Remarkable evolution of the distal coronary vessel in chronic total occlusion

A.M. Griffioen, MD, PhD candidate

S.C.H. van den Oord, MD, PhD, cardiologist, fellow interventional cardiologist

R.J.M. van Geuns, MD, PhD, interventional cardiologist

Radboudumc, Nijmegen, the Netherlands

Disclosures

- There are no conflicts of interest to be declared.

Literature

- Chronic total occlusion
  - Negative vessel remodeling of the distal coronary vessel
  - Possibly as a result of reduced blood flow

- After recanalization of a chronic total occlusion
  - Lumen gain as a result of positive remodeling (0.21 mm, p = 0.001; after 6 months)
  - Correlation with restoring of antegrade flow is unclear

- Increased lumen area
  - Increased rate of stent malapposition

1. Park, J.J., et al., *The recanalization of chronic total occlusion leads to lumen area increase in distal reference segments in selected patients: an intravascular ultrasound study.* JACC Cardiovasc Interv, 2012. **5**(8): p. 827-36.
2. Saito, S., et al., *Serial Intravascular Ultrasound Findings After Treatment of Chronic Total Occlusions Using Drug-Eluting Stents.* Am J Cardiol, 2016. 117(5): p. 727-34.
3. Okuya, Y., et al., *Novel predictors of late lumen enlargement in distal reference segments after successful recanalization of coronary chronic total occlusion.* Catheter Cardiovasc Interv, 2019. **94**(4): p. 546-552.

Clinical presentation

- Male, 68 years
- History
  - Paroxysmal atrial fibrillation
  - Hypertension

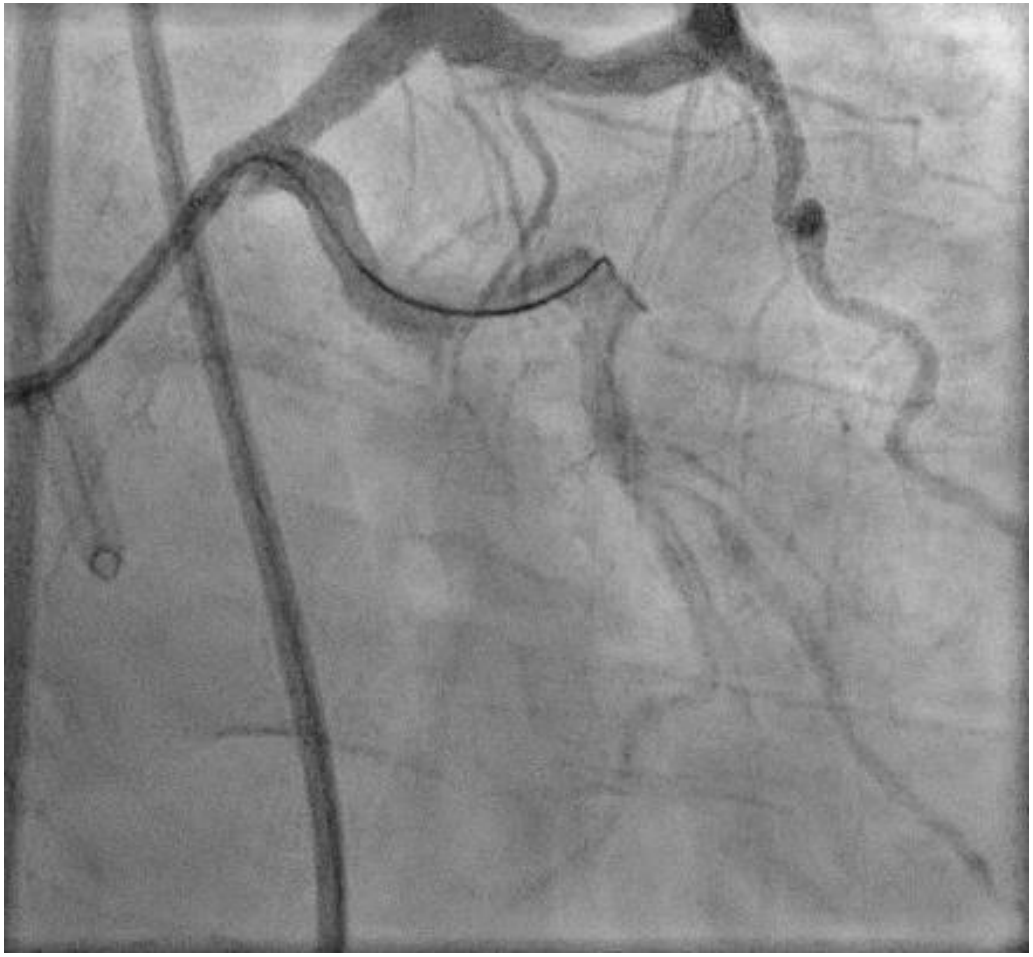
  - 2018-04: NSTEMI

  → PCI left anterior descending, CTO right coronary artery, CTO margo obtusus

  - 2018-05: Cardiac PET-CT

  → ischemia anterior and inferior

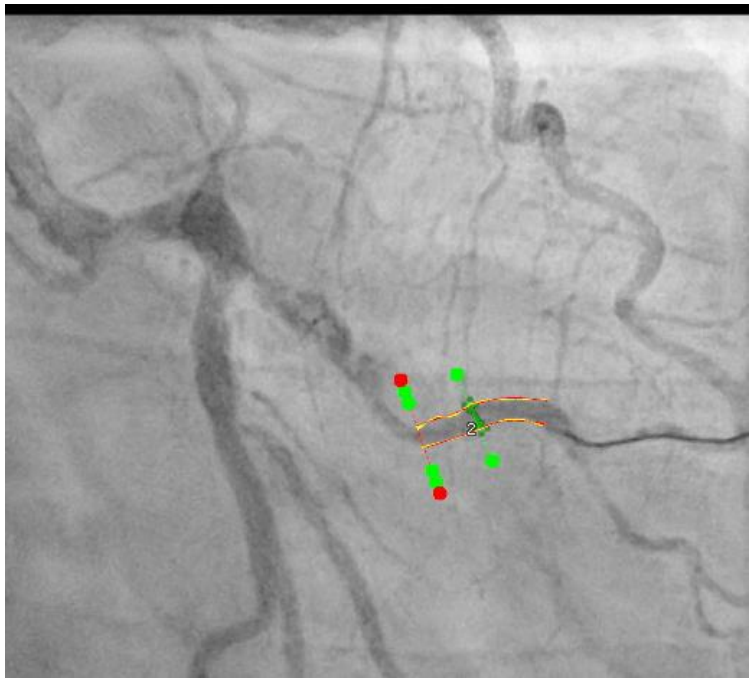
  - 2018-05: stent left anterior descending open; CTO right coronary artery, CTO margo obtusus



Intervention 17-05-2018

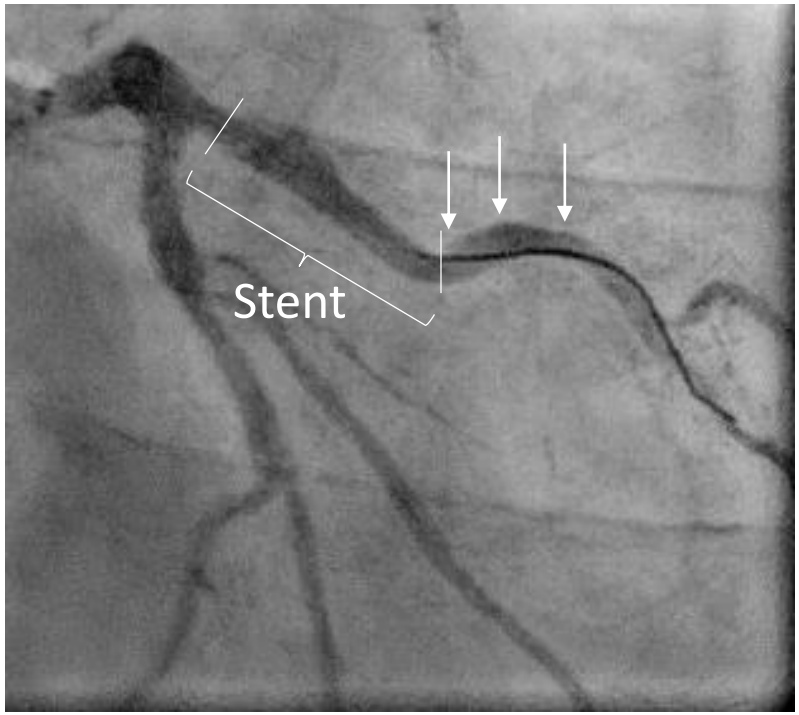
After pre-dilatation margo obtusus

Maximum diameter: 2.22 mm

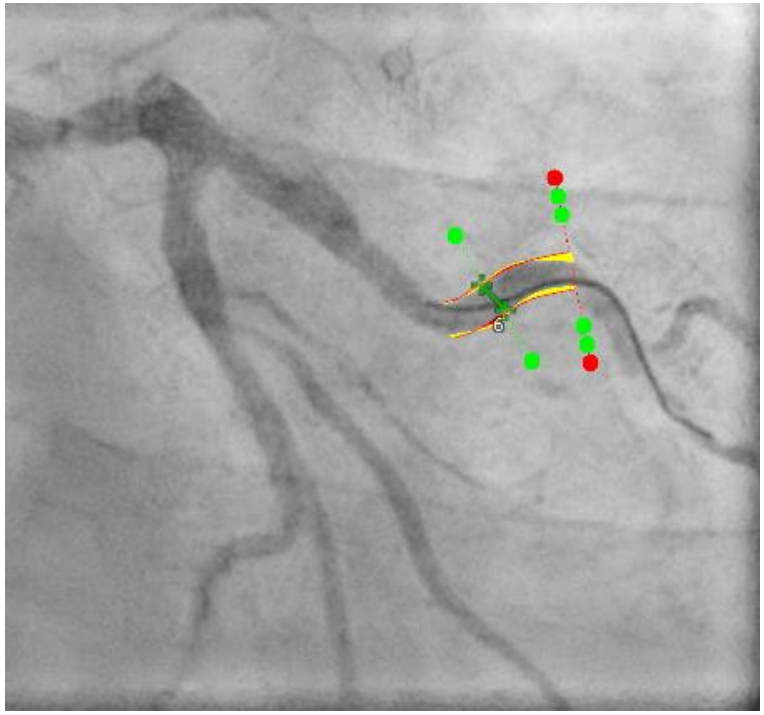


Intervention 17-05-2018

After placing DES 2.25 mm



Maximum diameter: 2.56 mm

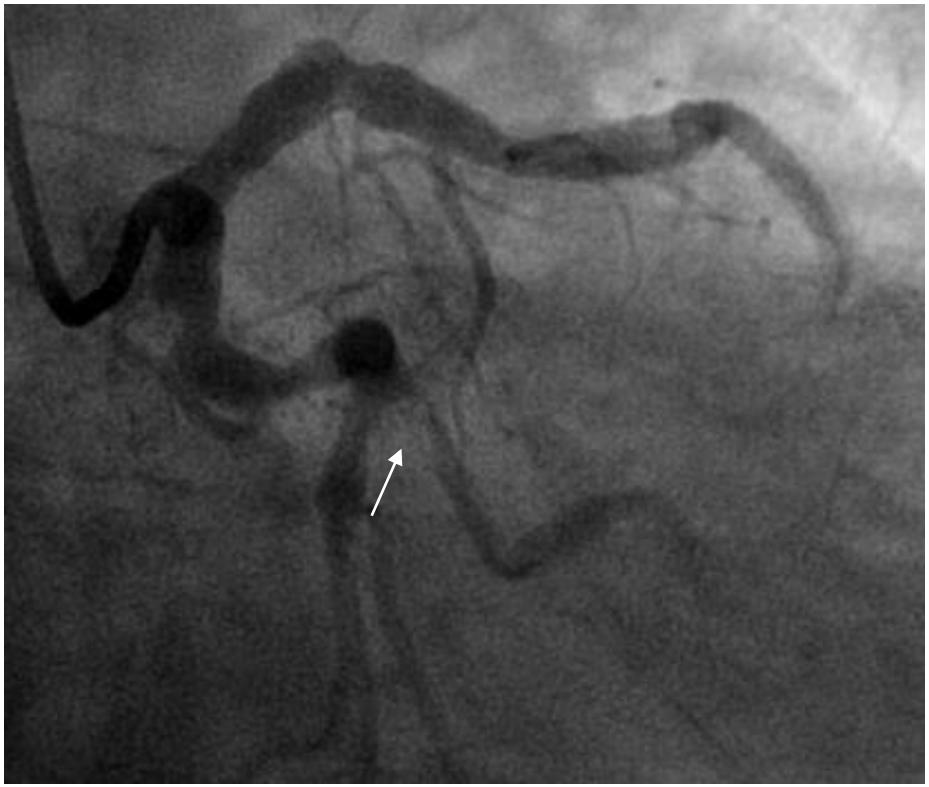


Intervention 05-01-2021

- NSTEMI 05-01-2021:
  - Stenosis left circumflex

  → Implantation stent: 4.5 mm

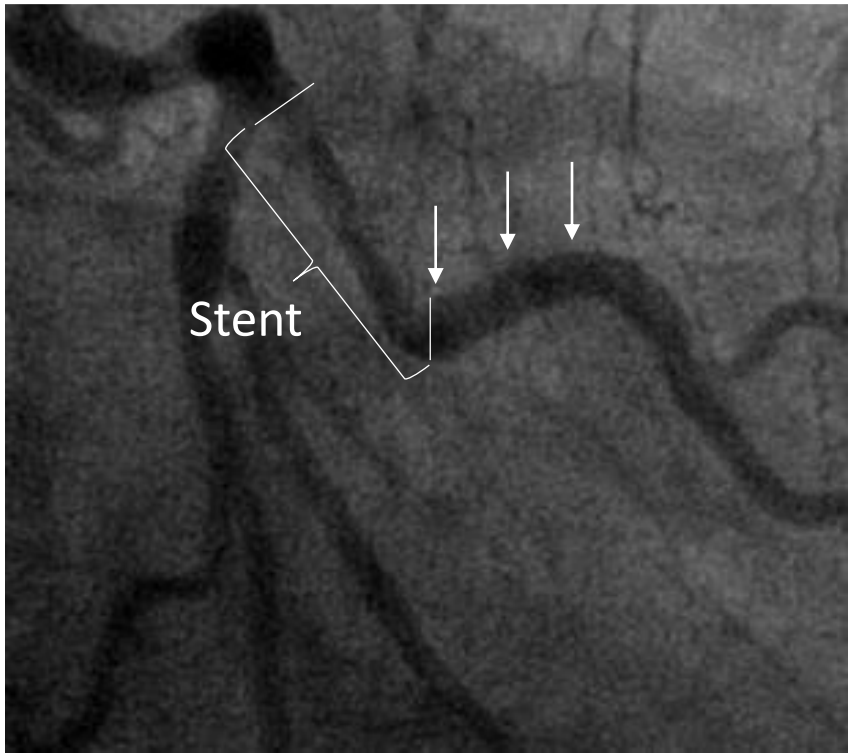
  - Thrombus proximal margo obtusus



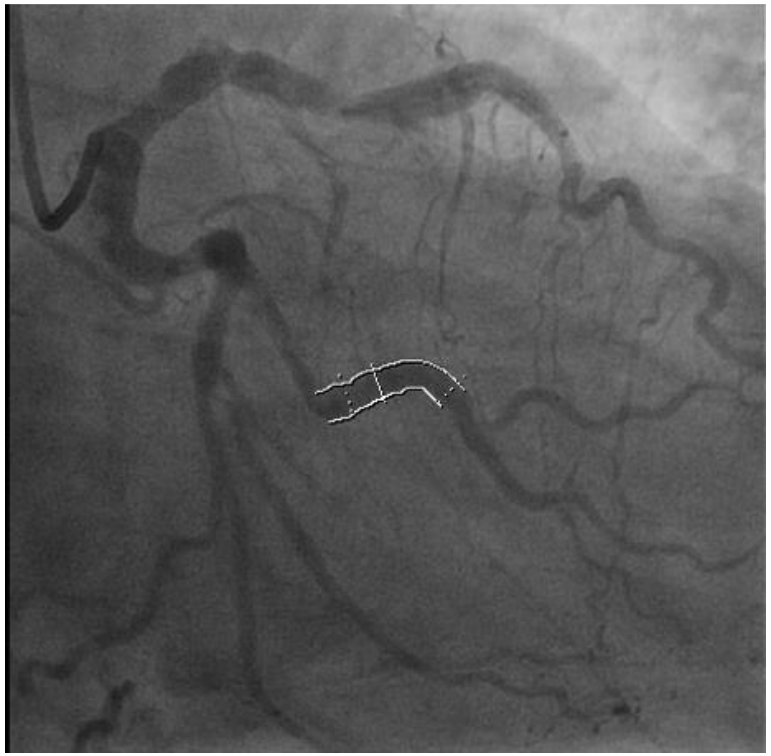
Intervention 05-01-2021

- Implantation stent: 3.5 mm
  - Stent 2018: 2.25 mm

Coronary angiography



Maximum diameter: 3.83 mm



Conclusion and take home message

- Remarkable distal lumen gain after 2 years
  - Acute gain: 2.22 mm → 2.56 mm
  - Late gain: 2.56 mm → 3.83 mm
  - Literature shows mean lumen gain of 0.21 mm in 6 months
- Distal lumen gain
  - Risk of stent malapposition and stent underexpansion
  - Stent malapposition and stent underexpansion:
    - Risk for stent thrombosis and restenosis
- Stent thrombosis in margo obtusus possibly as a result of stent malapposition
- Valuable information on differences of distal lumen gain
  - Prediction of distal lumen gain is however difficult
  - Predictors are yet unclear