



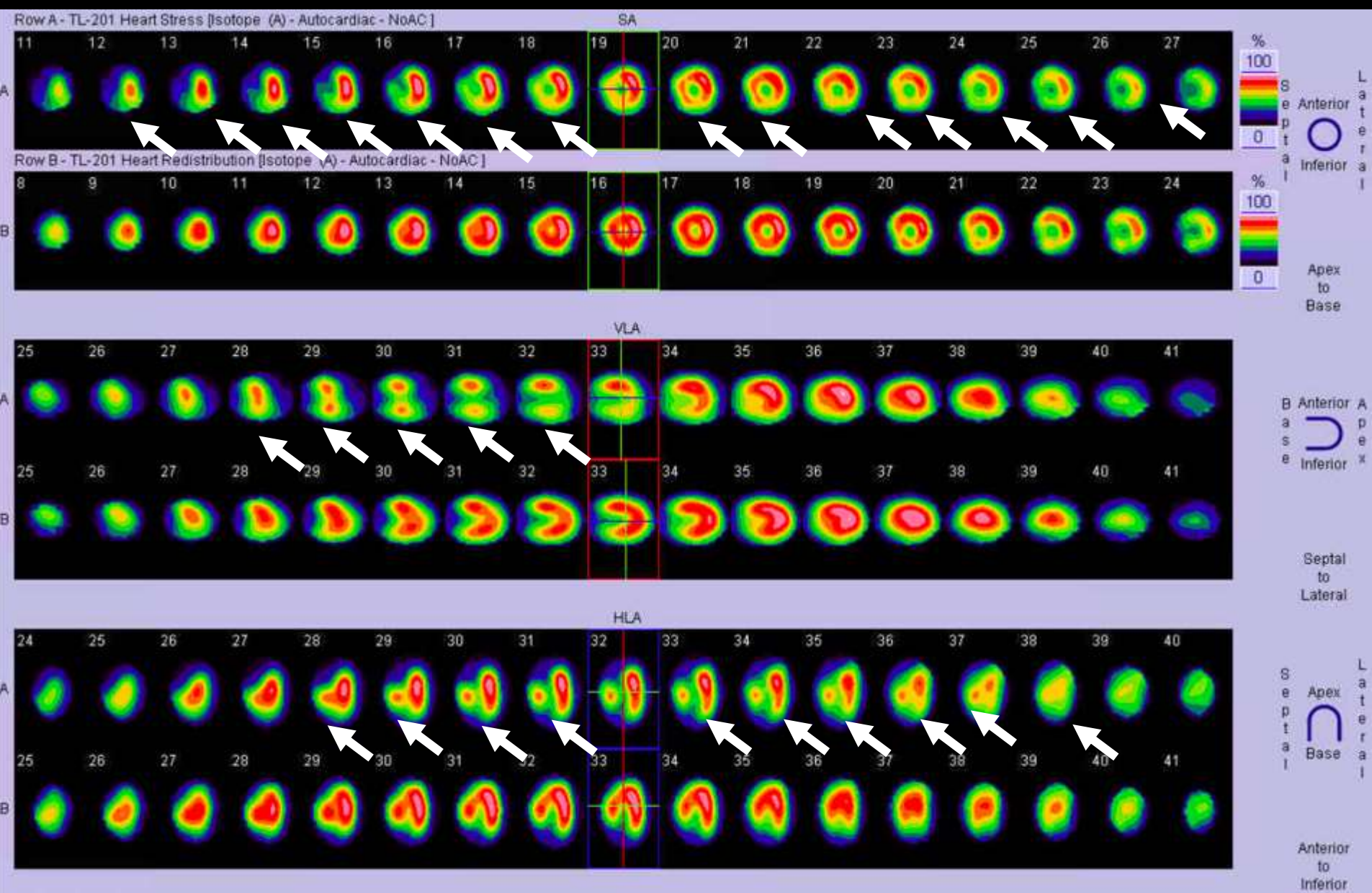
3rd COMPLEX PCI
Make It Simple!
Technical Forum: A to Z

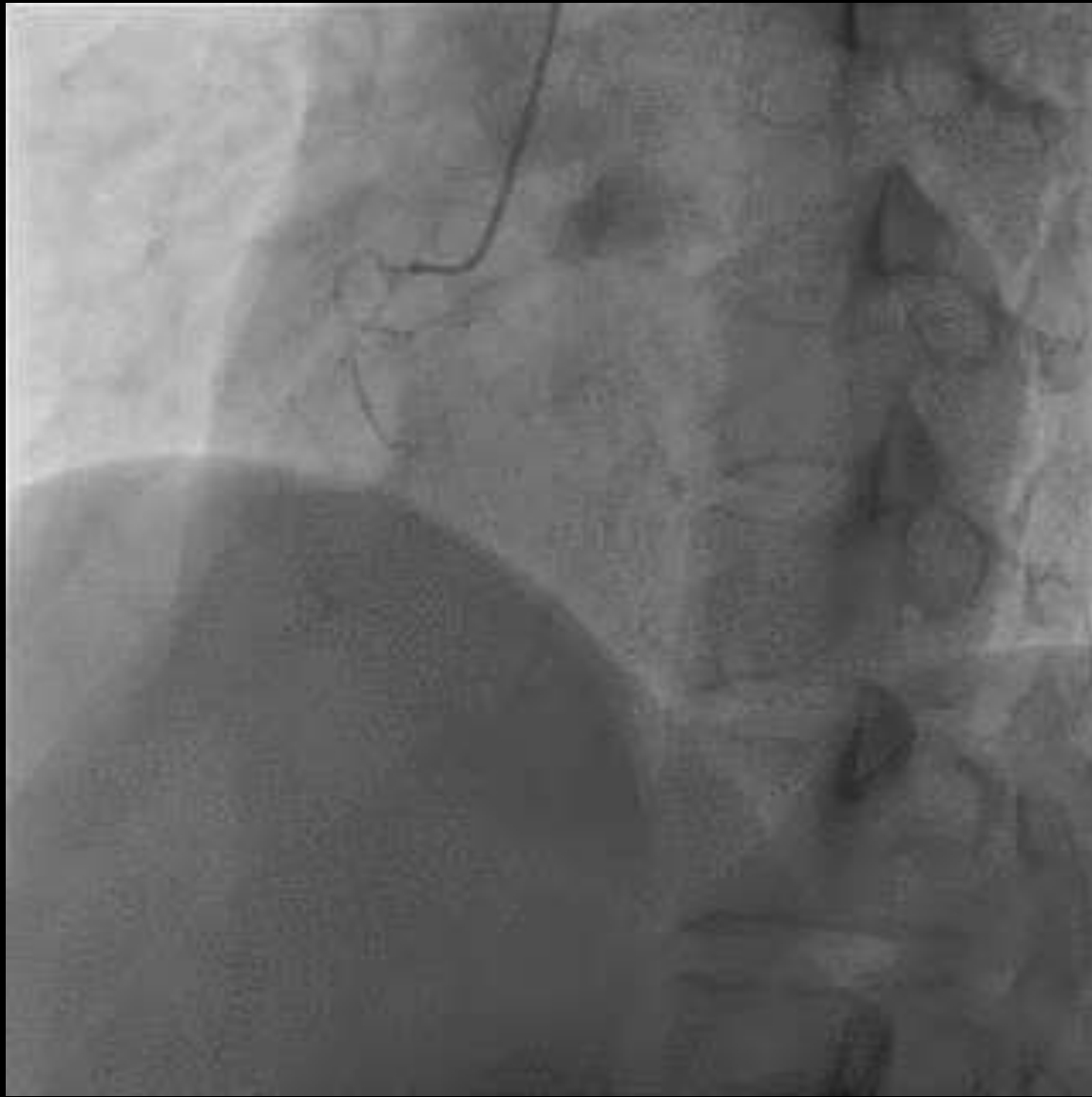
Total Occlusion of Bioresorbable Vascular Scaffold in a Young Patient with Coronary Aneurysm

**Mei-Tzu Wang, Wei-Chun Huang, Ta-Hsin Tai
Guang-Yuan Mar, Chun-Peng Liu
Kaohsiung Veteran General Hospital, TAIWAN**

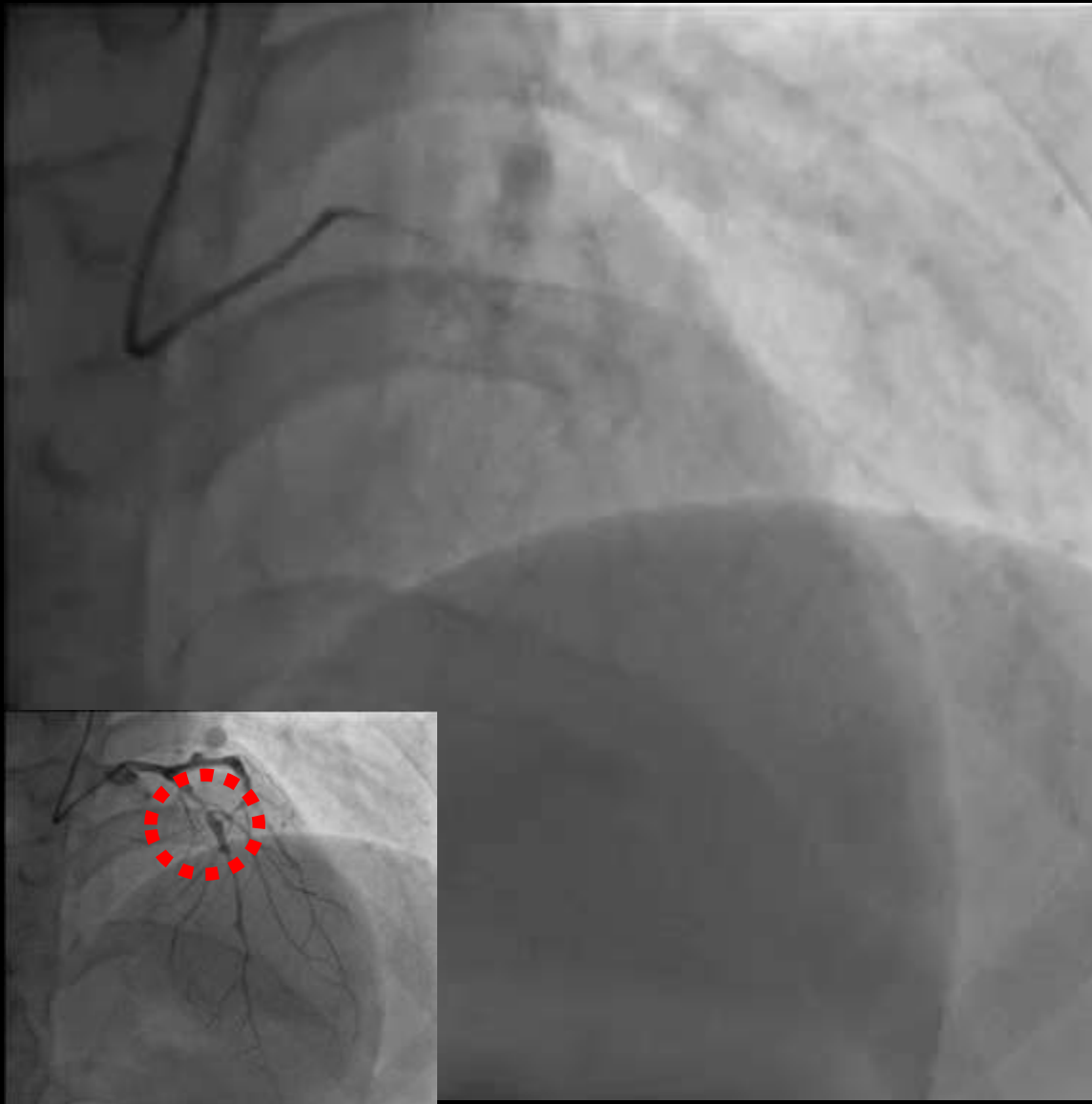
Case Report

- 36 Y/O male
- Risk factor
 - Smoking
- Chest tightness for months





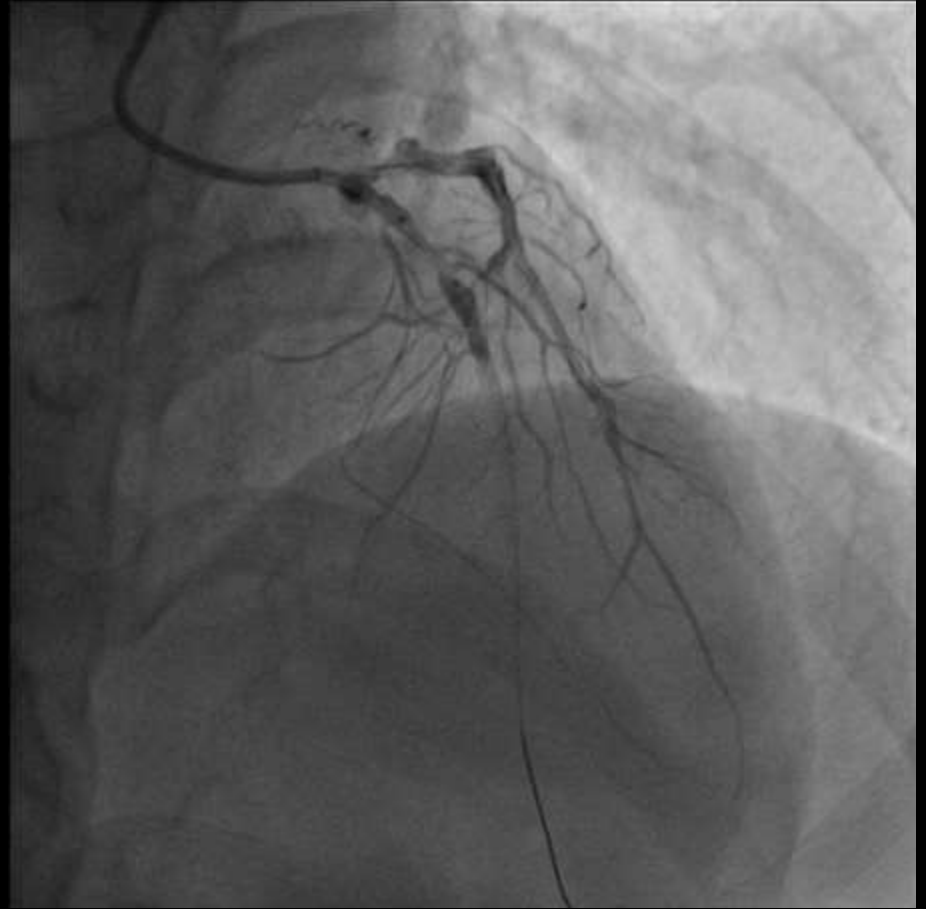
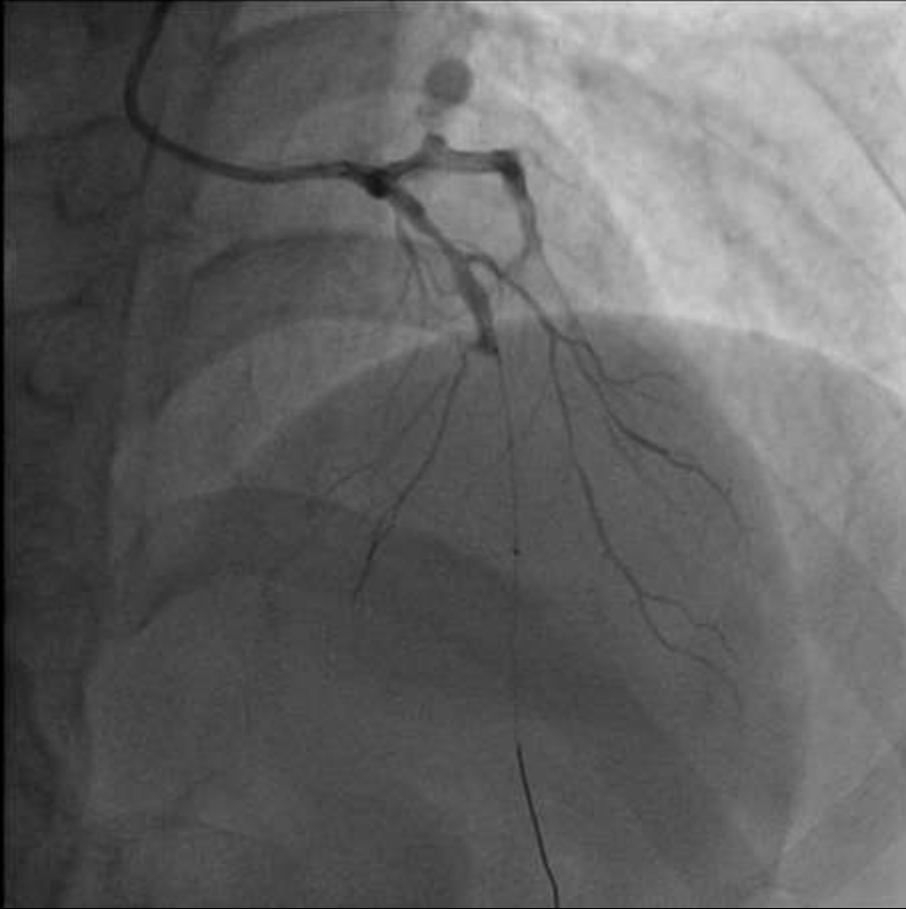
2015.5.31 CAD TVD with diffused aneurysmal dilatation



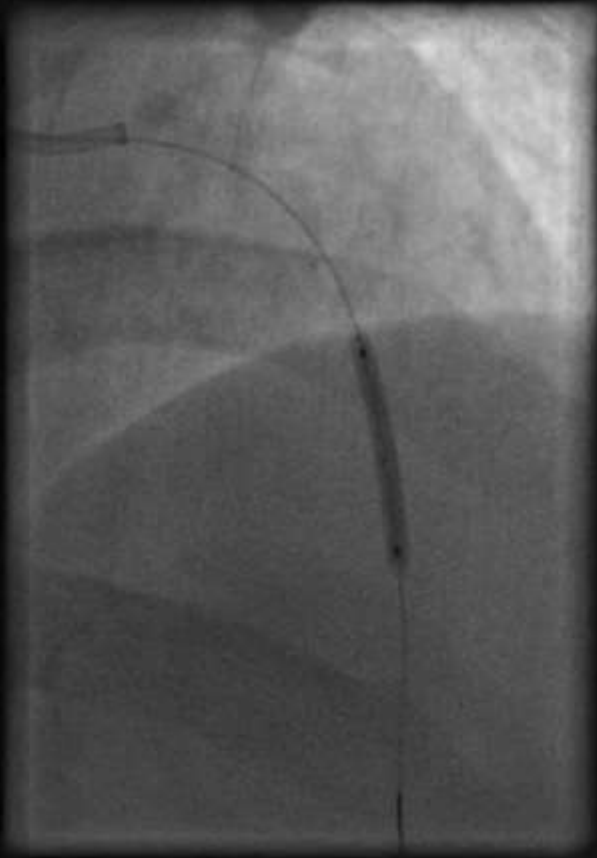
**Segment 6 :
90% stenosis**



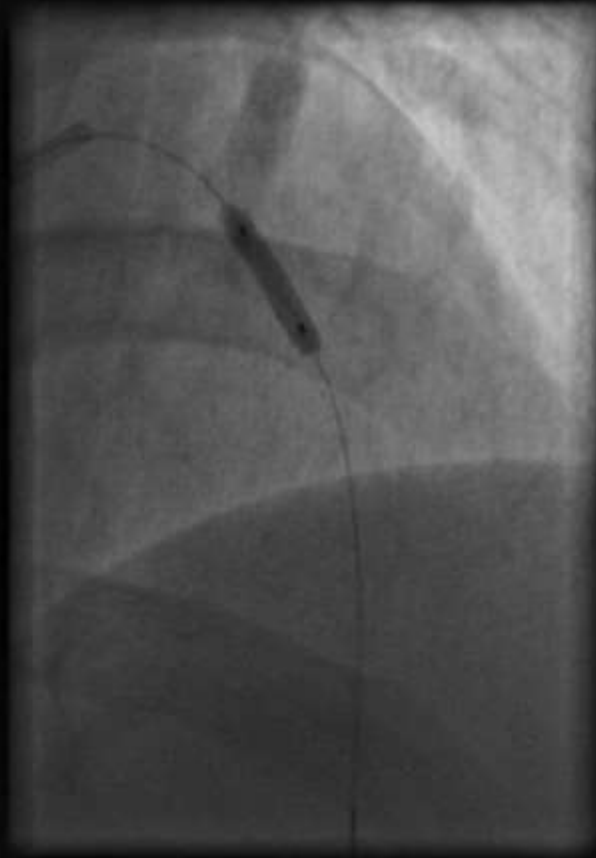
2015.5.31 CAD TVD with diffused aneurysmal dilatation



PTCA over segment 6, segment 7

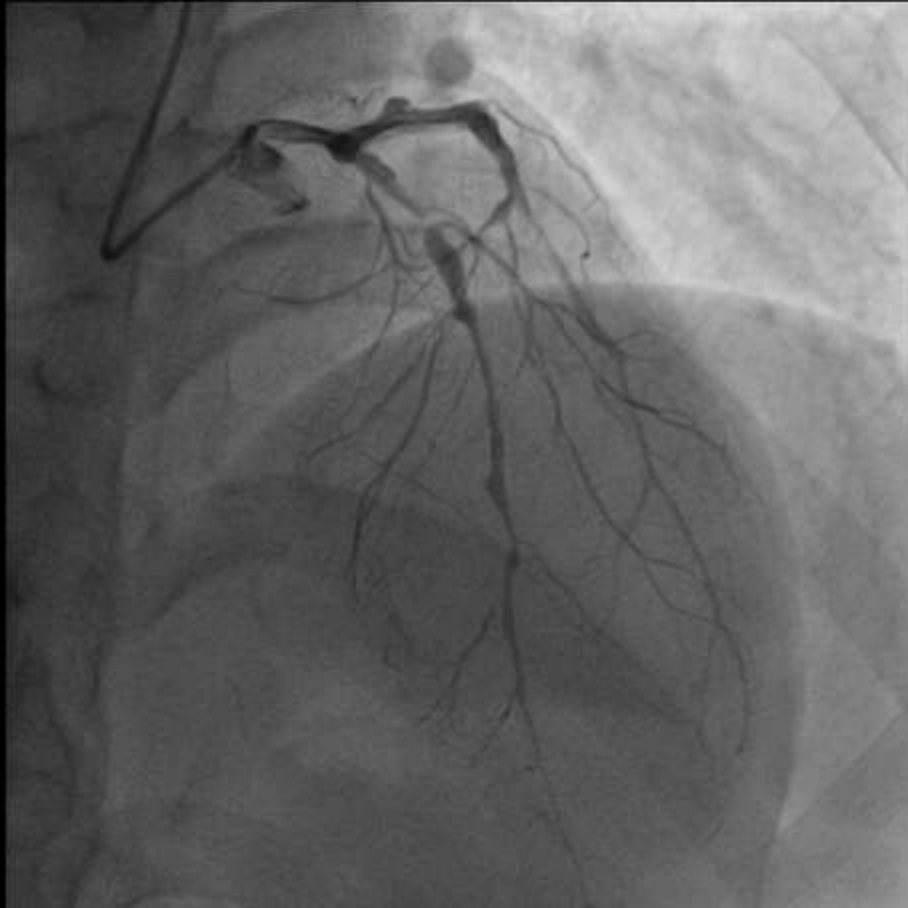


2.5/28 mm

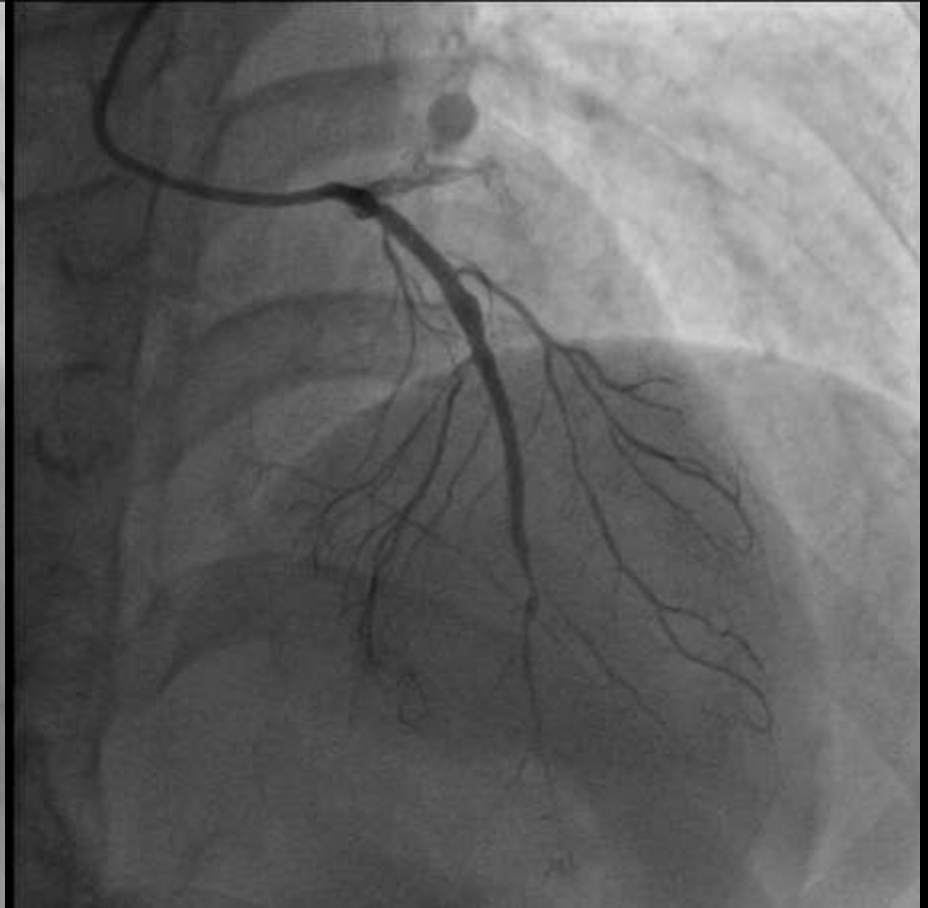


3.5/12 mm

**Two BRS were deployed over segment 6, segment 7
with post dilatation**

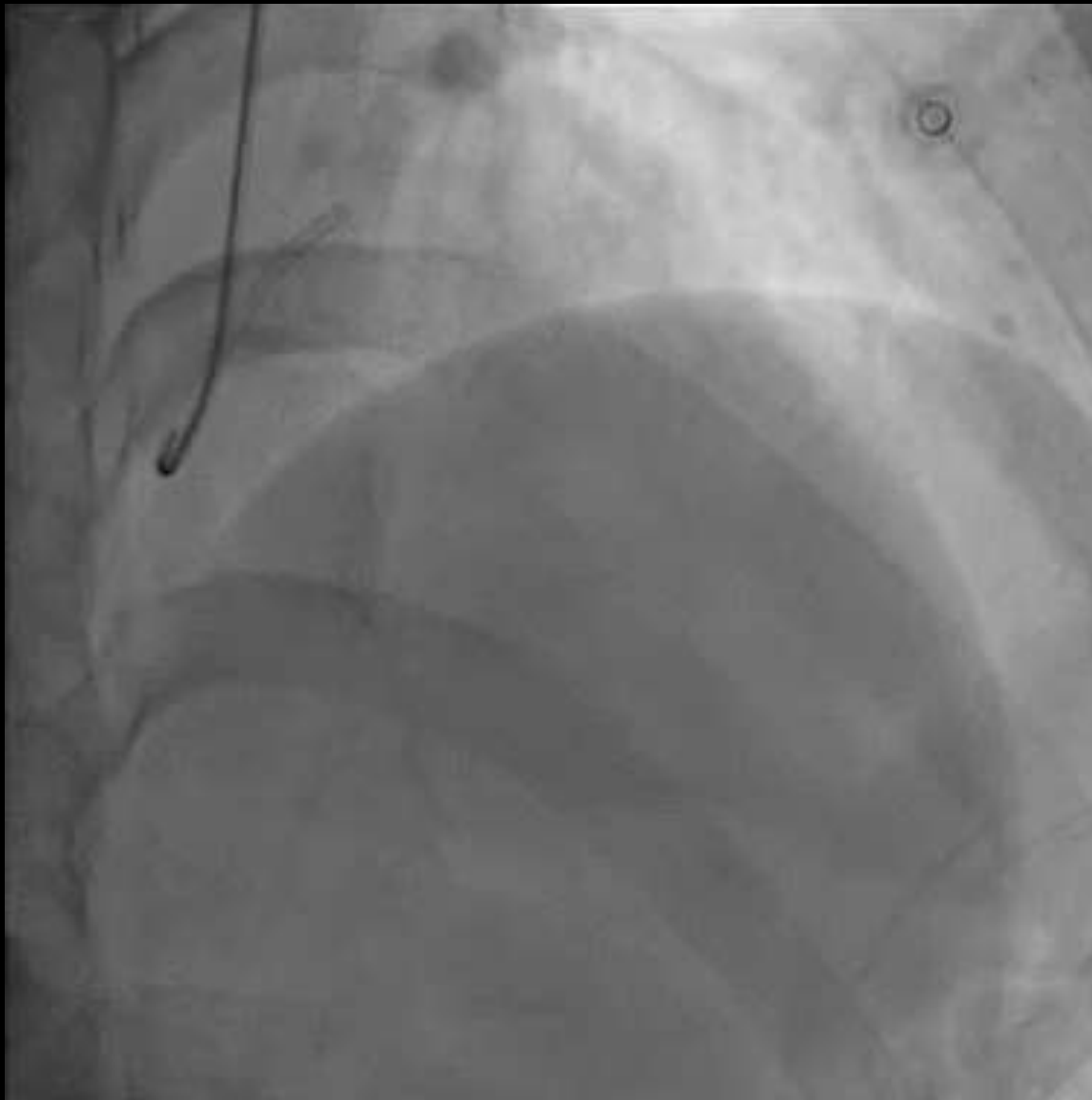


Before



After

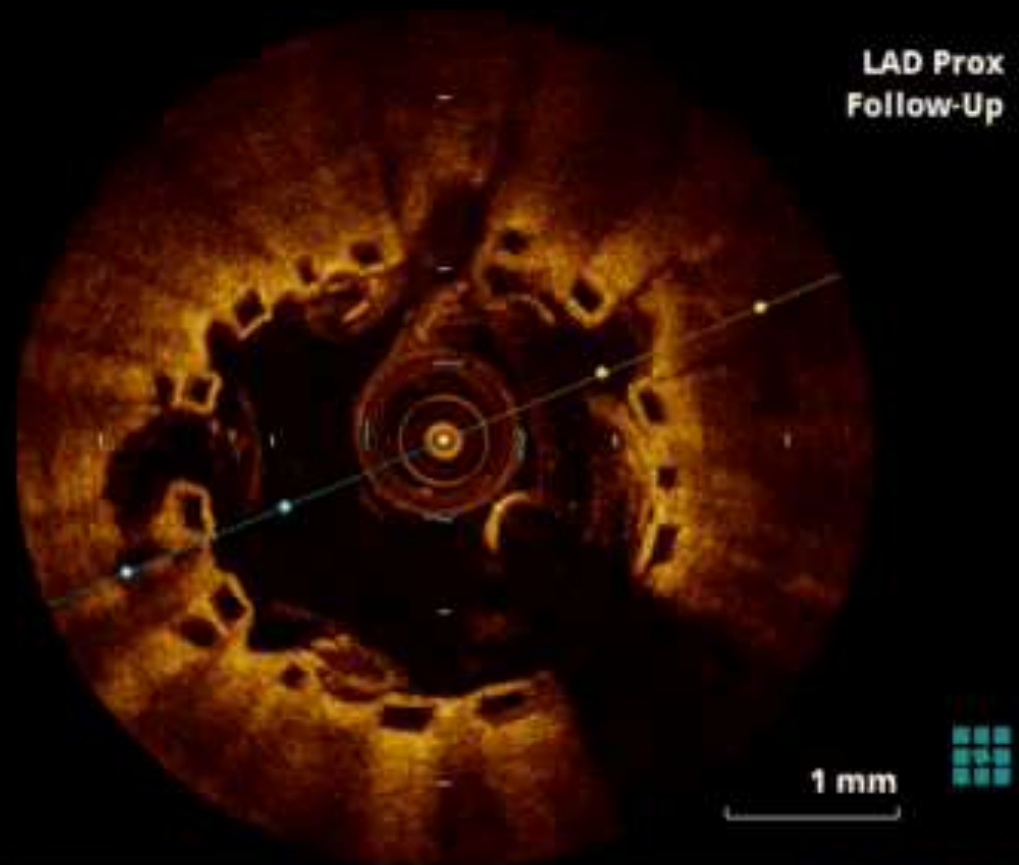
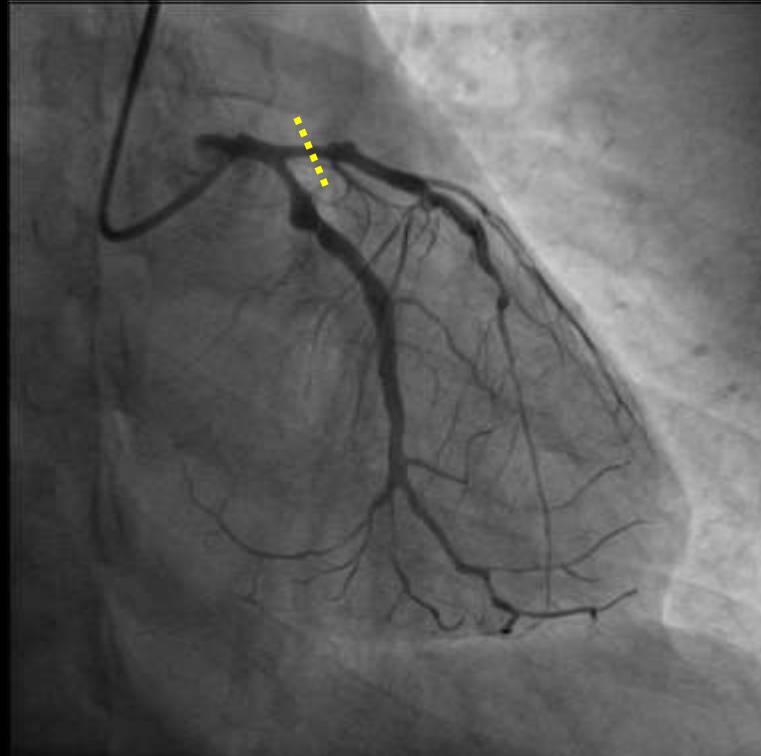
5 Months
Follow up



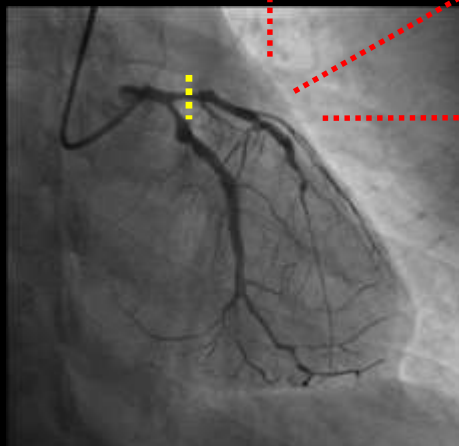
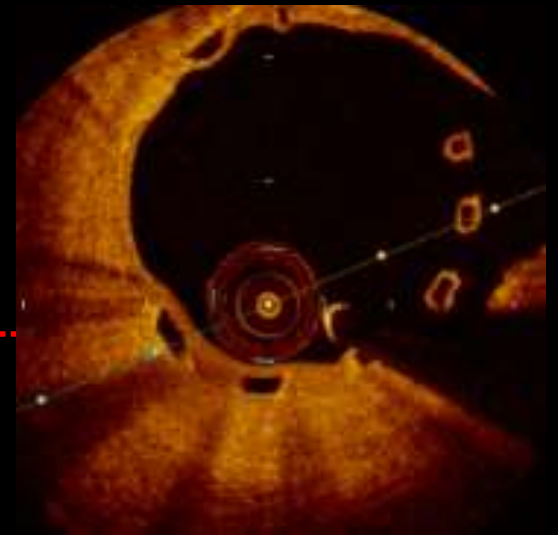
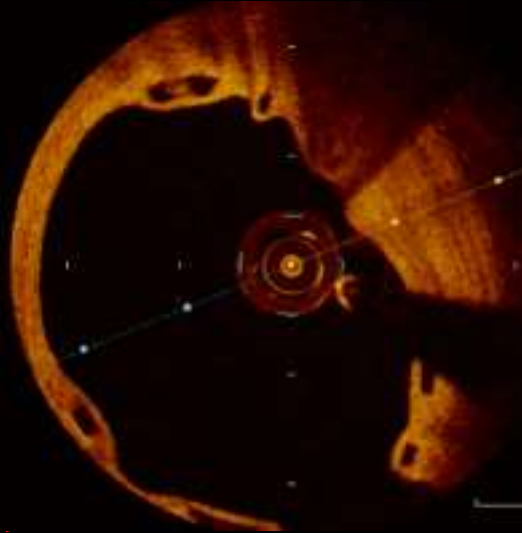
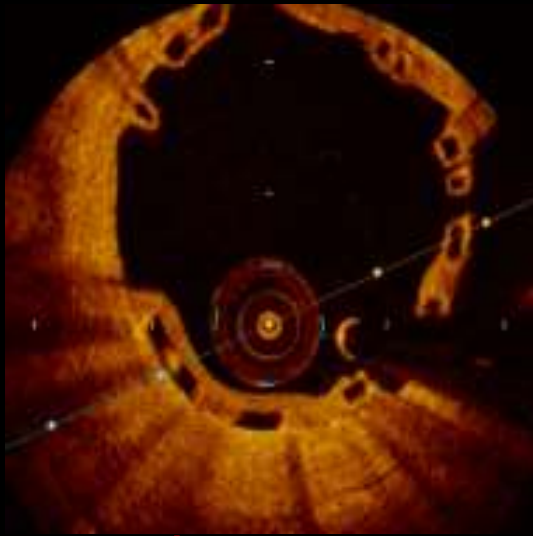
2015.5.31



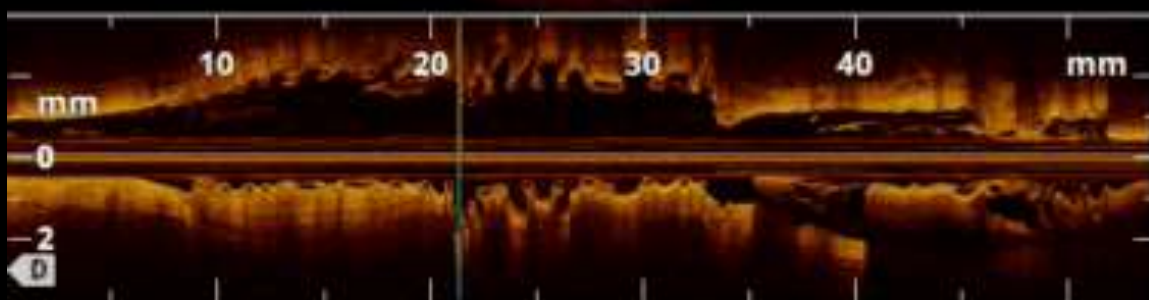
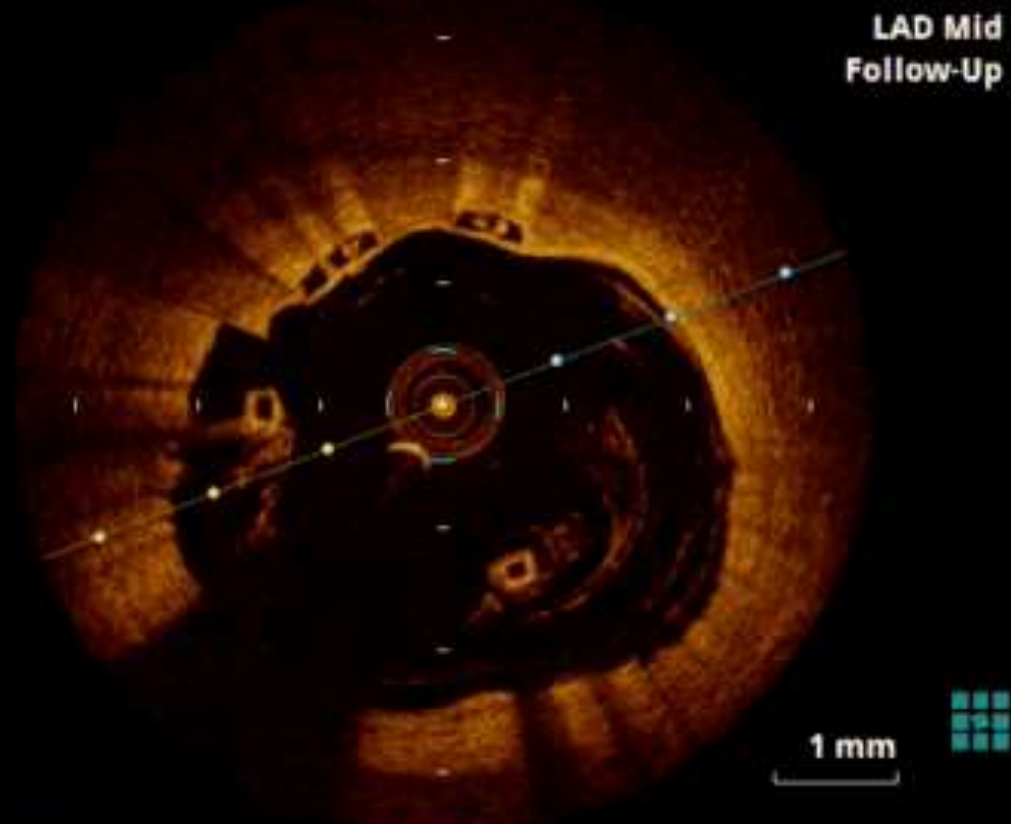
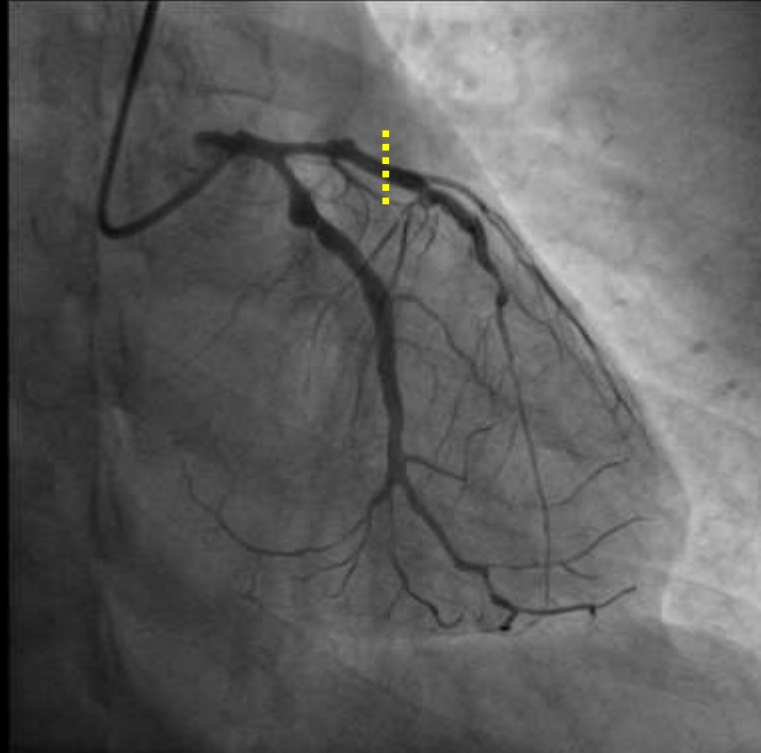
2015.10.12



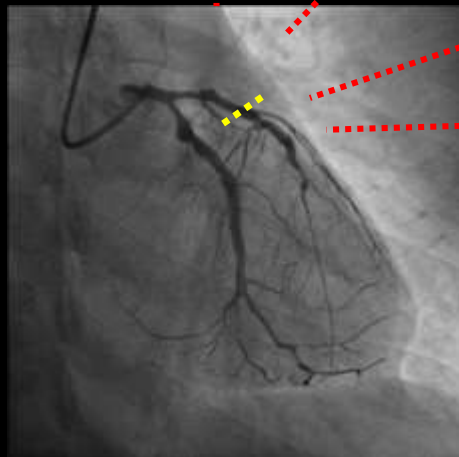
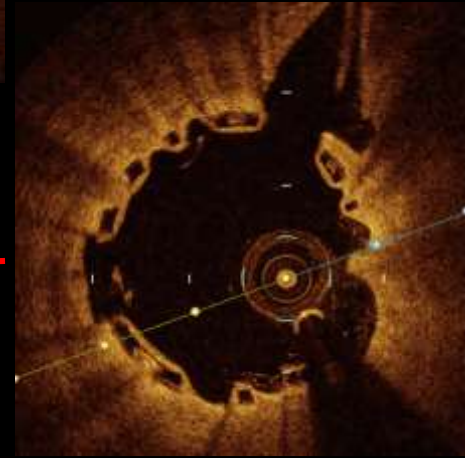
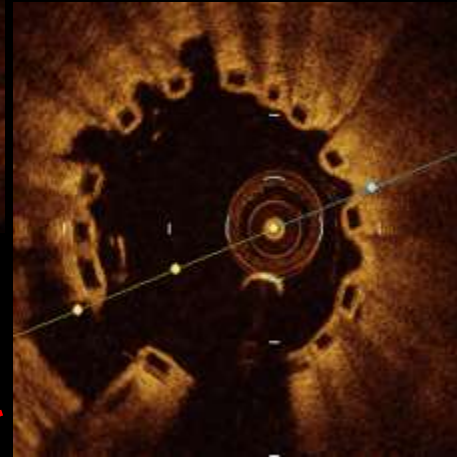
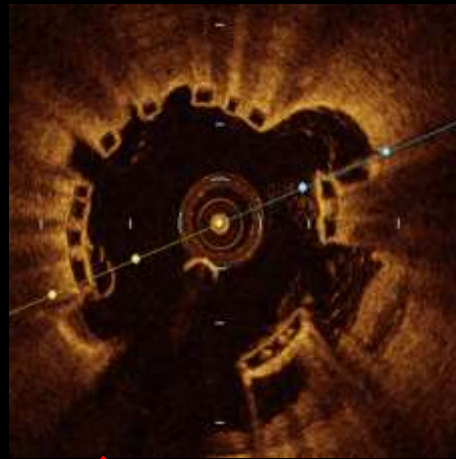
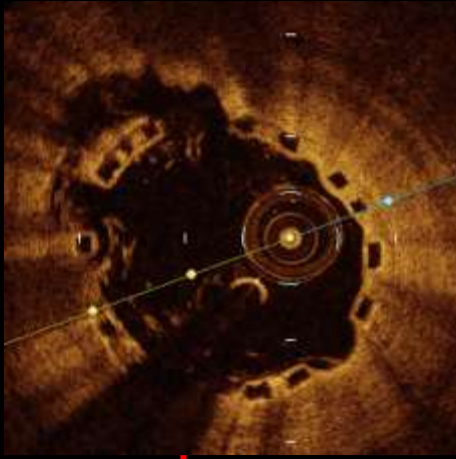
5 Months F/U Proximal LAD



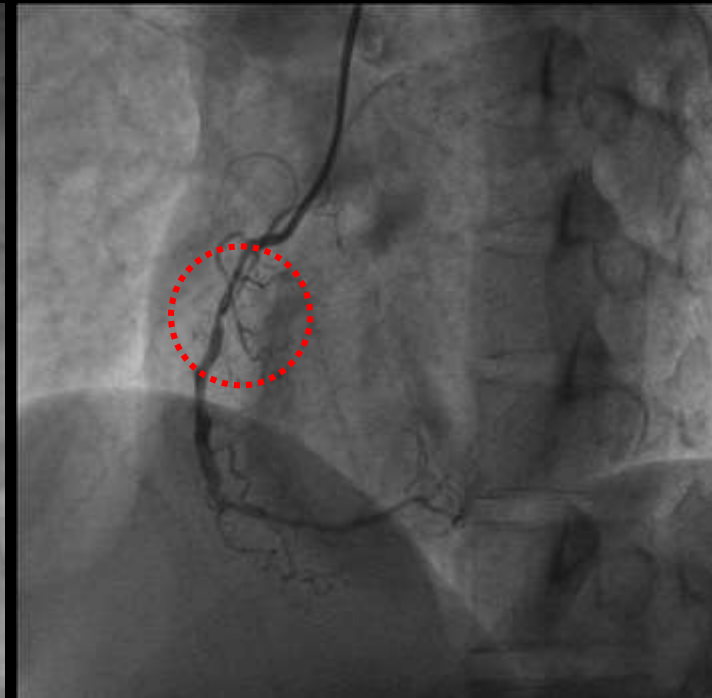
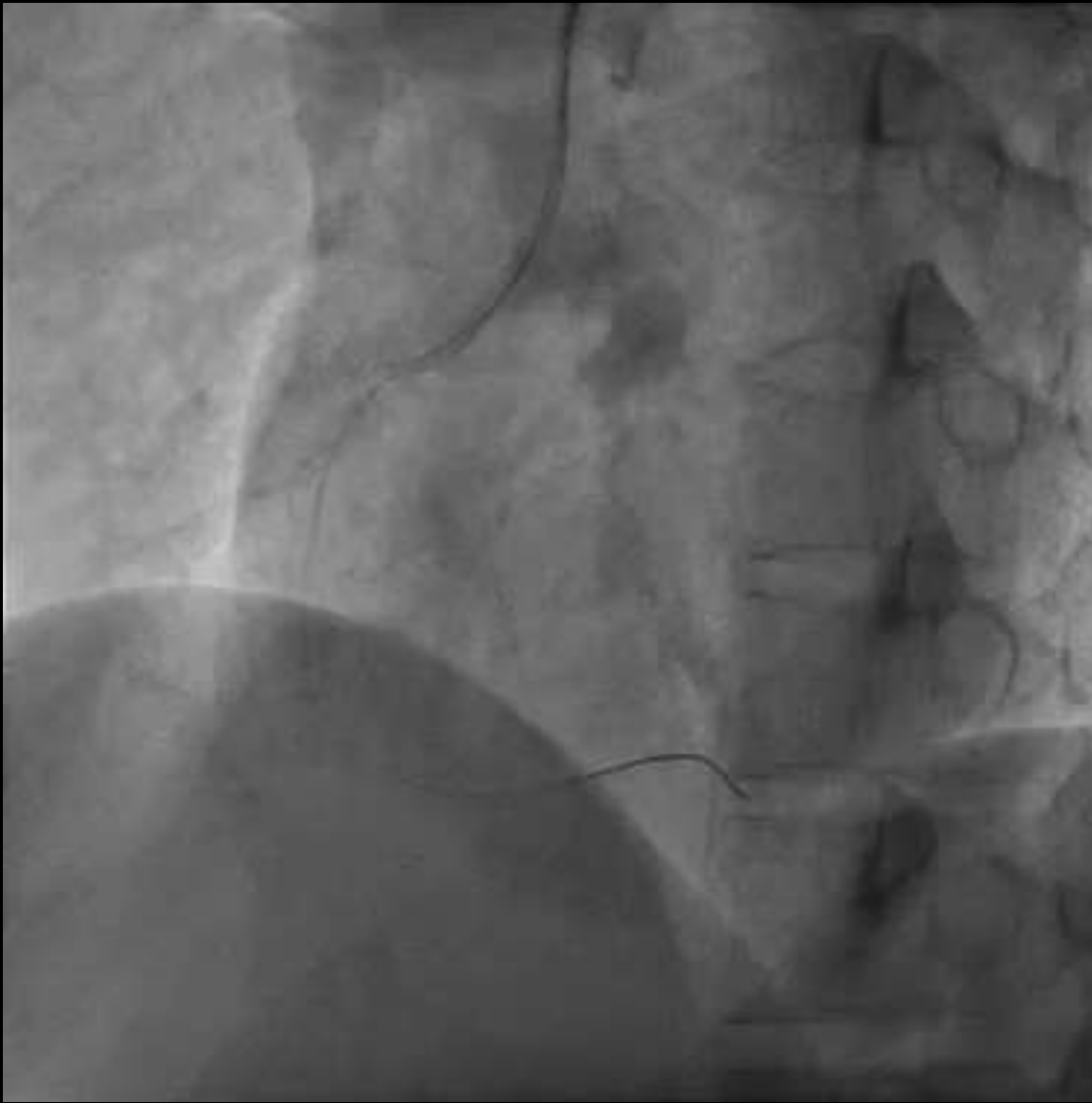
Post-BRS stenting coronary artery aneurysm



5 Months F/U Middle LAD



Post-BRS stenting coronary artery aneurysm



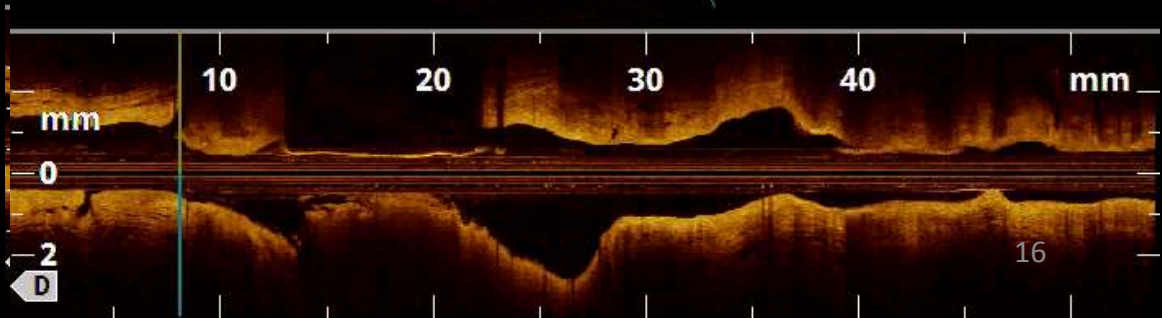
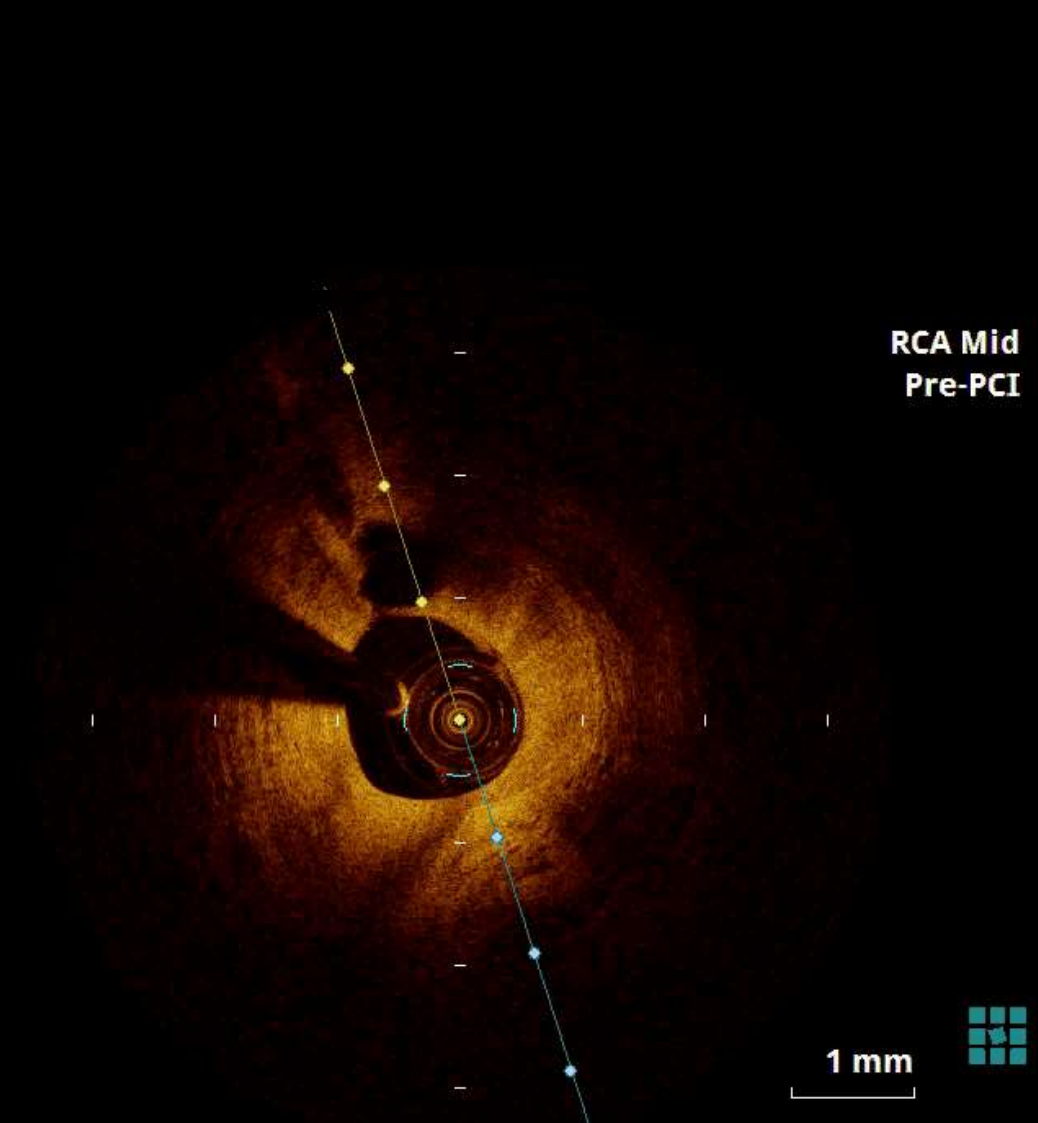
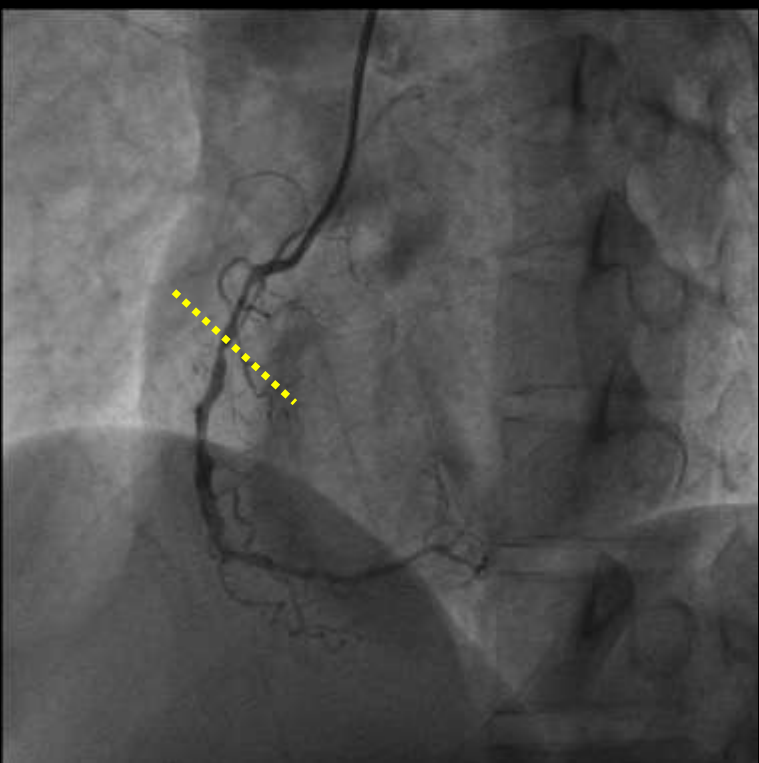
Segment 1 stenosis
Segment 2 aneurysm

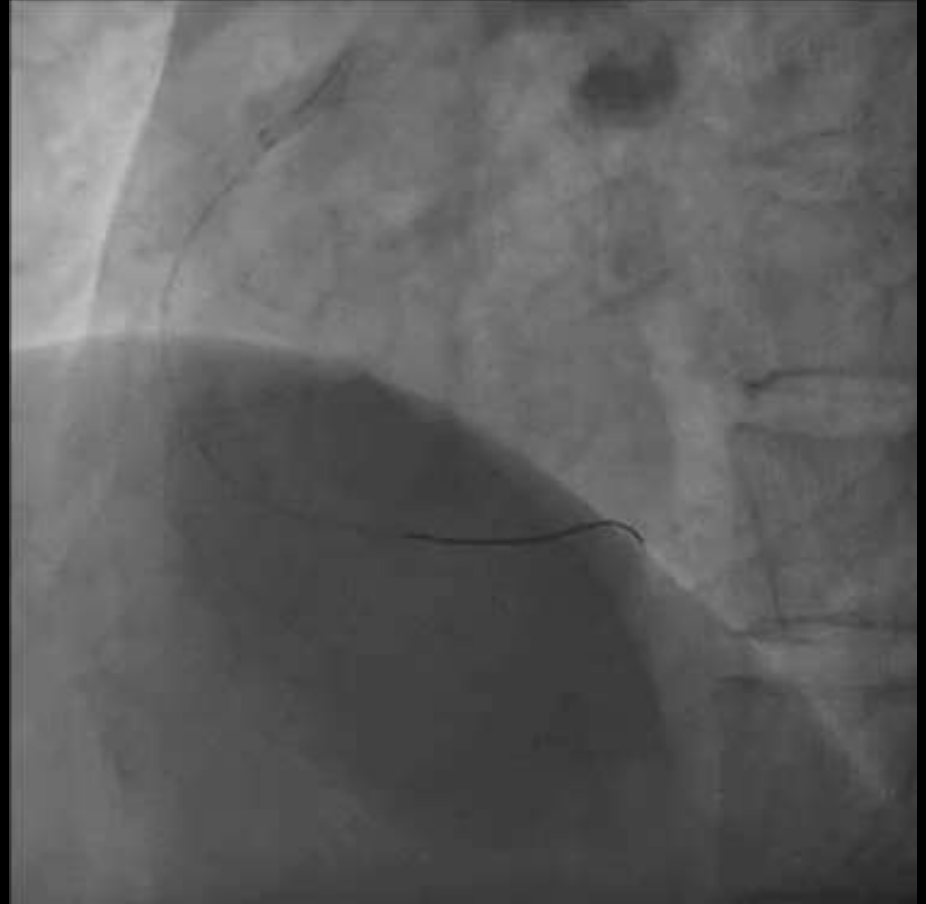
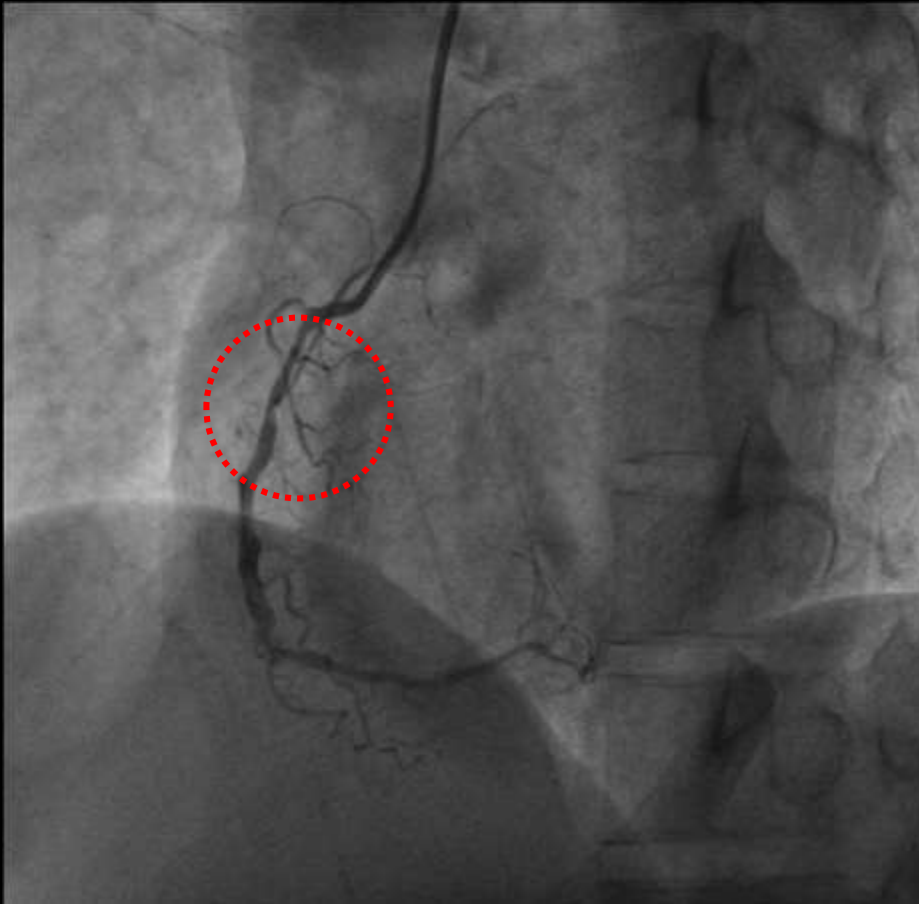


2015.5.31



2015.10.12





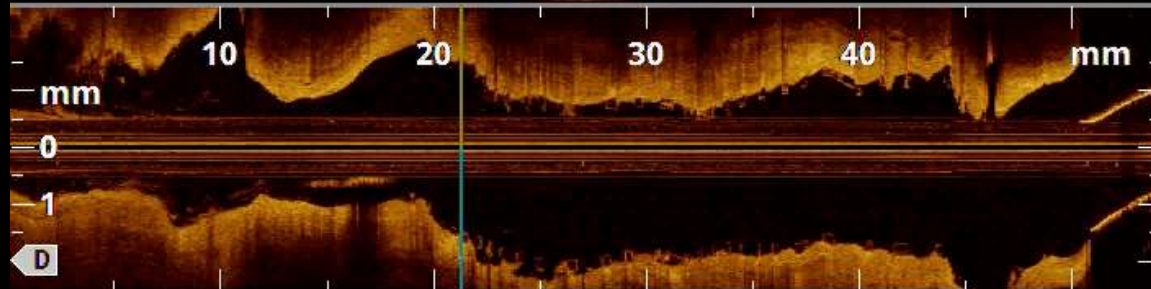
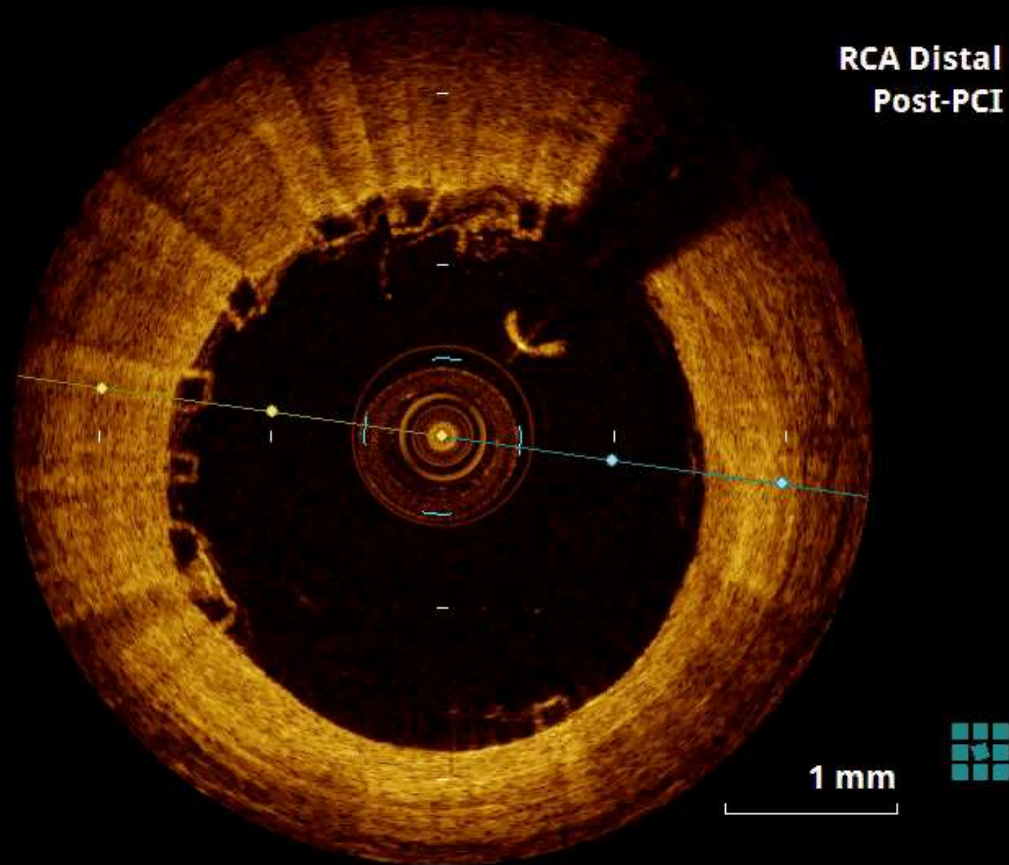
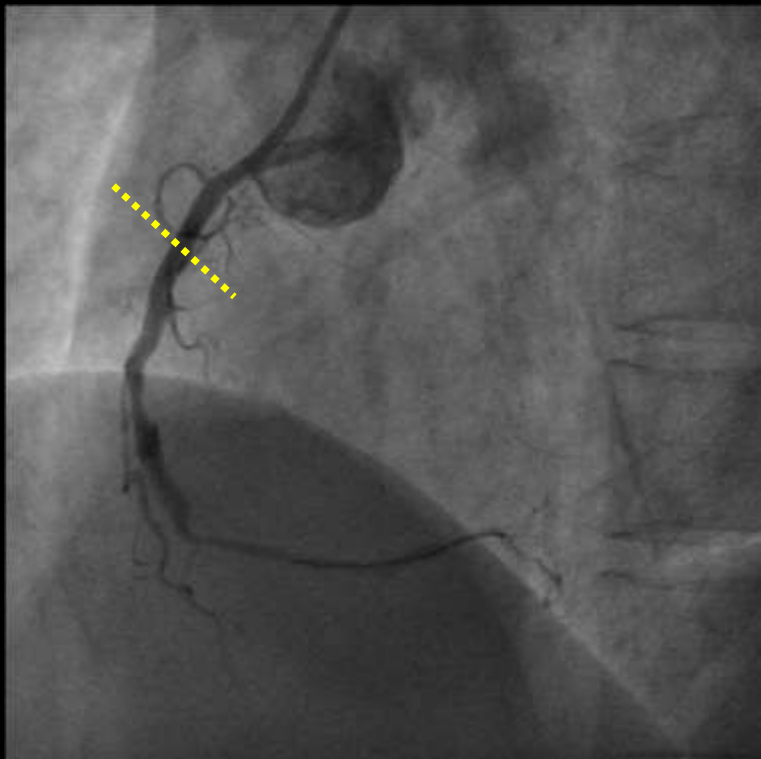
Segment 1 BRS stenting with post dilatation
3.5/23 mm



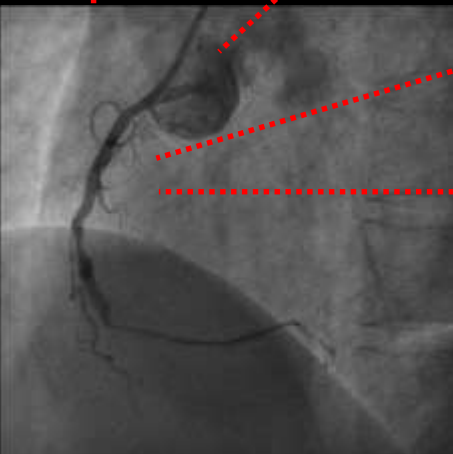
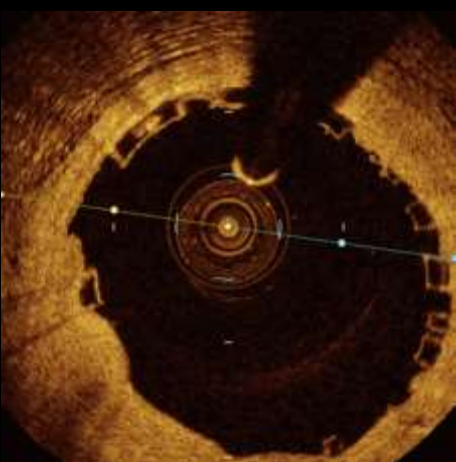
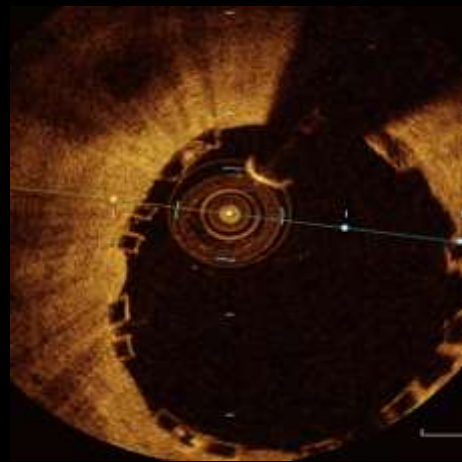
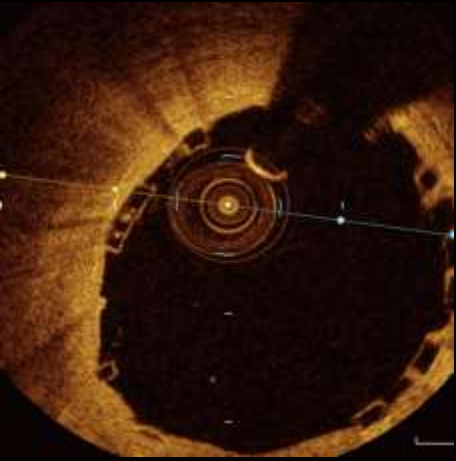
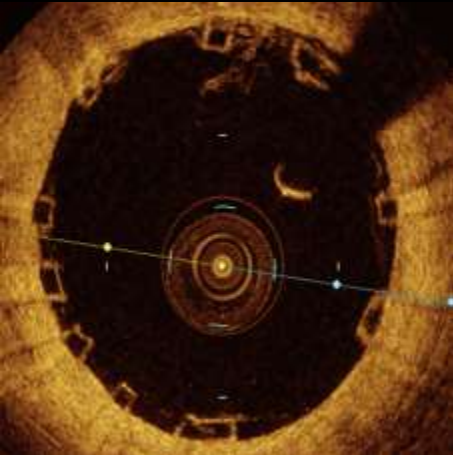
2015.5.31



2015.10.12



RCA Post-PCI



16 Months Follow up



**Segment 1
total occlusion**



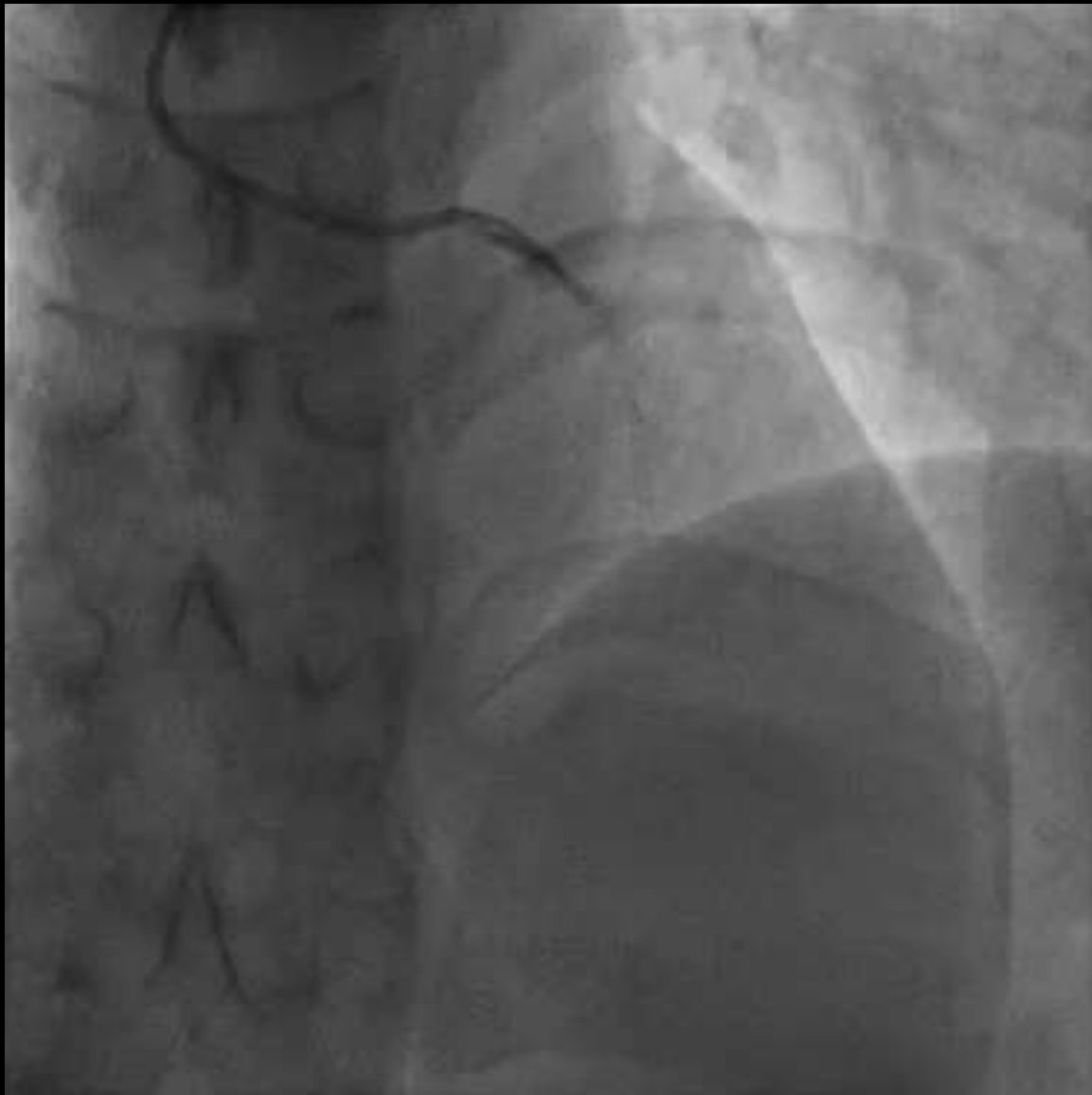
2015.5.31



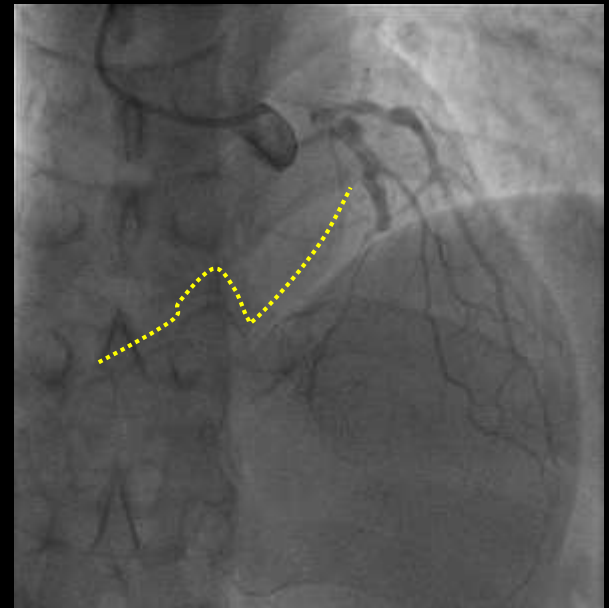
2015.10.12



2017.02.20



LAD total occlusion



**Septal branch
collateral to RCA**



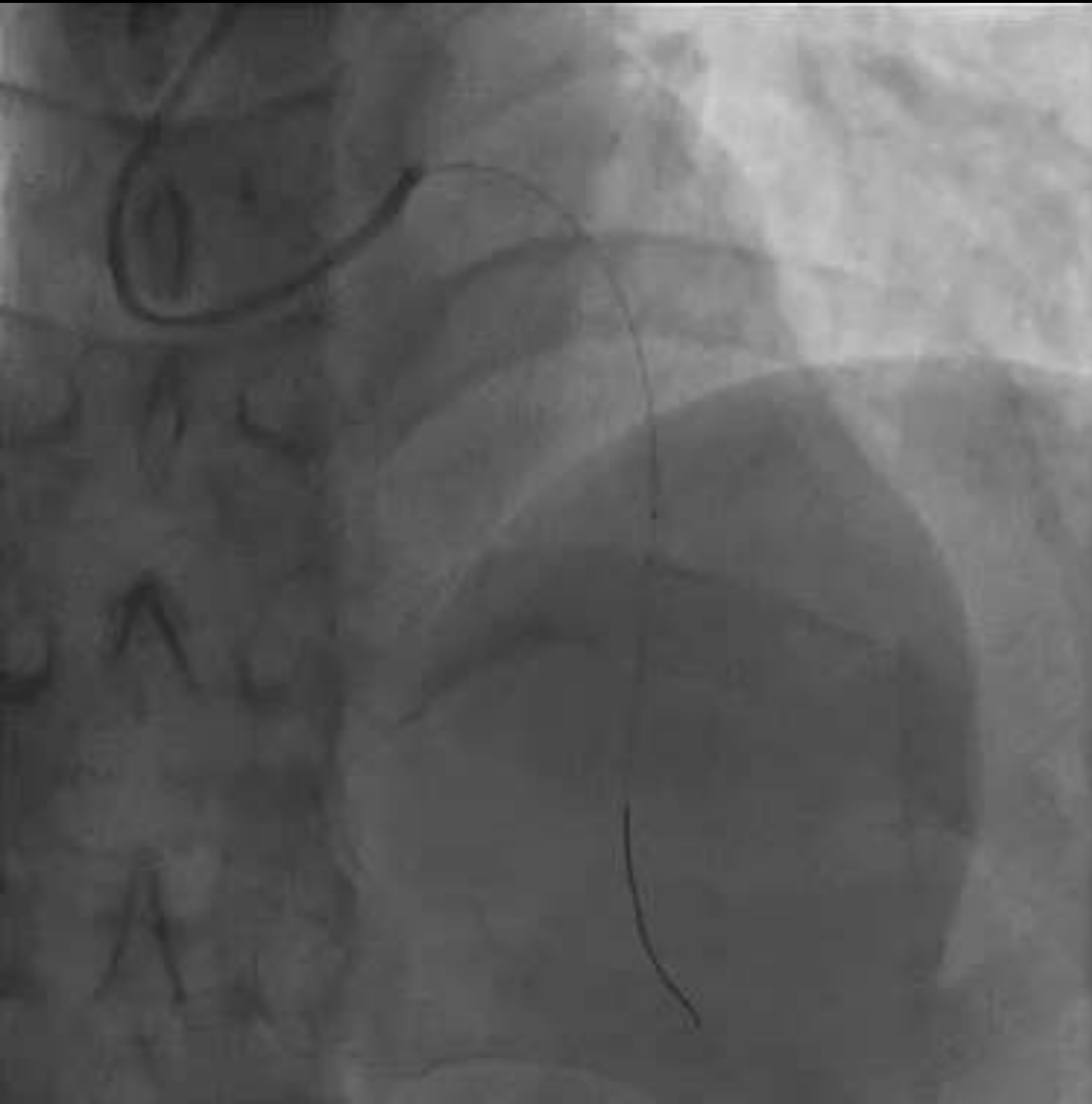
2015.5.31



2015.10.12



2017.02.20



Ikari guiding catheter
Sion wire
Ultimate wire
Progress 140 wire



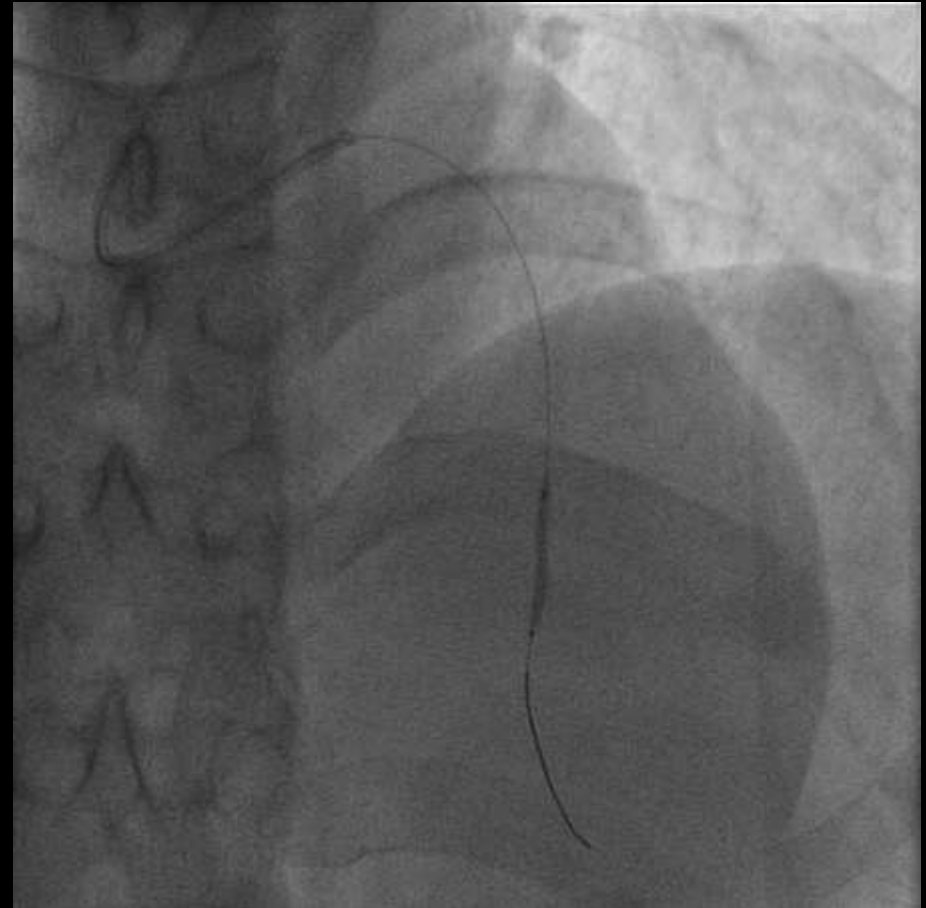
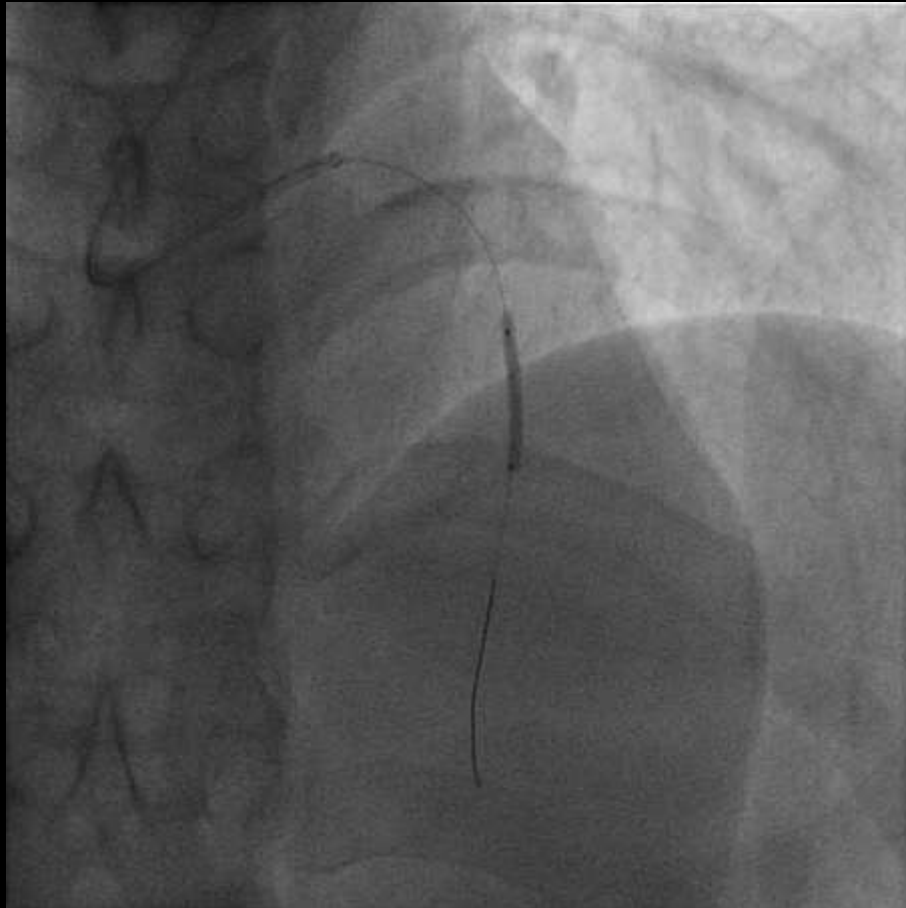
2015.5.31



2015.10.12



2017.02.20



2.0/20mm; 2.5/20mm; 3.0/15 mm PTCA



2015.5.31



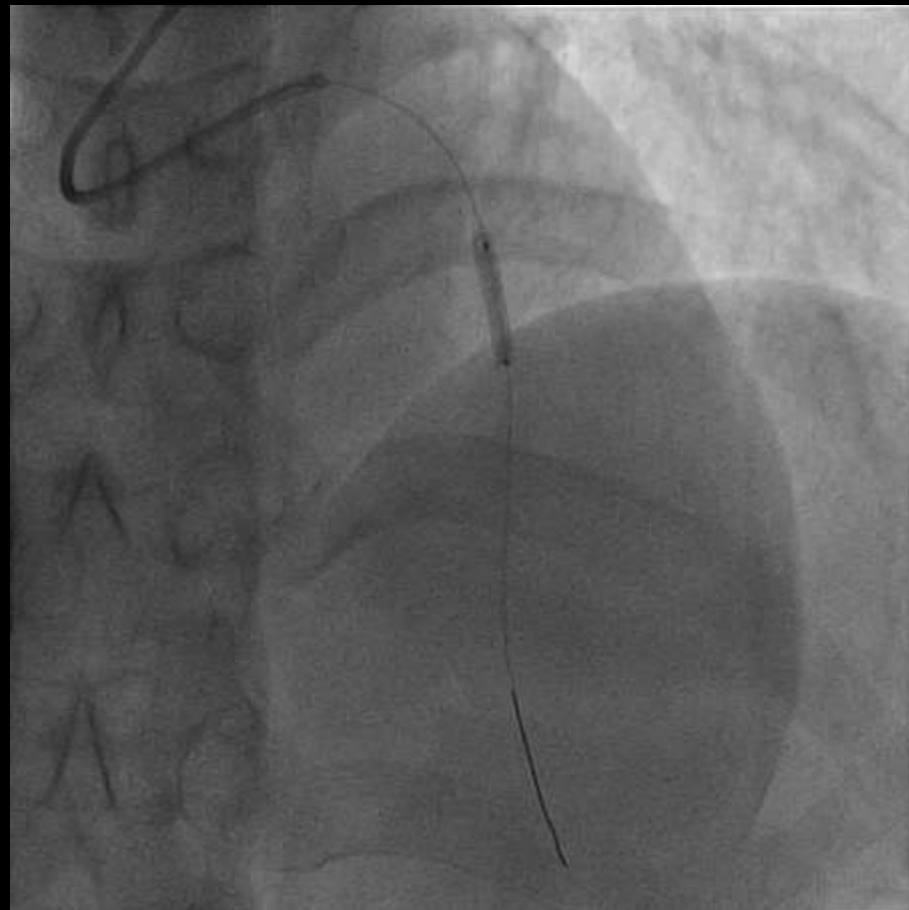
2015.10.12



2017.02.20



3/15 mm DES



Stent deployed



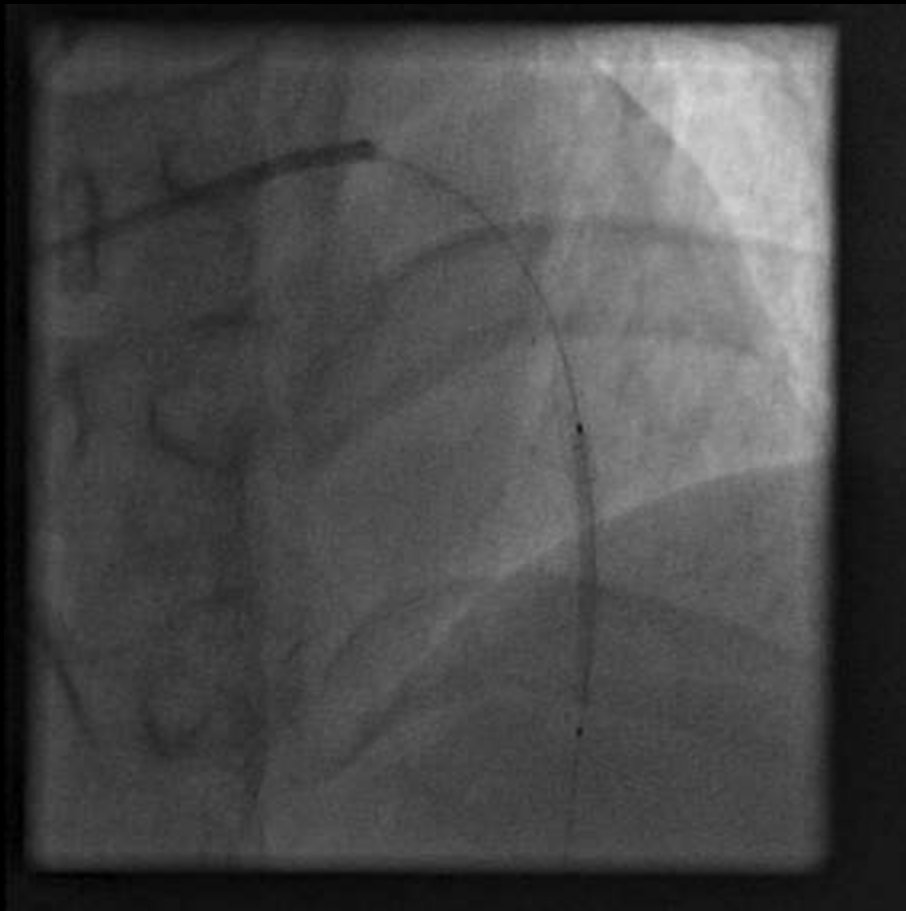
2015.5.31



2015.10.12



2017.02.20



2.5/30 mm DEB



Results



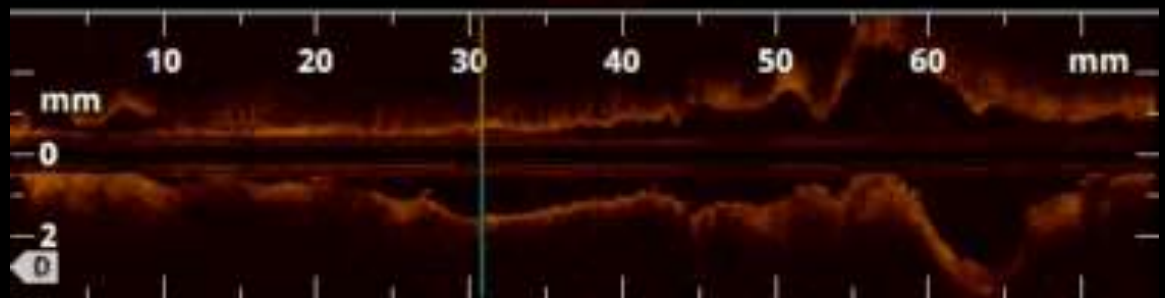
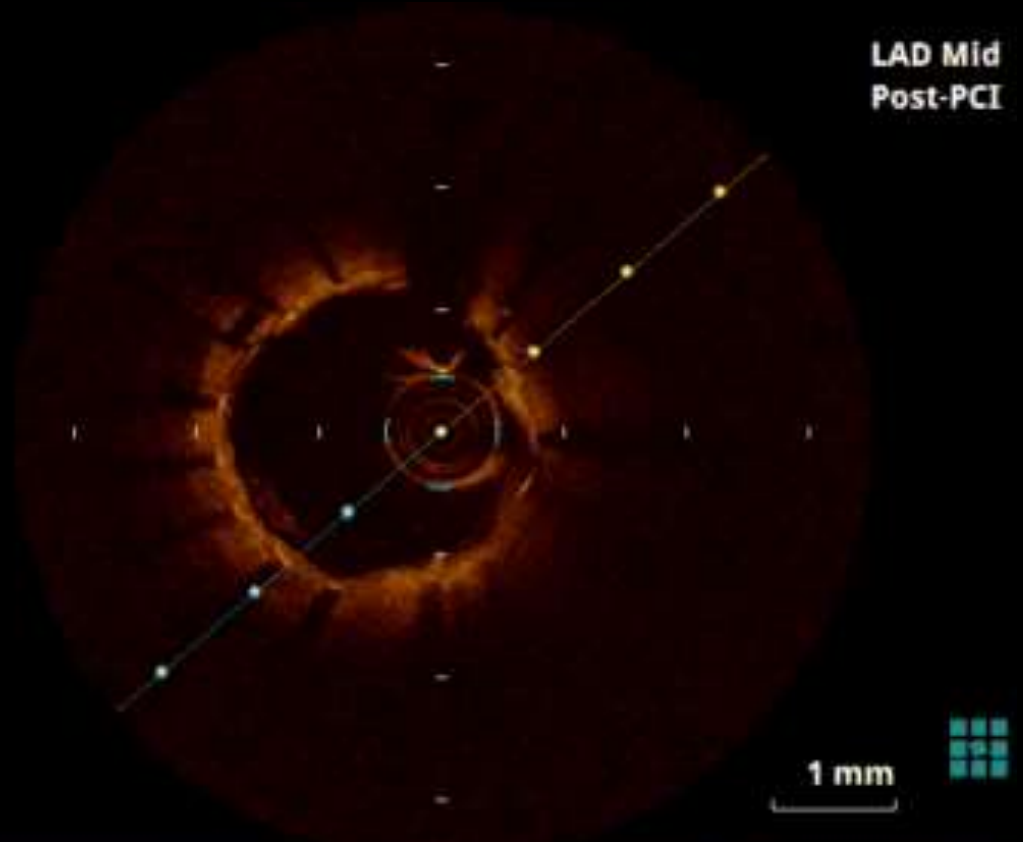
2015.5.31



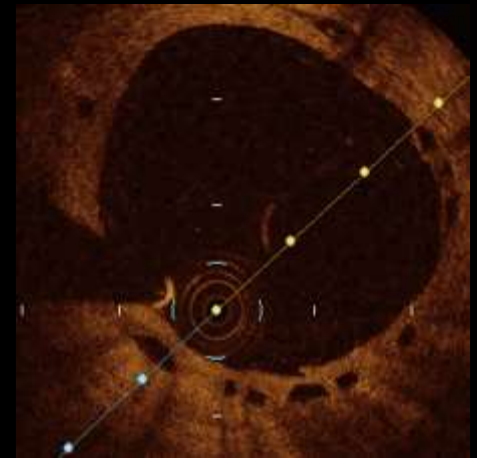
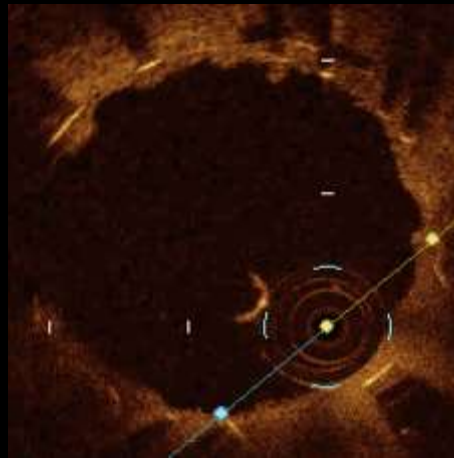
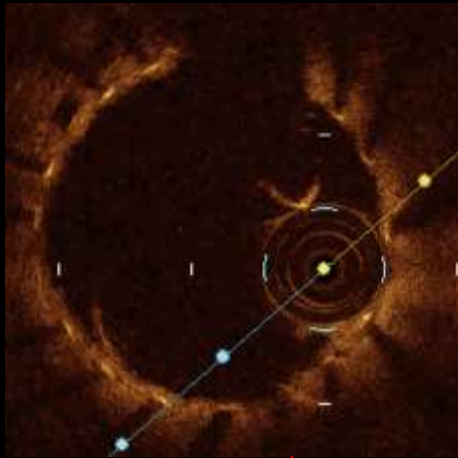
2015.10.12



2017.02.20



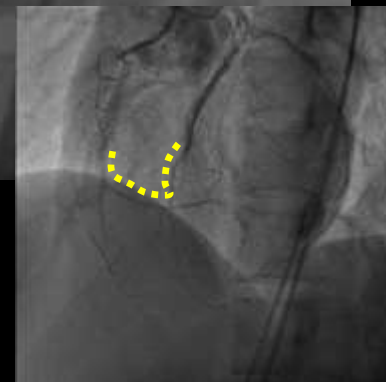
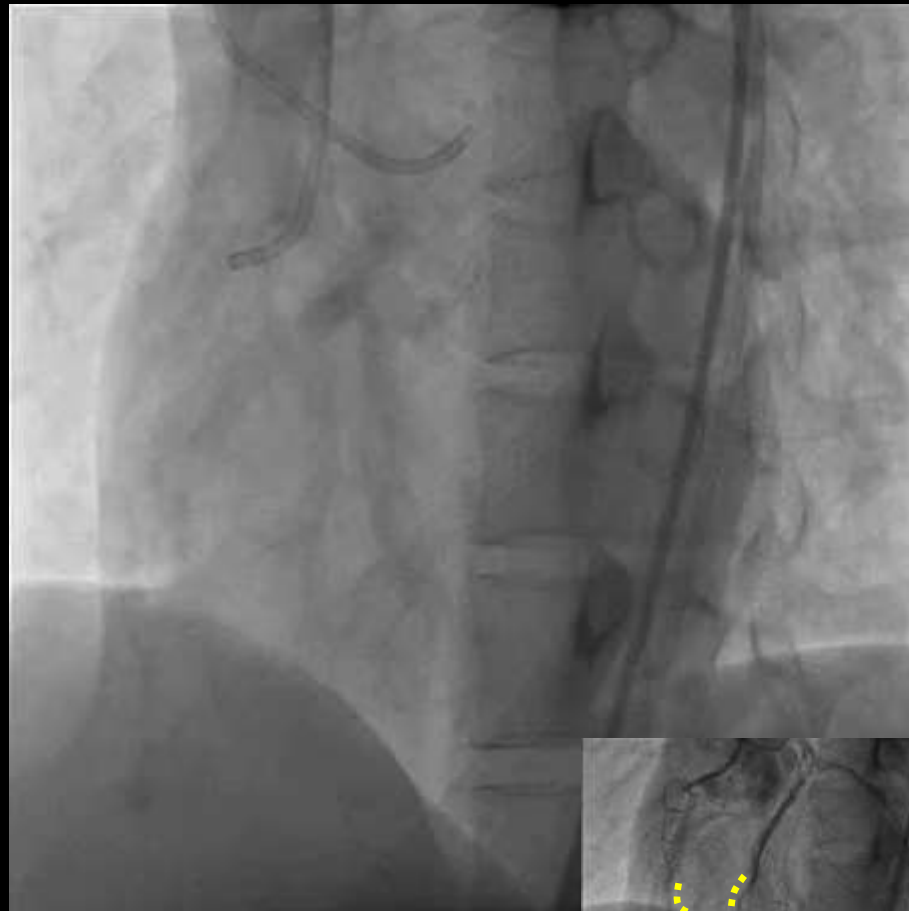
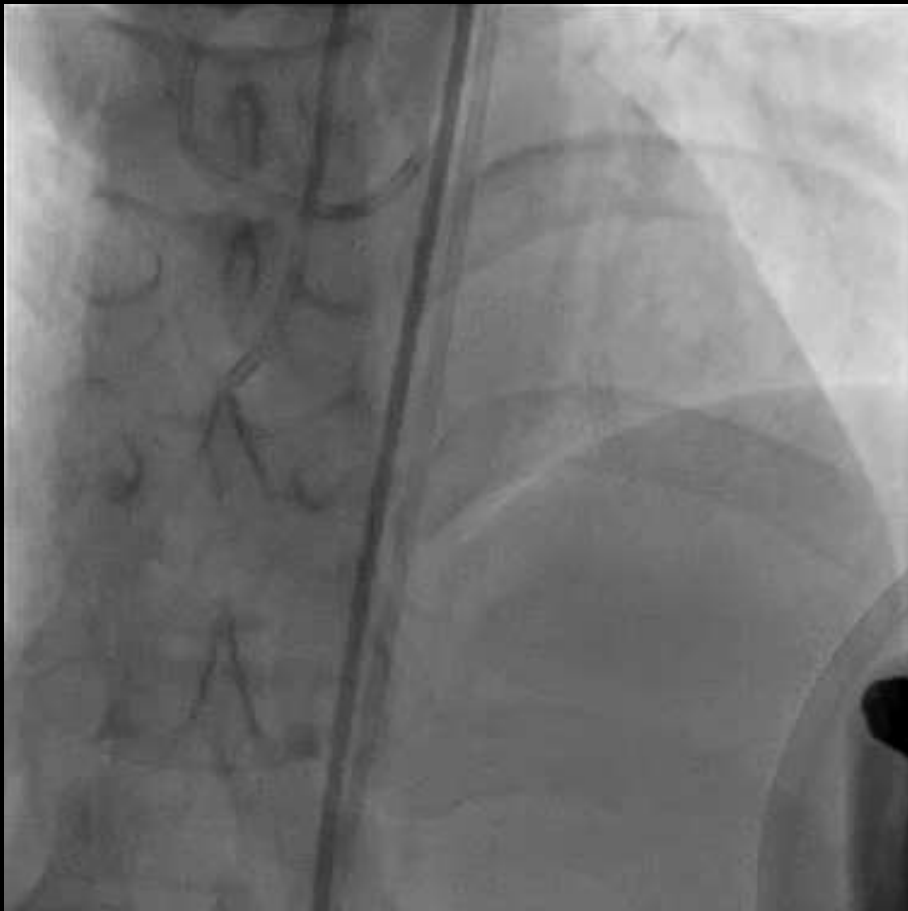
LAD Post-PCI



LAD Post-PCI

3 Month Later

Staging PCI of RCA



2015.5.31



2015.10.12



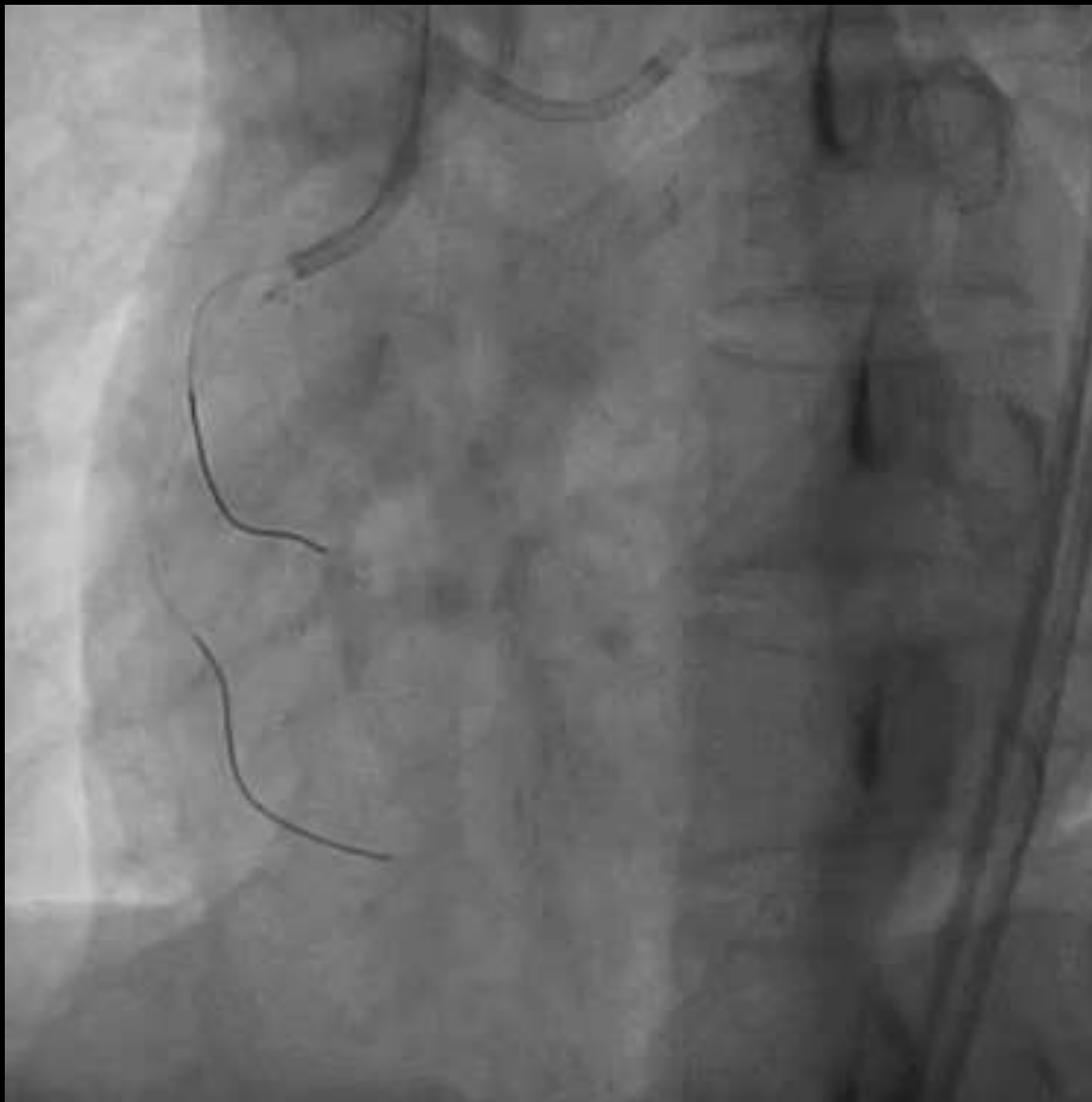
2017.02.20



2017.03.20



2017.06.30



Anchor technique



2015.5.31



2015.10.12



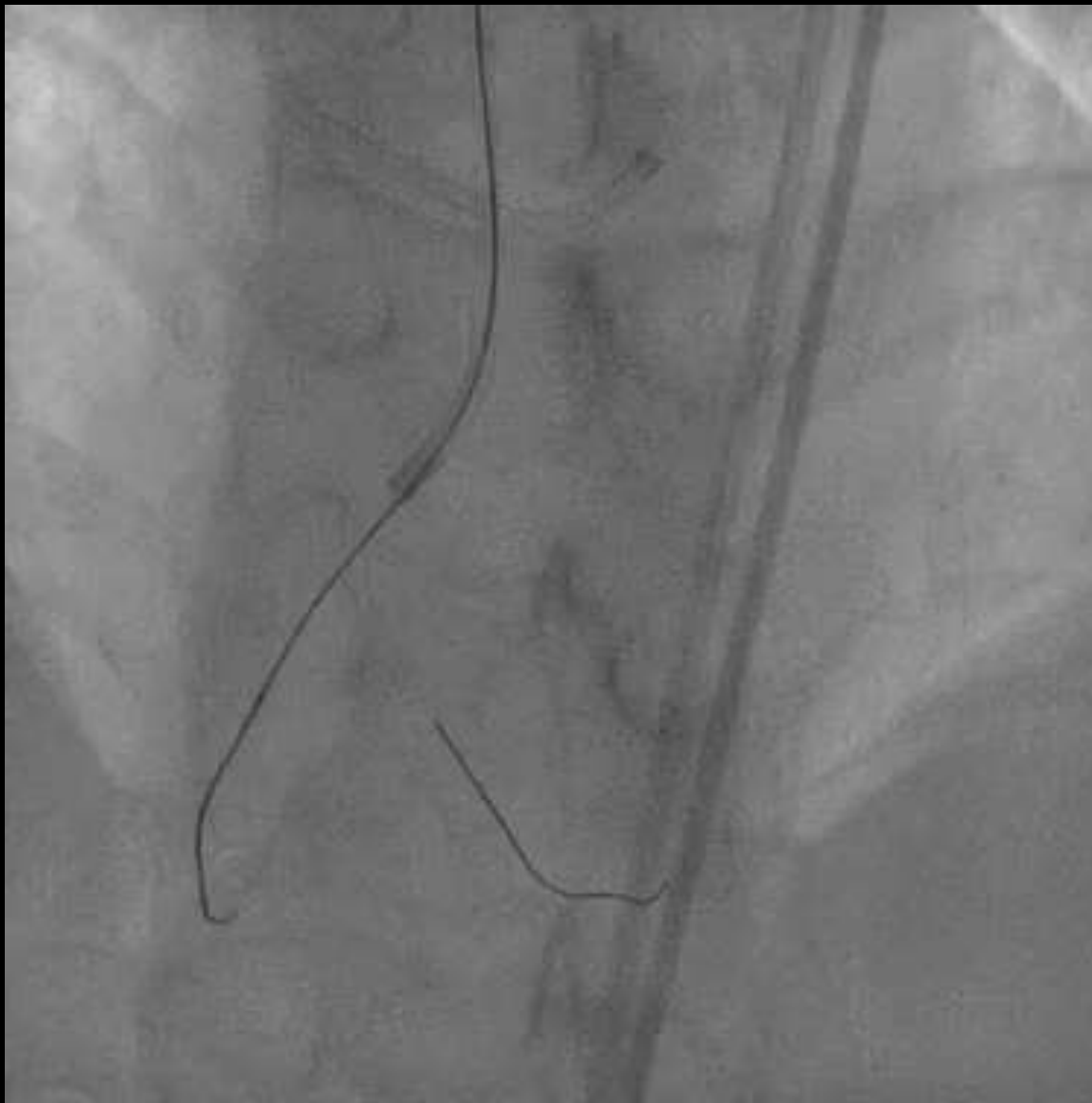
2017.02.20



2017.03.20



2017.06.30



failed antegrade



2015.5.31



2015.10.12



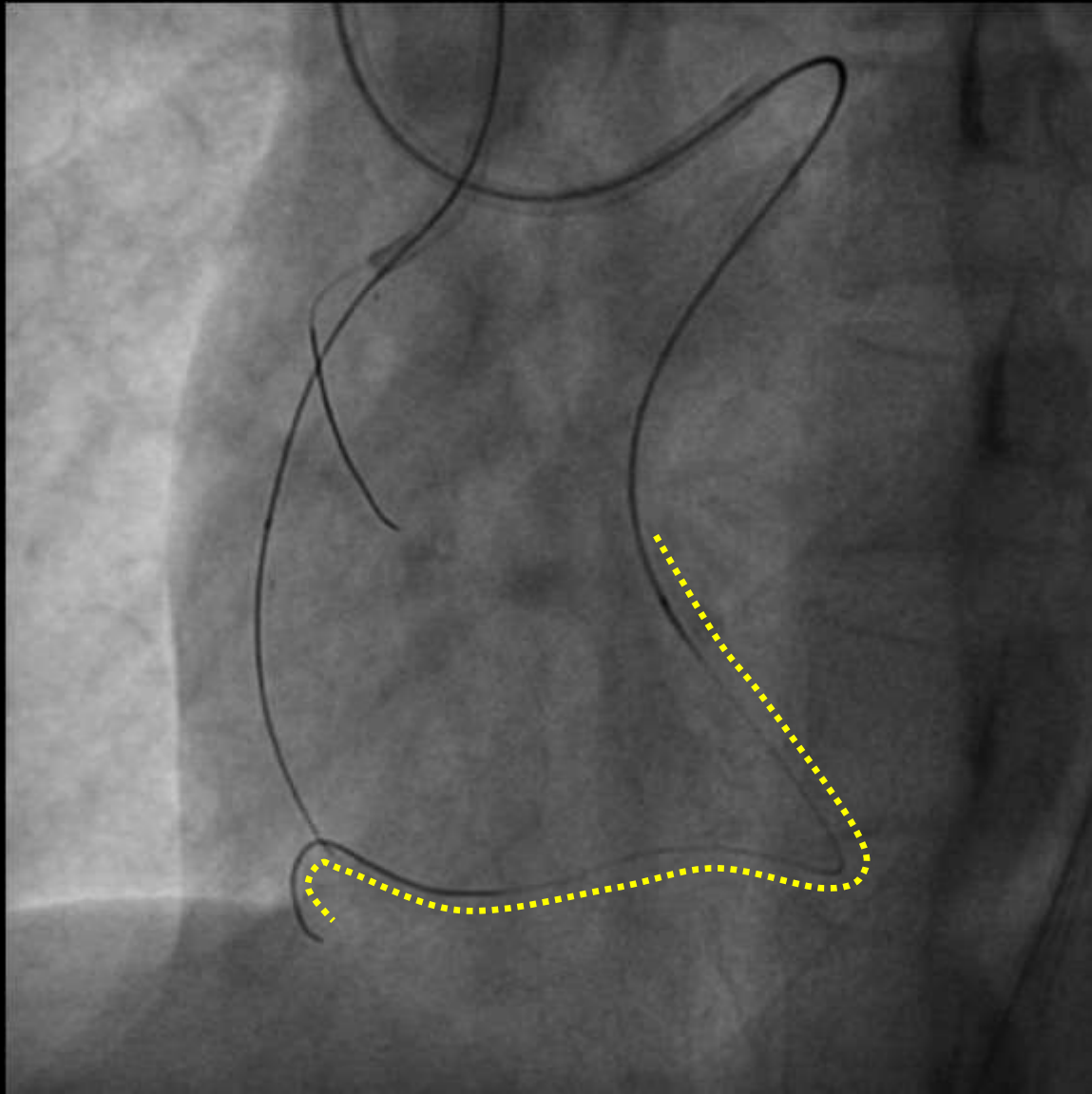
2017.02.20



2017.03.20



2017.06.30



**Retrograde via septal
branch of LAD
Crosair microcatheter**



2015.5.31



2015.10.12



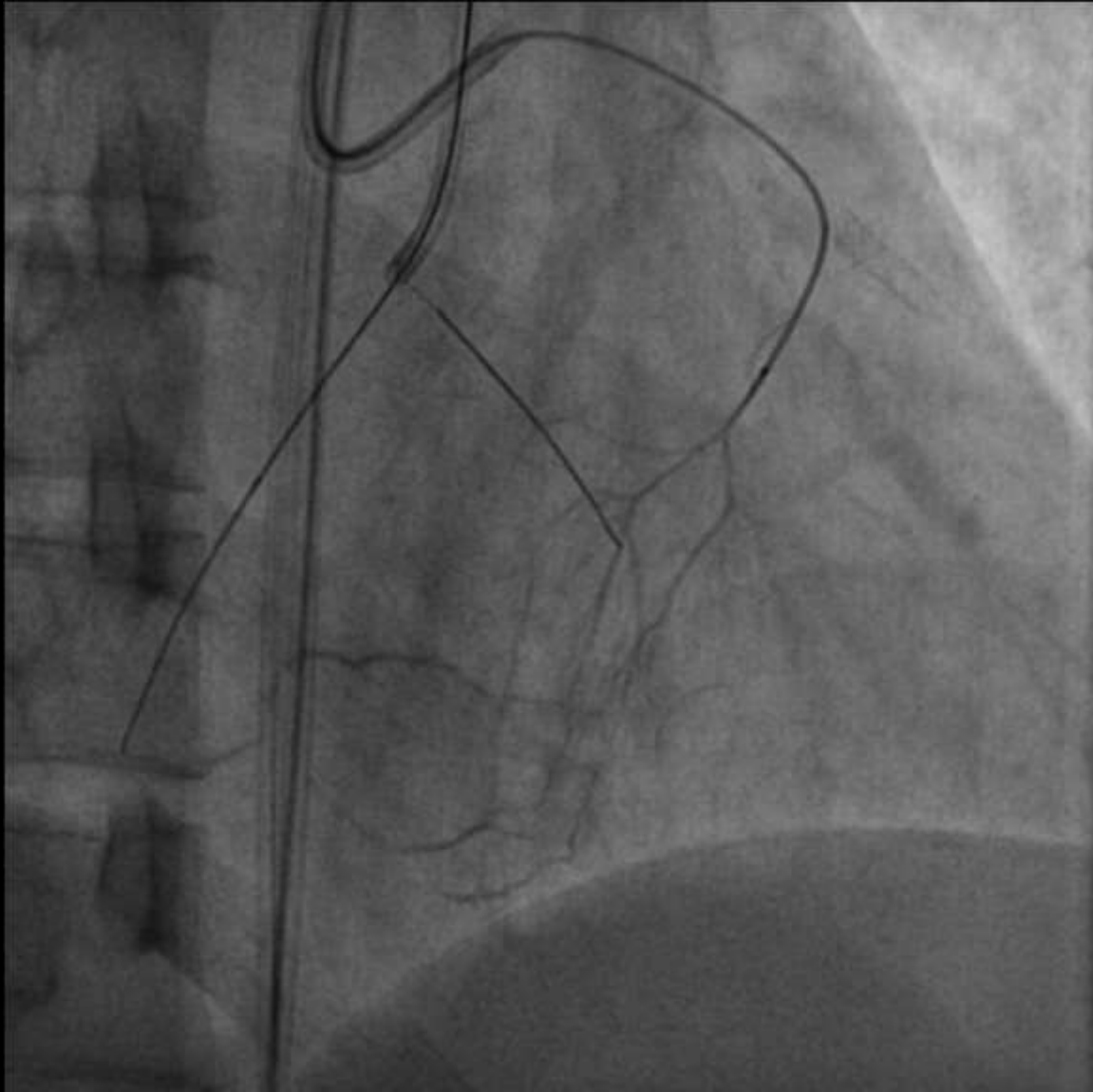
2017.02.20



2017.03.20



2017.06.30



Finecross microcatheter



2015.5.31



2015.10.12



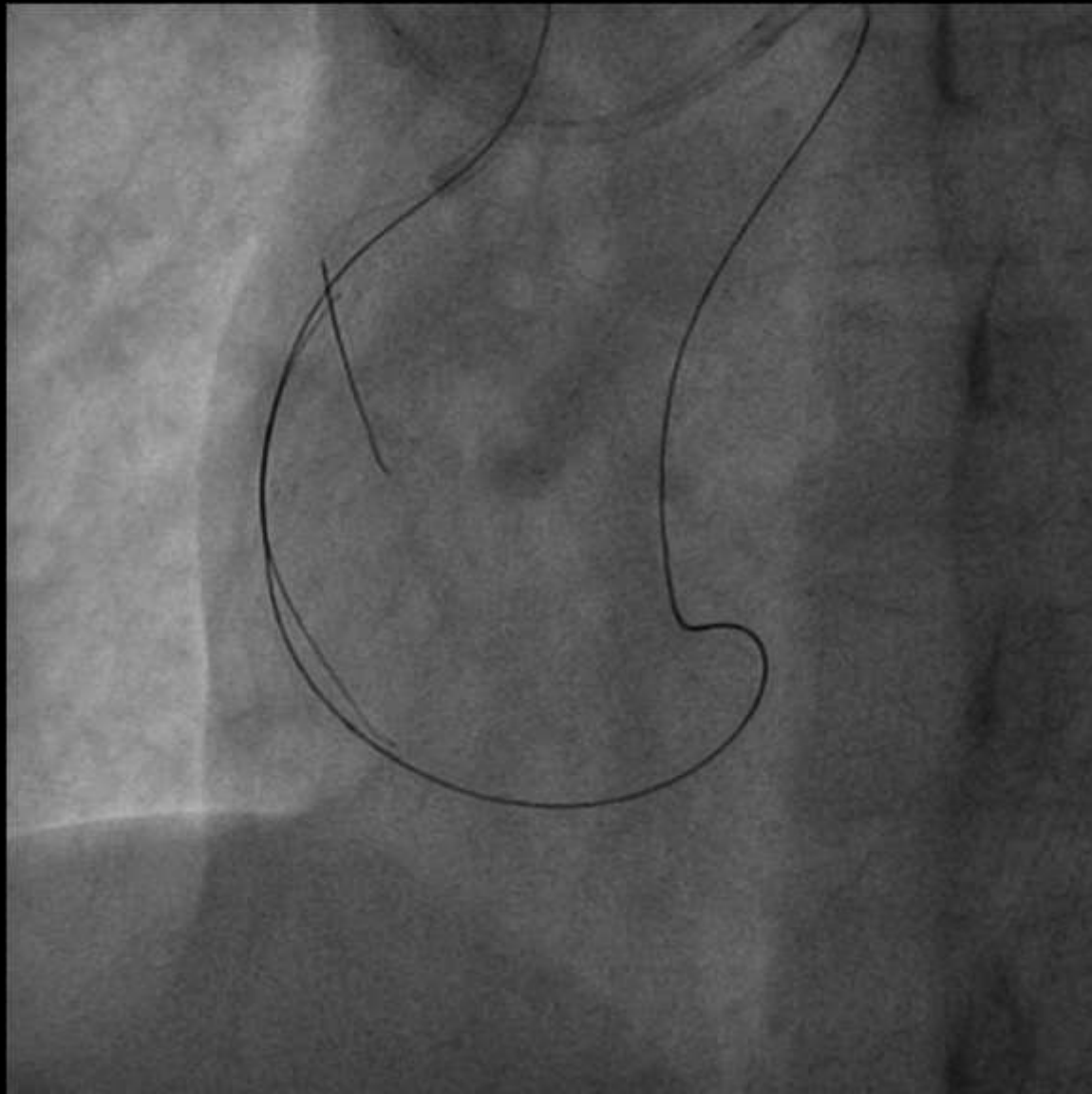
2017.02.20



2017.03.20



2017.06.30



Reverse CART



2015.5.31



2015.10.12



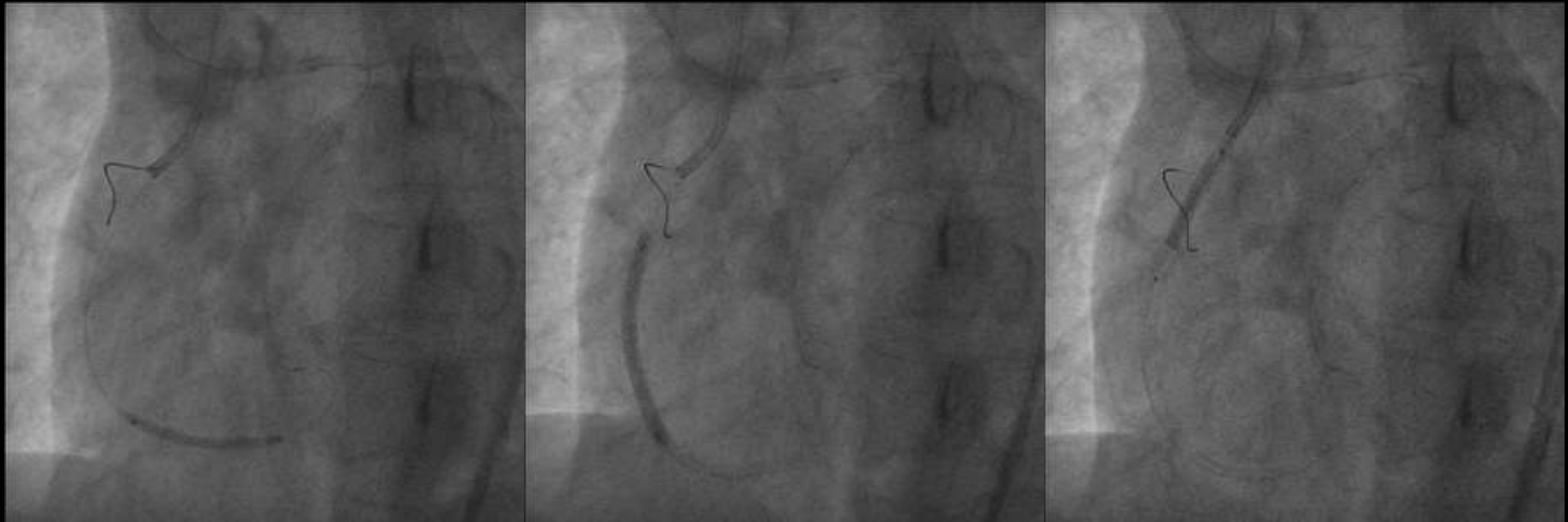
2017.02.20



2017.03.20



2017.06.30



2.25/28 DES

3.0/38 DES

3.5/28 DES



2015.5.31



2015.10.12



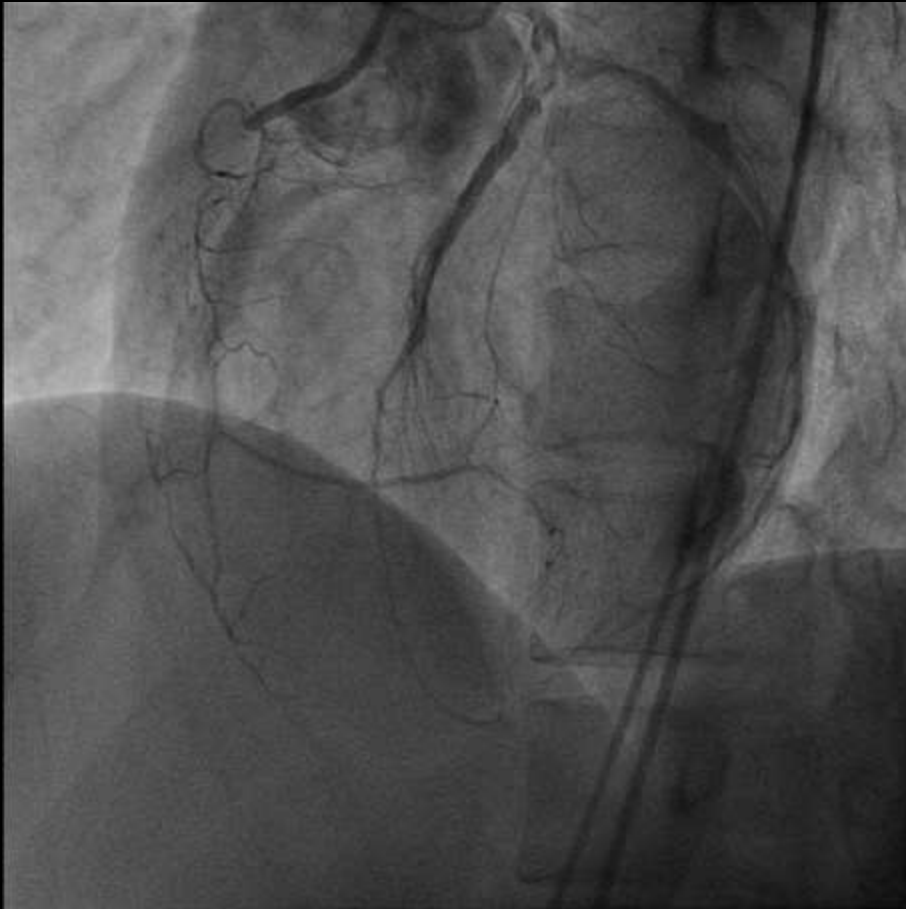
2017.02.20



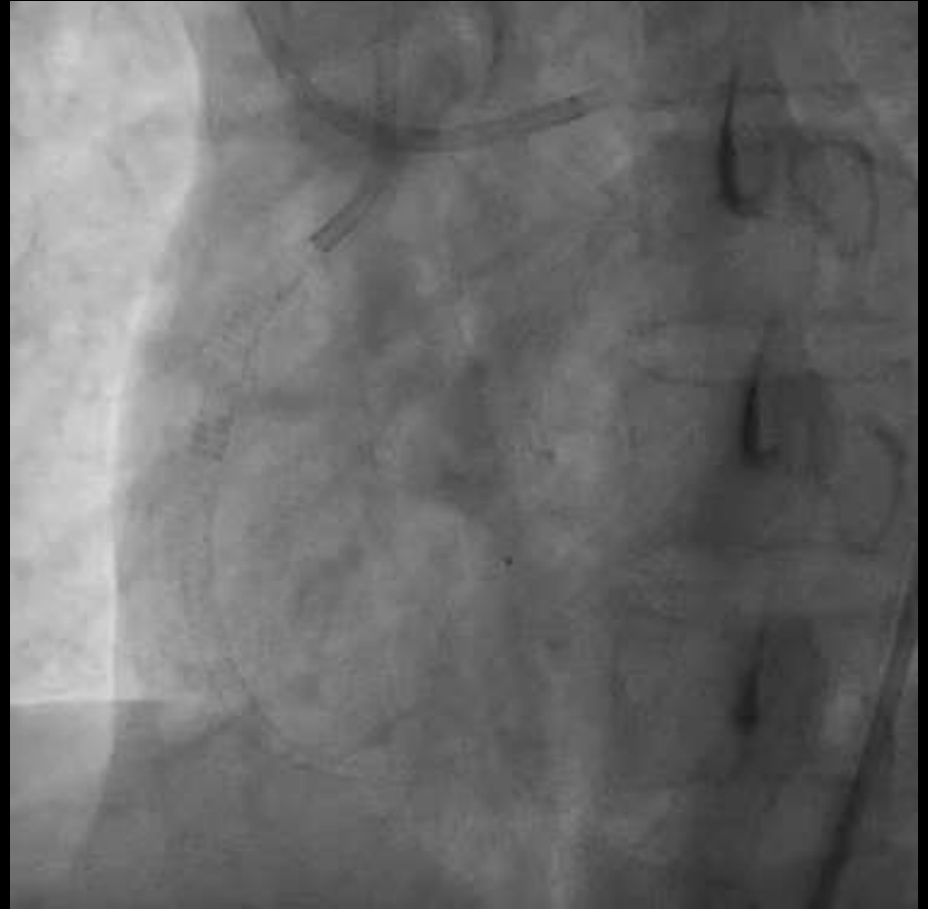
2017.03.20



2017.06.30



Before



After



2015.5.31



2015.10.12



2017.02.20

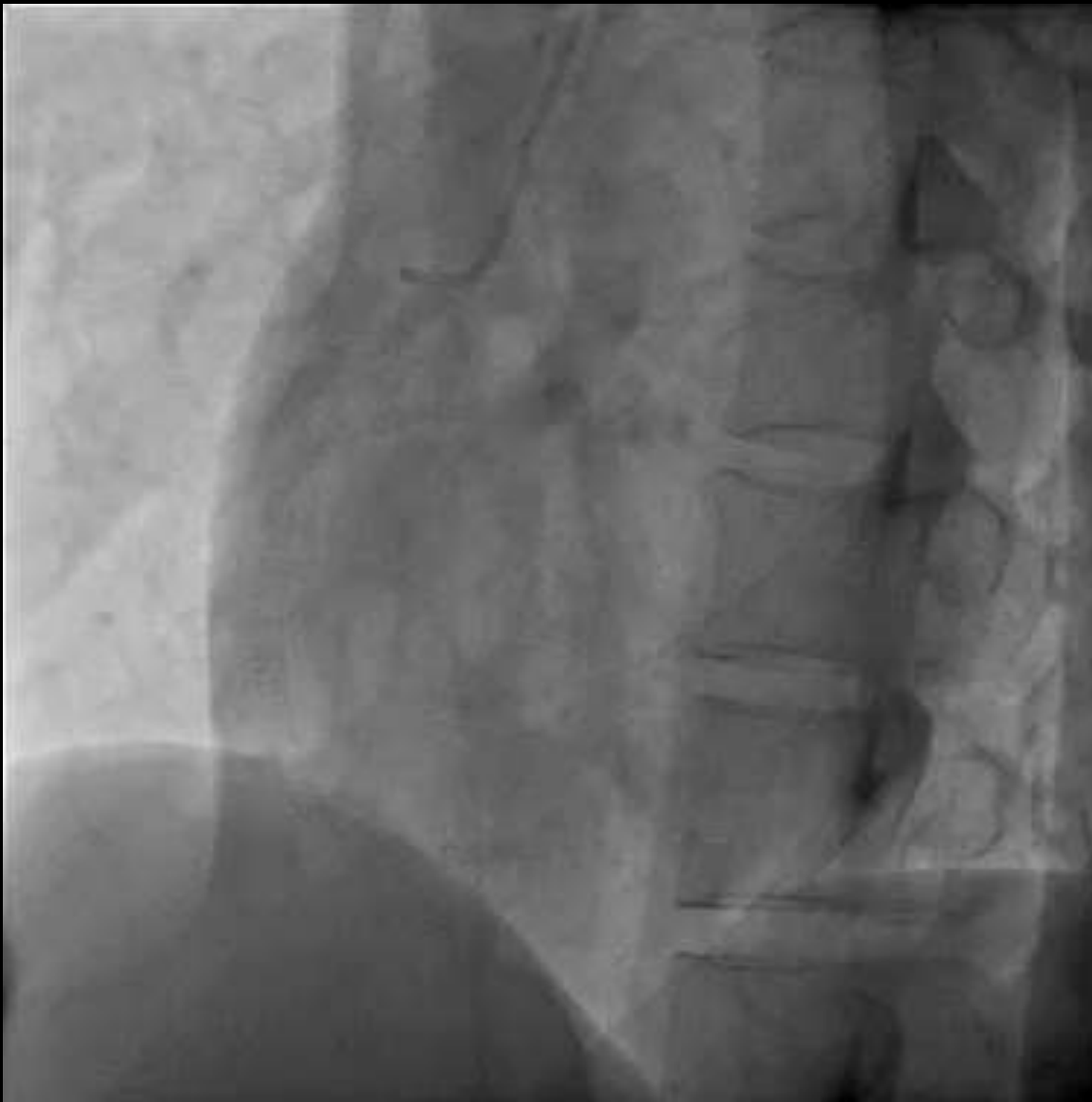


2017.03.20



2017.06.30

12 Months Follow up



2015.5.31



2015.10.12



2017.02.20



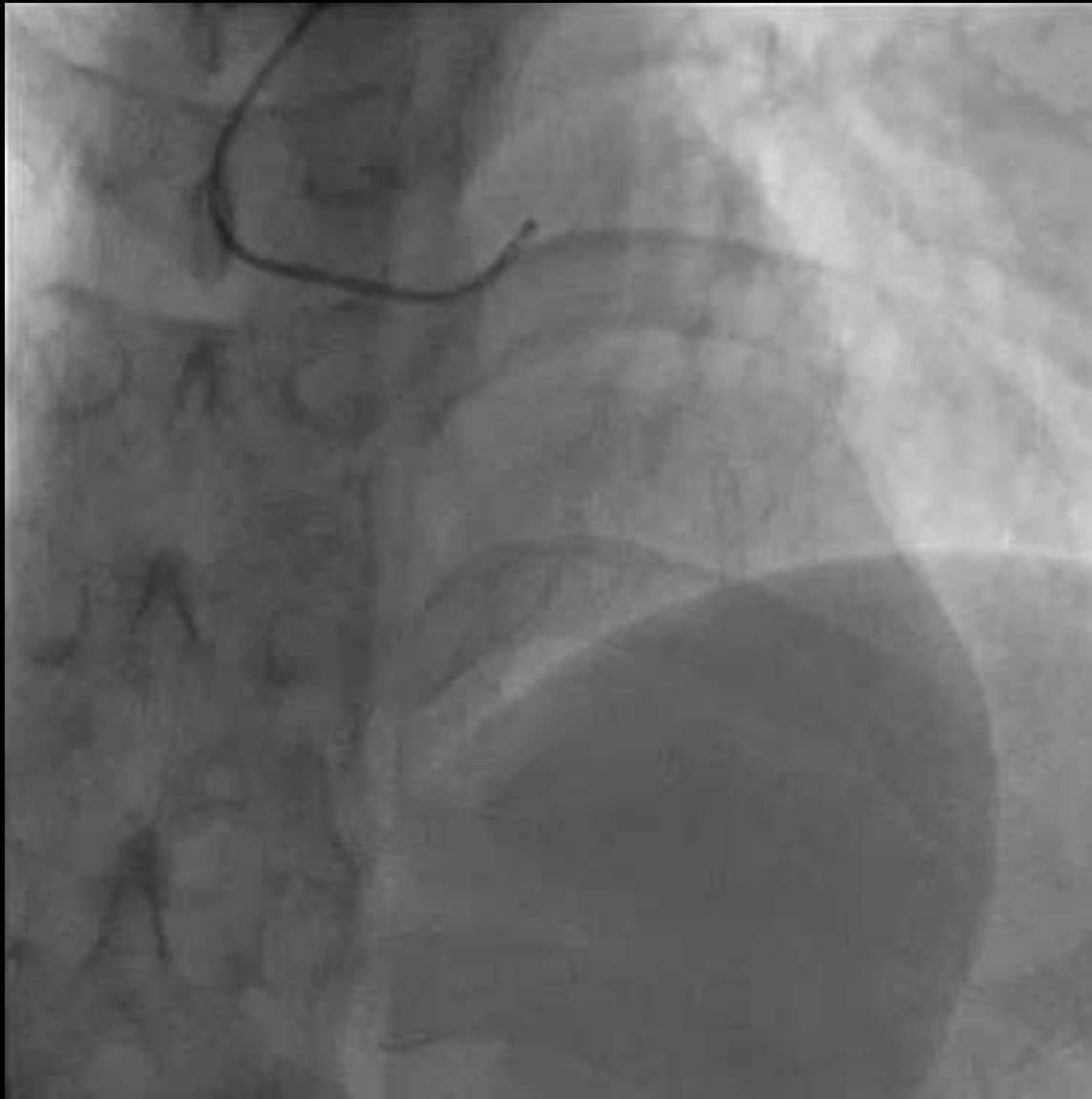
2017.03.20



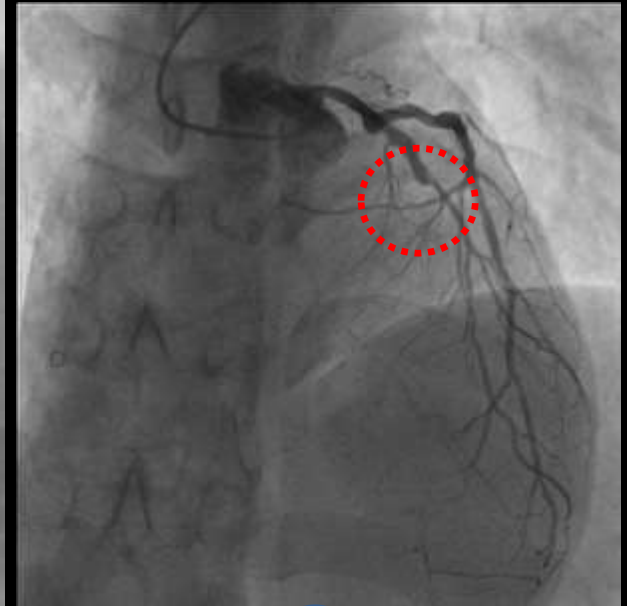
2017.06.30



2018.06.04



LAD total occlusion



2015.5.31



2015.10.12



2017.02.20



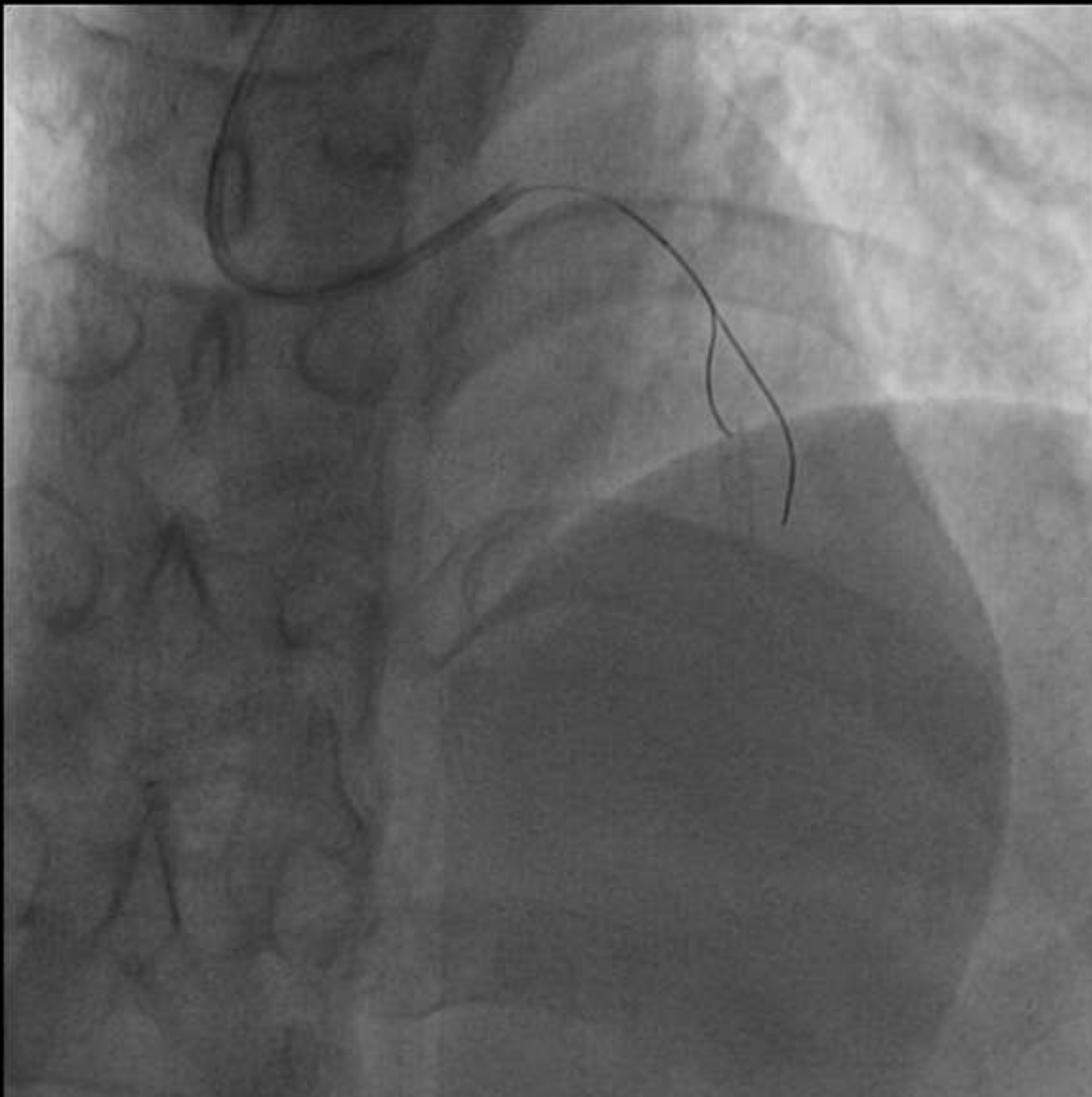
2017.03.20



2017.06.30



2018.06.04



**EBU guiding catheter
Parallel wire**



2015.5.31



2015.10.12



2017.02.20



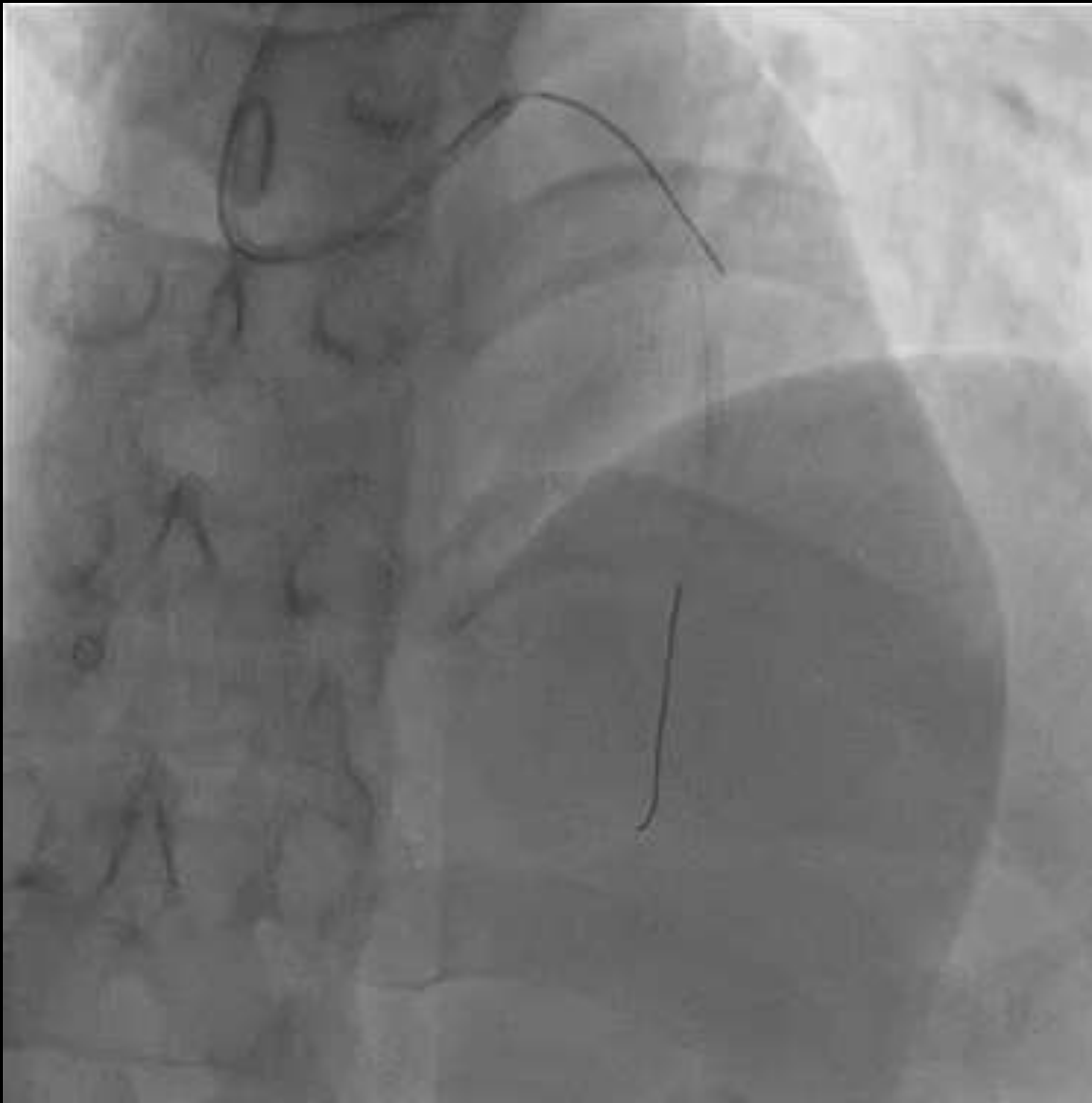
2017.03.20



2017.06.30



2018.06.04



Fielder FC wire
UB3 wire



2015.5.31



2015.10.12



2017.02.20



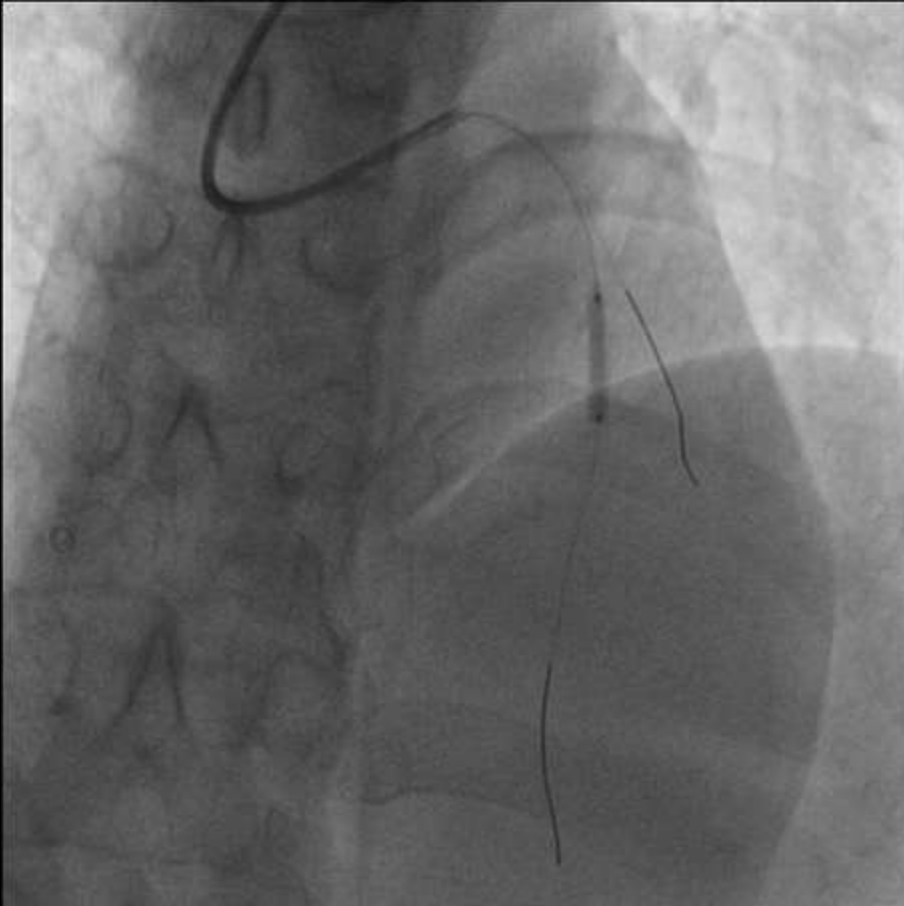
2017.03.20



2017.06.30



2018.06.04



No reflow after PTCA



2015.5.31



2015.10.12



2017.02.20



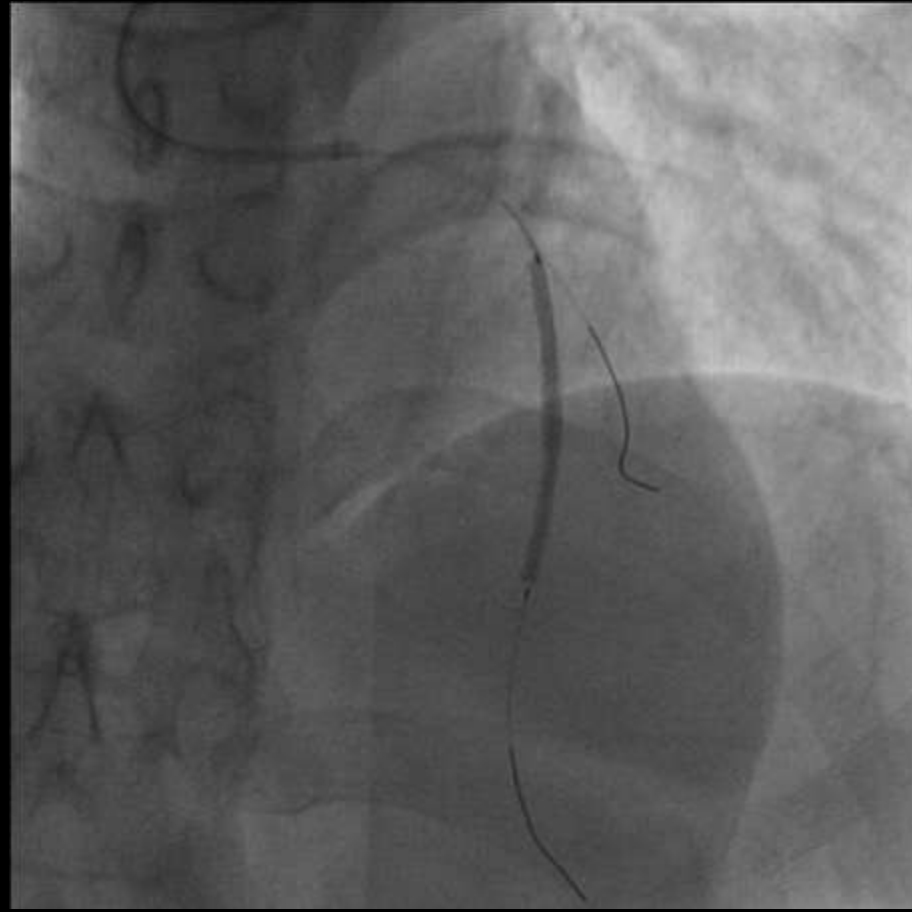
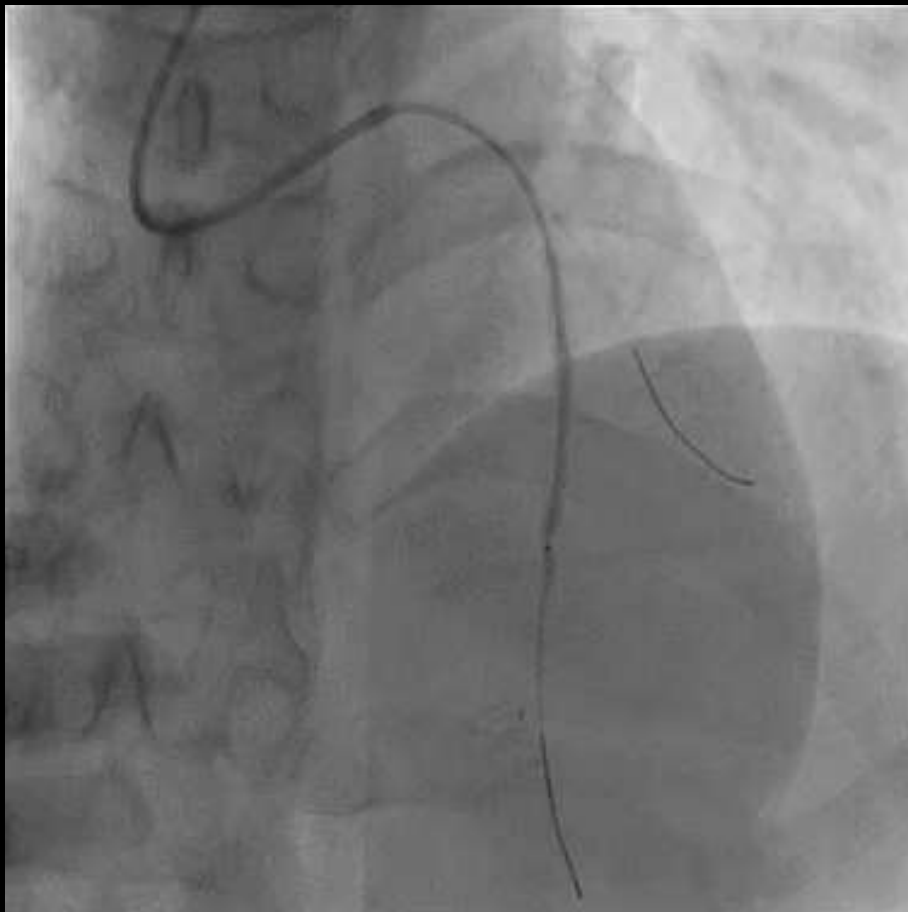
2017.03.20



2017.06.30



2018.06.04



DES 2.5/48 mm deployed over LAD



2015.5.31



2015.10.12



2017.02.20



2017.03.20

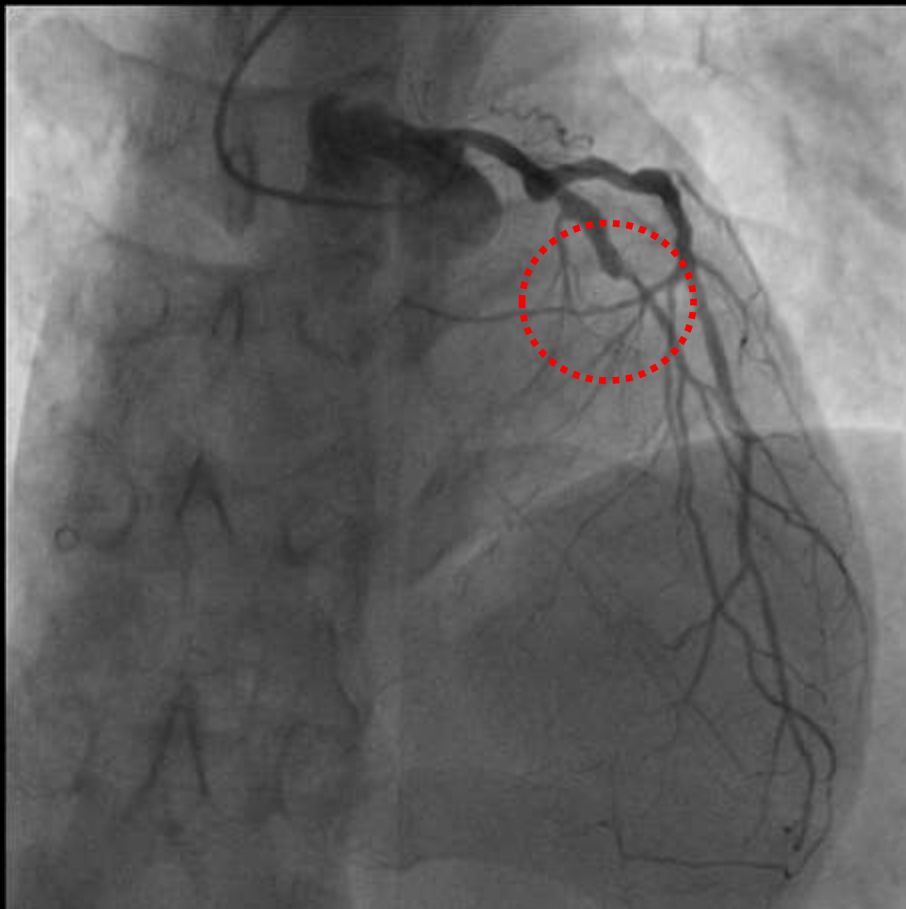


2017.06.30

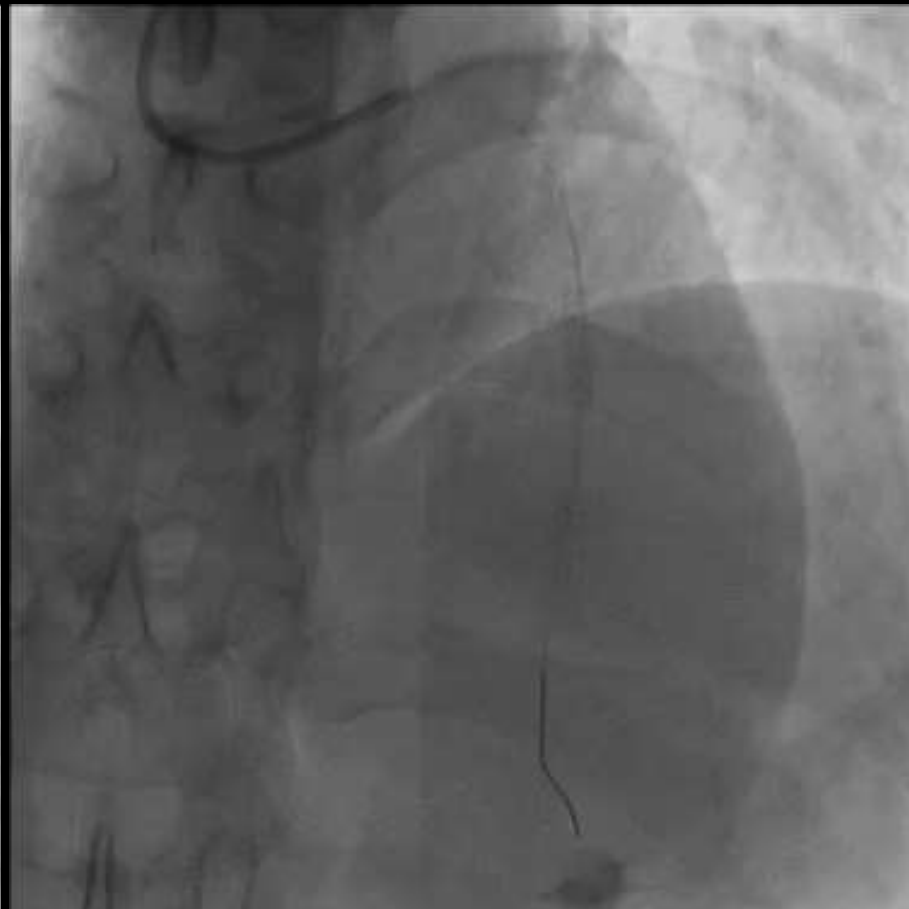


2018.06.04

Before



After



2015.5.31



2015.10.12



2017.02.20



2017.03.20



2017.06.30



2018.06.04

Common Underlying Pathologies of Coronary Artery Aneurysm

| Etiology (Ref. #) | Pathogenic Mechanism | Examples |
|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| Genetic susceptibility (24) | Specific HLA class II genotypes, such as HLA-DR B1*13, DR16, DQ2, and DQ5, are more detectable in patients with CAA | Idiopathic CAA |
| Overexpression of certain enzymes (e.g., angiotensin-converting enzyme) (51) | Enhanced inflammatory response Induces proteolysis of extracellular matrix proteins | Atherosclerotic CAA |
| Autoimmune/inflammatory process (29) | Increased plasma level of intercellular adhesion molecule-1, vascular cell adhesion molecule-1, and E-selectin Imbalances in protein levels of matrix metalloproteinase and its tissue inhibitor | Systemic vasculitis (Kawasaki, Takayasu) Lupus Marfan syndrome |
| Dynamic wall stress changes (24) | Episodic hypertension and vasoconstriction ± endothelial damage | Cocaine use |
| Direct vessel wall injury (20,30-38) | Mechanical and shear wall stress Non-healing dissections, and so on | Iatrogenic CAA (post-balloon angioplasty, stenting, atherectomy) Post-stenotic CAA |
| Infectious (24,39) | Direct invasion of pathogens into the vessel wall Immune complex deposition | Bacterial, mycobacterial, fungal, syphilitic, Lyme, septic emboli, and mycotic aneurysm |

What is The Most Suitable Management ?

- **BMS ?**
 - Hypersensitivity to metals increased frequency of in-stent restenosis
- **DES ?**
 - Impaired intimal healing effects of the antiproliferative agents
 - Coronary artery aneurysm formation
- **Covered stent grafts ?**
 - Not suitable for a major side branch
- **Stent-assisted coiling?**
 - Saccular or fusiform
- **Surgical exclusion?**
 - Involving the left main coronary artery
 - Multiple or giant
 - Saphenous vein graft aneurysms

The Advantage of BRS

- **Restoration of Function**
 - Recovery of both vasomotor function and vessel pulsatility
- **Thrombogenic Risk Attenuation**
 - Replacing the resorption sites with connective tissue
 - Minimizing the risk of late acquired strut malapposition.
- **Elimination of the Risk of In-Scaffold Neoatherosclerosis**
 - Complete scaffold resorption
 - Regenerated intact endothelium/vasomotor function/plaque passivation
- **Anatomic Restoration**
 - More compliant platforms
 - Diminishing disturbed flow
 - Restored vessel angulation and curvature

The Disadvantage of BRS

- ✓ Thicker struts and slower expandability
- ✓ Bulky struts are prone to side-branch jailing or occlusion
- ✓ Require higher pressures of balloon inflations
- ✓ Deep arterial wall injury/inflammation cause coronary artery aneurysm formation after intervention.

Take Home Message

- Previous discussions of PCI for asymptomatic coronary artery aneurysm or elective intervention were only limited to small case series.
- We presented a case of coronary artery aneurysm treated with BRS, with post intervention associated new-developed coronary aneurysm.
- There are several treatment modalities including BMS, DES, BRS, covered stent grafts, stent-assisted coil embolization, or surgical exclusion.

Take Home Message

- ✓ Covered stent has successful experience if not involving a major side branch, but is not suitable for this patient
- ✓ We tried BRS, however, BRS made deep arterial wall injury and cause coronary artery aneurysm after intervention
- ✓ The most suitable management is inconclusive at this moment

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**Many Thanks
Your Attention**



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