



A Case of IVUS Guided LM PCI



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I, (Ning Guo) DO NOT have a financial interest/arrangement or affiliation with one or more organizations that could be perceived as a real or apparent conflict of interest in the context of the subject of this presentation.

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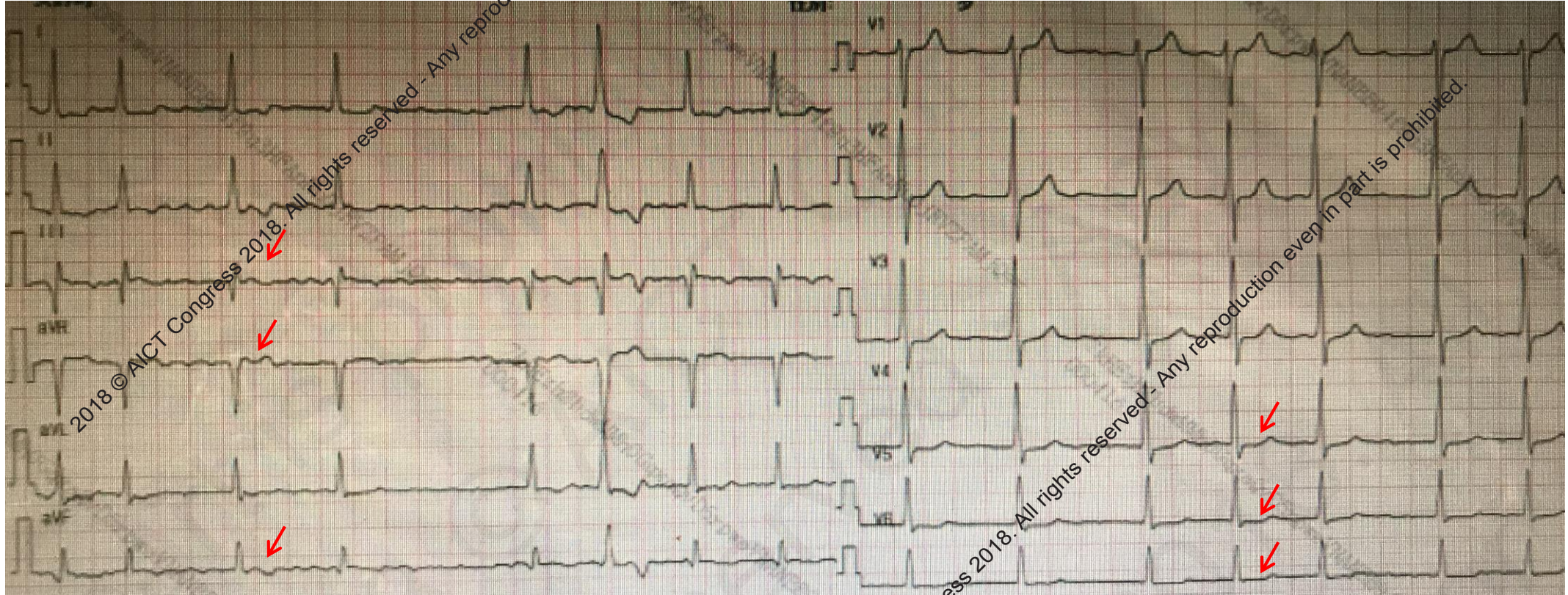
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Patient History

- 55 y/o male, was admitted with exertional chest pain for one year. In recent 20 days, the chest pain has been aggravated.
- CAD risk factors: Uncontrolled hypertension for 4 yrs, atrial fibrillation for 2 yrs without anticoagulant therapy, hyperuricemia for 1 yr.
- Echo: LVEDV 47mm, LA 38mm, EF 63%.
- NT-proBNP 618pg/mL, hs-cTNT 0.032ng/mL, hsCRP >9.70mg/L.
- Diagnosis: ACS.

ECG



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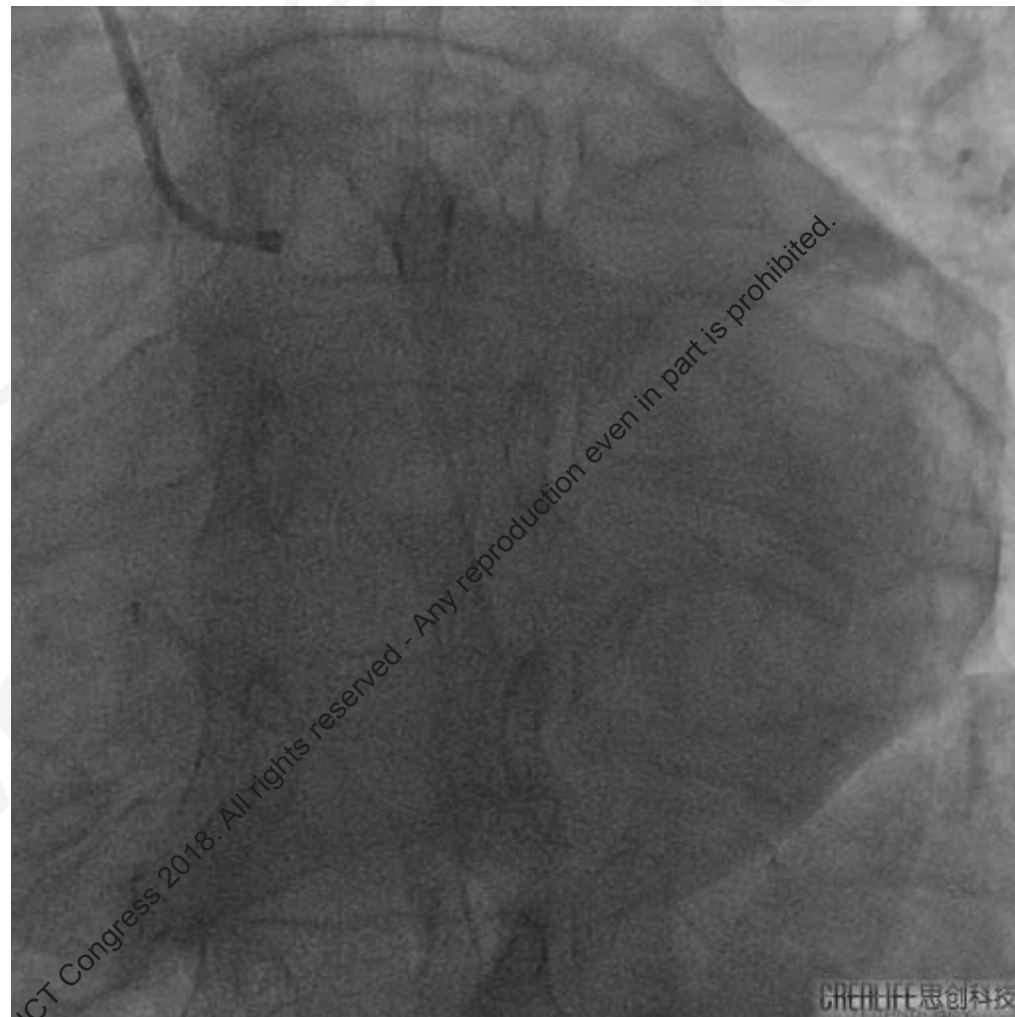
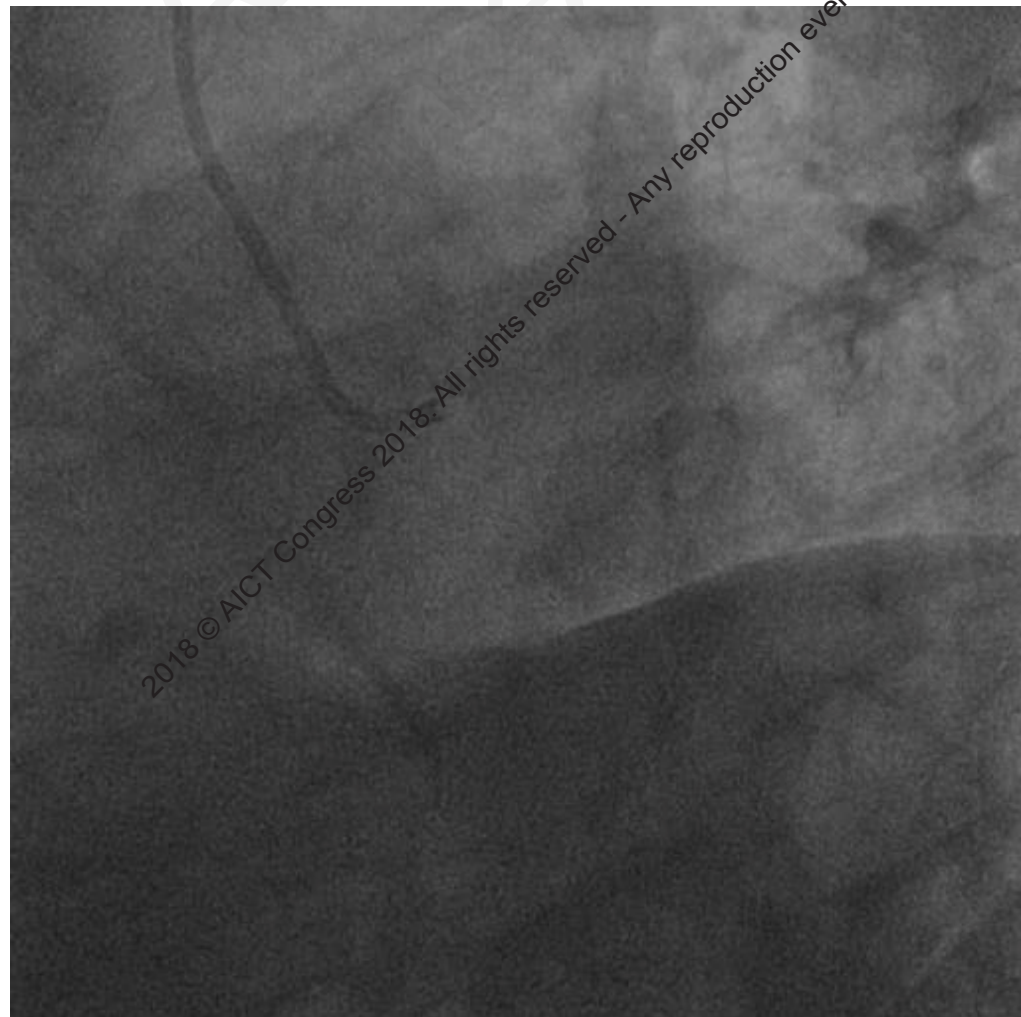
Pre-PCI Medication

- DAPT
 - Aspirin: 100mg/d
 - Clopidogrel: 75mg/d
- Atorvastatin: 20mg/d
- Fondaparinux 2.5mg i.h./d
- Anti-ischemic medication

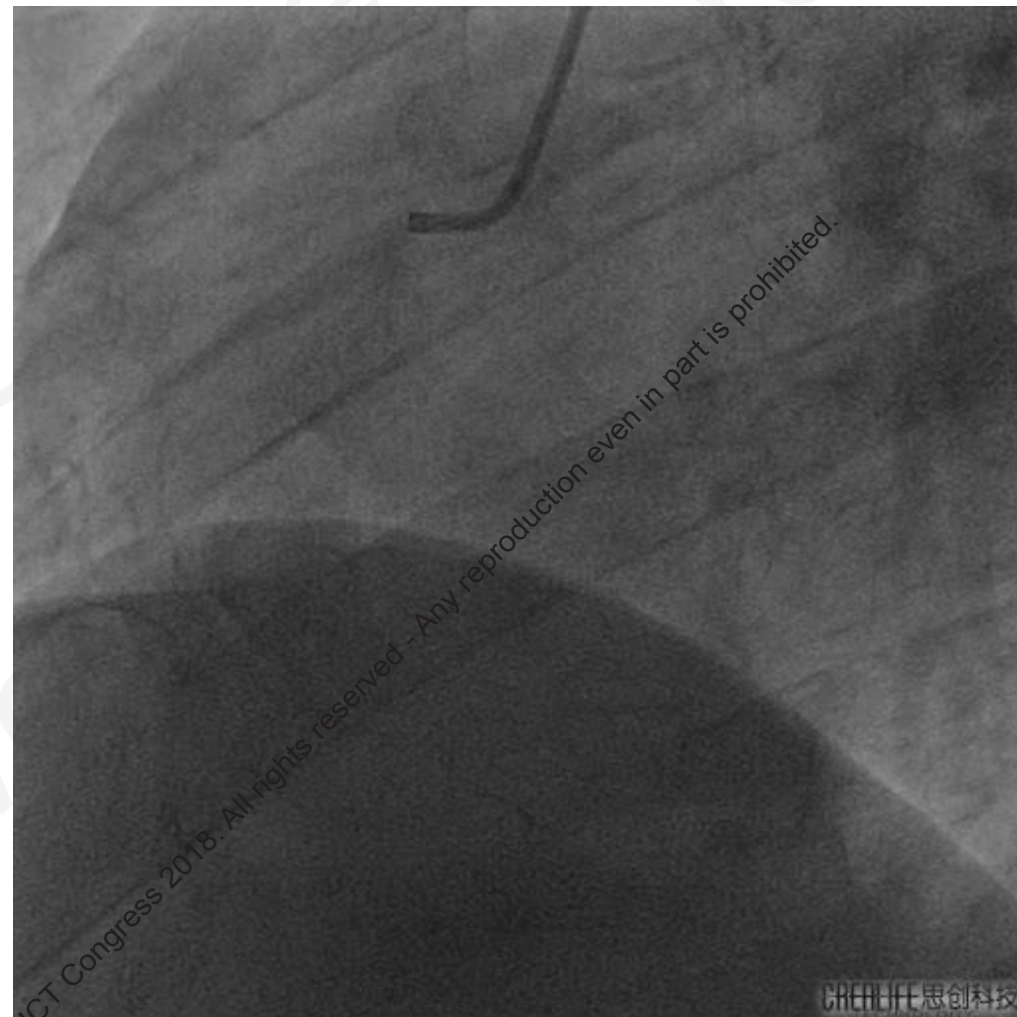
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Diagnostic Angiograms



Diagnostic Angiograms





How should I treat this patient?

SYNTAX Score I	37
Lesion 1 (segment 3): 1x2= Length >20 mm Sub total lesion 1	2 3
Lesion 2 (segment 5): 5x2= Bifurcation Type: Medina 1,1,1: Sub total lesion 2	10 2 12
Lesion 3 (segment 6): 3.5x2= Sub total lesion 3	7 7
Lesion 4 (segment 7): 2.5x2= Bifurcation Type: Medina 1,1,0: Length >20 mm Sub total lesion 4	5 1 1 7
Lesion 5 (segment 11): 1.5x2= Sub total lesion 5	3 3
Lesion 6 (segment 12a): 1x2= Length >20 mm Sub total lesion 6	2 1 3
Diffuse disease/Small vessels Segment 7 Segment 12a Sub total diffuse disease/small vessels	1 1 2
TOTAL:	37

SYNTAX Score II

SYNTAX II

Decision making -between CABG and PCI- guided by the SYNTAX Score II to be endorsed by the Heart Team.

PCI

SYNTAX Score II: 27.2
PCI 4 Year Mortality: 5.4 %

CABG

SYNTAX Score II: 22.4
CABG 4 Year Mortality: 3.7 %

Treatment recommendation  CABG or PCI

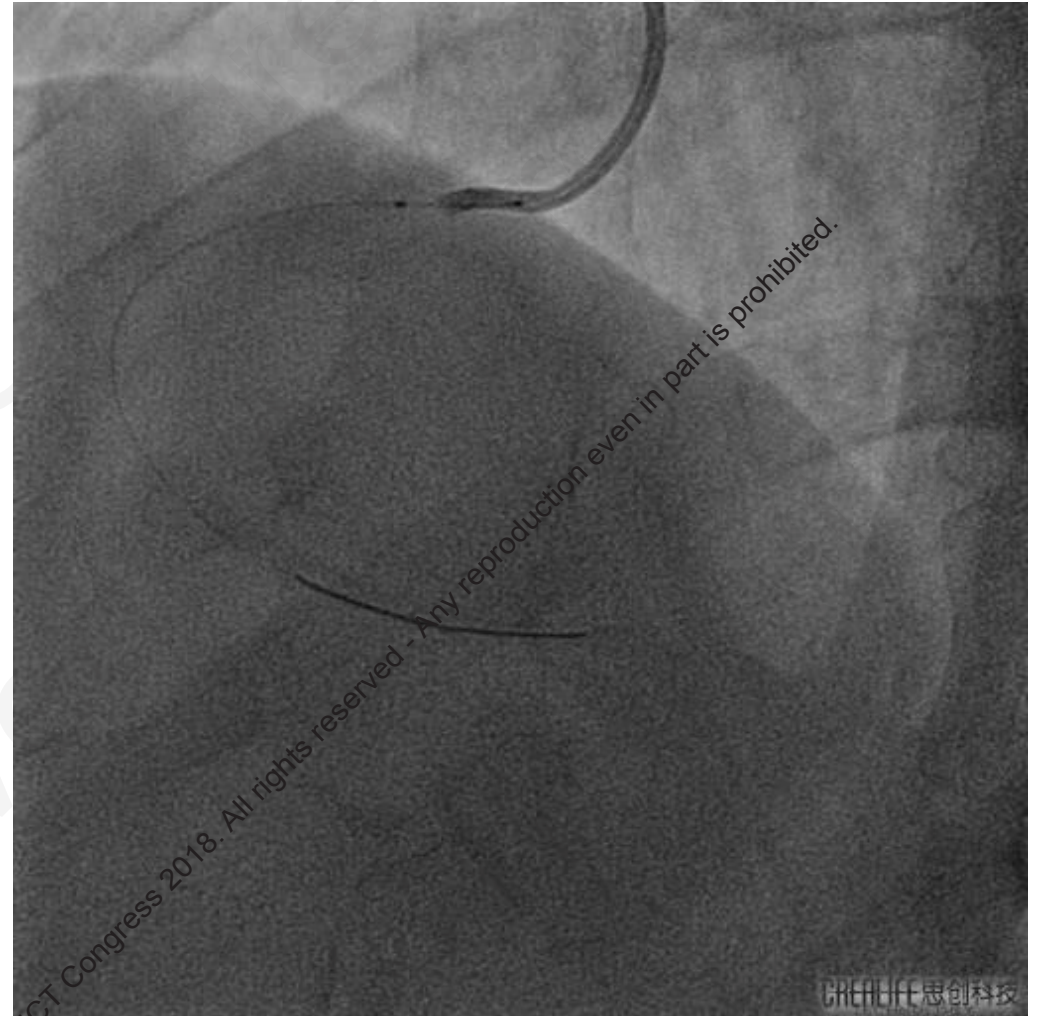
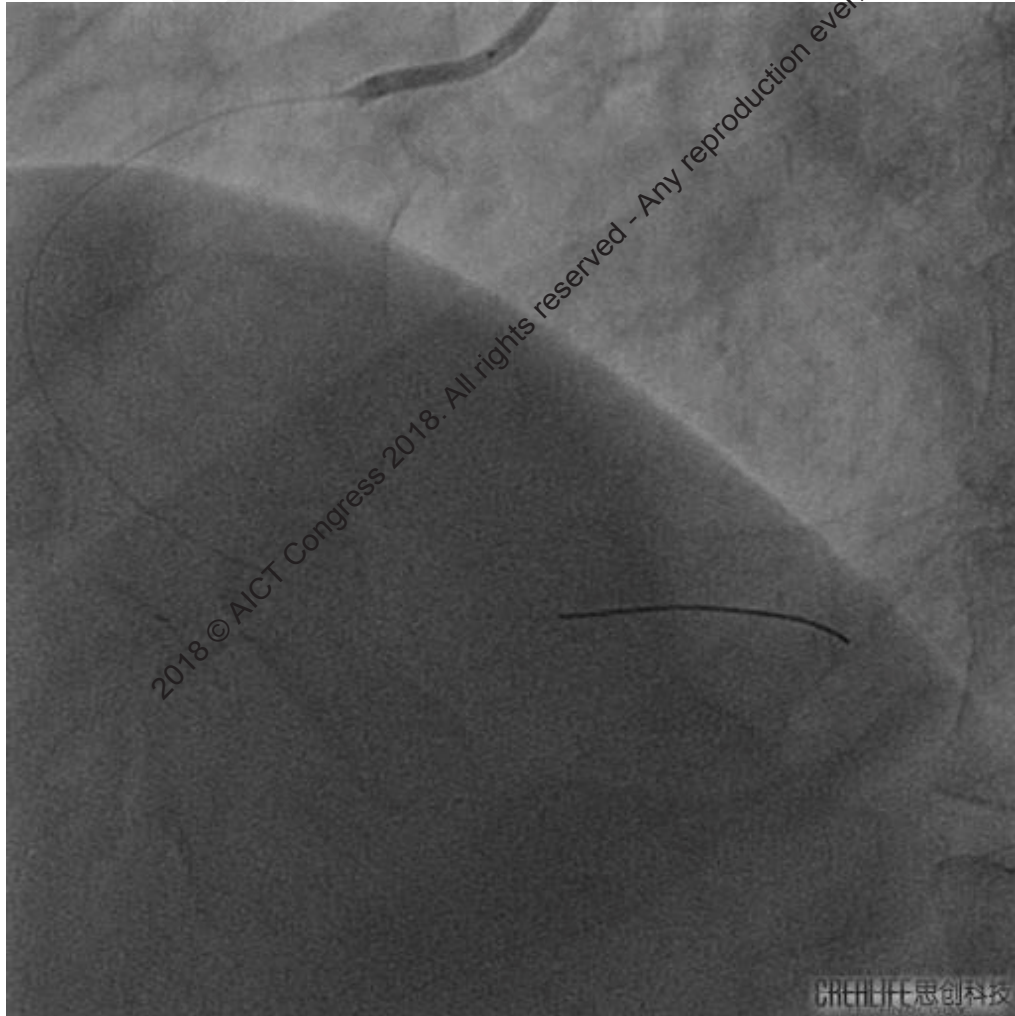
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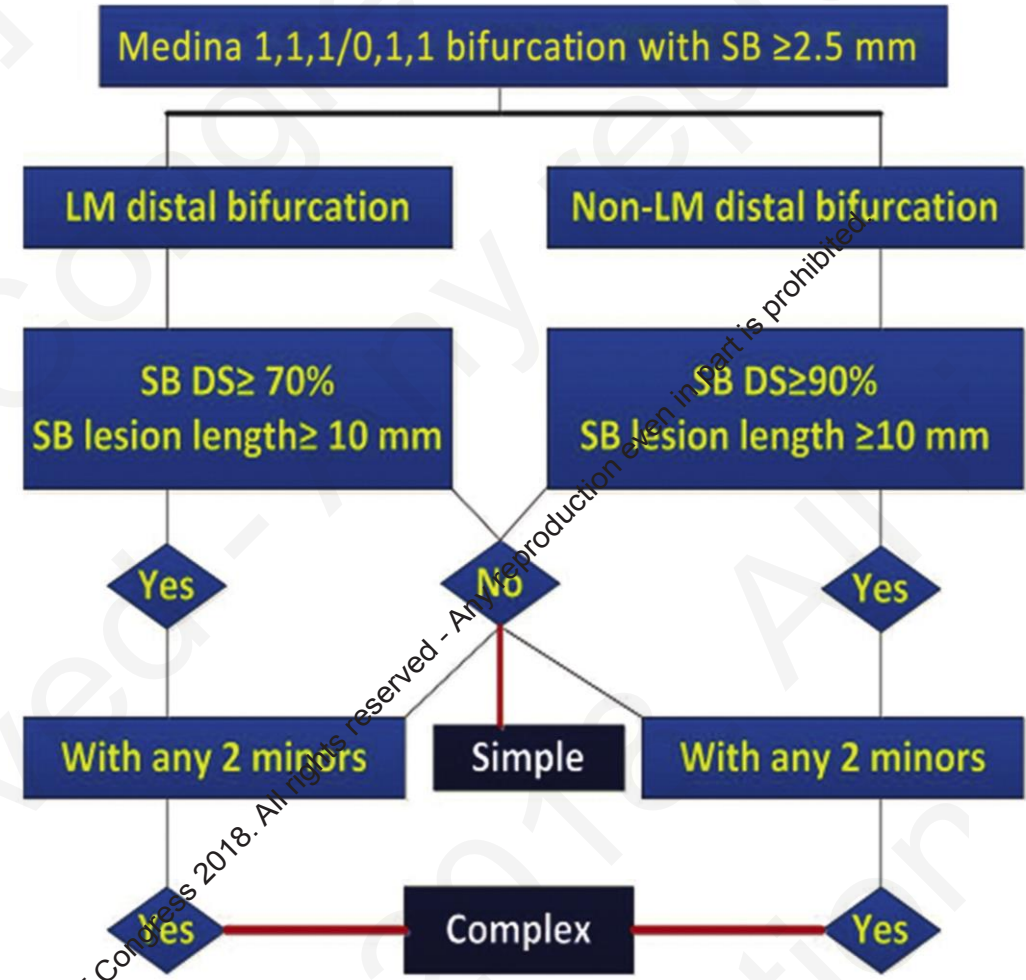
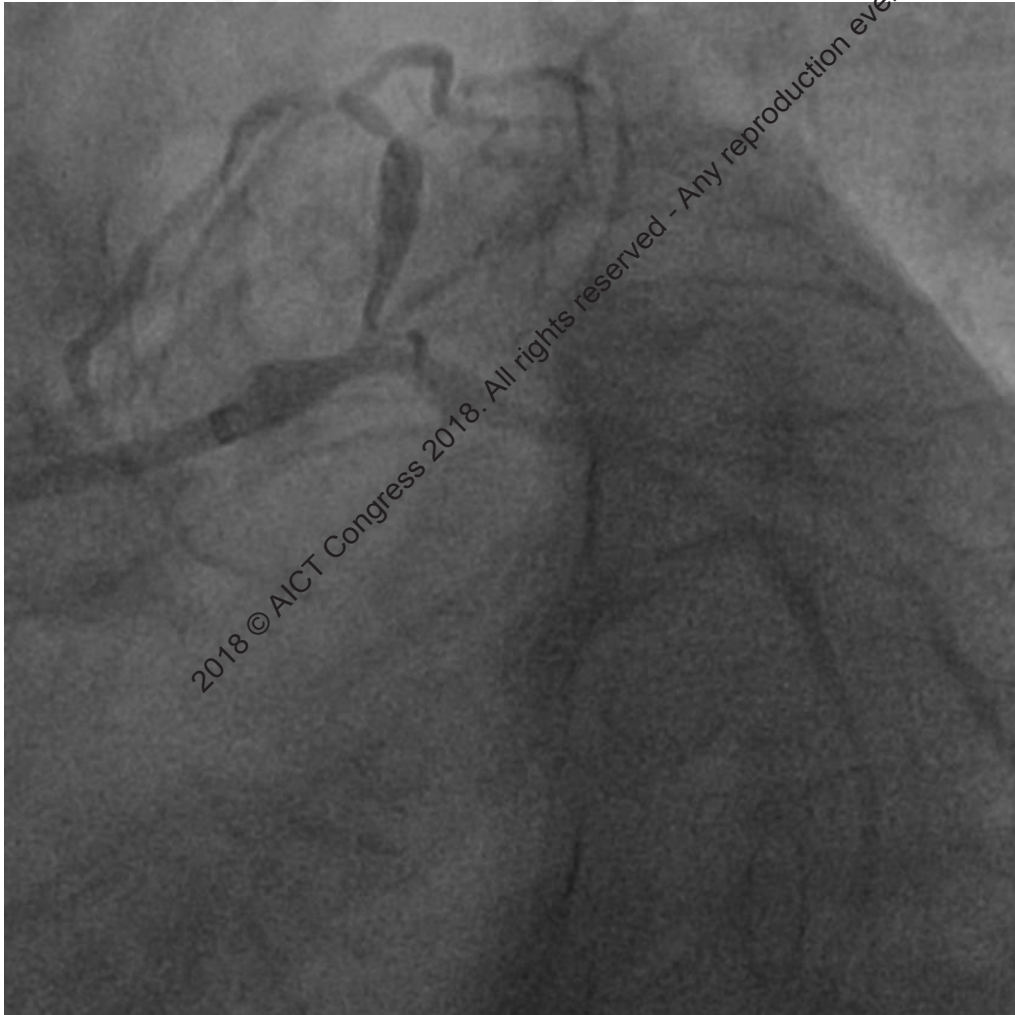


1st PCI

6F SAL1.0 GC; Runthrough GW; 2.0×20mm Balloon (14atm);
2.5×28mm EES; 2.75×18mm EES; 2.75×15mm NC Balloon



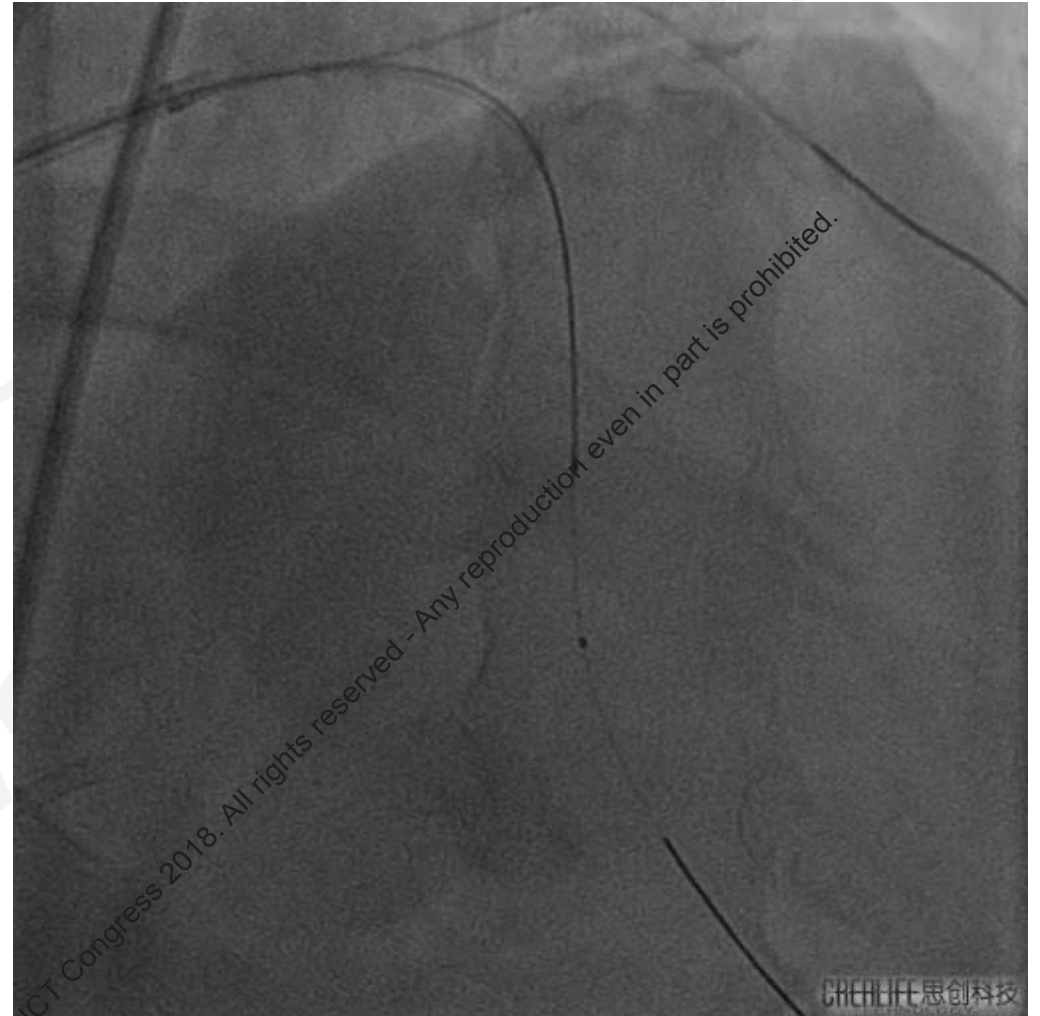
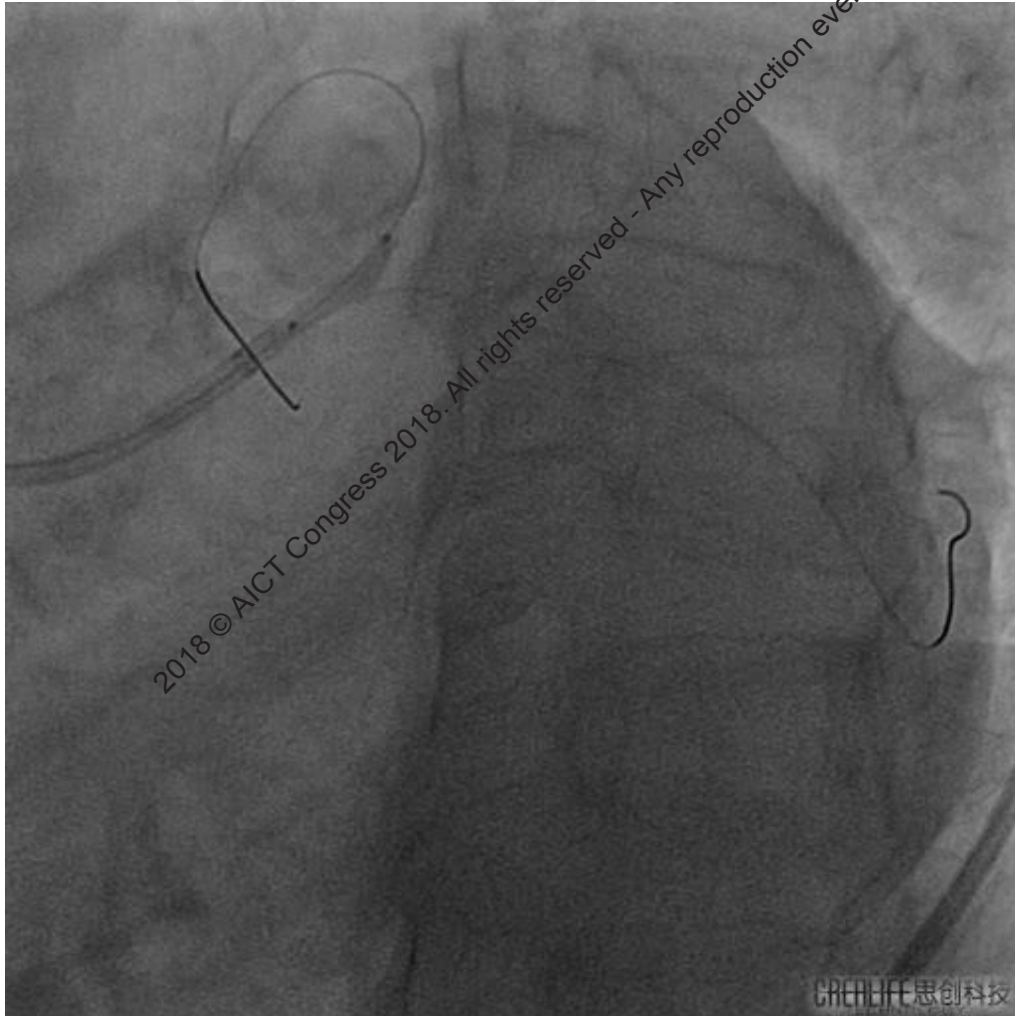
2nd PCI



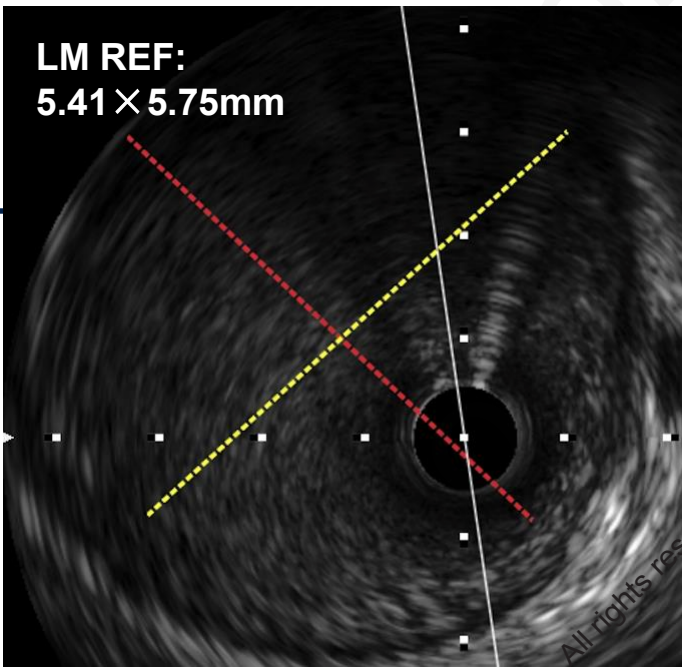
Chen SL, et al. JACC Cardiovasc Interv. 2014;7(11):1266-76.

2nd PCI

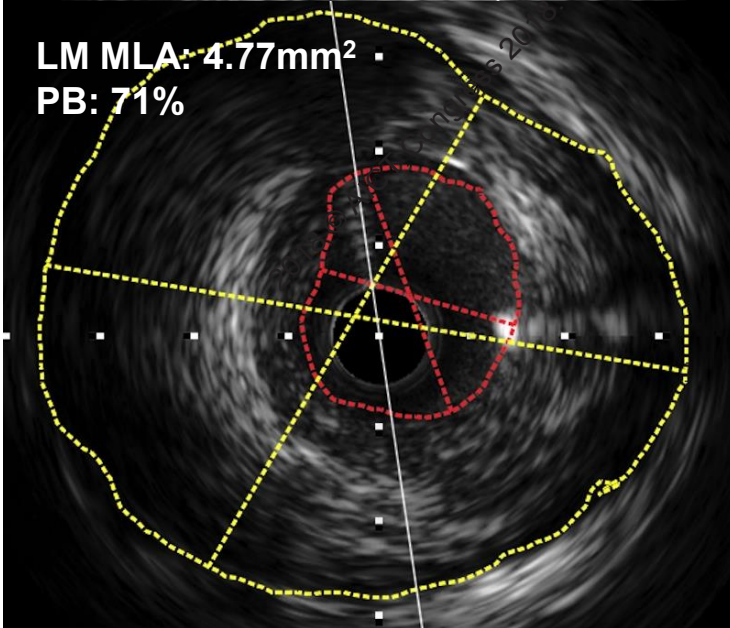
7F EBU3.5 GC; Runthrough GW; 2.5×15mm Balloon (10atm)



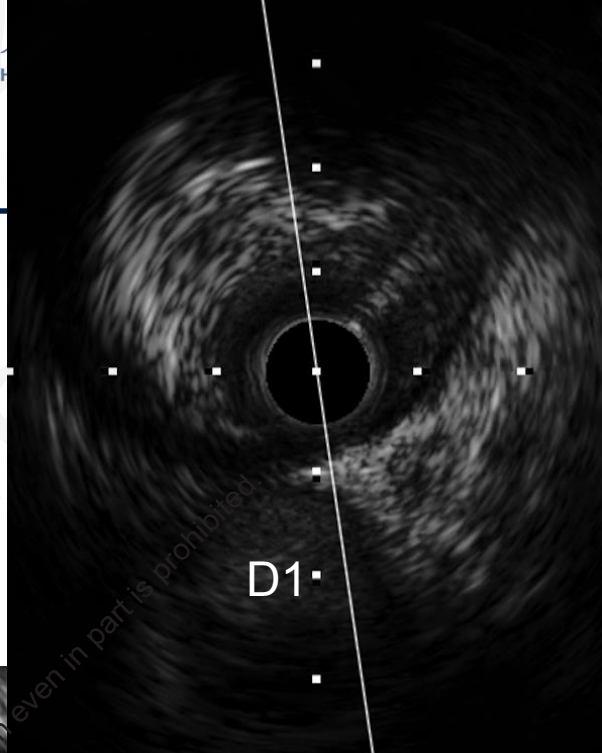
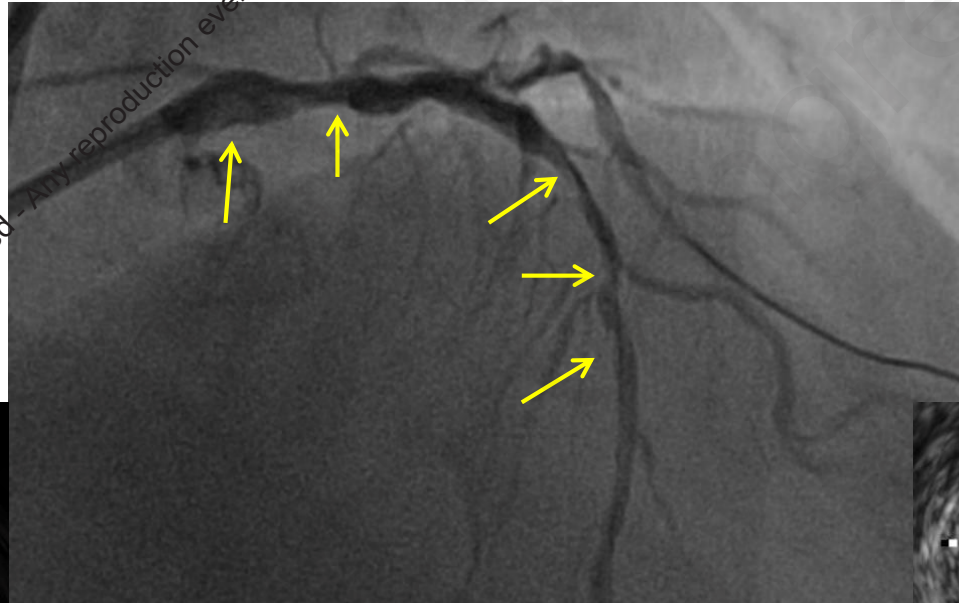
LM REF:
5.41 × 5.75mm



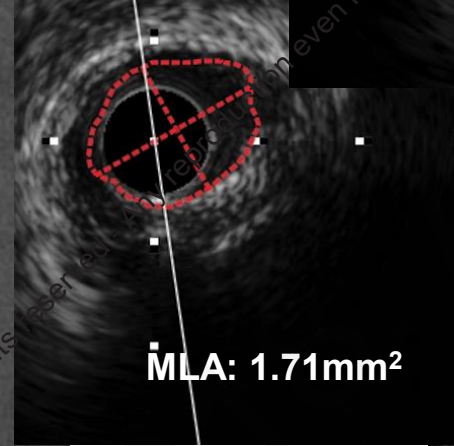
LM MLA: 4.77mm²
PB: 71%



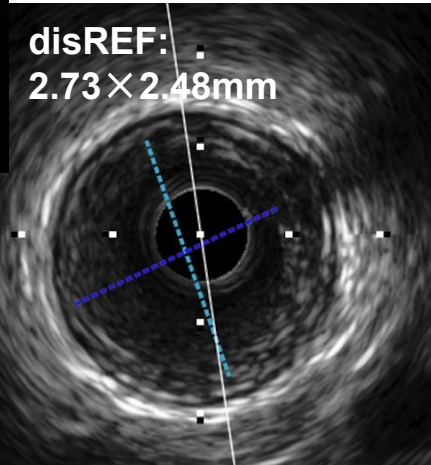
IVUS (LAD-LM)



D1



MLA: 1.71mm²



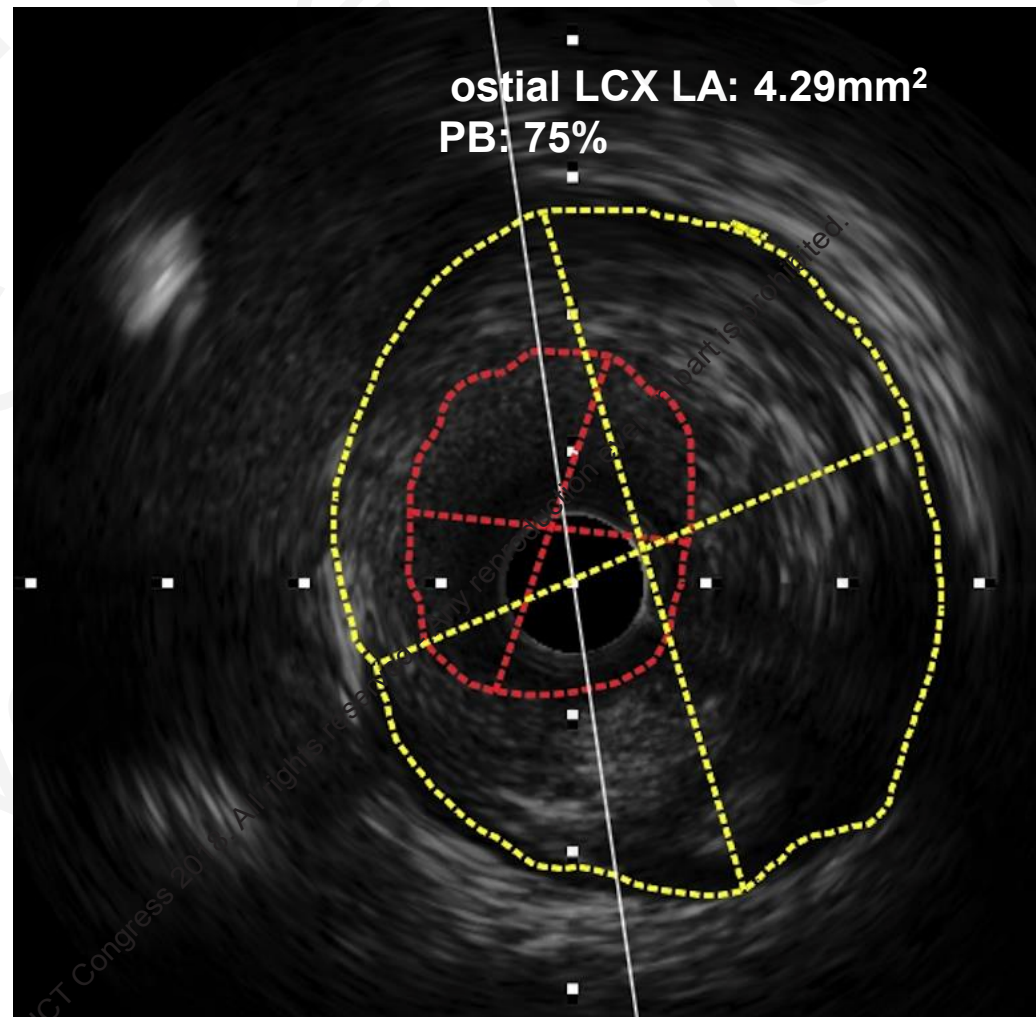
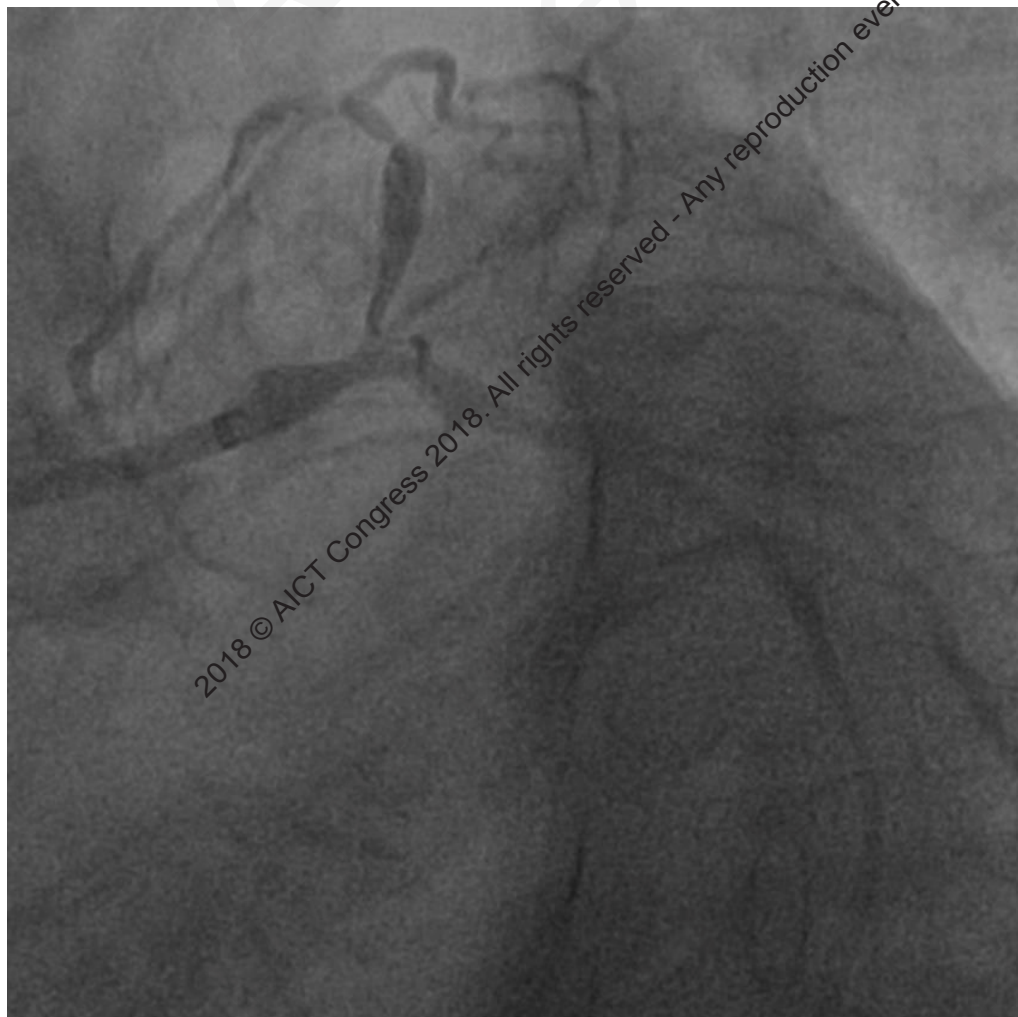
disREF:
2.73 × 2.48mm



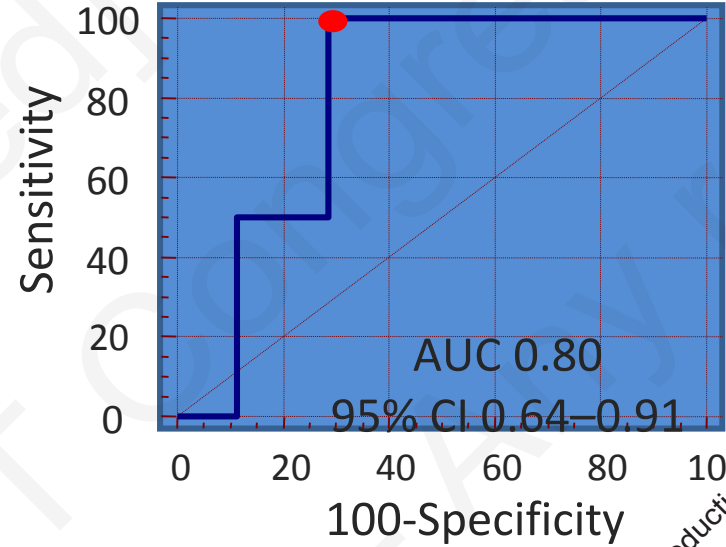
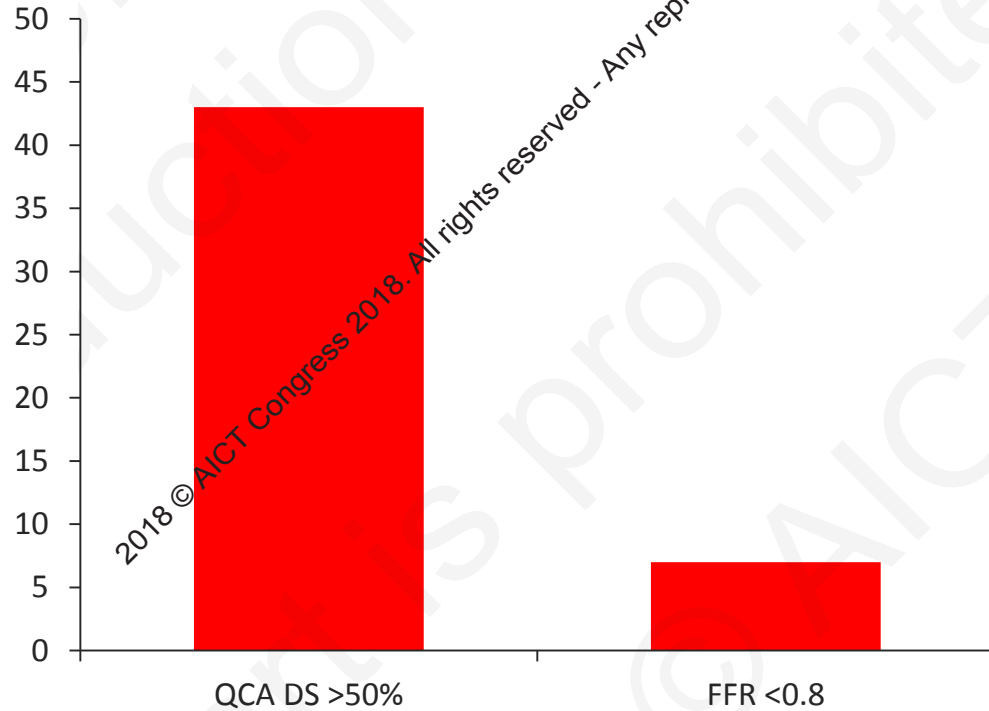
LCX

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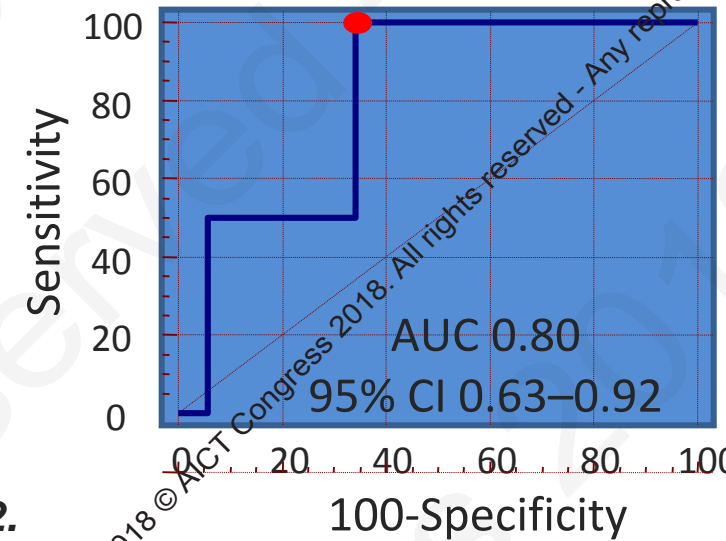
IVUS (LCX-LM)



43 LMCA bifurcation lesions with pre-PCI LCX ostial DS <50% were treated by single-stent cross-over

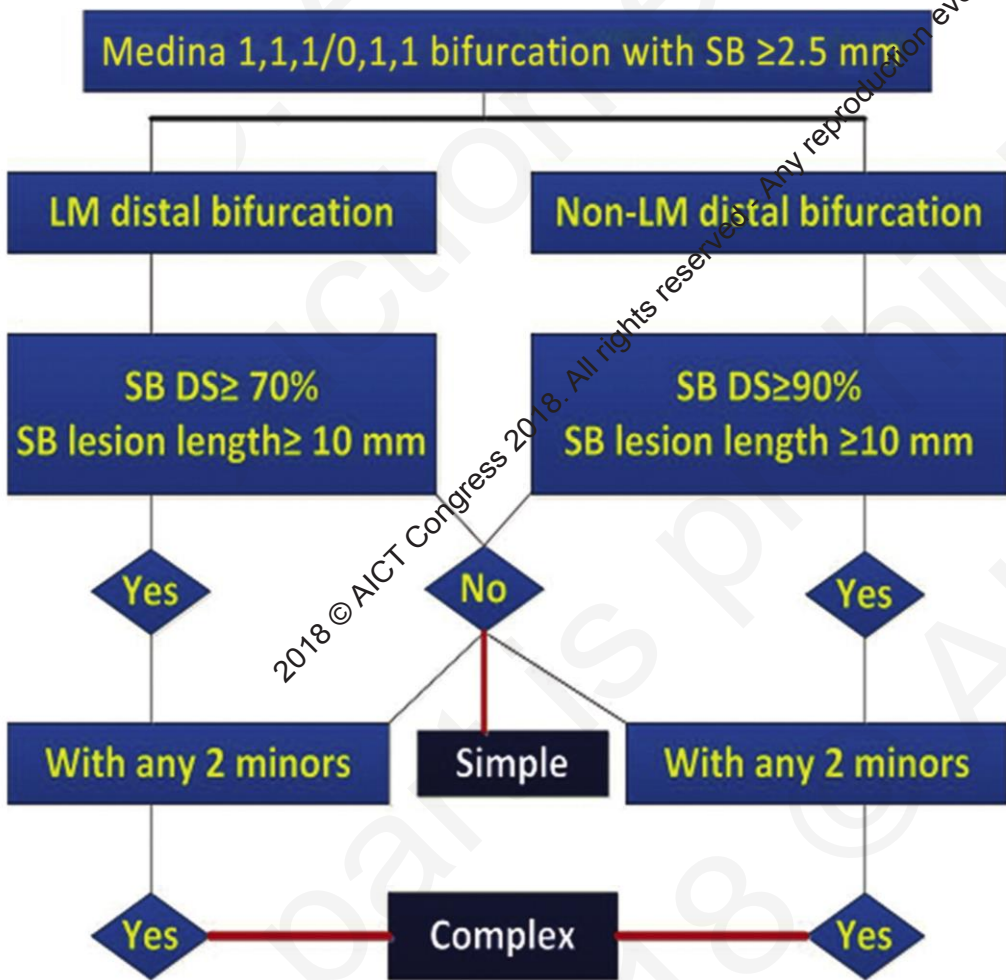


- **MLA <3.7mm²**
- Sensitivity 100%
- Specificity 71%
- PPV 16%
- **NPV 100%**



- **Plaque Burden >56%**
- Sensitivity 100%
- Specificity 65%
- PPV 14%
- **NPV 100%**

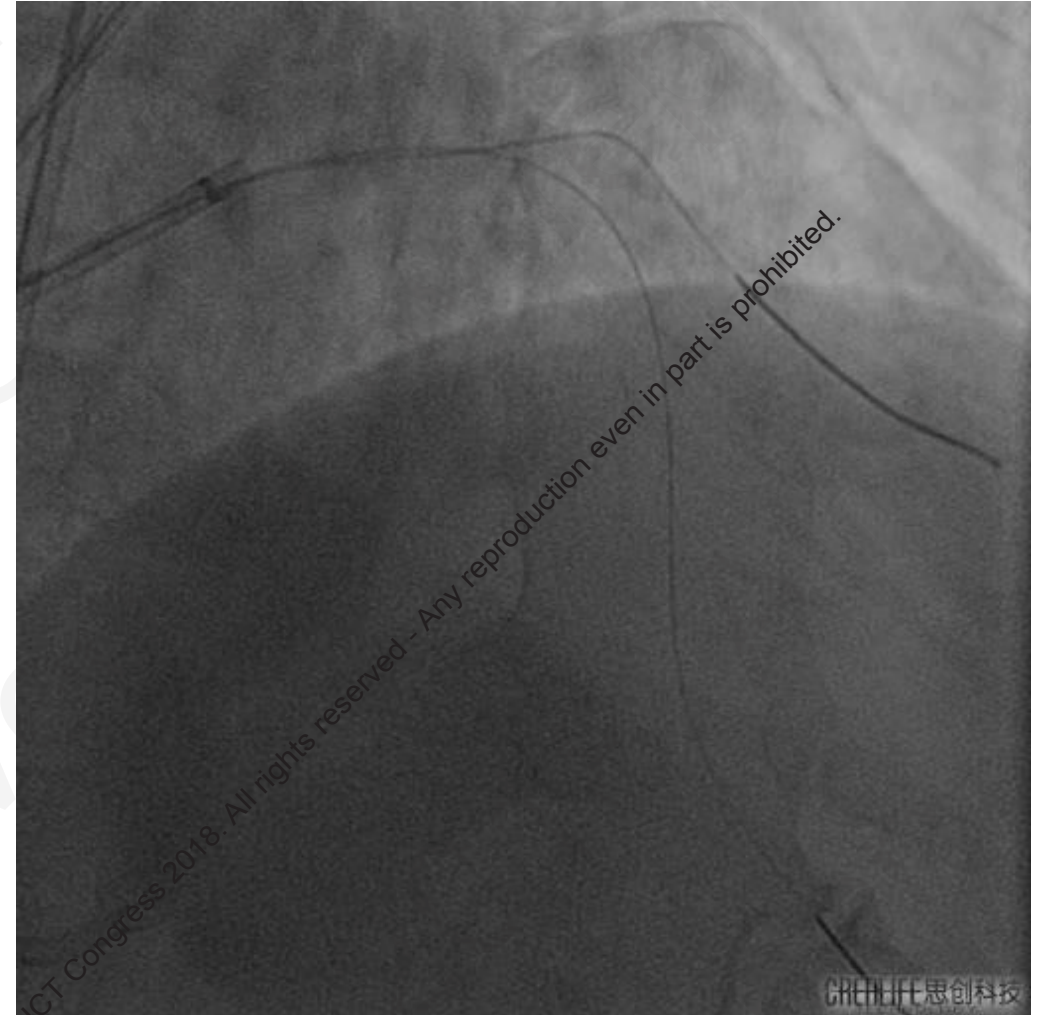
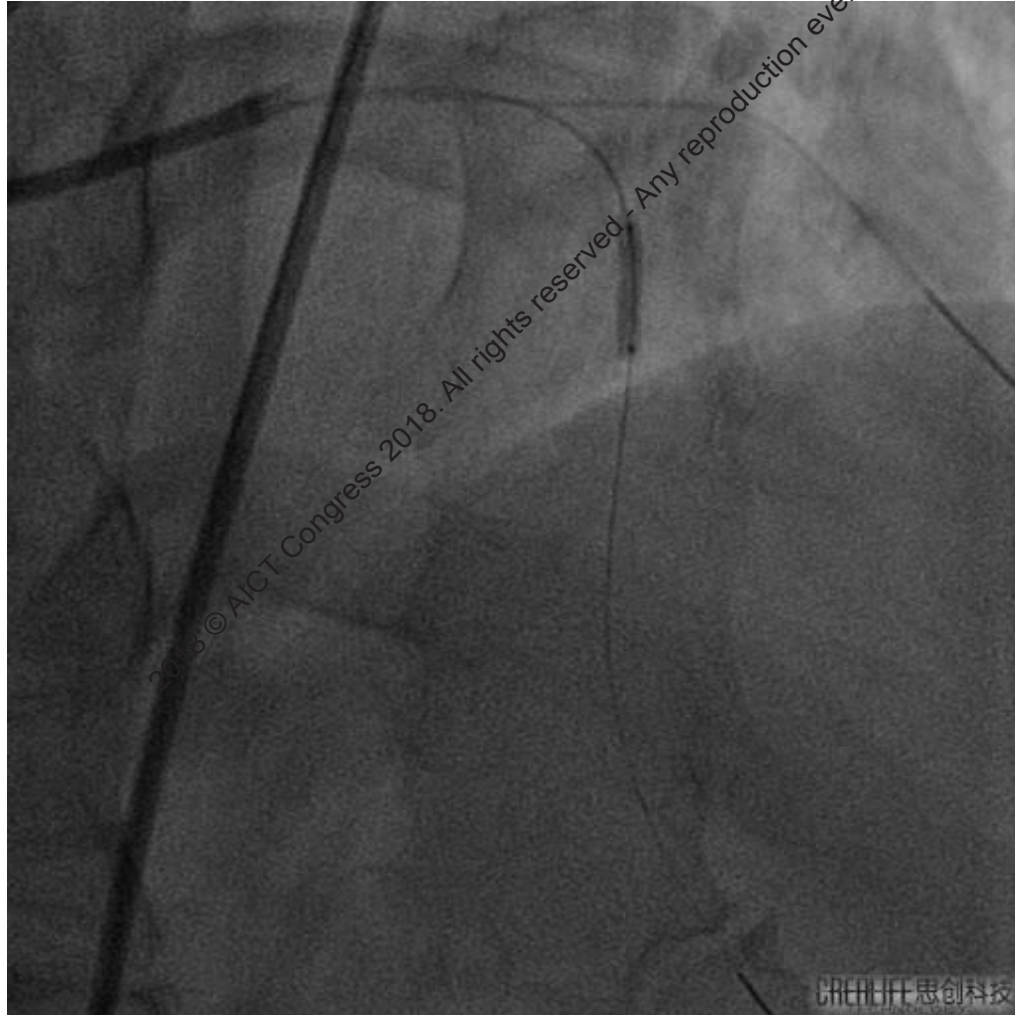
DEFINITION: Clinical Outcomes in 2-Stent vs Provisional Stenting in the Patients with Complex Bifurcation Lesions



	2-Stent	PS	HR	P
In hospital				
MI	27 (5.0)	48 (8.4)	0.58 (0.35-0.94)	0.026
At 1 year				
Cardiac death	15 (2.8)	30 (5.3)	0.52 (0.28-0.97)	0.041



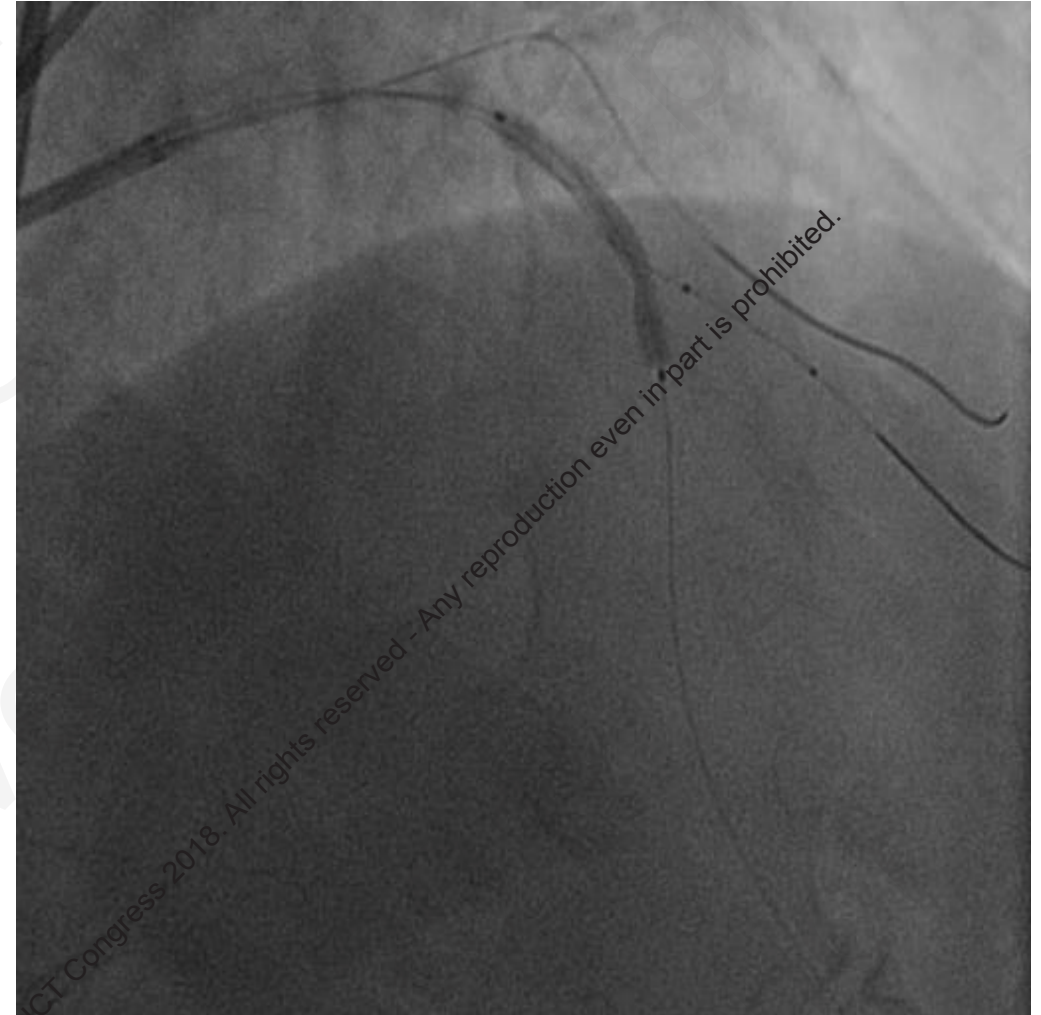
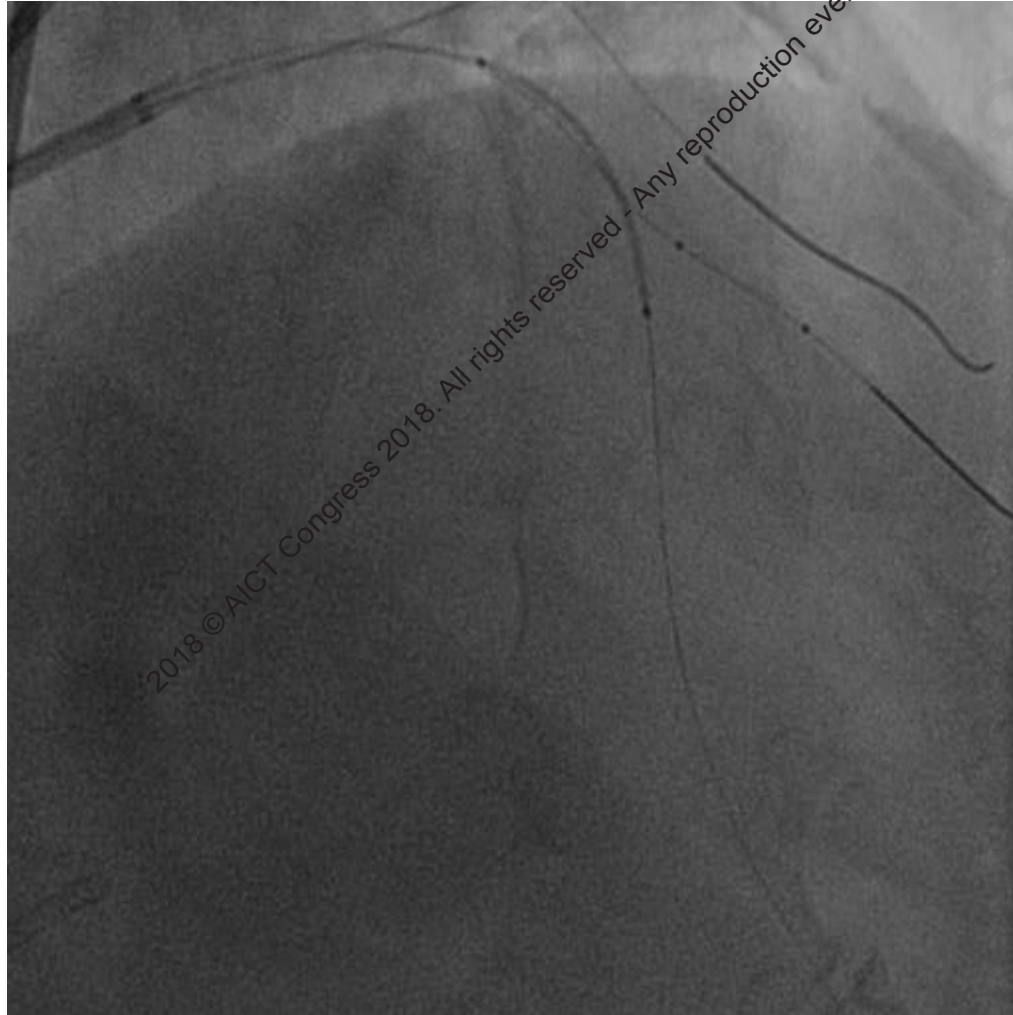
2.5×15mm Sprinter Balloon (12atm)





Jailed Balloon Technique

LAD: $2.75 \times 30\text{mm}$ Integrity DES (10atm)
D2: $2.5 \times 15\text{mm}$ Balloon

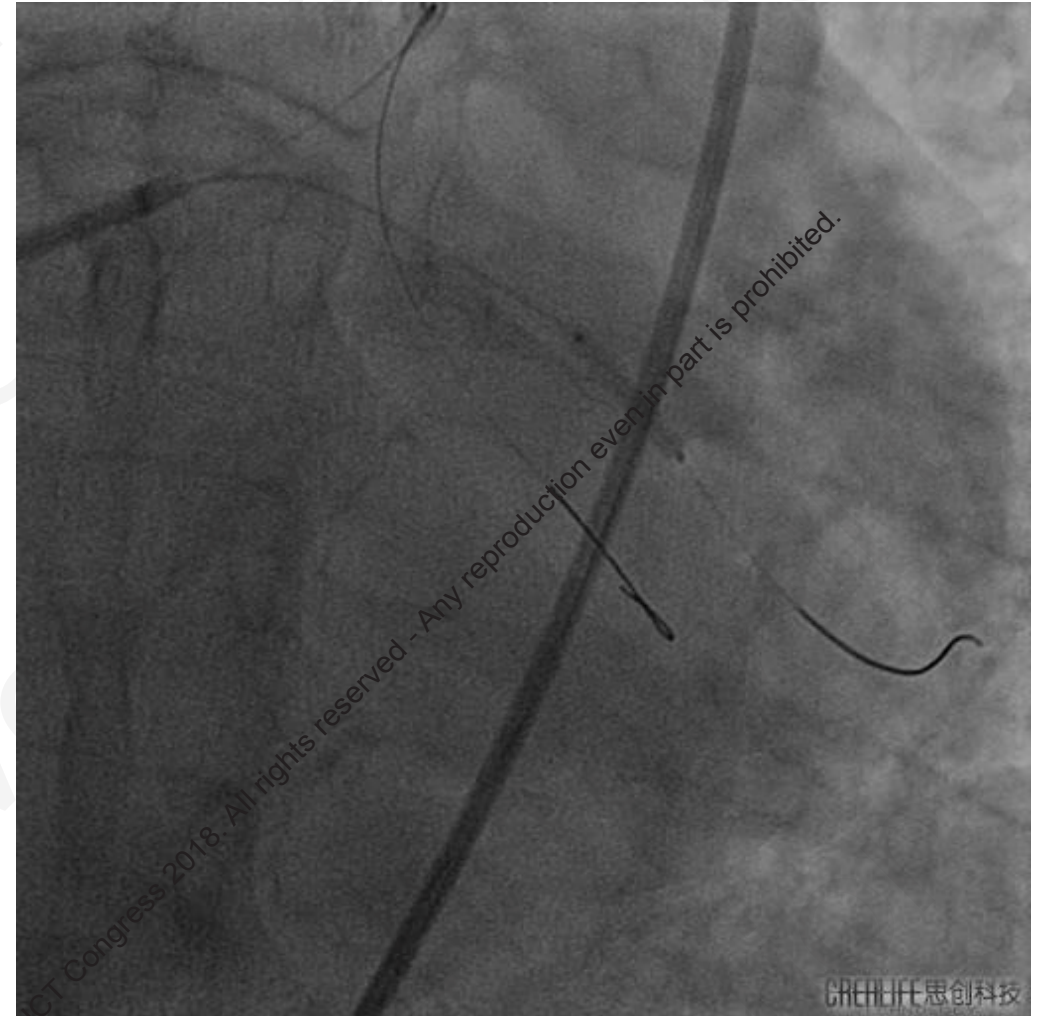
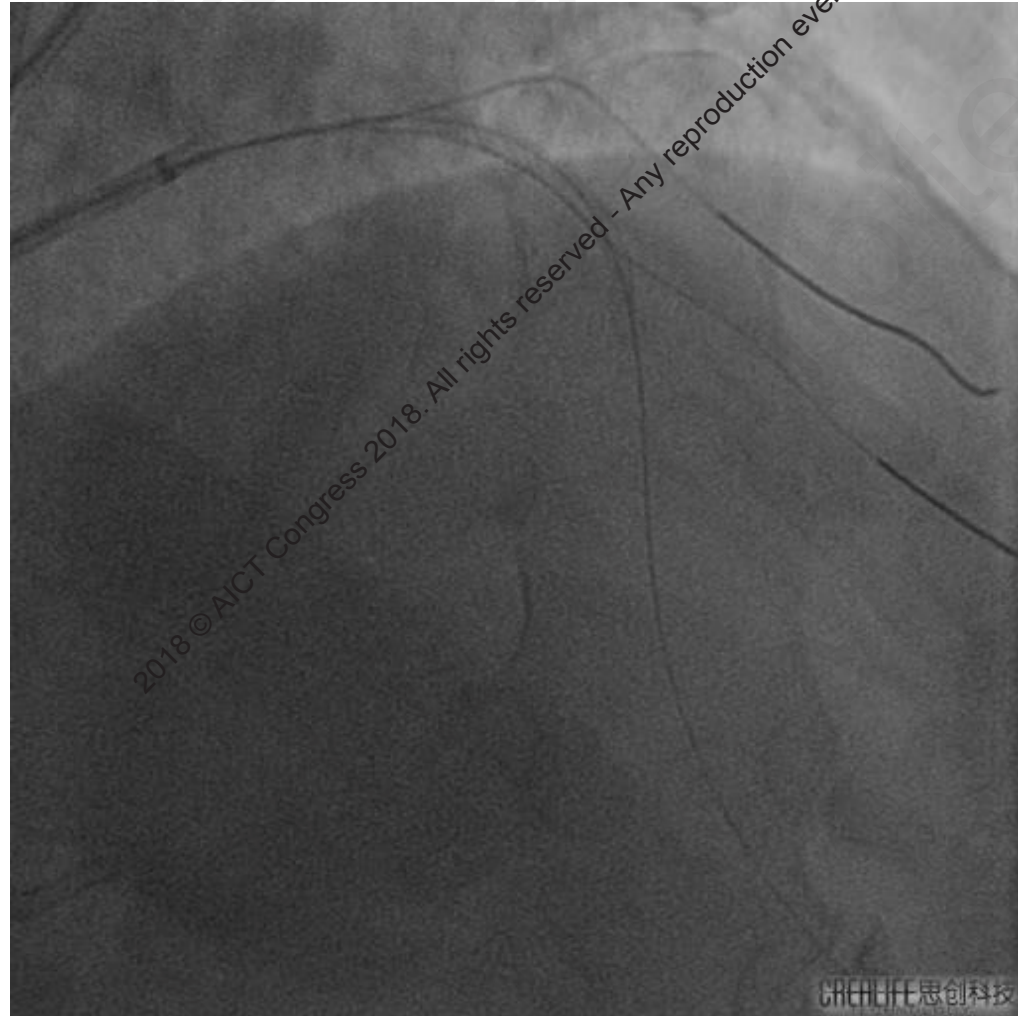


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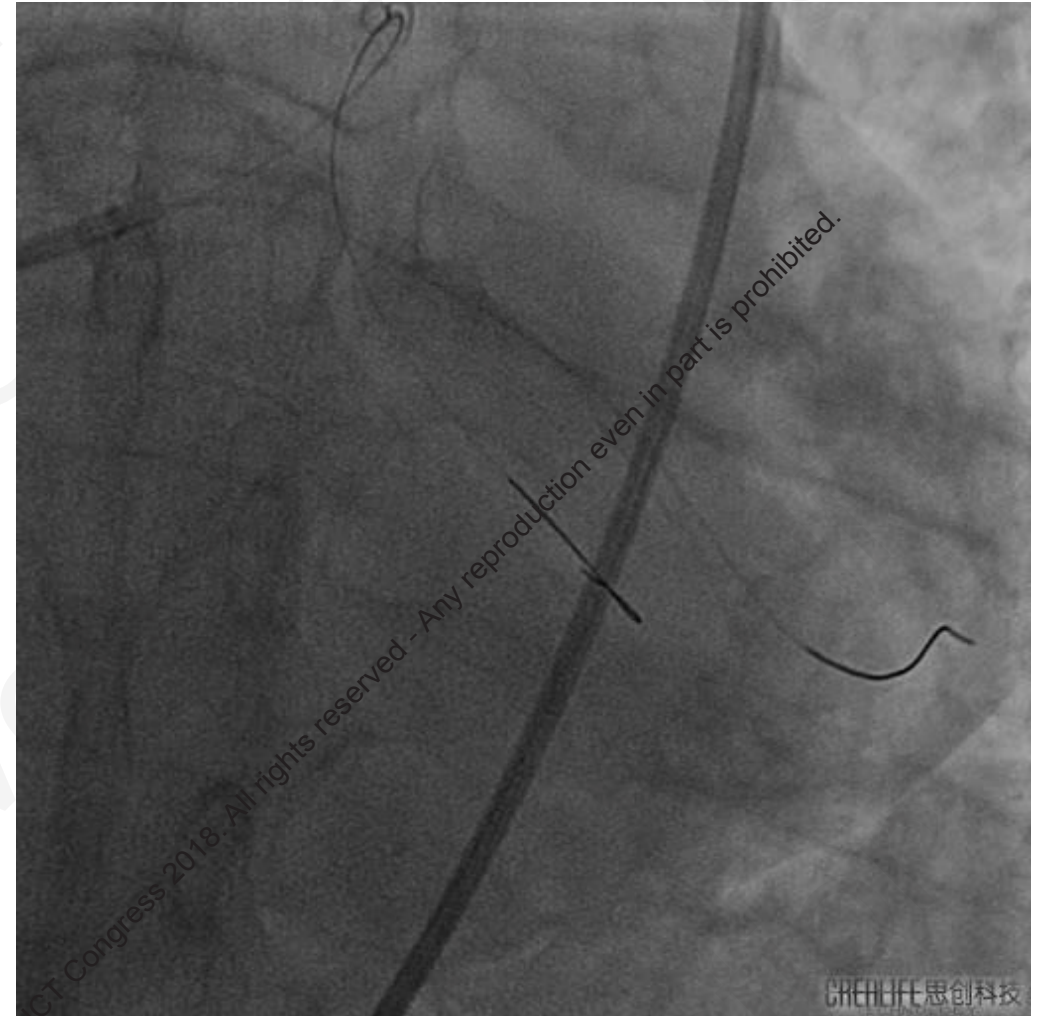
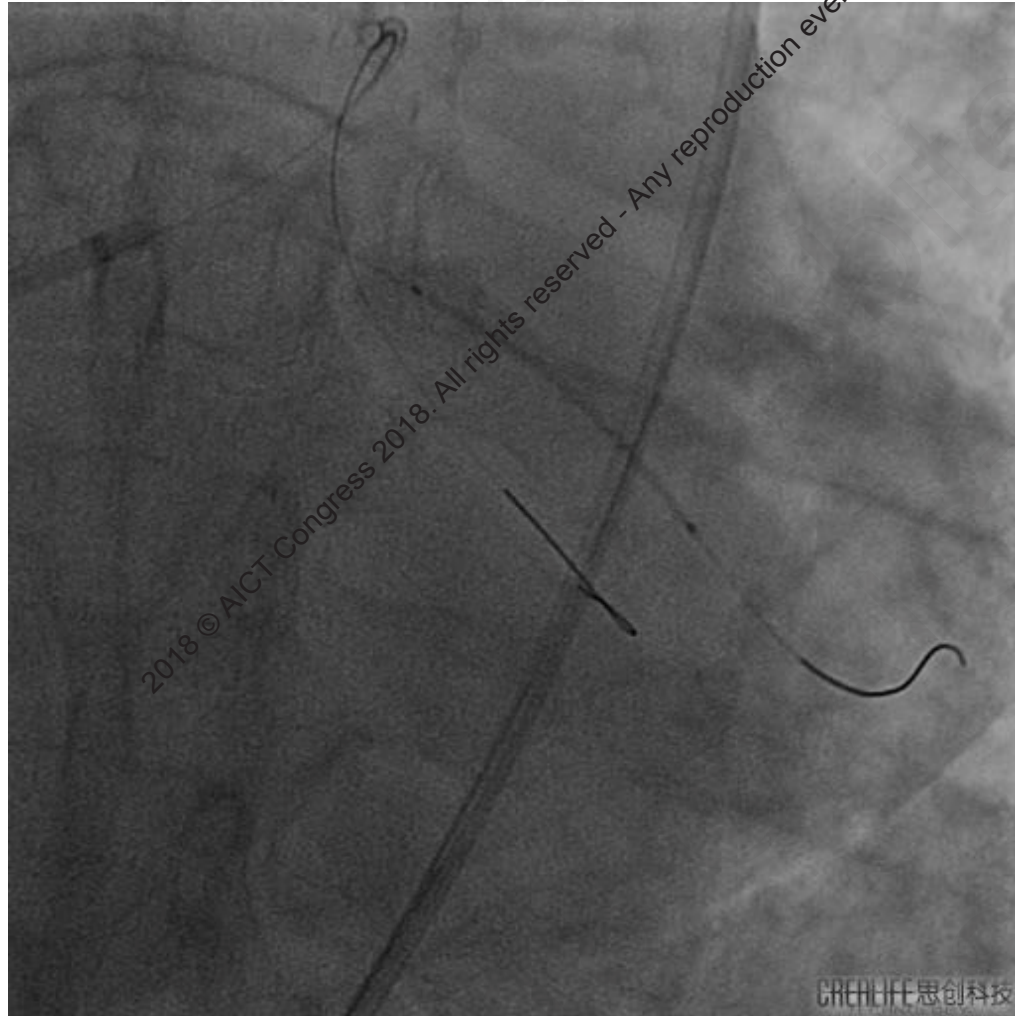


2.5×15mm Balloon (12atm)





2.5×30mm Integrity DES (12atm)

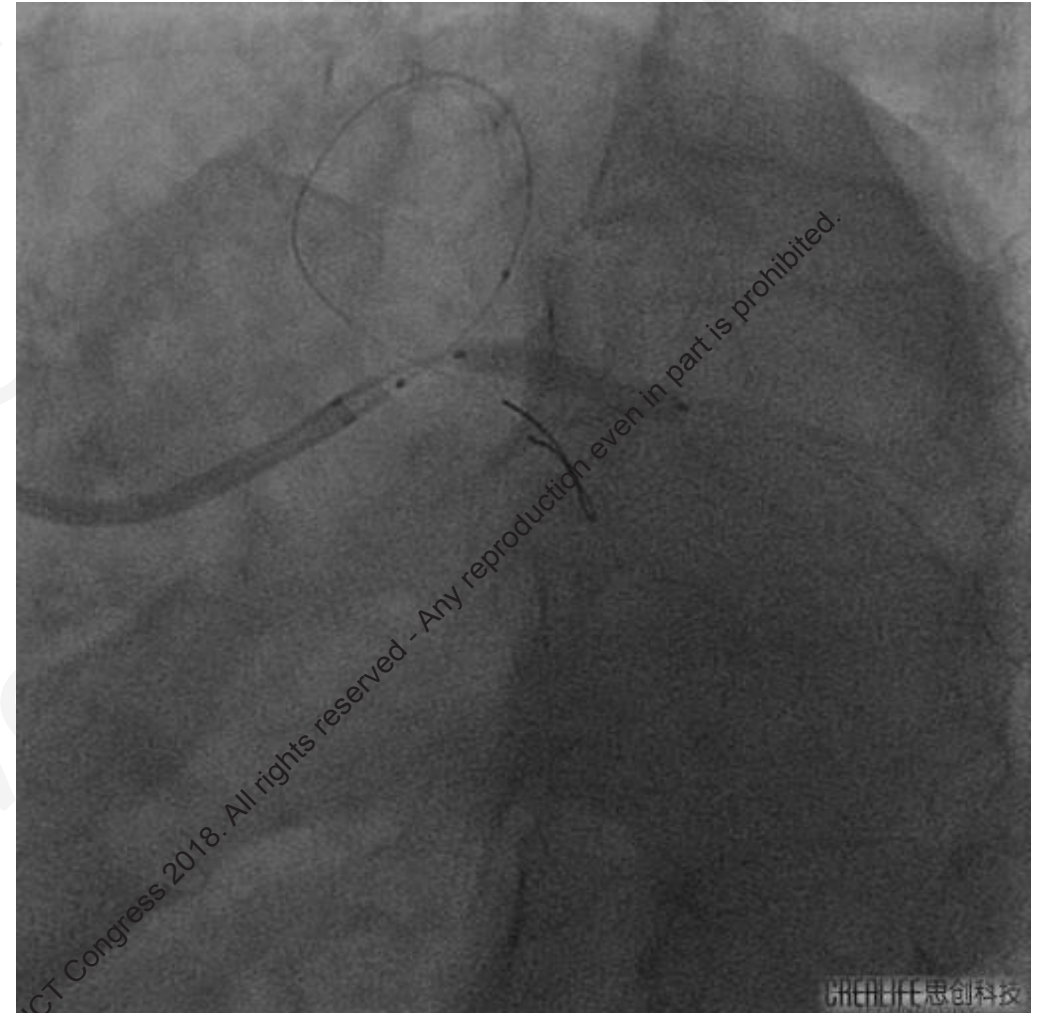
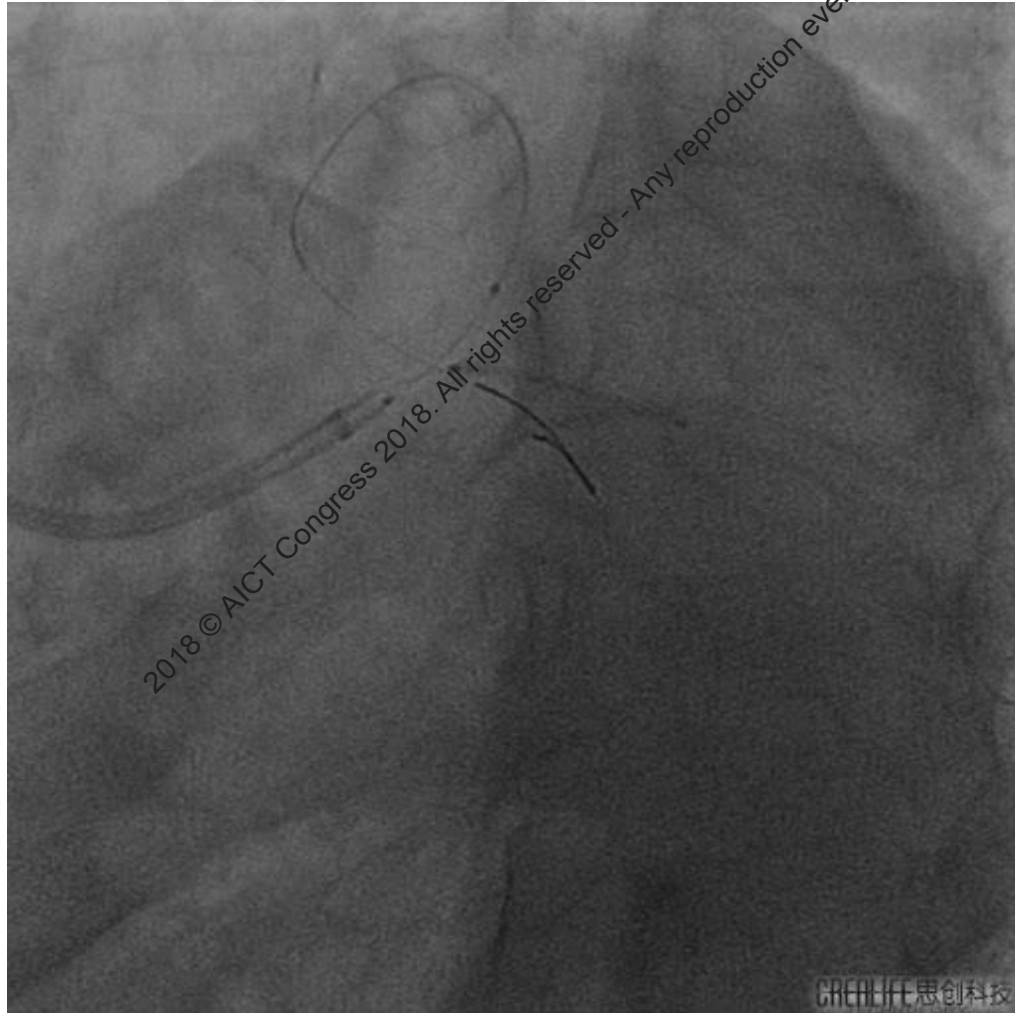




Step Mini-Crush Technique

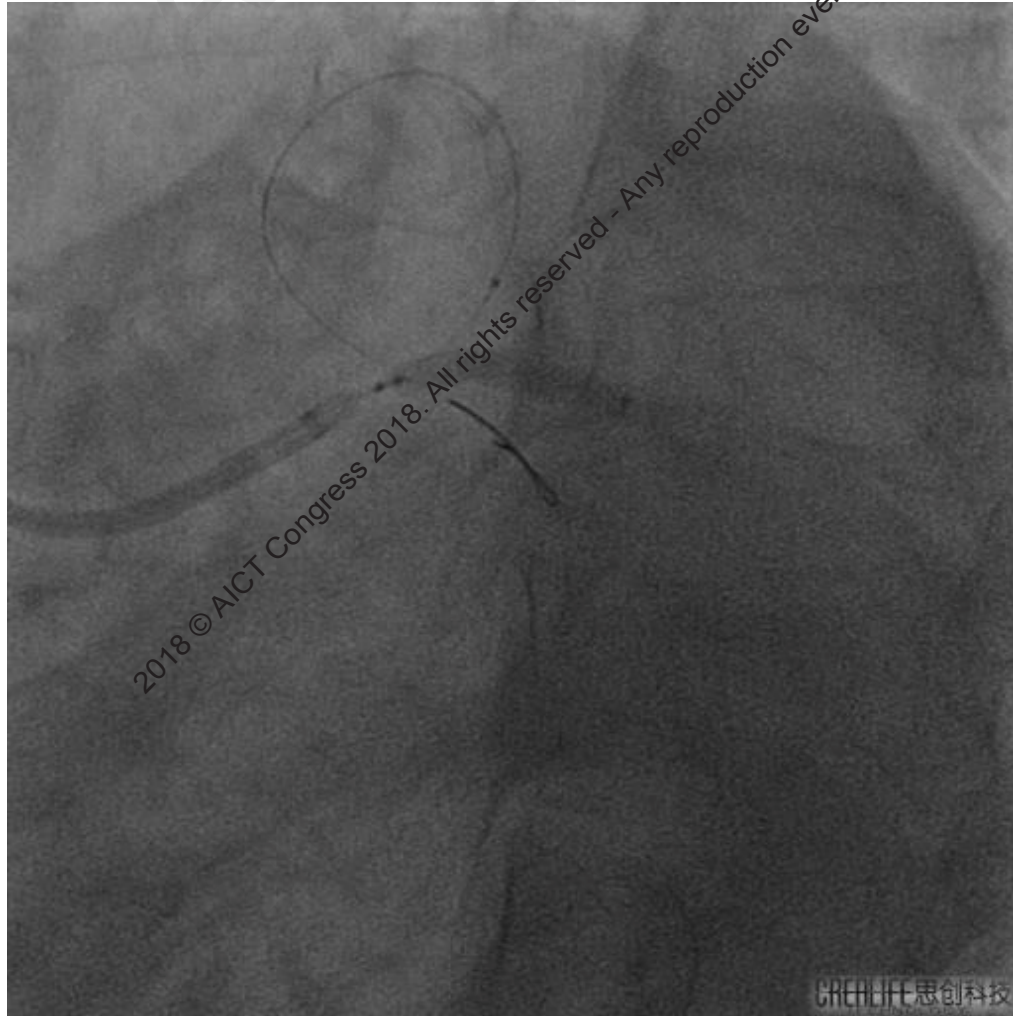
LAD: $2.75 \times 15\text{mm}$ NC Balloon

LCX: $3.0 \times 18\text{mm}$ Integrity DES (12atm)



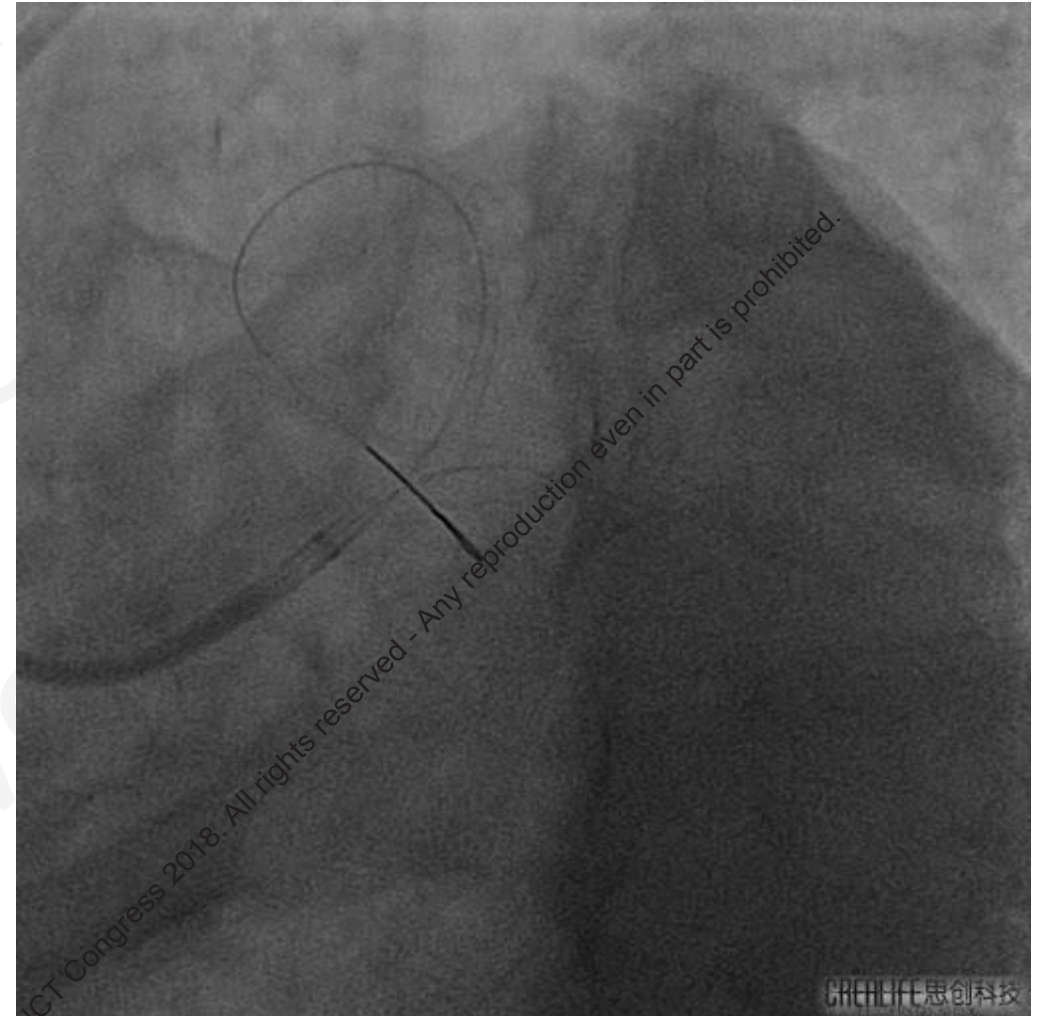
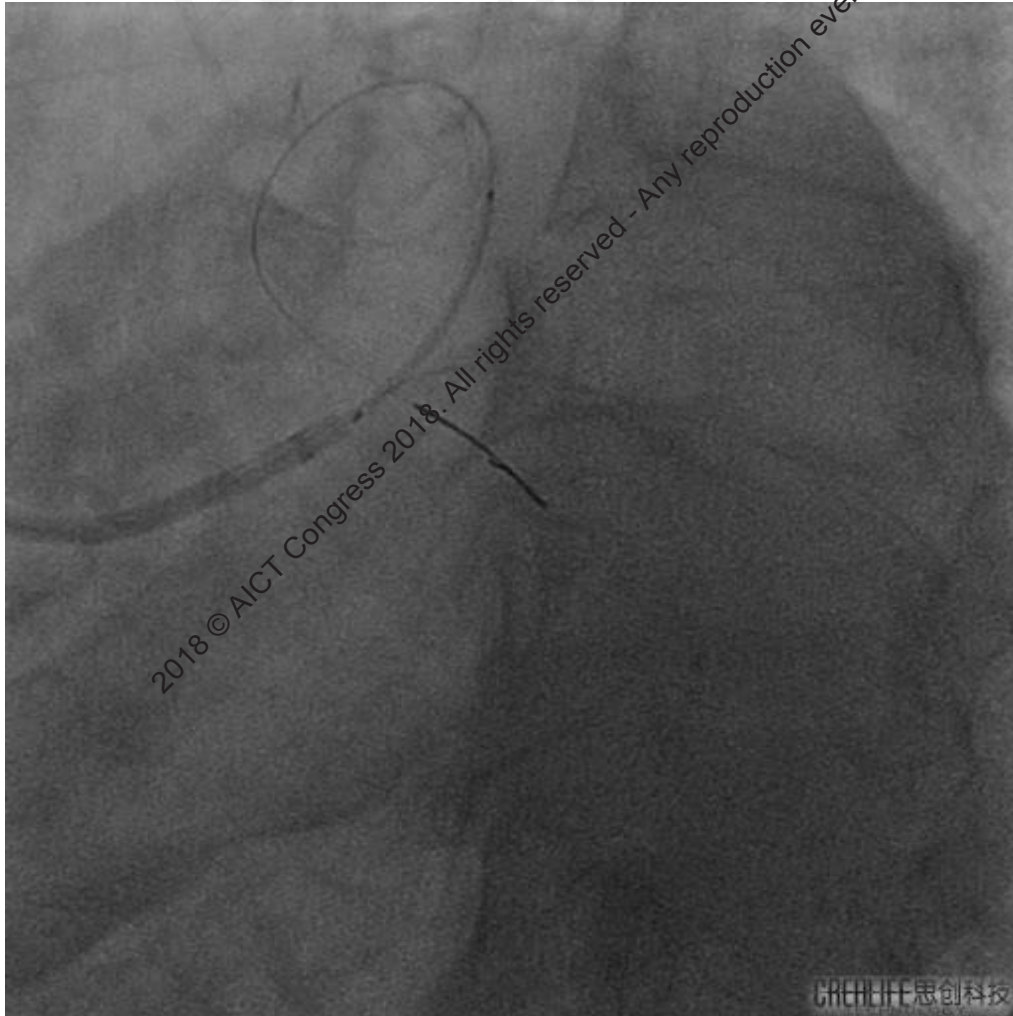


LAD: 2.75 × 15mm NC Balloon (18atm); LCX: 3.0 × 18mm Integrity Stent Balloon (16atm)



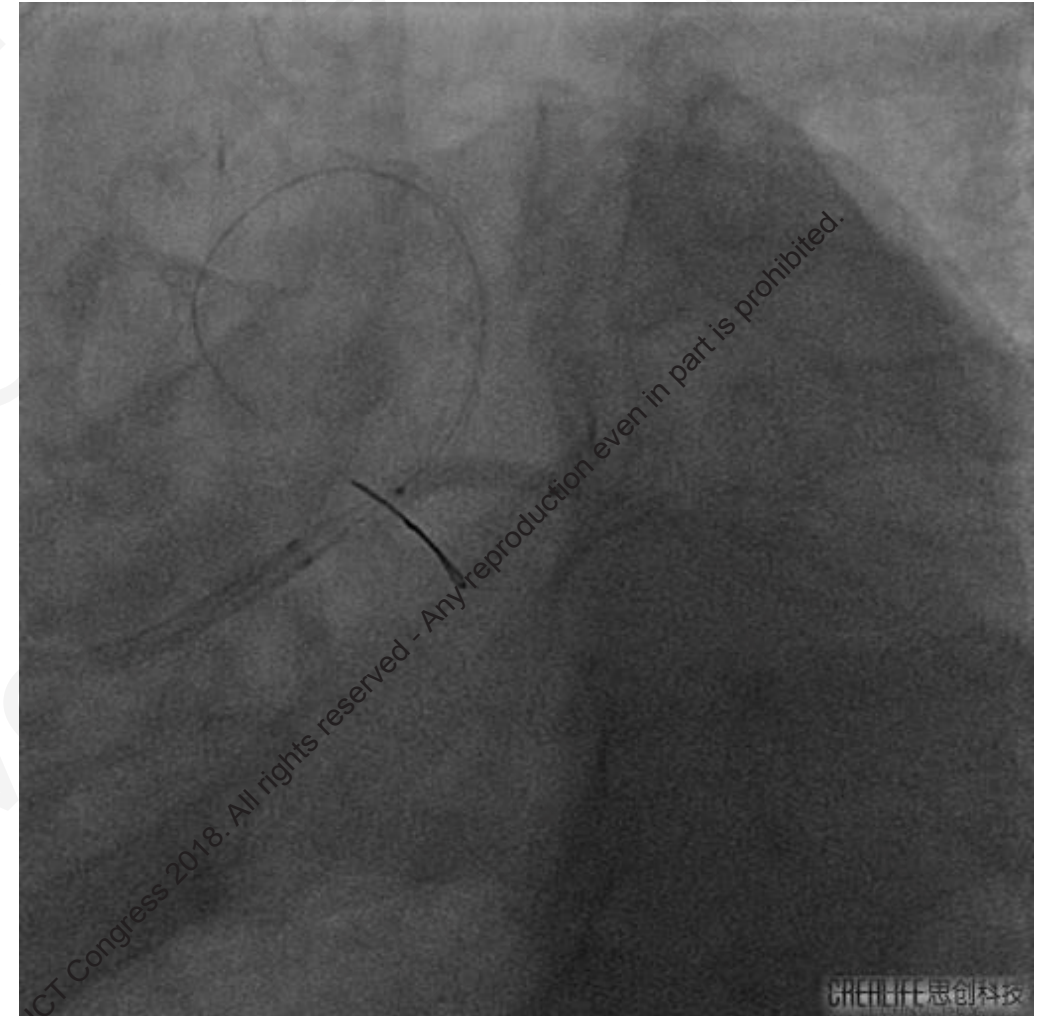
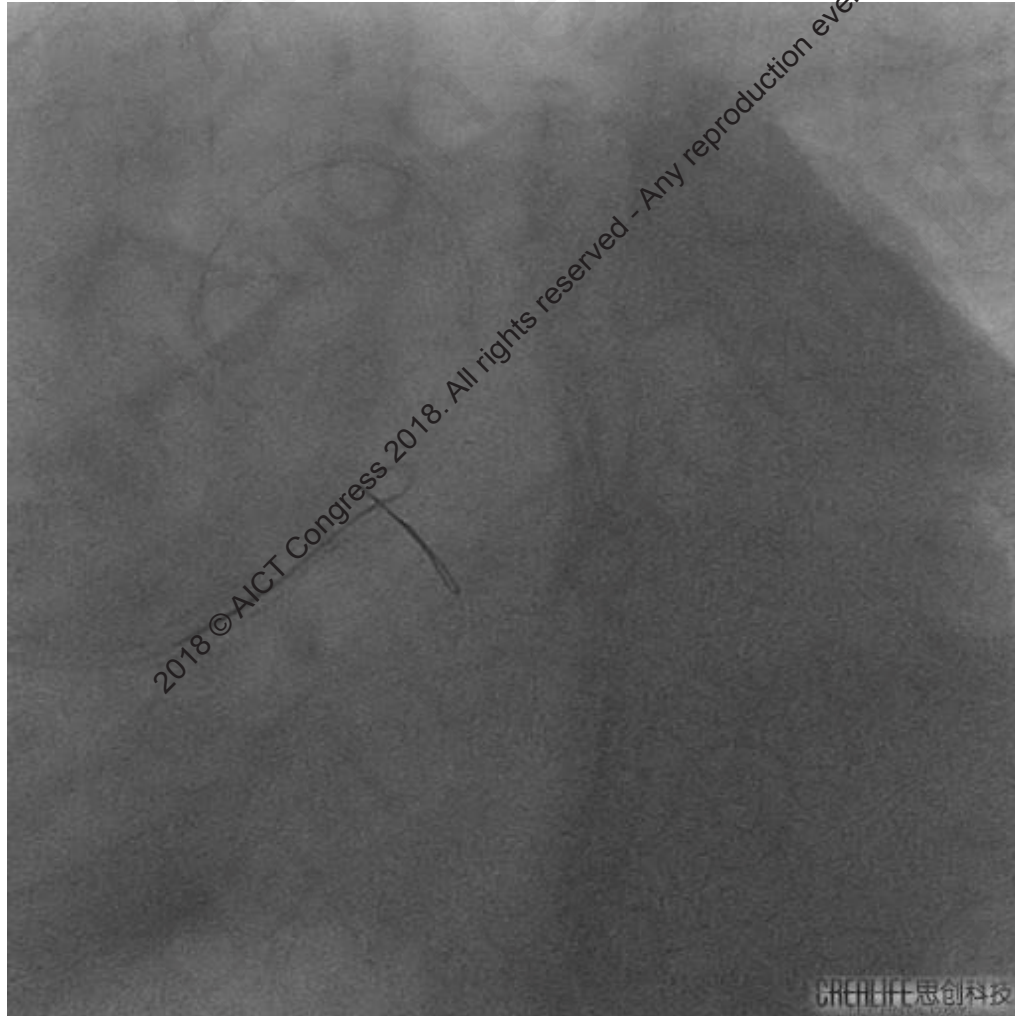


LAD: 4.0 × 26mm Integrity DES (12atm)



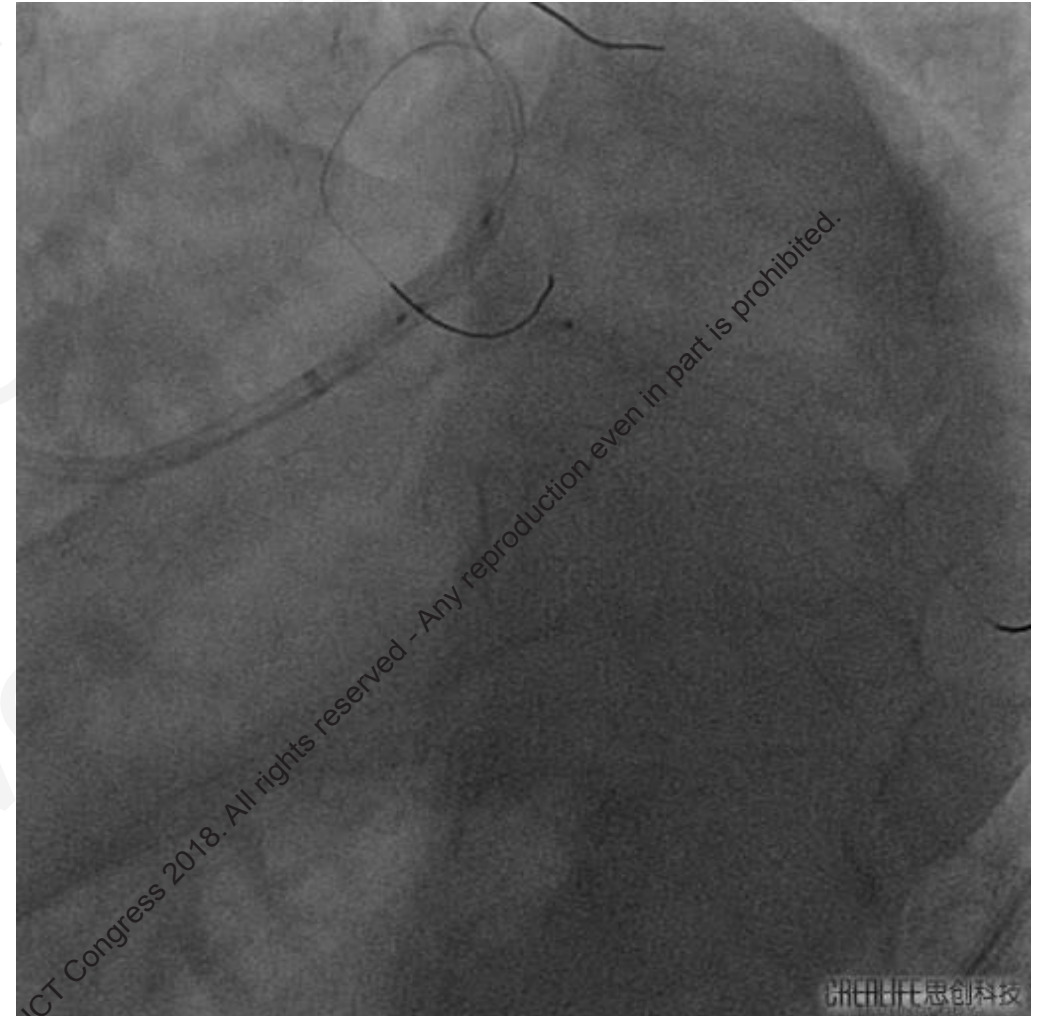
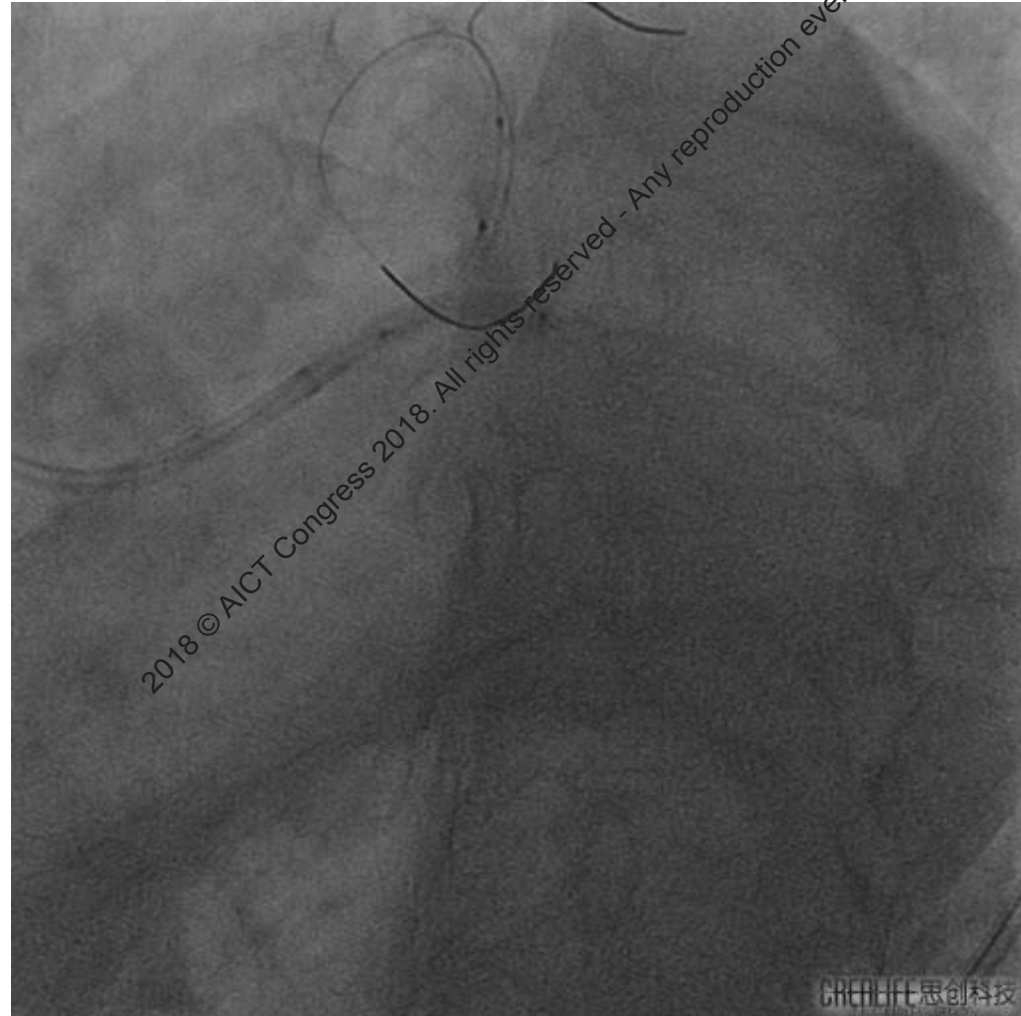


Sion Blue GW; 2.5 × 15mm Balloon (16atm)





LAD: 4.0 × 12mm NC Balloon (18atm), LCX: 3.0 × 15mm NC Balloon (18atm)



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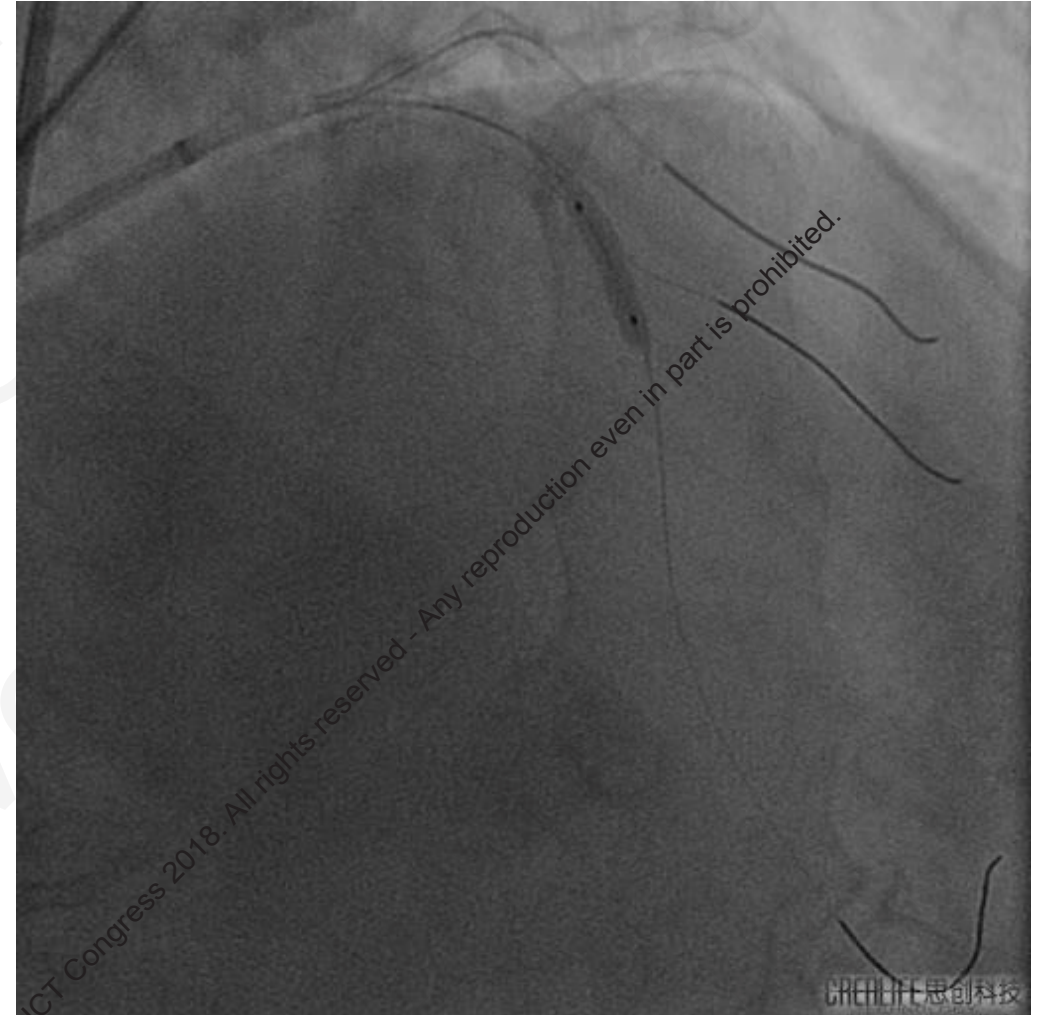
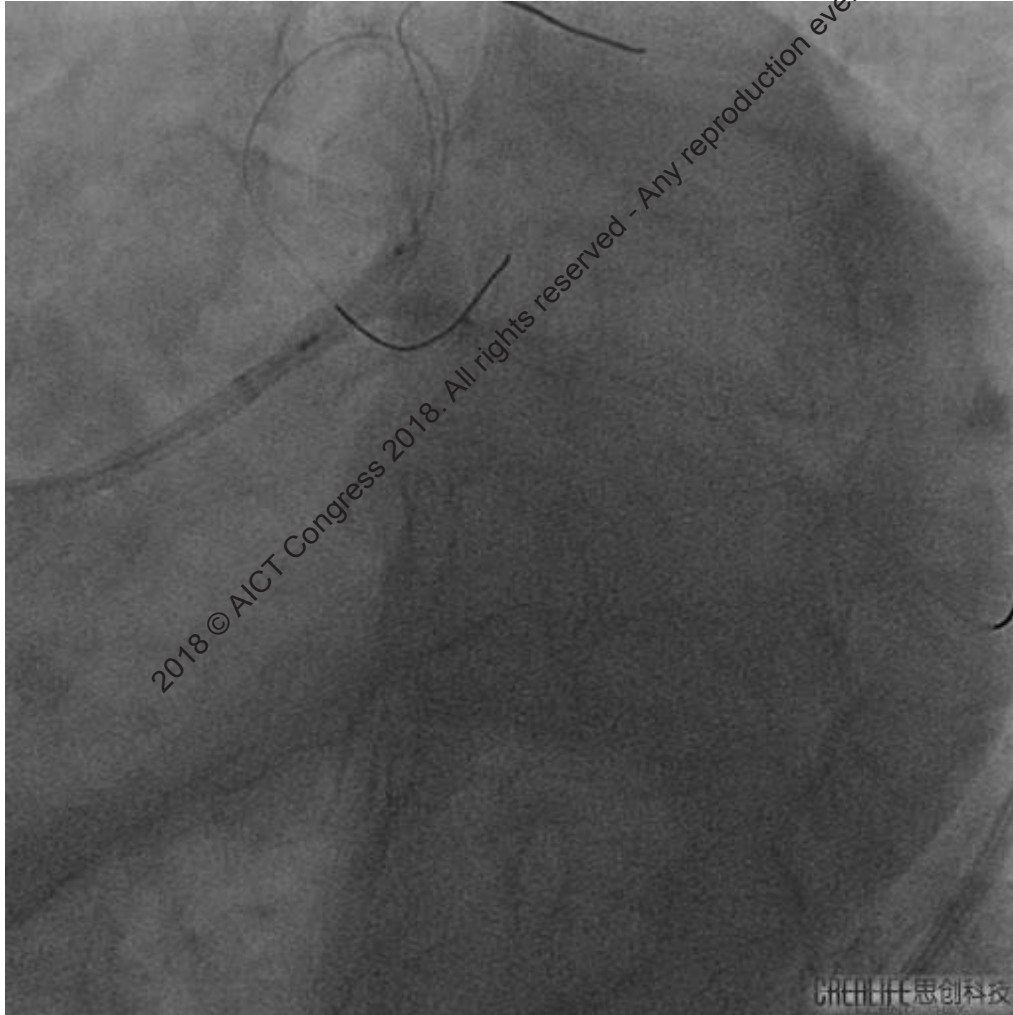
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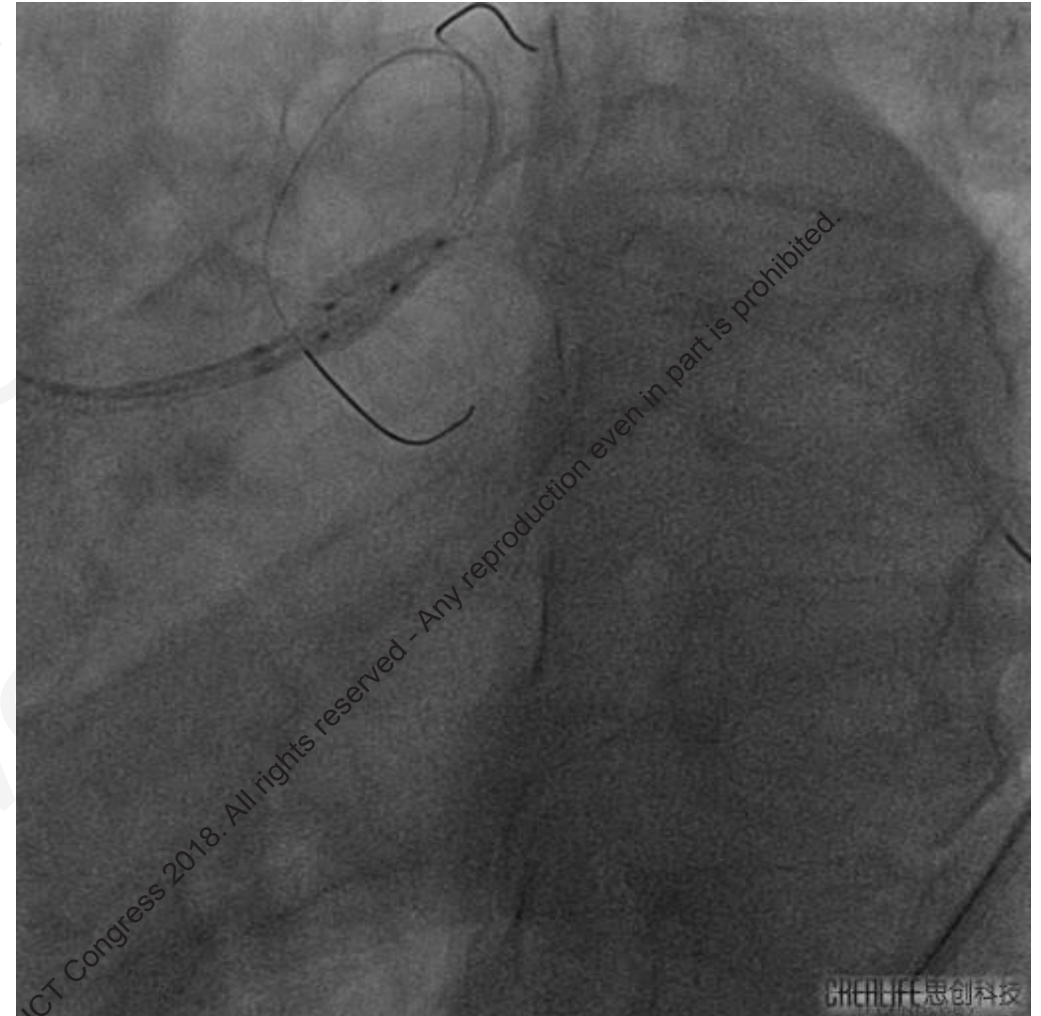
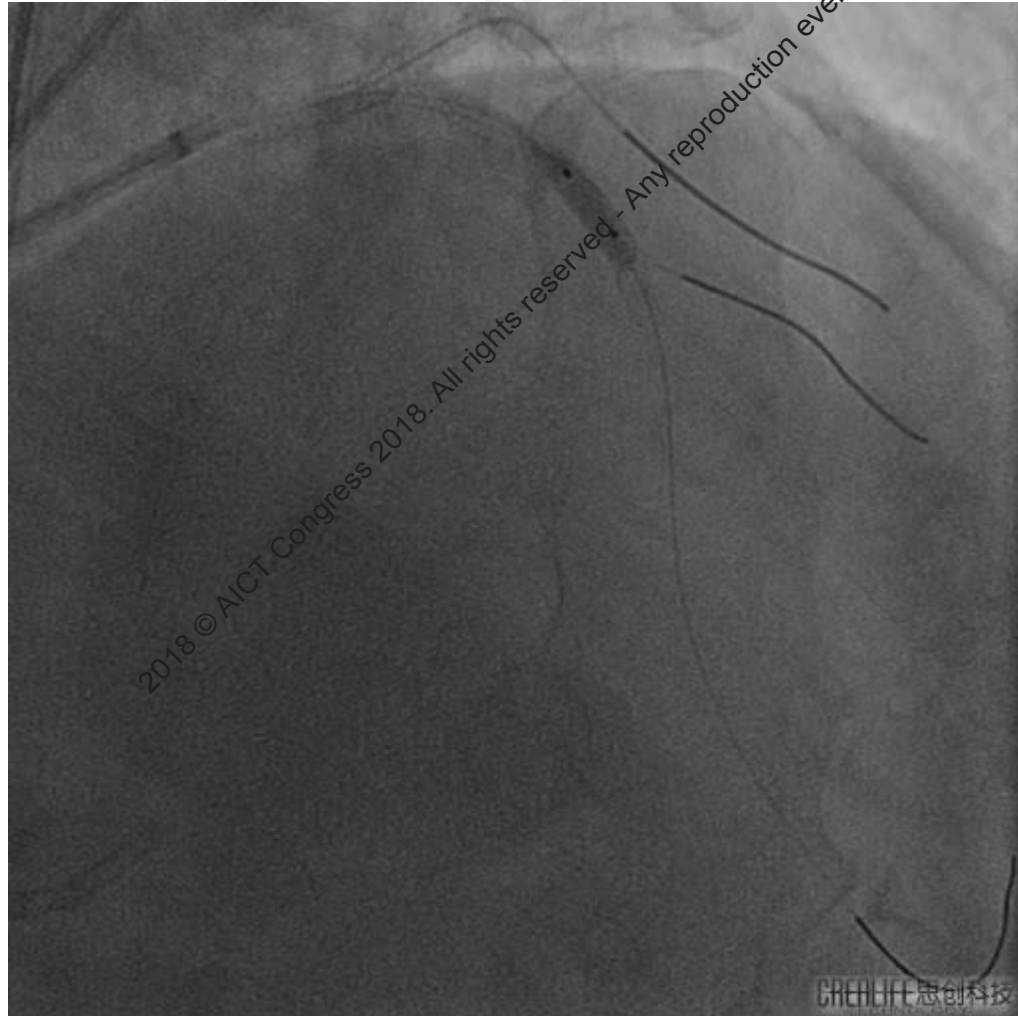


Kissing Balloon (8atm); LAD: 2.75 × 15mm NC Balloon (18atm)

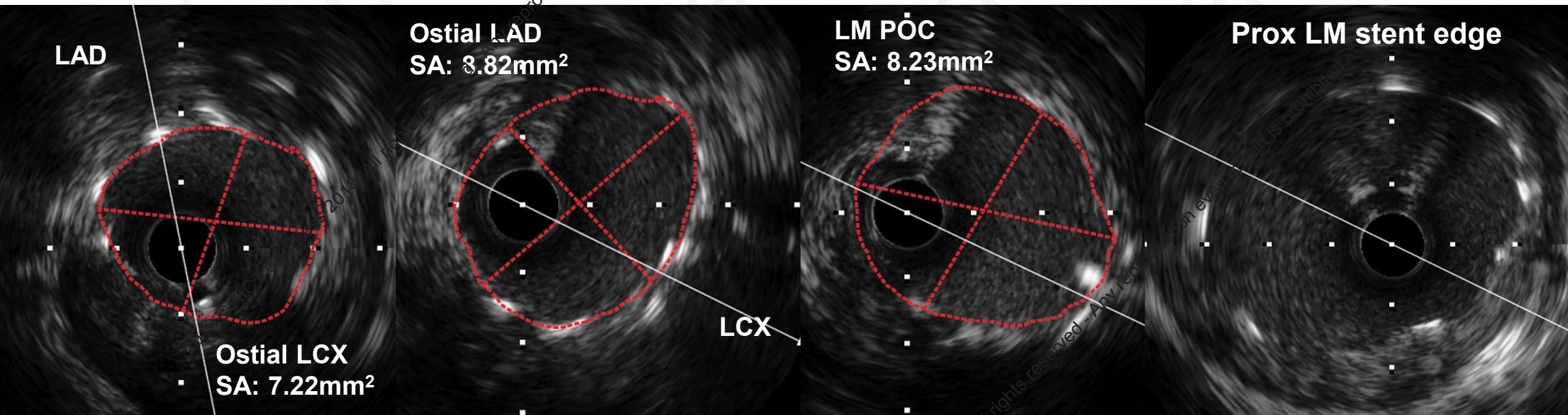




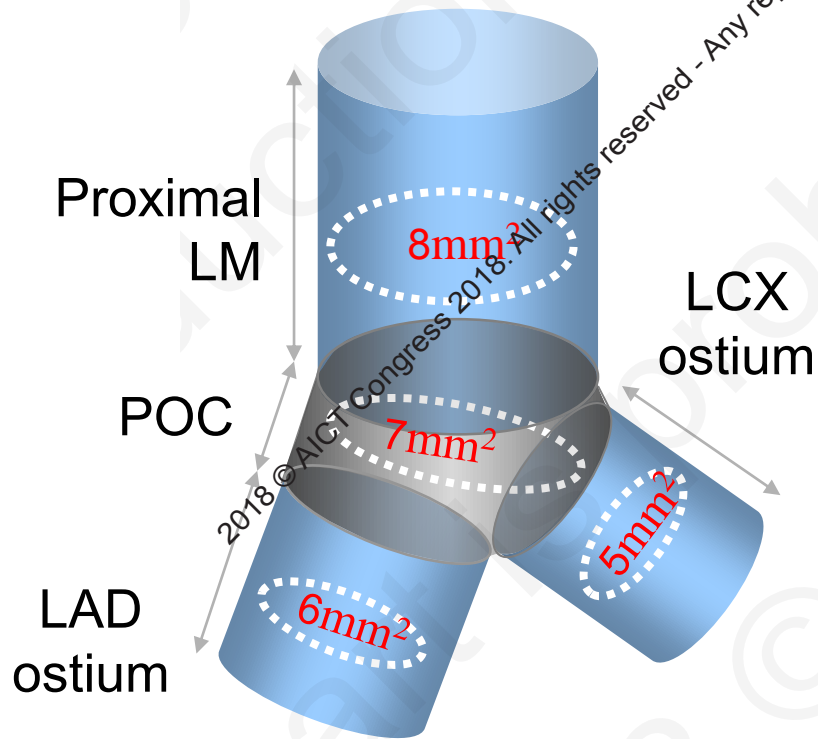
LAD: 3.5×9mm NC Balloon (16atm): POT: 3.5+2.75mm NC Balloon (10atm)



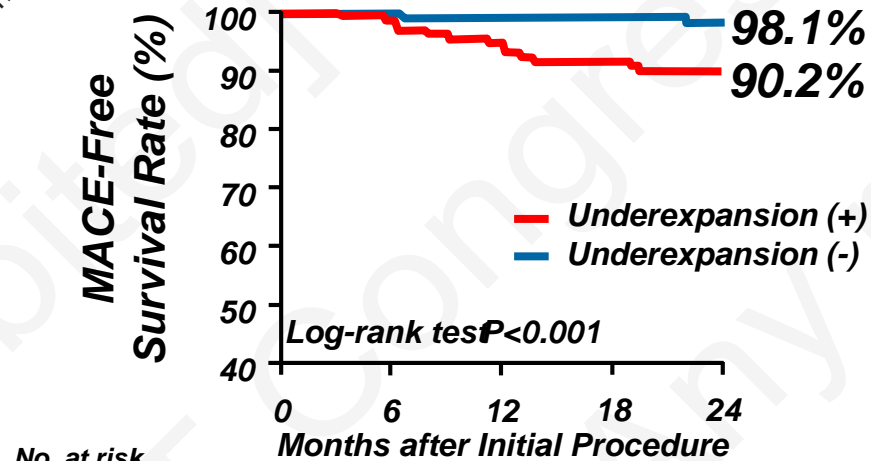
Post-PCI IVUS



Criteria for LMCA stent underexpansion (n=403)

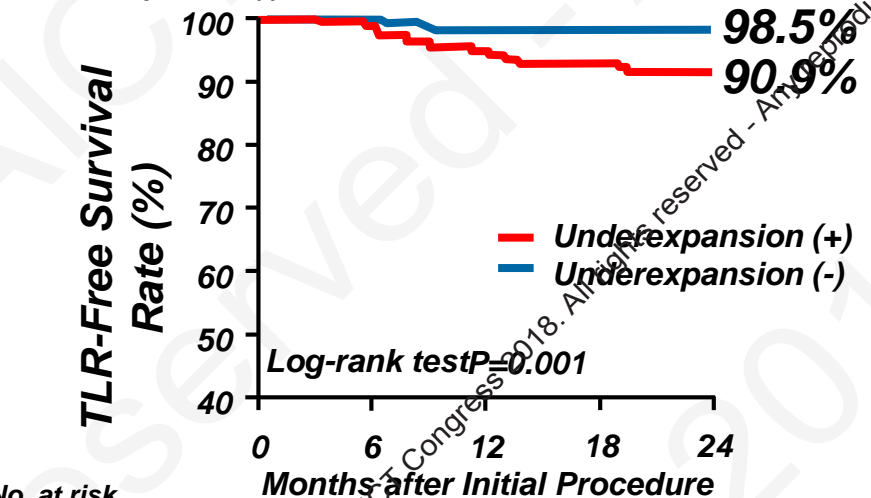


Kang et al. *Circulation Cardiovasc Interv.* 2011;4(6):562-9.



No. at risk

Underexpansion (+)	6	12	18	24
133	131	126	121	75
260	260	255	246	129

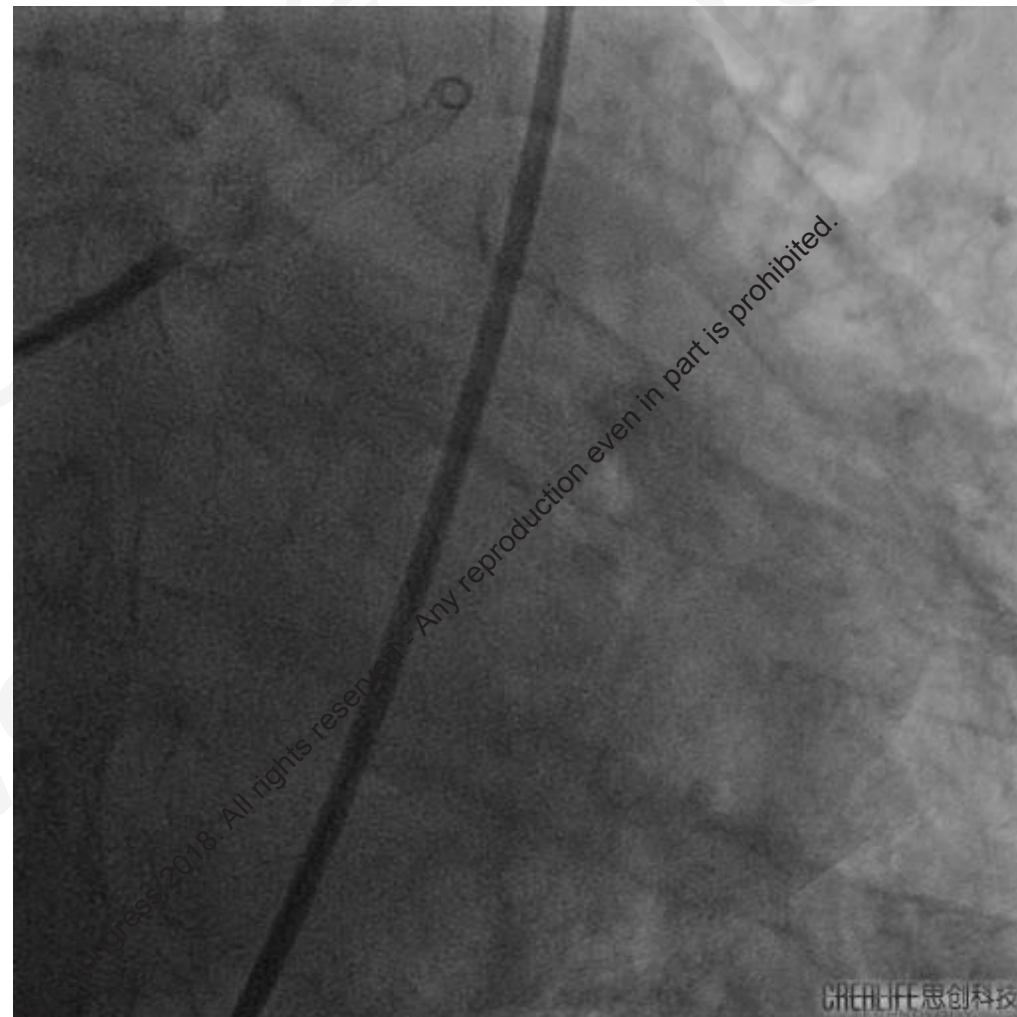
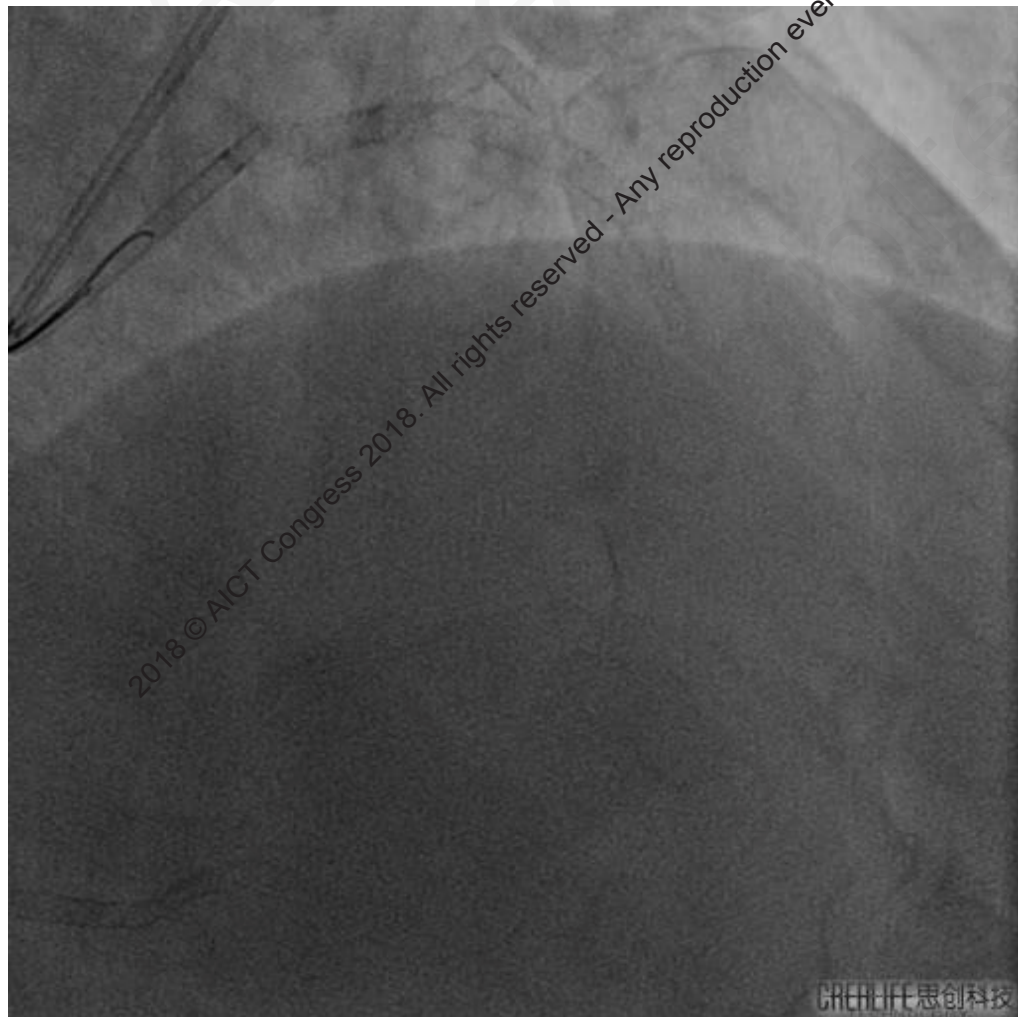


No. at risk

Underexpansion (+)	6	12	18	24
133	131	126	121	75
260	260	255	246	129

- MACE-free survival was lower in pts with underexpansion vs those without underexpansion (89.4% vs 98.1%).
- TLR-free survival was lower in pts with underexpansion vs no underexpansion (90.9% vs 98.5%).
- Although acute malapposition was observed in 28 pts, malapposition was not related to MACE at follow-up.

Final Result



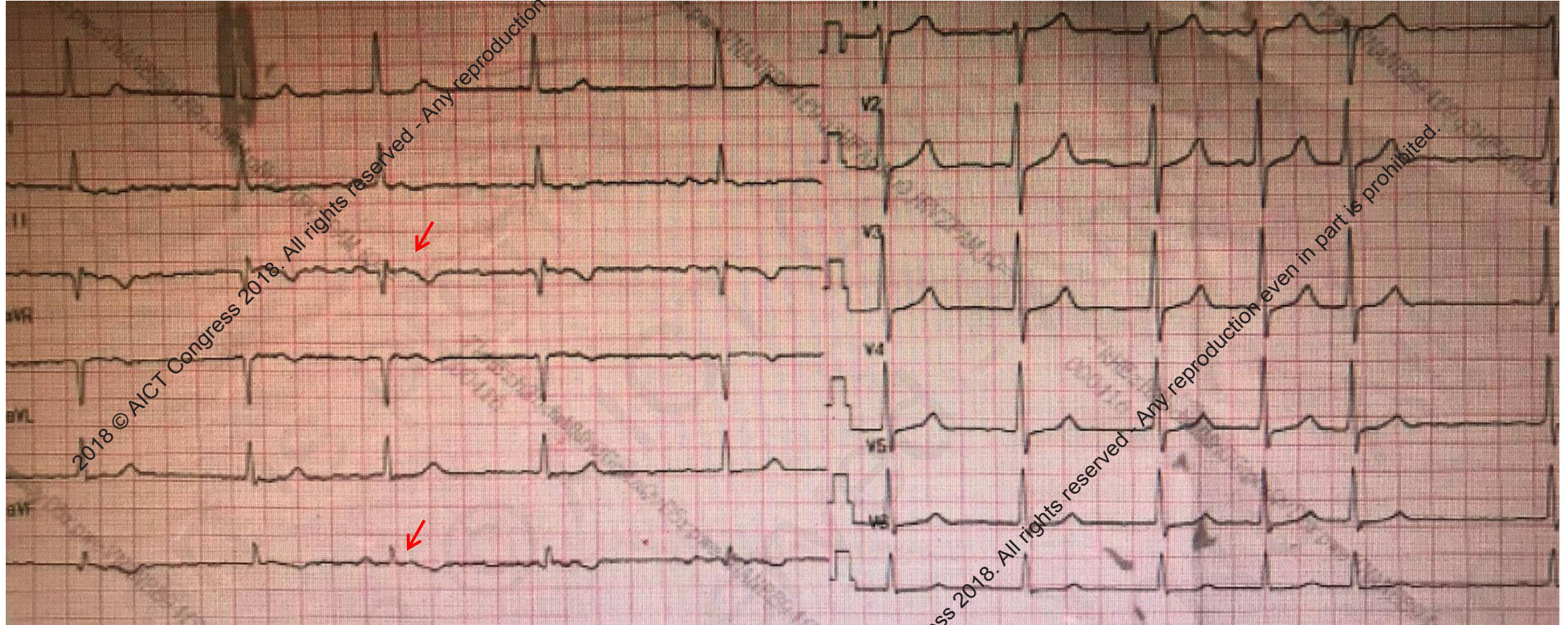
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ECG



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Post-PCI Medication

- **CHA2DS2-VASc=2, HASBLED=3, EHRA=I**
- **Complexity of coronary stenting technique, multivessel disease**
- **4 weeks:**
 - **Aspirin: 100mg/d**
 - **Ticagrelor: 90mg bid**
- **Up to 12 months:**
 - **Clopidogrel: 75mg/d**
 - **Rivaroxaban: 15mg/d**
- **Atorvastatin: 40mg/d**



In Summary

- **Complex bifurcation lesions had higher rates of MACE. For the patients with complex LM bifurcation lesions, 2-stent techniques should be considered at the beginning of PCI procedure.**
- **Use IVUS to guide LM bifurcation PCI and optimize revascularization results.**

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