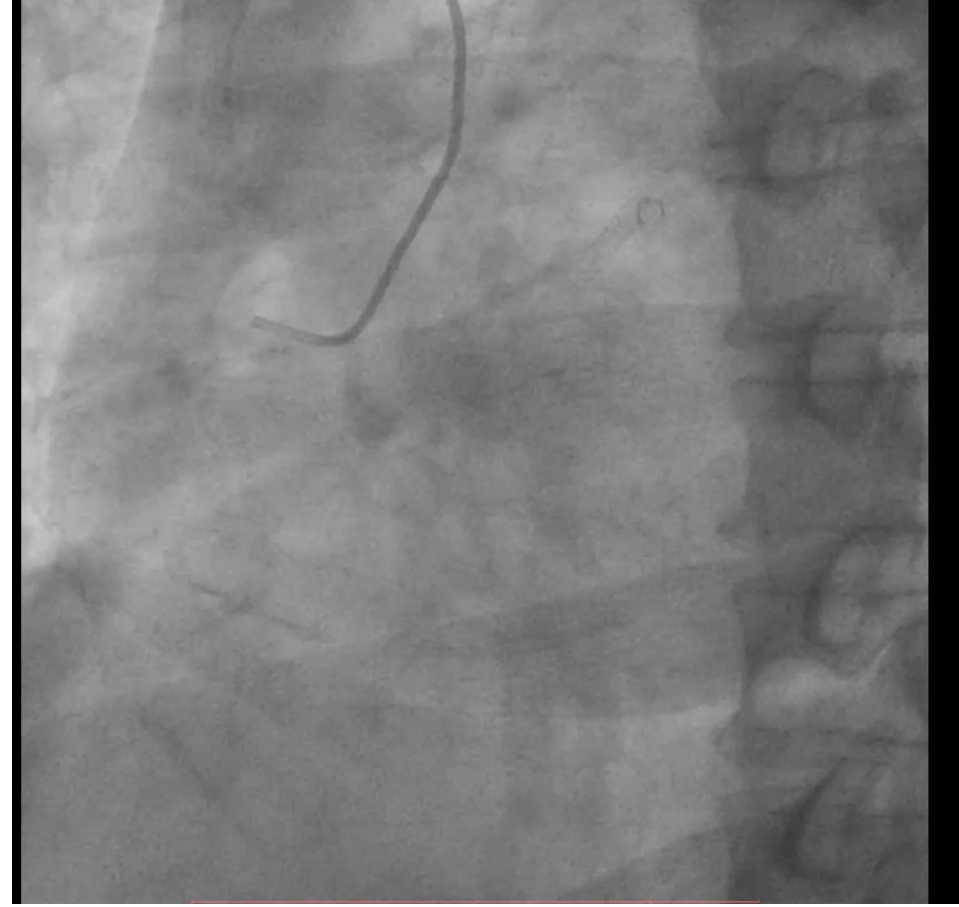


- Final angiology presented the dissection occurred in diffuse LAD distal segment

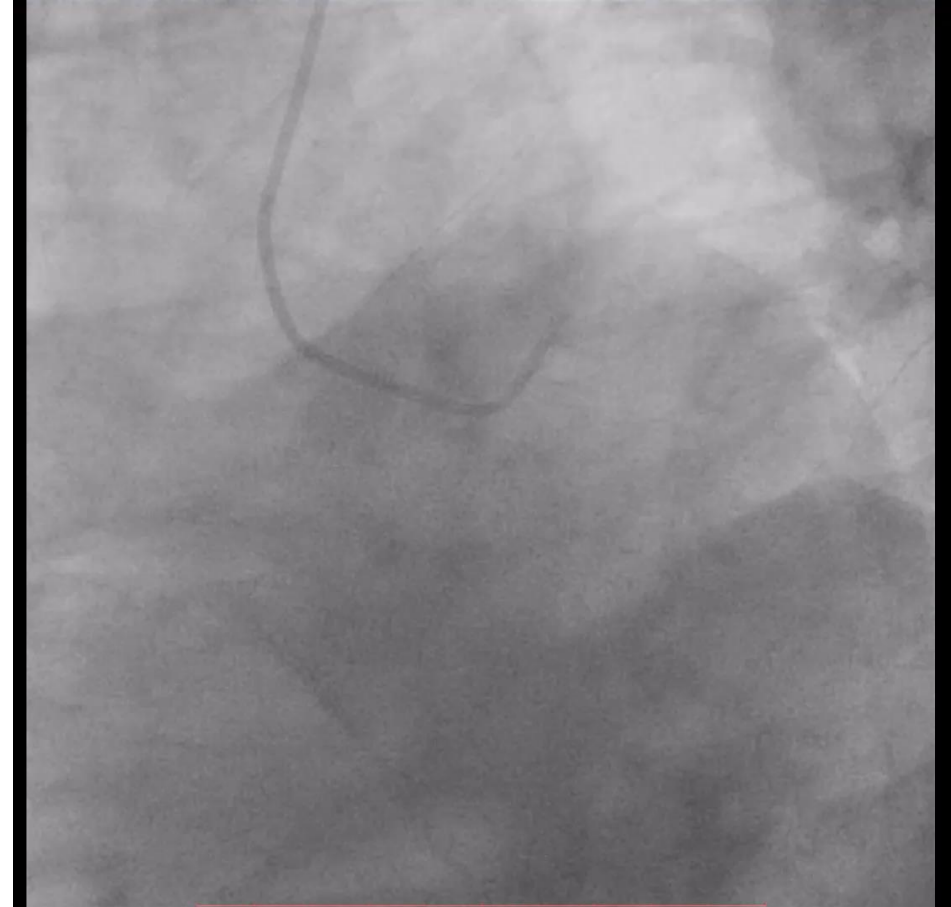


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**What is the prognosis for the long subintimal tracking?**

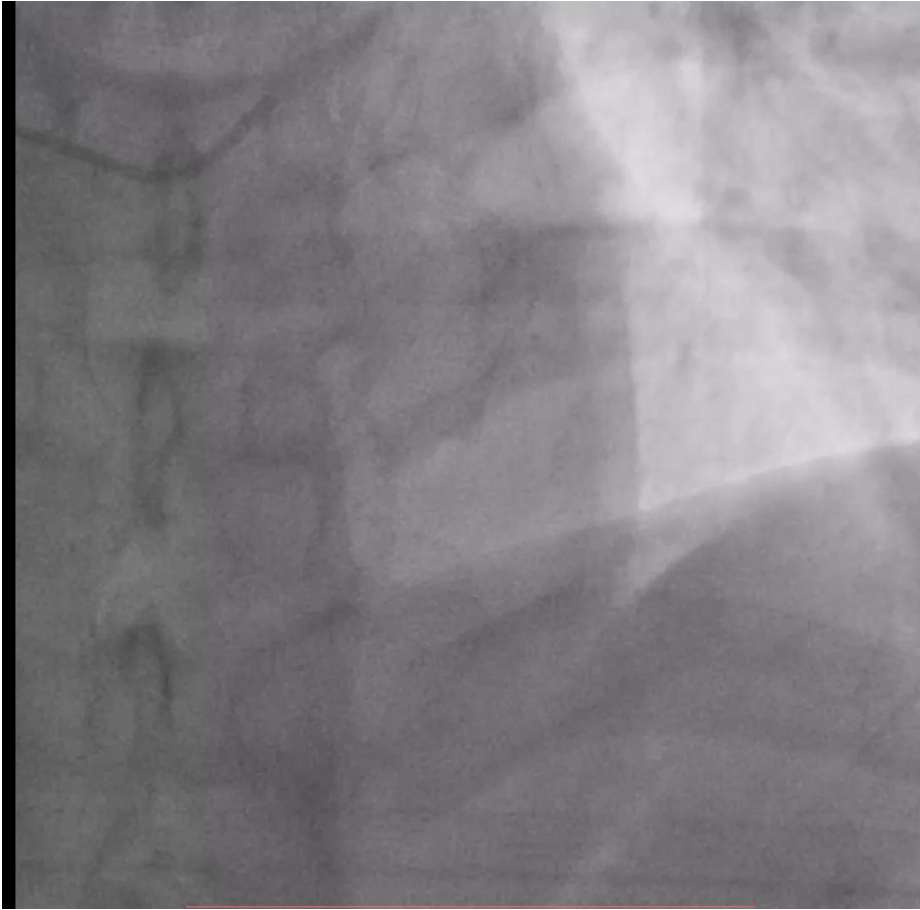


- Angiology indicated that 50% local stenosis at RCA proximal segment

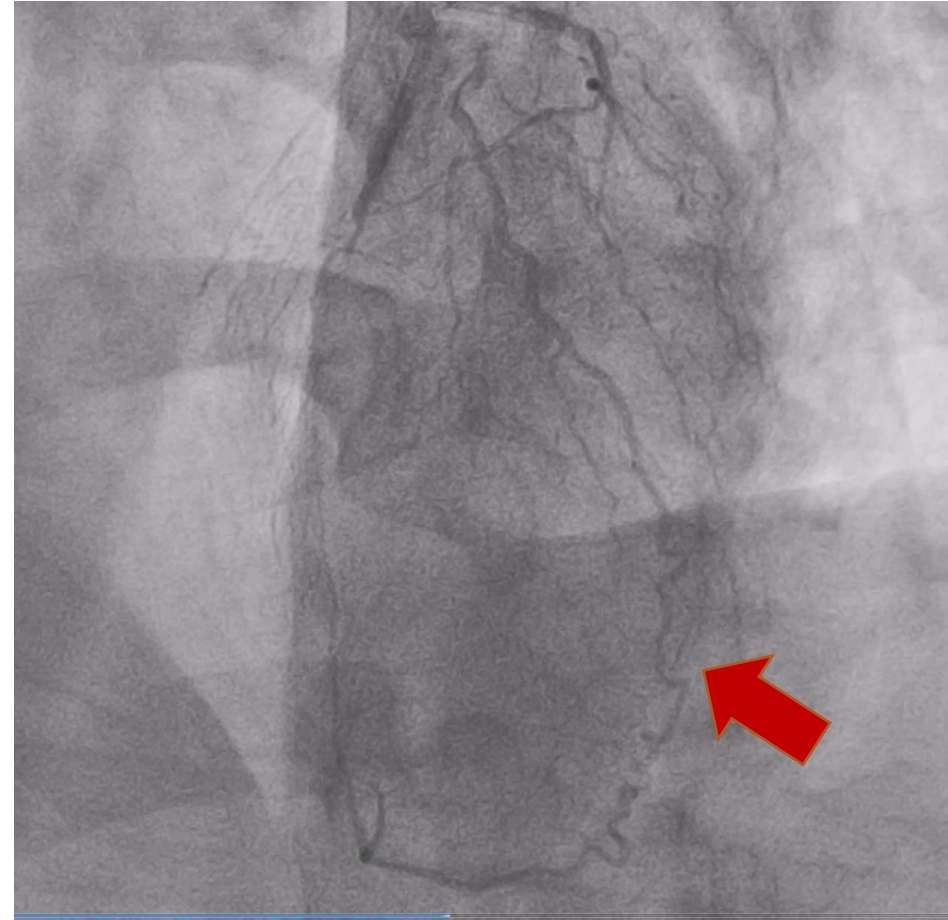
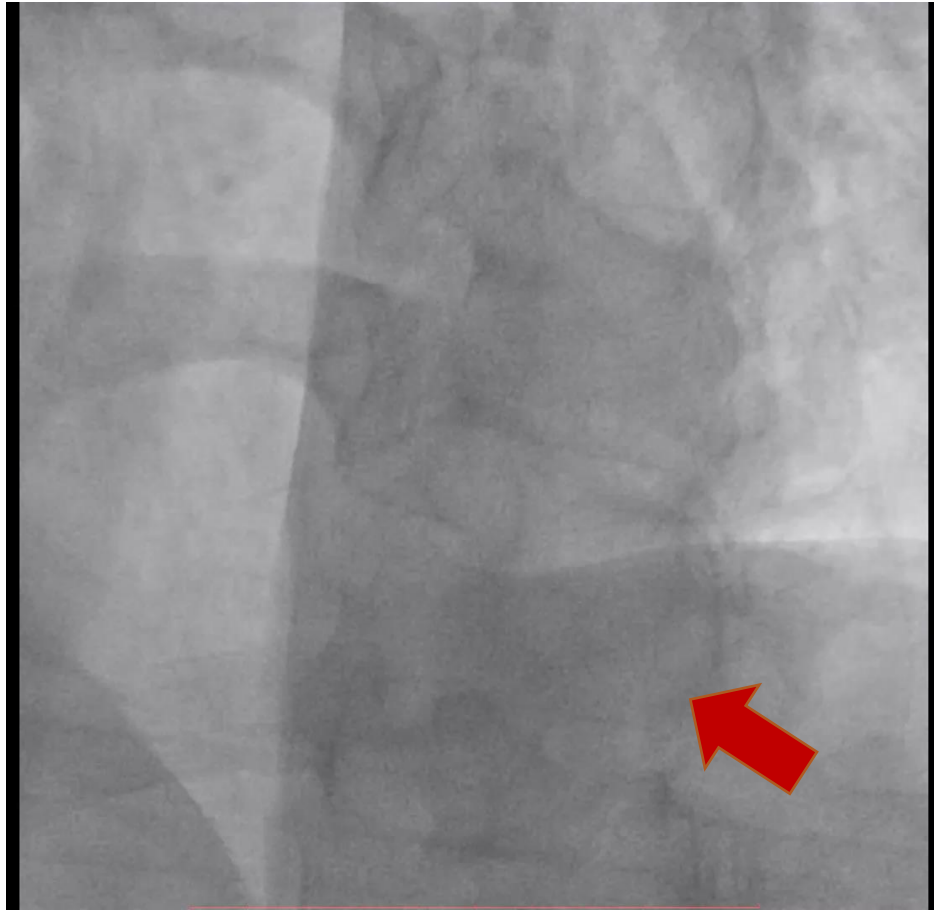


The occlusion in the middle segment of LAD reoccurred at the time of six months

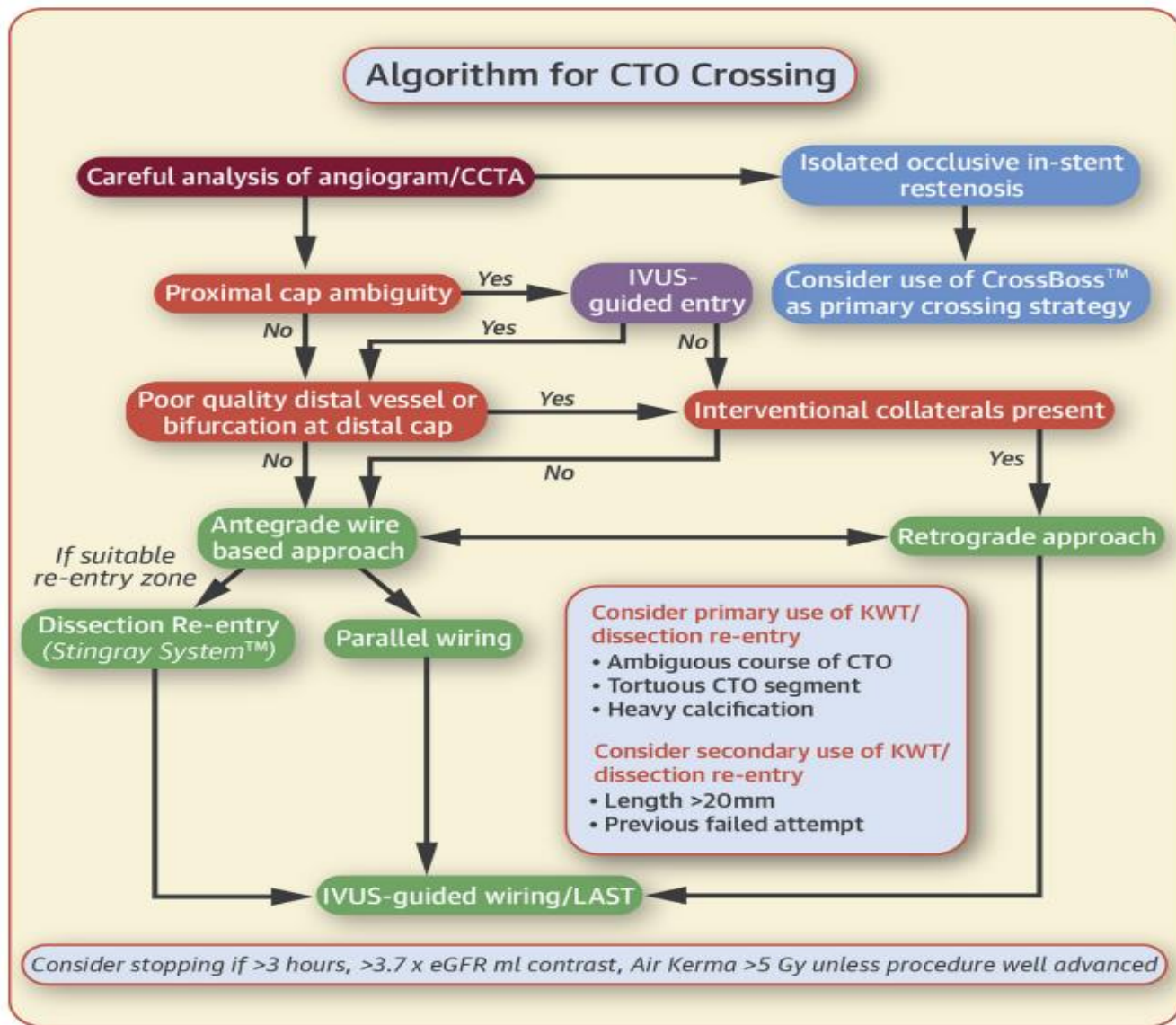


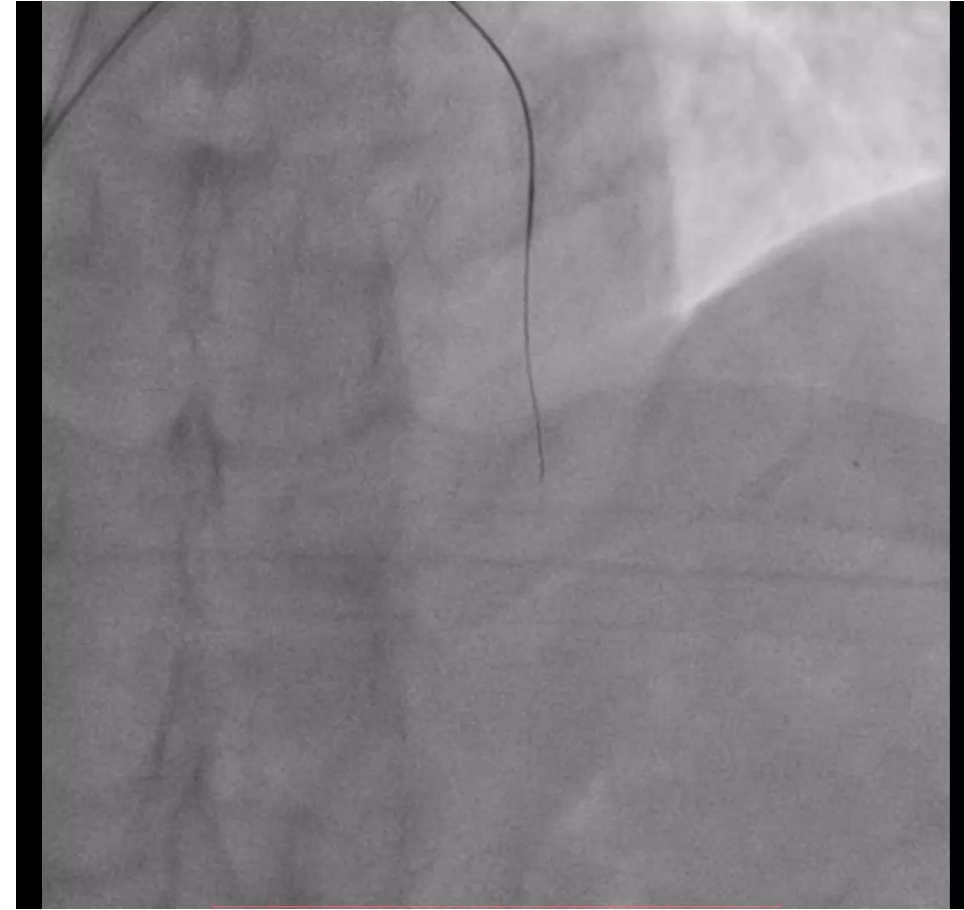
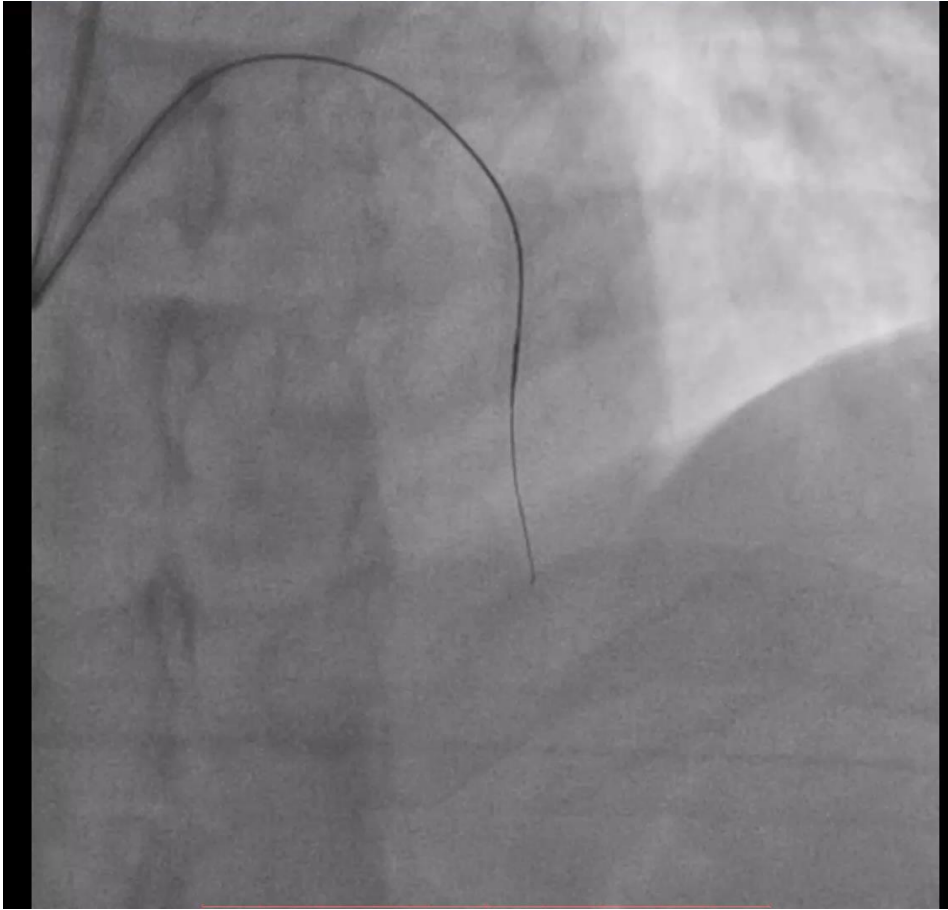


- Collateral vessels from D1 to the distal of LAD with TIMI grad 3 flow



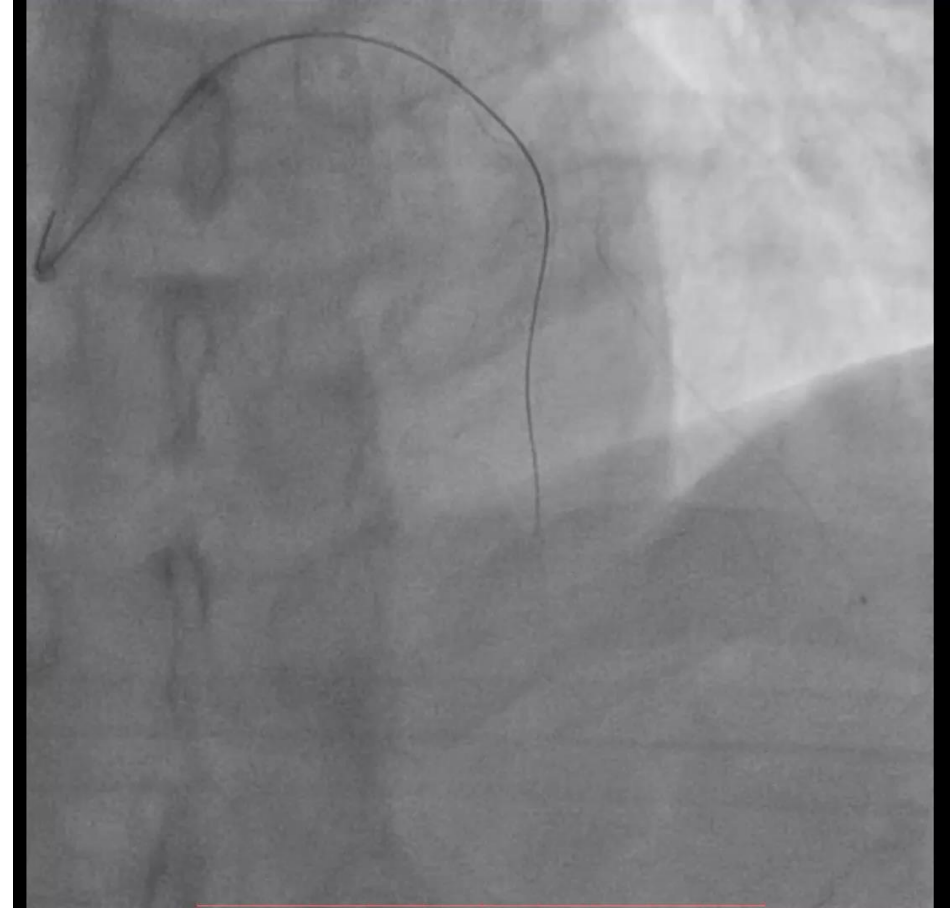
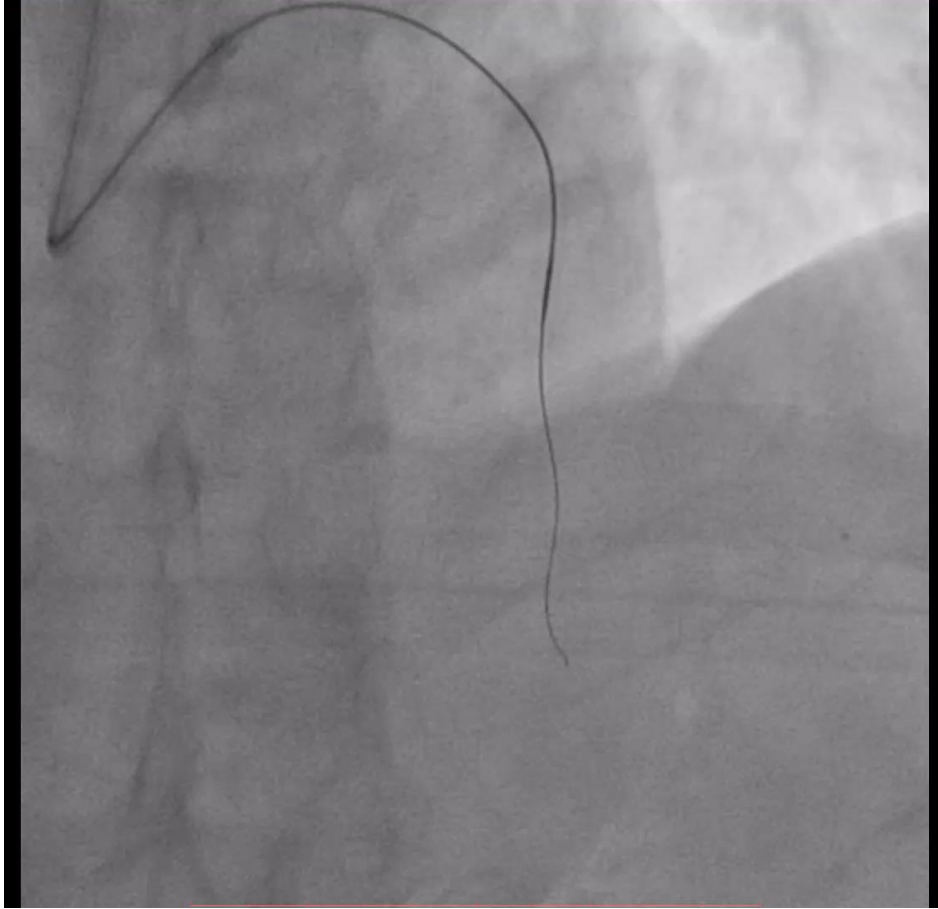
- Microcatheter provides the angiography by collateral vessels from D1 to the distal of LAD;
- The collateral flow is good and tortuous;





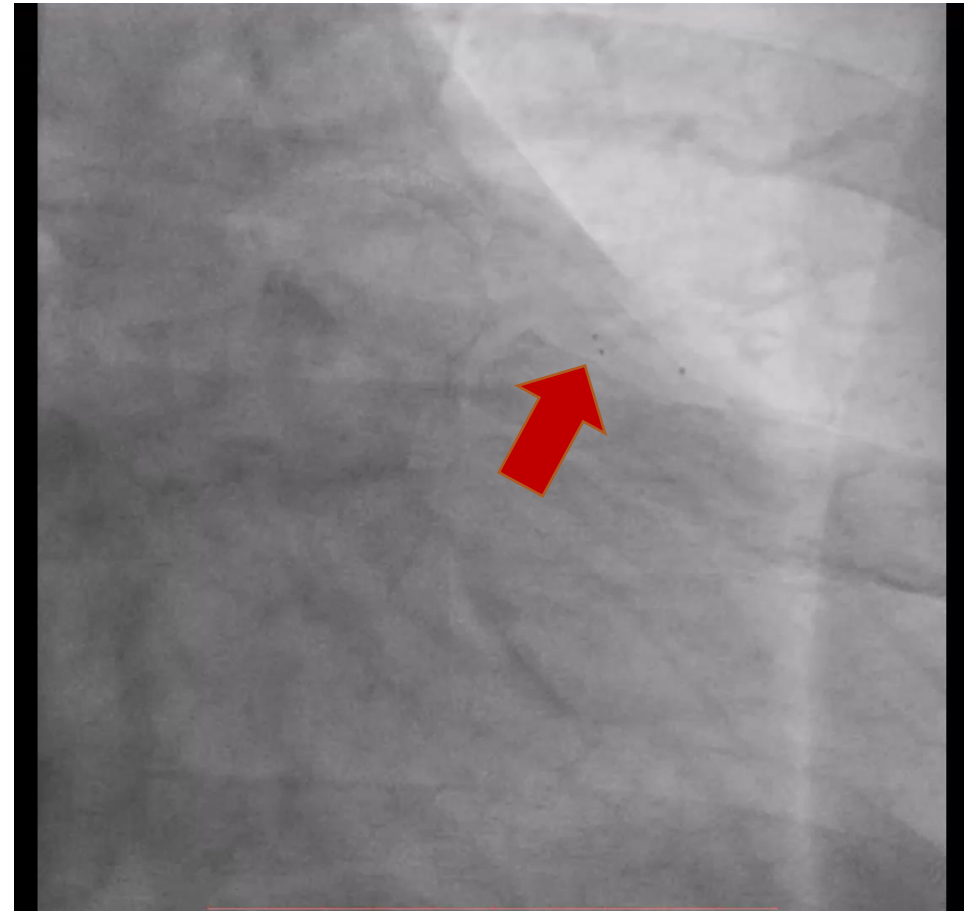
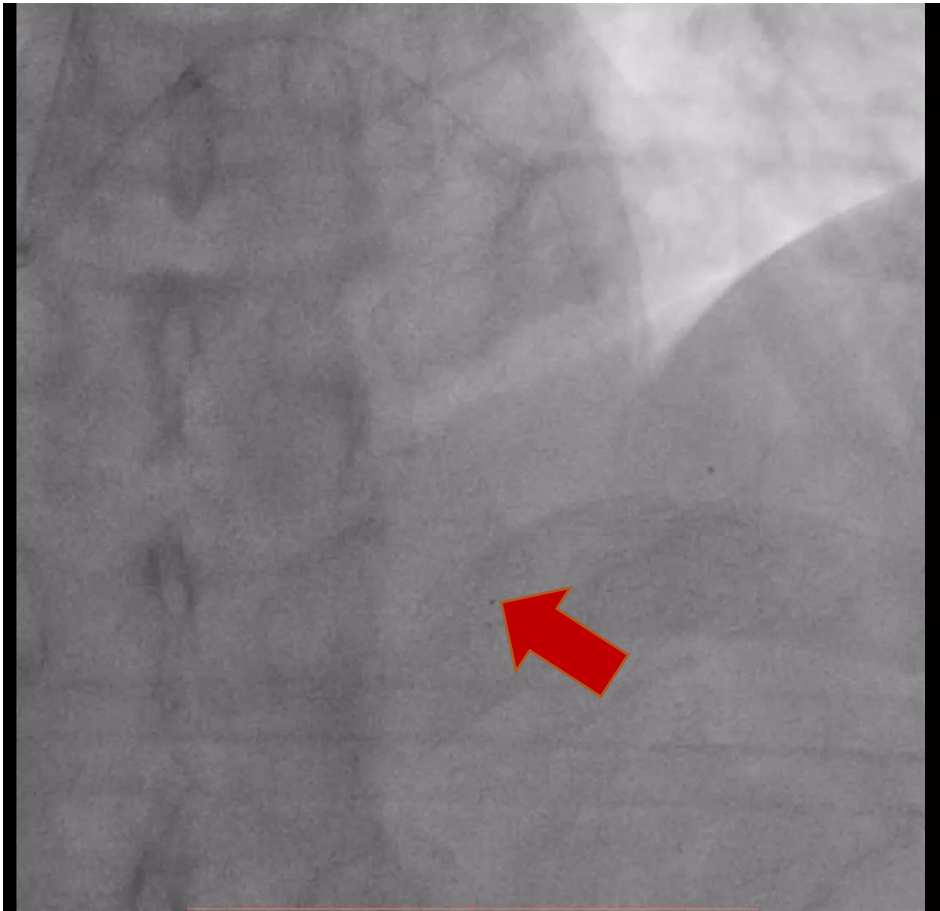
- Launcher 7F EBU 3.5GC and Cosair microcatheter were selected;
- ASAHI Gaia First was used for penetrating into 内膜下;
- The other microcatheter was advanced into the D1 for the reverse angiology;



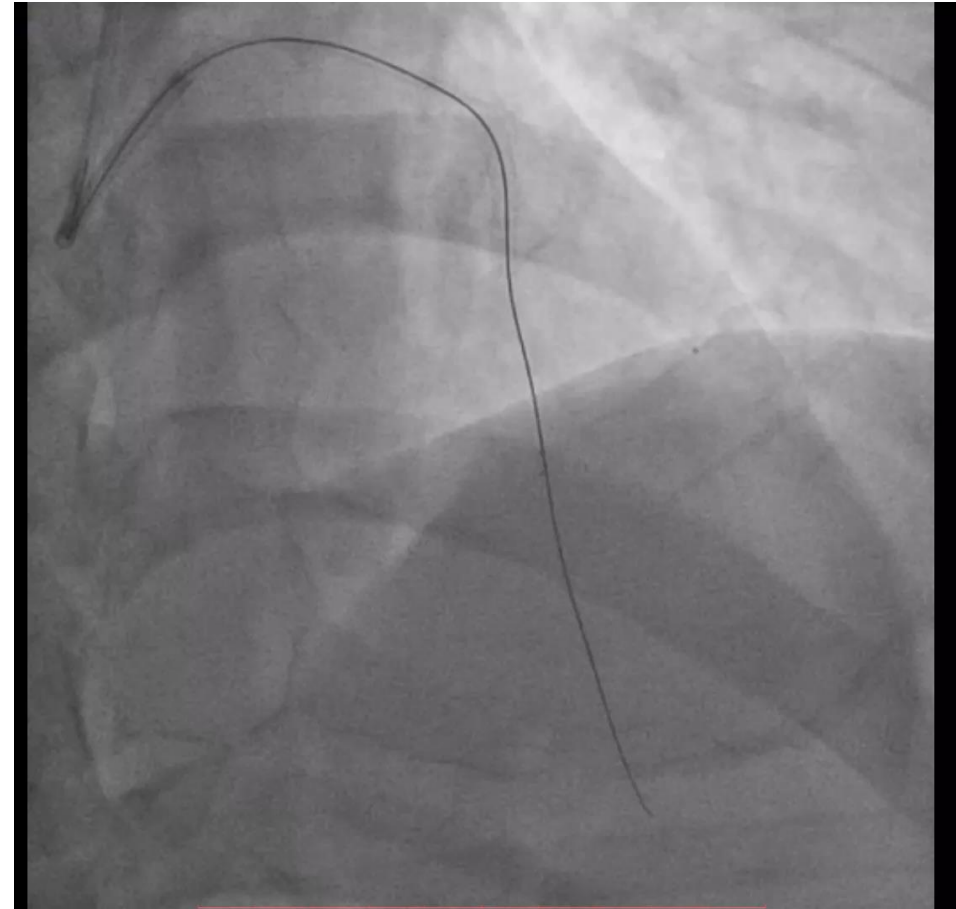
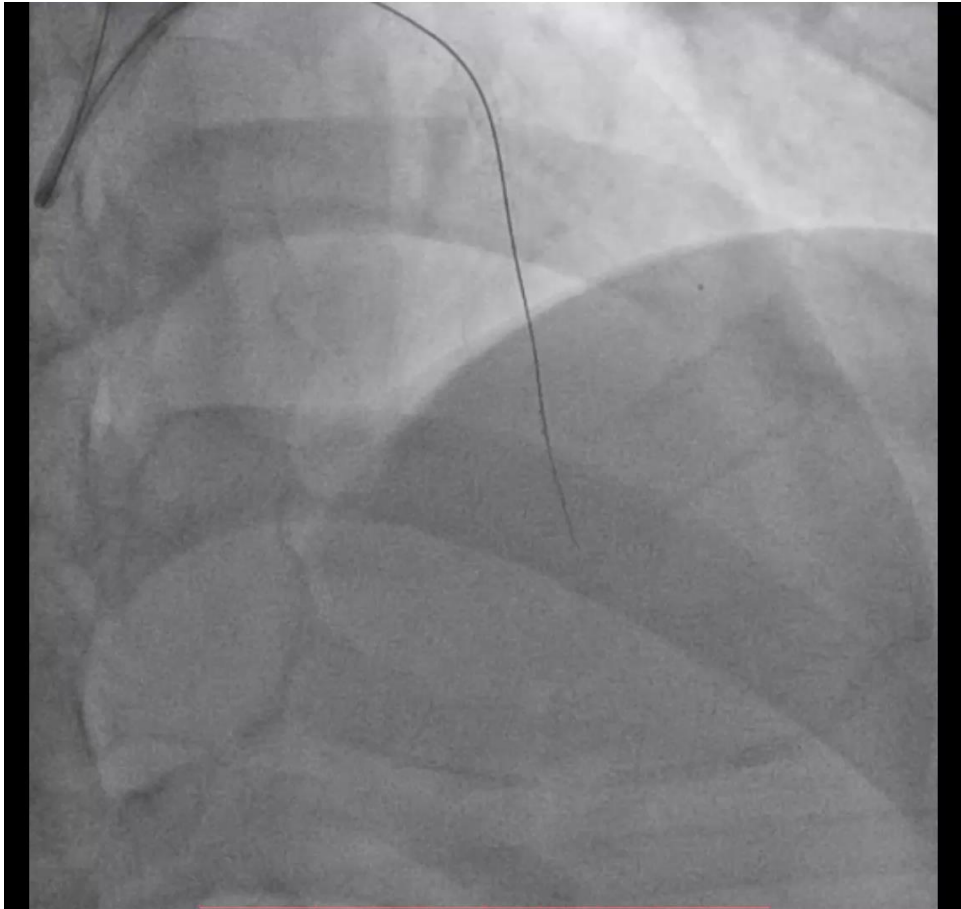


- Due to the prior PCI experience, ASAHI Gaia First wire still failed into the true lumen at the middle of LADd;

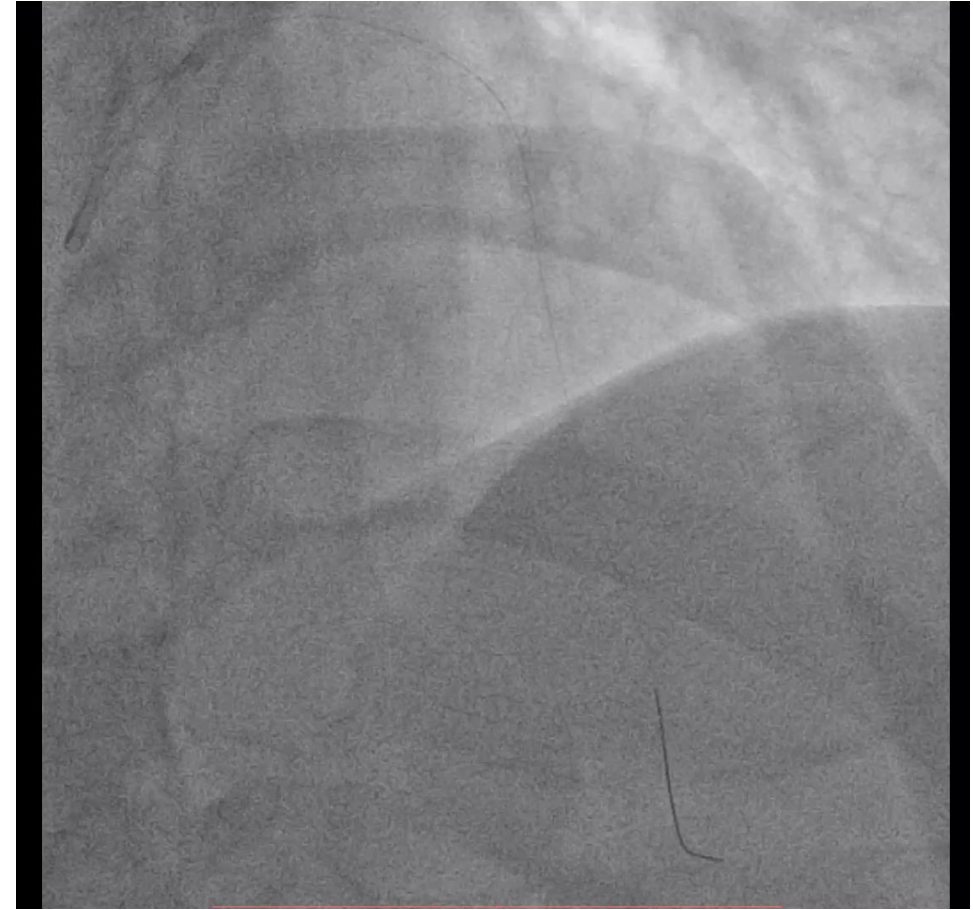
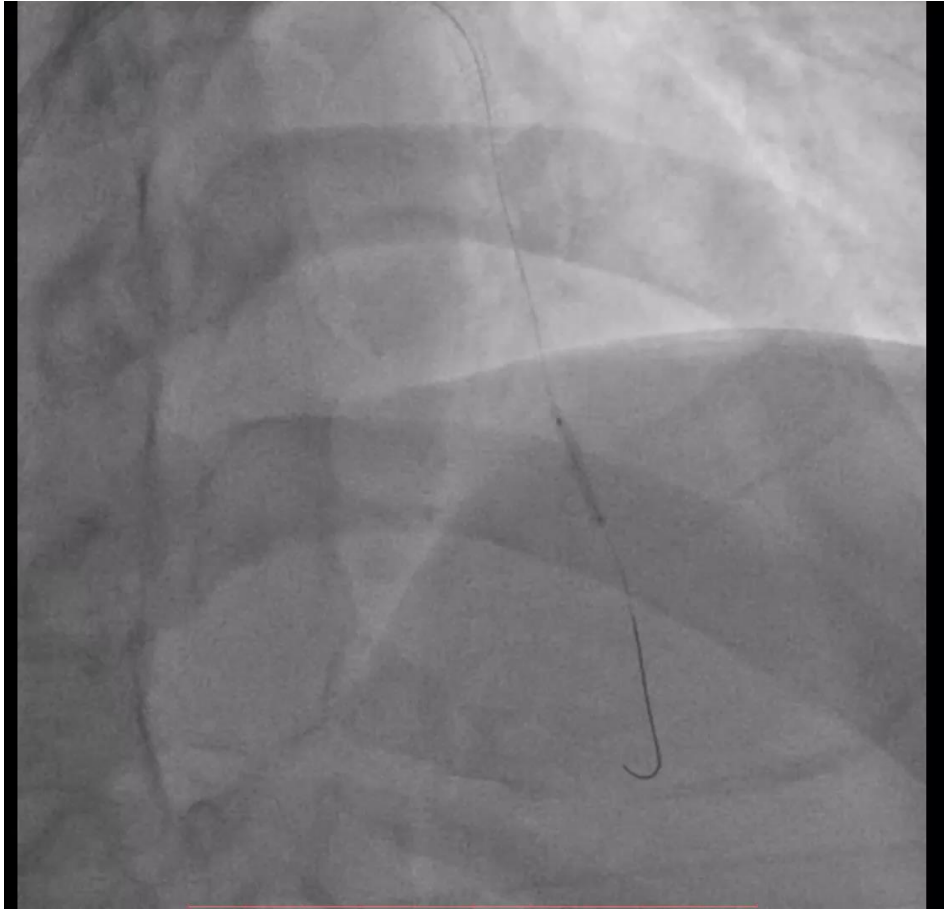




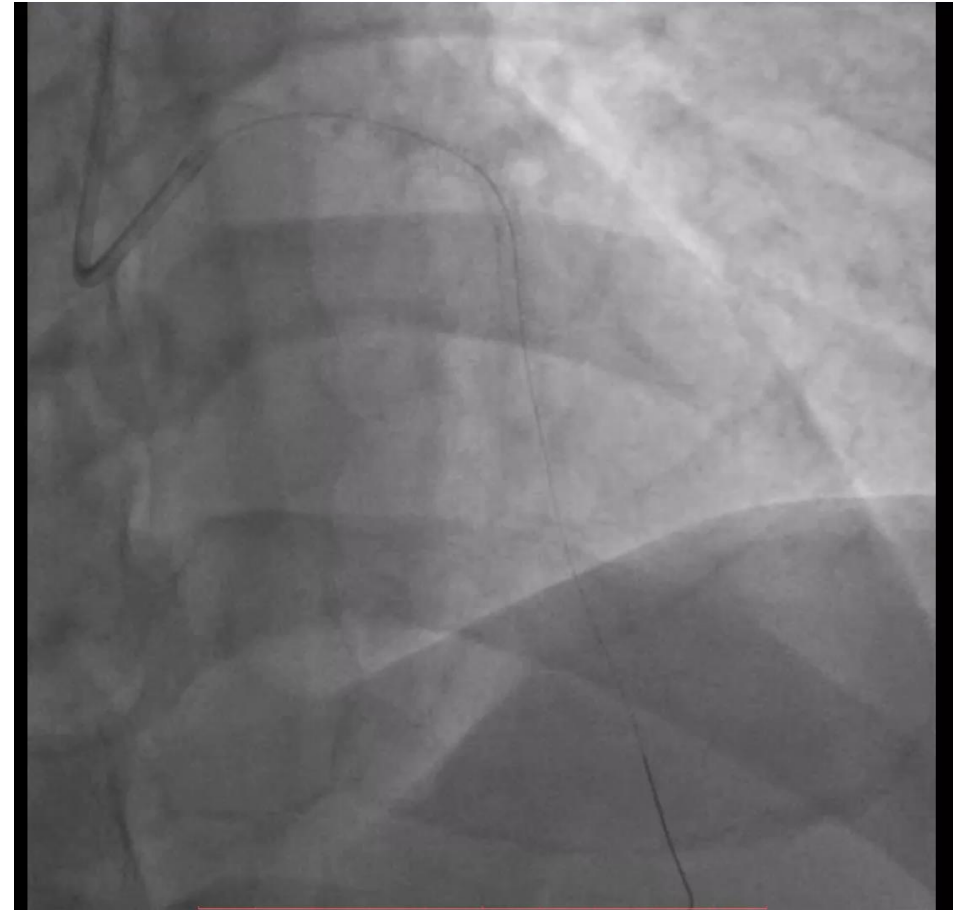
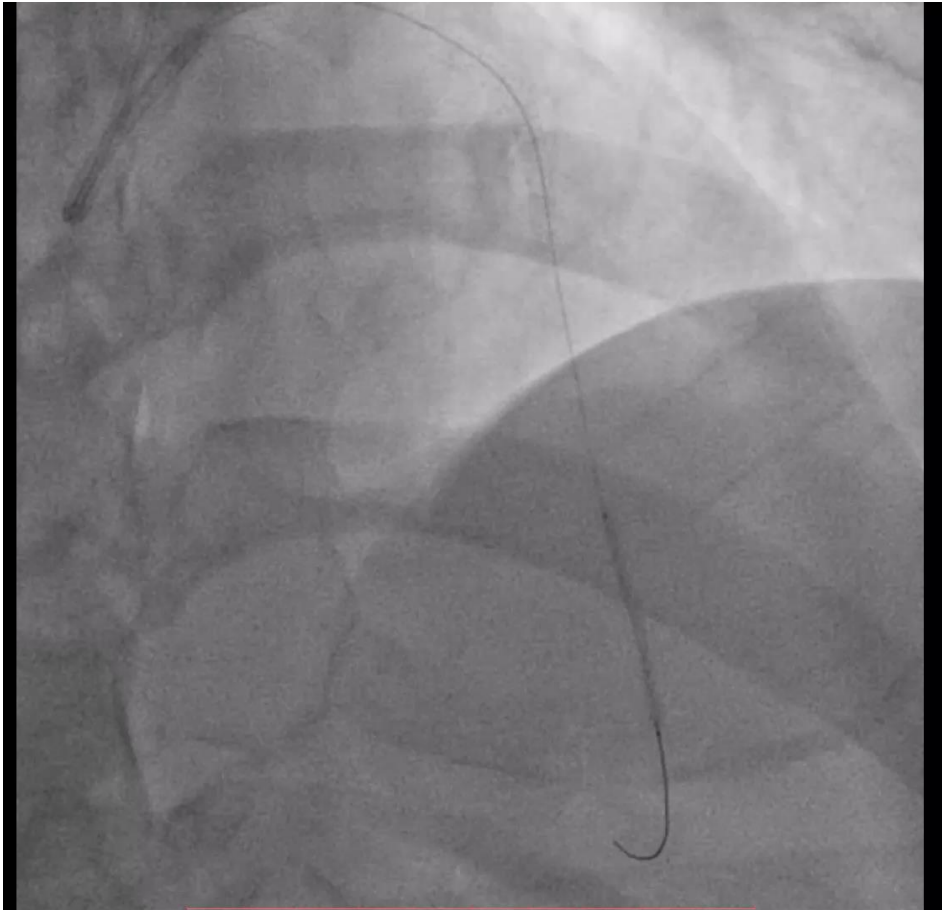
- ADR strategy was onset;
- The Stingray balloon was advanced into the middle segment of LAD occlusion;
- The collateral angiography confirmed the optimal Landing zone;



- The Conquest Pro wire was used for penetrating into the true lumen;



- Balloon of 2.0×15mm dilated;



- Subsequent DCB of 2.25×25mm and 2.75×25mm were treated for CTO;



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**What is the outcome for CTO treated by DCB?**



## Elective versus Deferred Stenting Following Subintimal Recanalization of CTO

	Elective stent group ( <i>n</i> = 60)	Deferred stent group ( <i>n</i> = 69)	<i>P</i>
Death	3 (5%)	0	0.10
MI	1 (1.9%)	0	0.47
Death and MI	4 (6.7%)	0	0.049
Death, MI, and TVR	16 (26.5%)	22 (32%)	0.84
Clinically driven TVR	13 (21.5%)	22 (32%) <sup>a</sup>	0.23
Repeat-PCI	13 (21.5%)	20 (29%)	0.42
CABG	0	2 (3%)	
Stent thrombosis	3 (5%)	0	0.10
Definite	1 (1.5%)		
Probable	0		
Possible	2 (3.3%)		

CTO recanalization with the STAR technique suggests that deferring stent implantation after successful recanalization **limits the stent length** and is **associated with a significant lower MACE rate**

## Clinical Outcomes of Drug-Coated Balloon Treatment After Successful Revascularization of *de novo* Chronic Total Occlusions

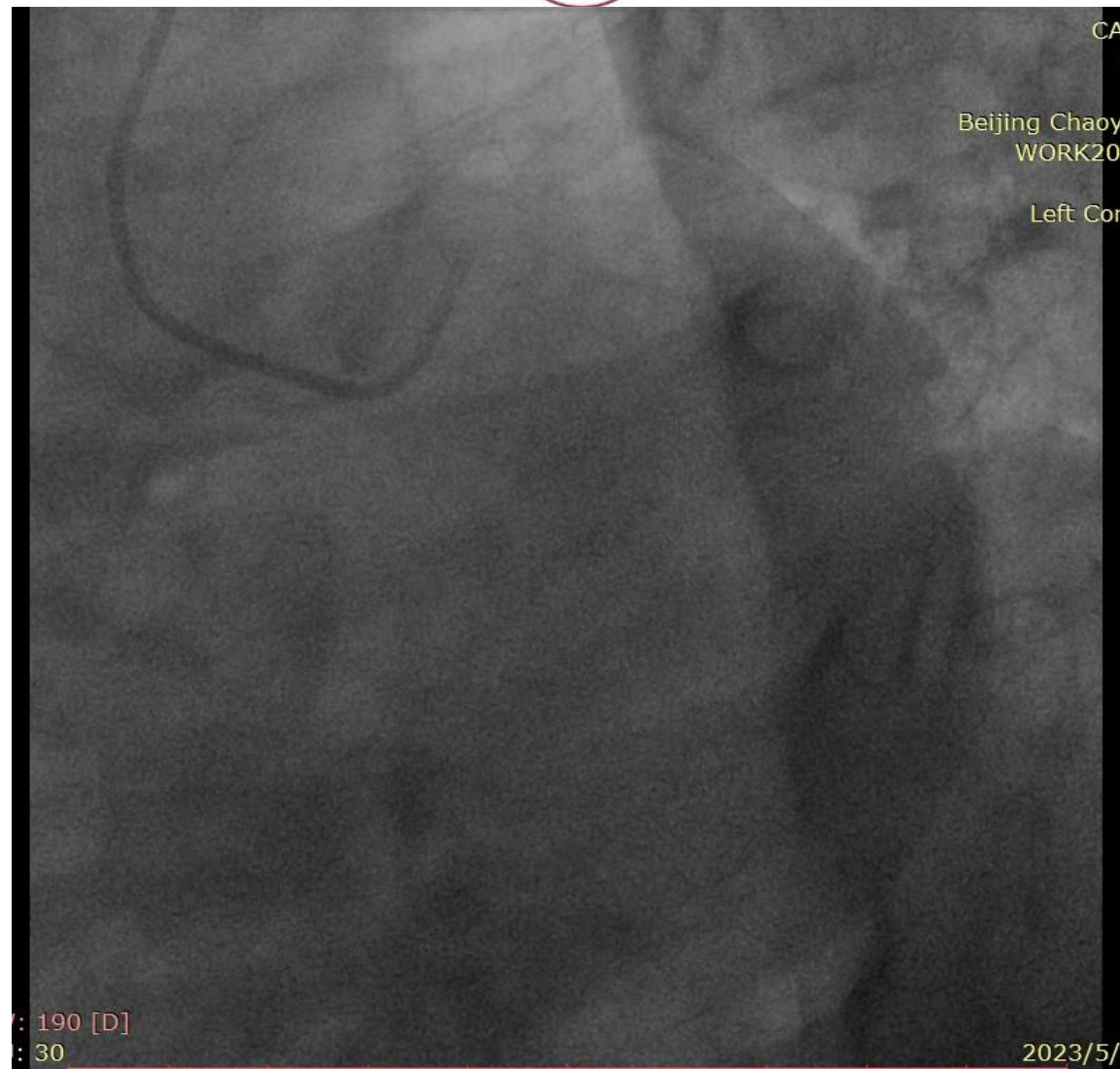
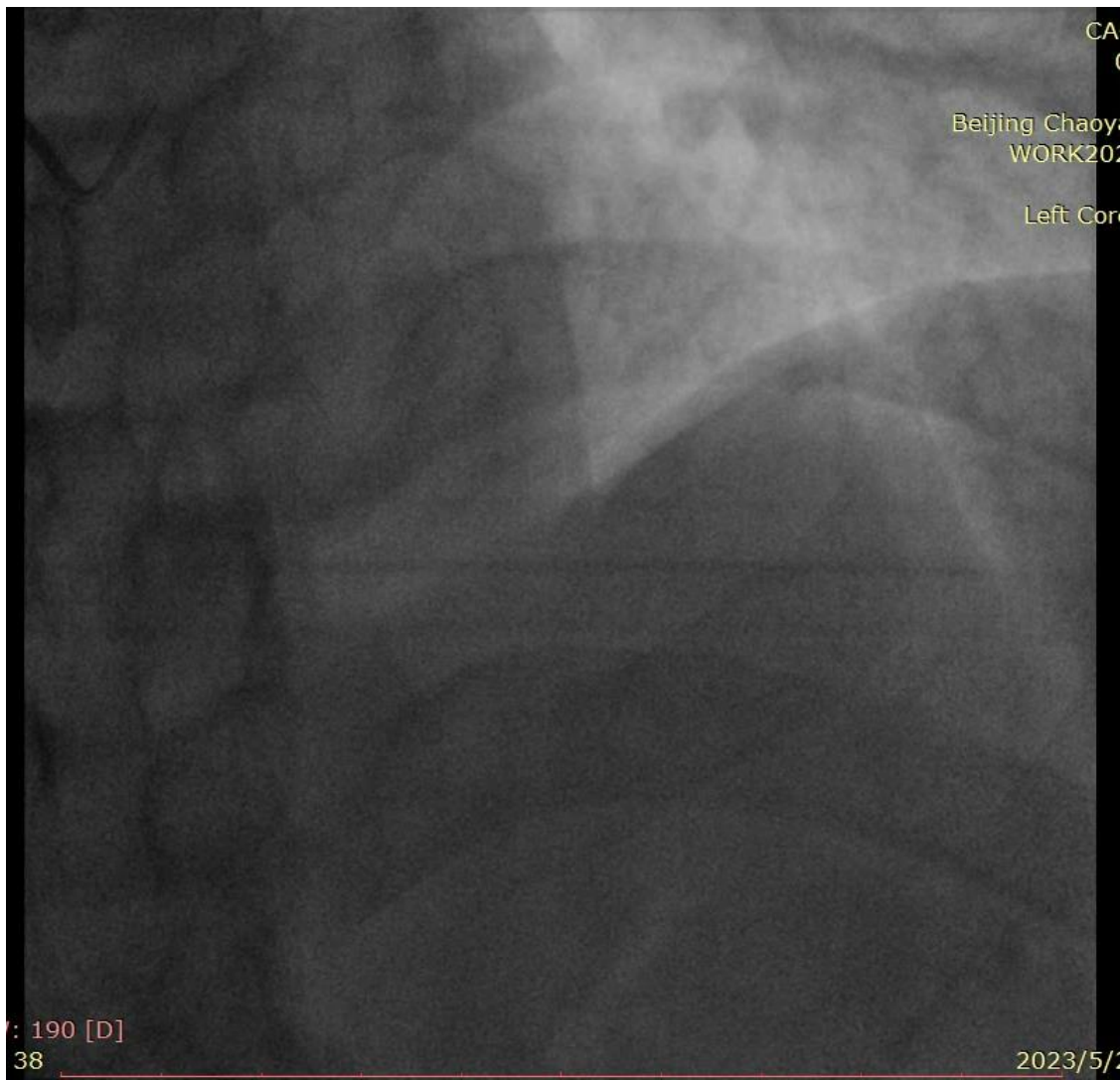
	<i>n</i> = 93 vessels	Clinical outcomes at 1 year	
Post-DCB treatment		Major adverse cardiac events	7 (8.3)
Reference vessel diameter, mm	2.3 ± 0.5	All death	1 (1.2)
Lesion length, mm	42.4 ± 17.0	Cardiac death	1 (1.2)
Minimal lumen diameter, mm	1.6 ± 0.4	Non-fatal myocardial infarction	0
Diameter stenosis, %	30.6 ± 9.3	Target lesion revascularization	6 (7.1)
Acute lumen gain, mm	1.6 ± 0.4	Target vessel revascularization	6 (7.1)
Follow-up	<i>n</i> = 67 vessels	New vessel revascularization	9 (10.7)
Reference vessel diameter, mm	2.5 ± 0.7	Target vessel thrombosis	0
Lesion length, mm	43.7 ± 16.8	Stroke	2 (2.4)
Minimal lumen diameter, mm	1.6 ± 0.6	Clinical outcomes at 2 years, day, median (IQR)	720 (406–1268)
Diameter stenosis, %	37.8 ± 17.3	Major adverse cardiac events	14 (16.7)
Late lumen loss, mm	0.03 ± 0.53	All death	2 (2.4)
Binary restenosis	10/67 (14.9)	Cardiac death	2 (2.4)
Scheduled angiography follow-up duration, day, median (IQR)	186 (134–291)	Non-fatal myocardial infarction	3 (3.6)
		Target lesion revascularization	11 (13.1)
		Target vessel revascularization	11 (13.1)
		New vessel revascularization	9 (10.7)
		Target vessel thrombosis	0
		Stroke	2 (2.4)

- The revascularization using balloon angioplasty is good, clinical outcomes of DCB only treatment of *de novo* CTOs at the 2-year follow-up are encouraging, **with a low rate of hard endpoints and acceptable MACE rates**

# 6 month Follow-up



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- Due to the failed PCI experience of this case, Parallel wire and IUVS-guide entry is impossible; If suitable re-entry zone existed, ADR strategy could be implemented by stringray balloon, as we preseted in this case;
- Hence, the Landing zone was observed by multiple position and harden wire should be used for penetration.
- For the small CTO vessel following successful PCI, the length of subintimal should be considered as an important factor for the selection of PTCA, DCB or DES strategy.



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感谢

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