Percutaneous Coronary Intervention in AAOCA

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Introduction

- Anomalous aortic origin of coronary arteries (AAOCA) from the opposite sinus of Valsalva with interarterial course are at risk for sudden death and myocardial ischemia
- Prevalence:
  - Anomalous left coronary artery (ALCA): 0.03%
  - Anomalous right coronary artery (ARCA): 0.23%
- Increasingly recognized by cardiac imaging
- Debate regarding their management
- Emerging of PCI as a treatment option

Cheezum et al., JACC 2017

Guidelines

2015

AHA/ACC Scientific Statement

Surgical procedures are the only therapies available for correcting these anomalies,[50] with return to intense athletic activities permitted after 3 months after the procedure with demonstration of the absence of ischemia on postoperative stress testing.[51]

2017

AATS EXPERT CONSENSUS GUIDELINES

Individuals with AAOCA and symptoms of ischemic chest pain or syncope suspected to be due to ventricular arrhythmias, or a history of aborted SCD, should be activity restricted and if deemed prohibitively high risk for surgery, catheter-based intervention may be considered. *(Class IIb; Level of Evidence C)*

No European Guidelines in this area so far …….

Six-Month Success of Intracoronary Stenting for Anomalous Coronary Arteries Associated With Myocardial Ischemia

Andrew J. Doorey, MD, Michael J. Pasquale, MD, James F. Lally, MD, Gary S. Mintz, MD, Erik Marshall, MD, and David A. Ramos, MD

- First series of PCI patients (n=14)
- Objective evidence of ischemia
- 9 ARCA with interarterial course
- 44-72 years old
- Bare-metal stents (BMS)
- No procedural complications
- Resolution of myocardial ischemia on stress testing at follow-up

Doorey et al., Am J Cardiol 2000

Origin of the Right Coronary Artery from the Opposite Sinus of Valsalva in Adults: Characterization by Intravascular Ultrasonography at Baseline and After Stent Angioplasty

Paolo Angelini,[1,2*] MD, Carlo Uribe,[2] MD, Jorge Monge,[2] MD, Jonathan M. Tobis,[3] MD, MacArthur A. Elayda,[4] MD, PhD, and James T. Willerson,[1] MD

- 42 patients with ARCA and interarterial intramural proximal course
- Mean age 48±12 years (12-73)
- IVUS-guided PCI
- Symptomatic, positive stress test, significant stenosis (IVUS surface reduction >50%)
- Successful PCI in all patients with 93% of drug-eluting stents (DES)
- Improved symptoms at one-year follow-up (30 patients)
- 13% restenosis rate at 5-year follow-up
- No AAOCA-related deaths during follow-up

Angelini et al., Cathet Cardio Int 2015

PCI in surgically treated patients

- Necker Hospital
- 31 patients between 2005 and 2017
- Mean age 14 years (4-66)
- 9 ALCA and 22 ARCA
- Coronary reimplantation / Ostioplasty
- No death
- 3 post-operative PCI (2 for acute ischemia, 1 for late ischemia)

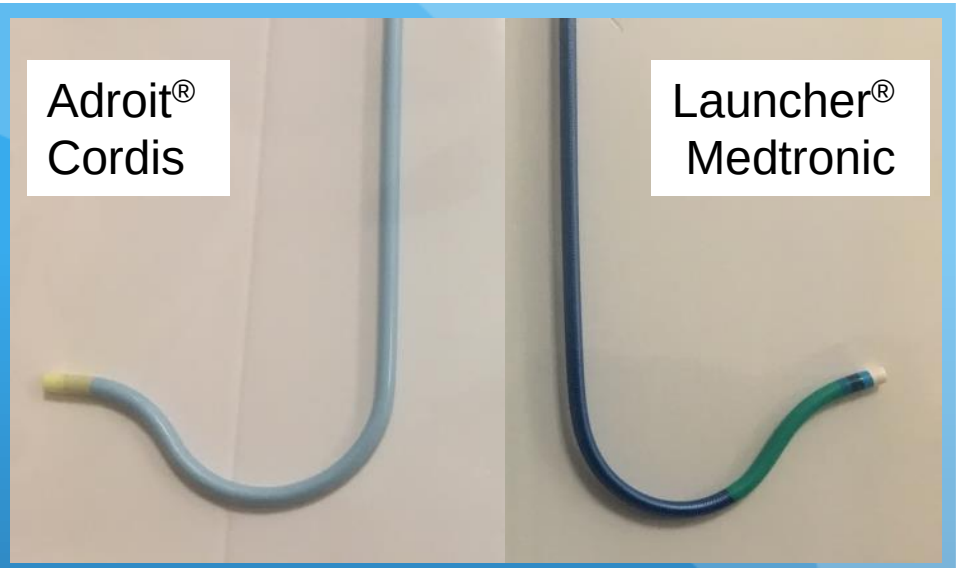
By courtesy of Gaillard Maïra, 2017

Technical aspects

- Difficult canulation
- No coaxiality because of tangential origin
- Less back-up support

→Amplatz Left (AL) guiding catheter

→0.014 guidewires to improve stability



Rationale for PCI in AAOCA

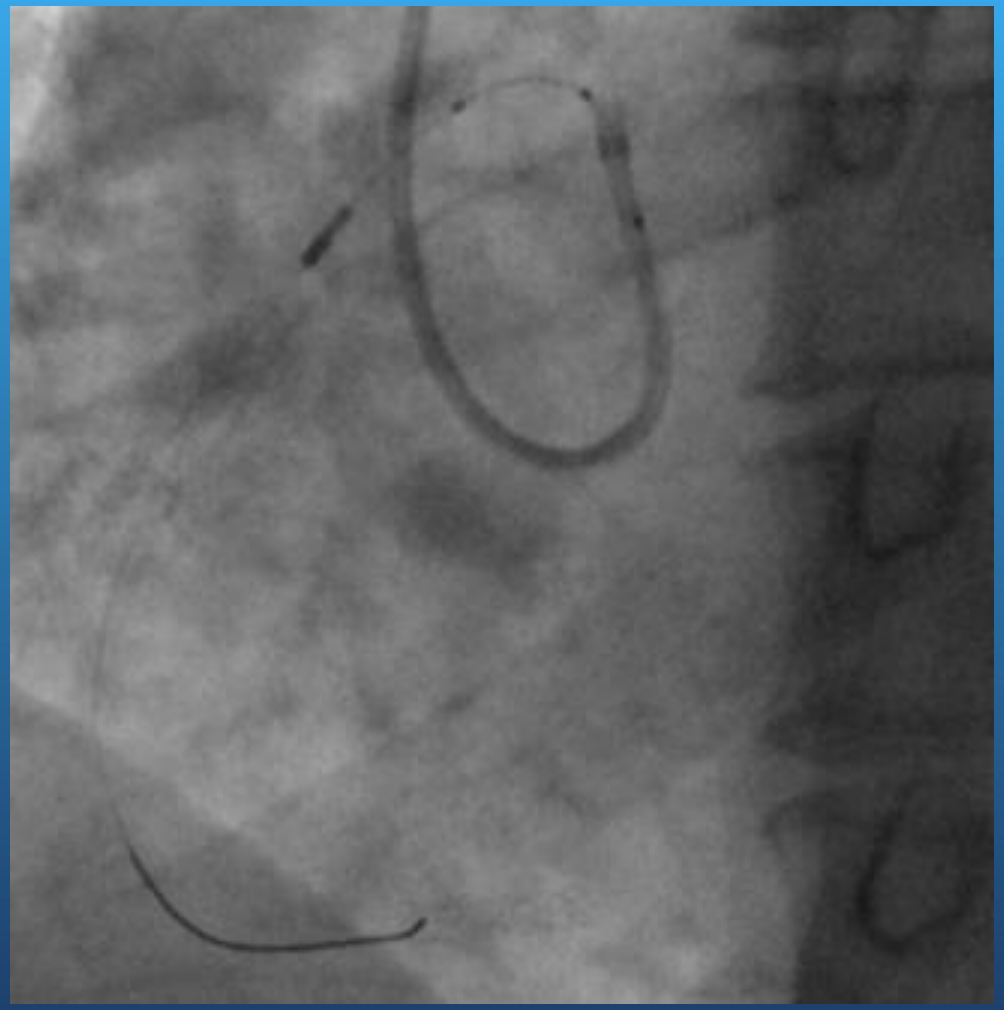
- Guidelines focused on young people
- No randomized controlled studies
- Lack of long-term data after surgical correction
- Possible failure (stenosis/aneurysm/thrombosis) after surgery
- Population with lower risk of sudden death (>30 year-old)
- Population with symptoms of ischemic chest pain (>50 year-old)

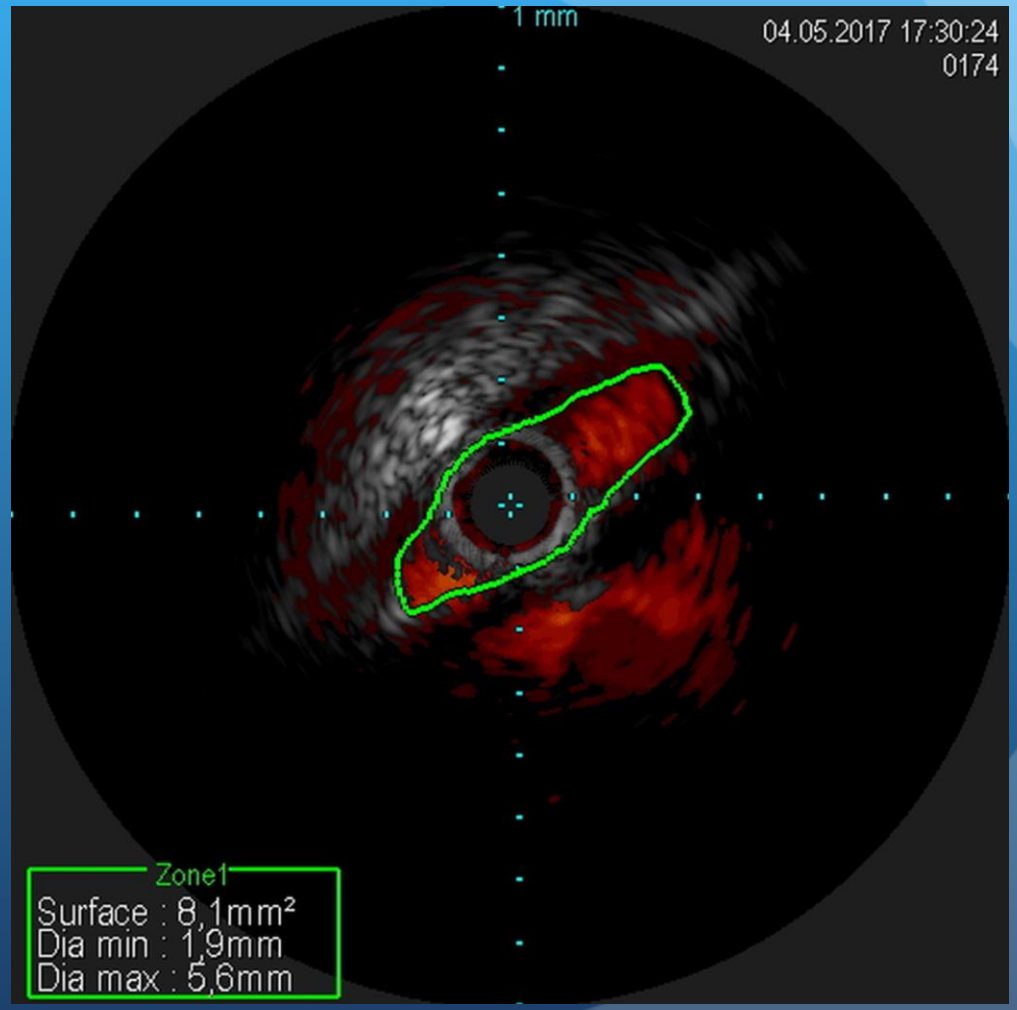
ANOCOR stenting registry

- ARCA with interarterial course with/without intramural pathway
- Age >30 years
- No history of aborten sudden death
- Angina and/or documented ischemia
- No significant associated CAD

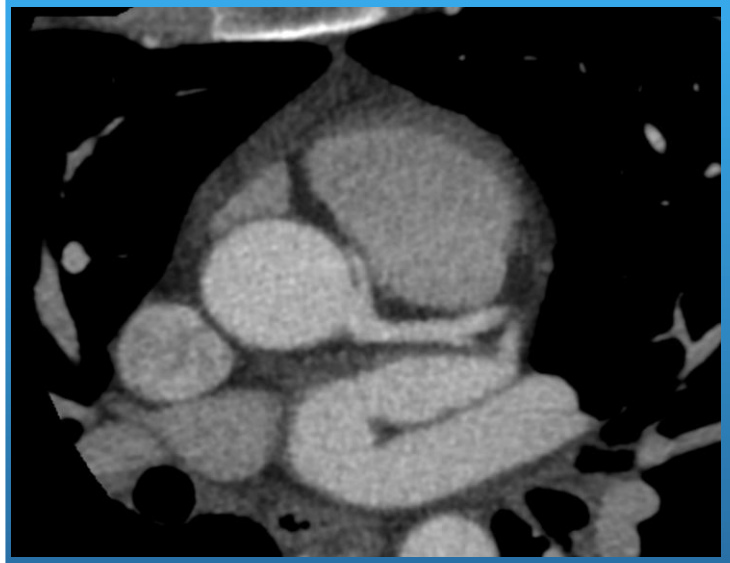
→ selected population

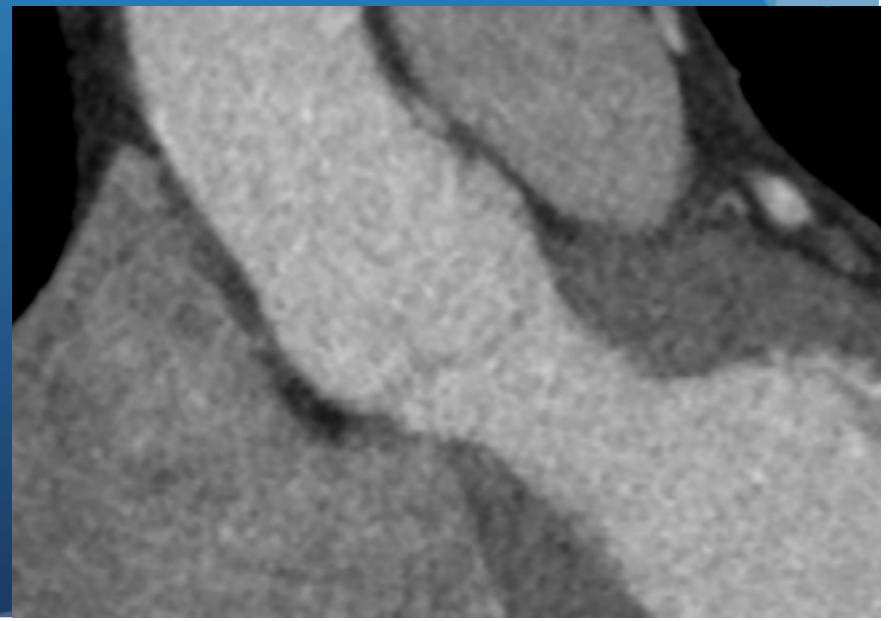
Intravascular imaging-guided





CT scan



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Volume Rendering No cut
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STND/AR50 Ph:75%
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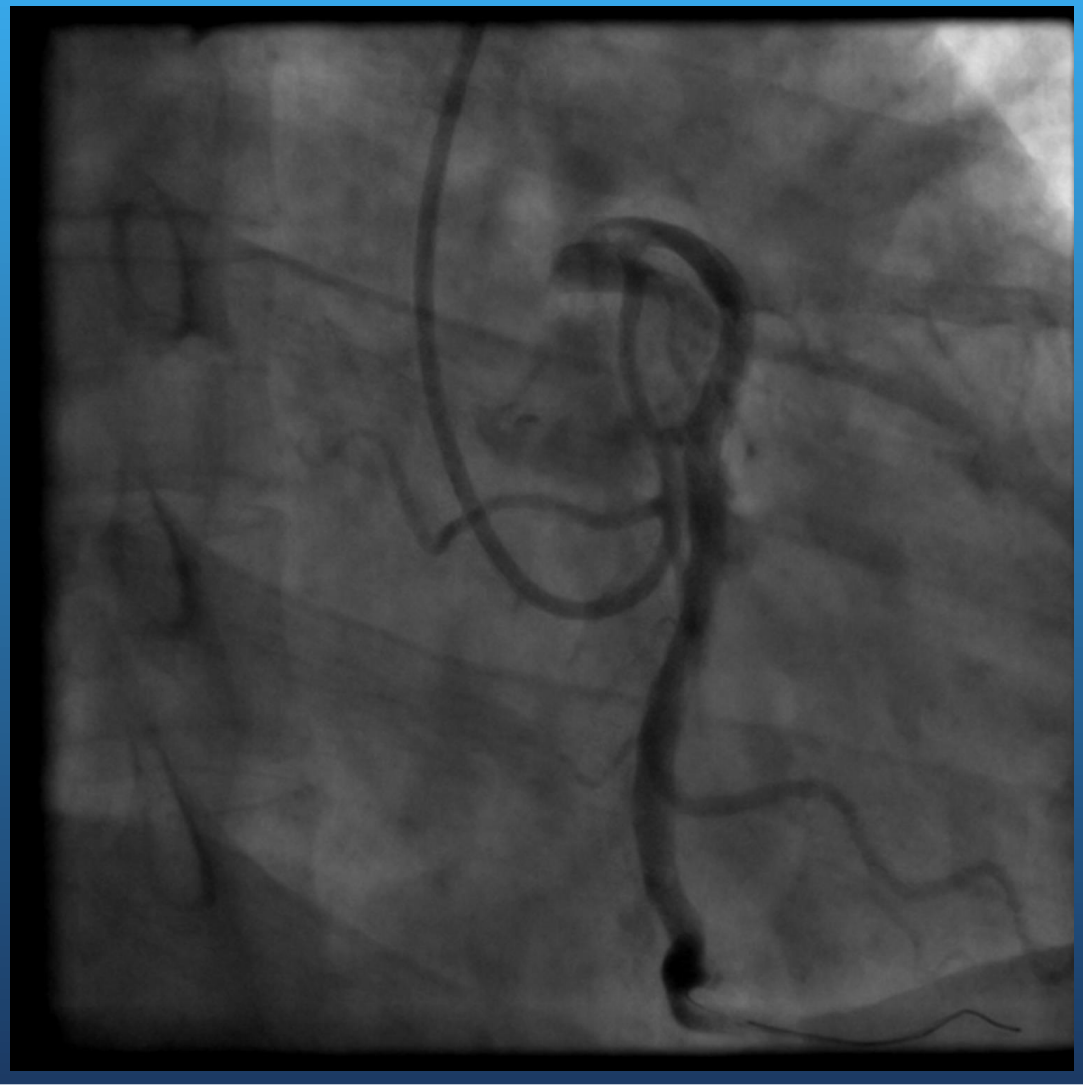
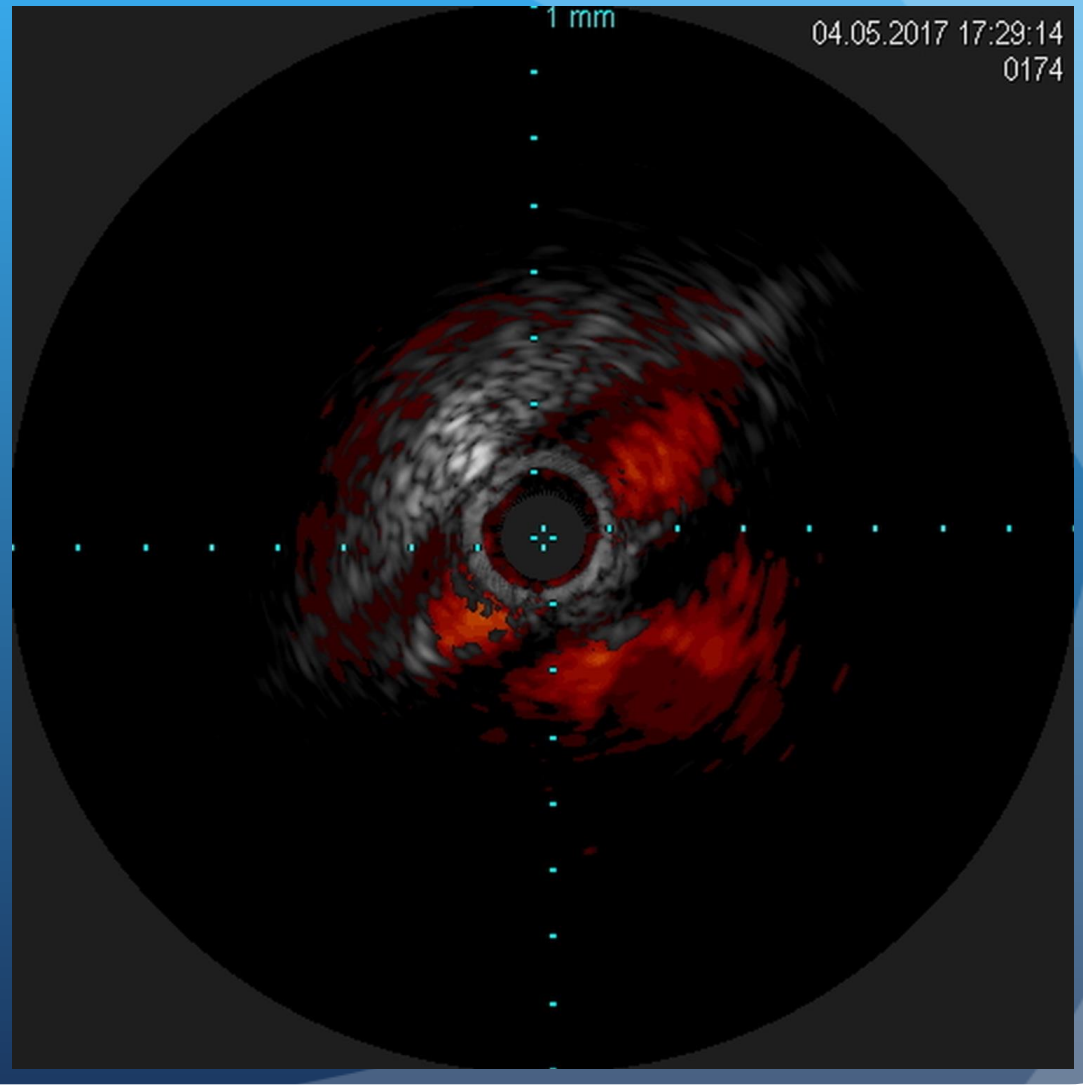
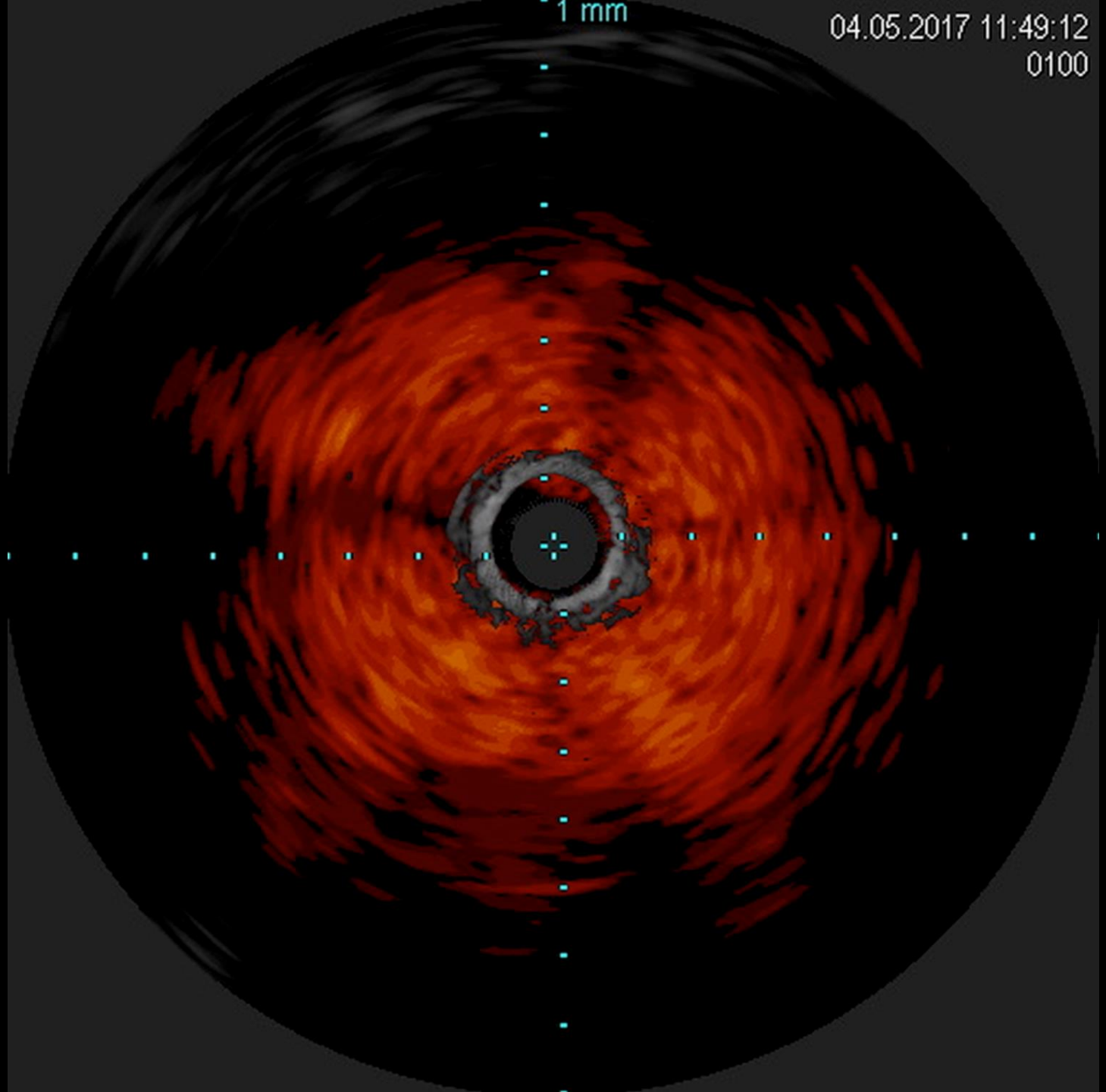
kV 120
0.6mm/0.62sp
W =1000 L =100
LAI

Pre-PCI



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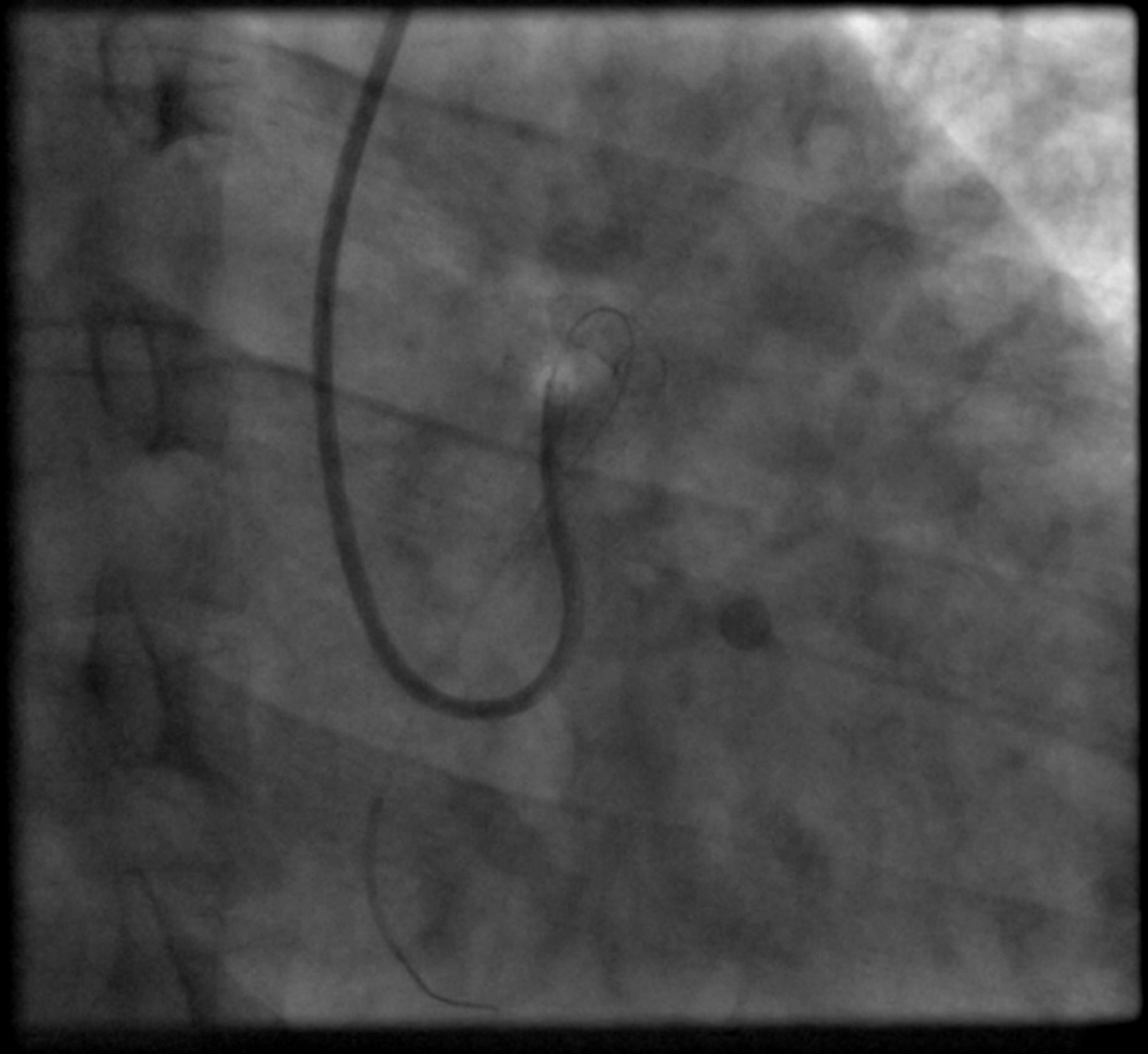

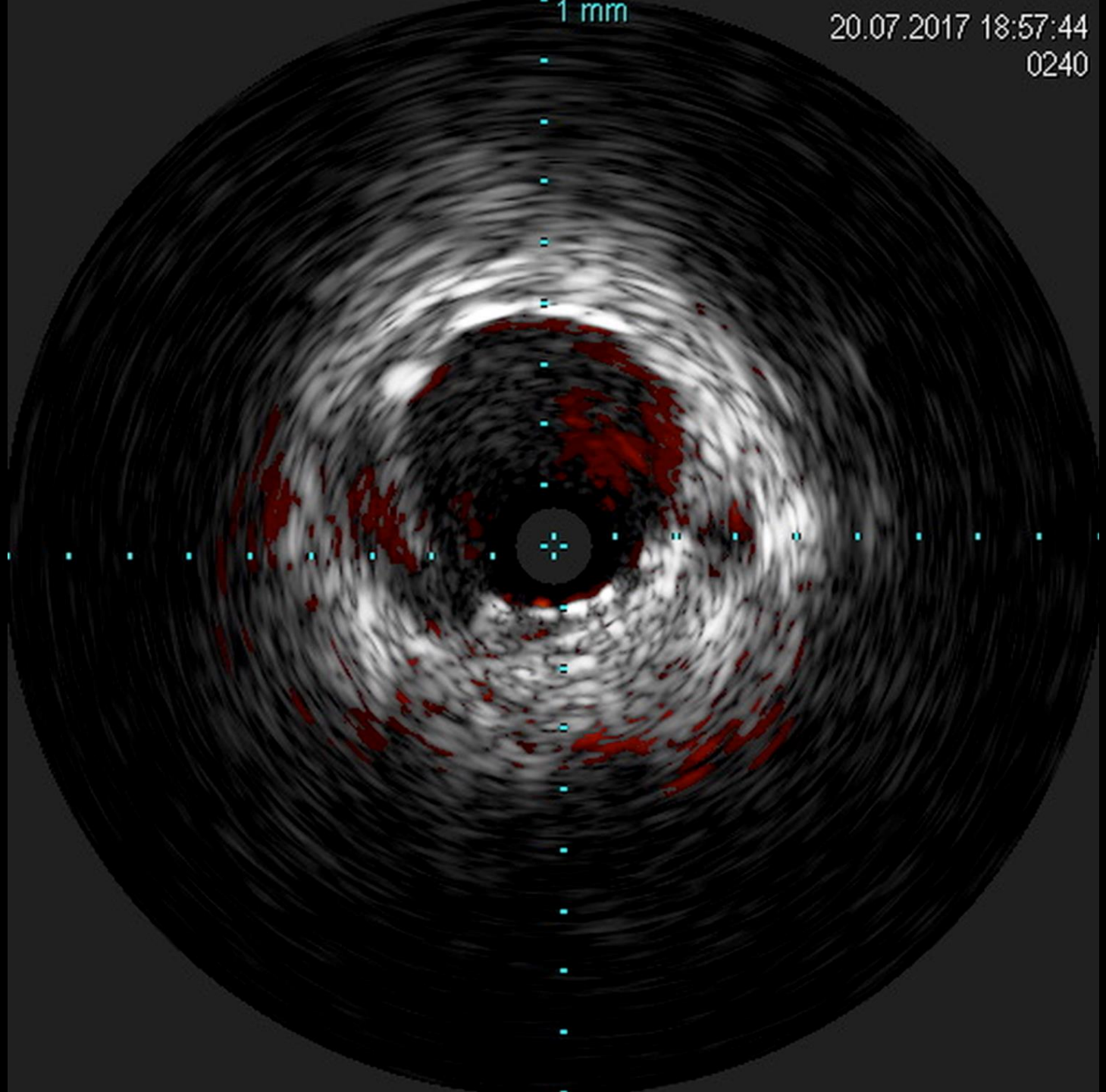
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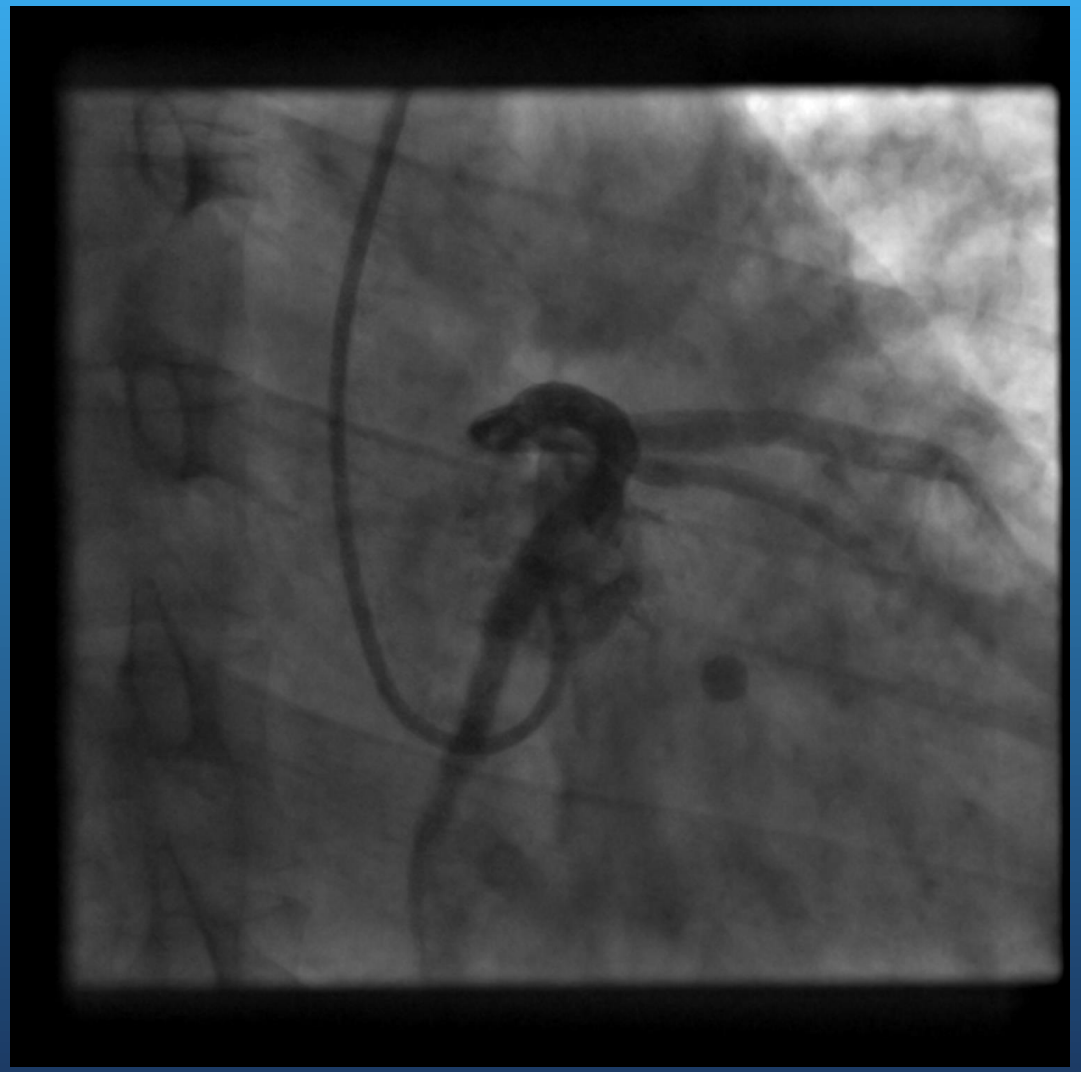
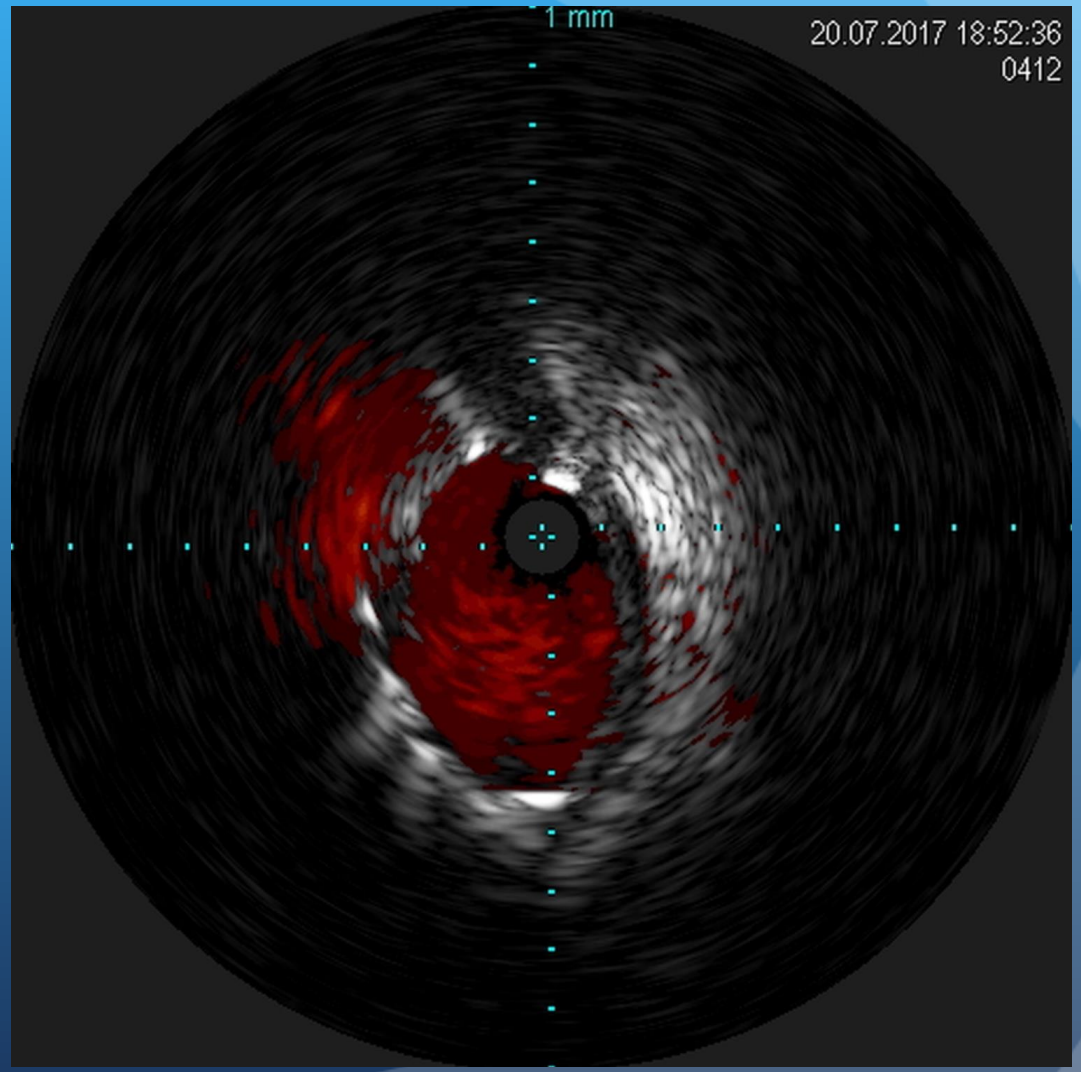
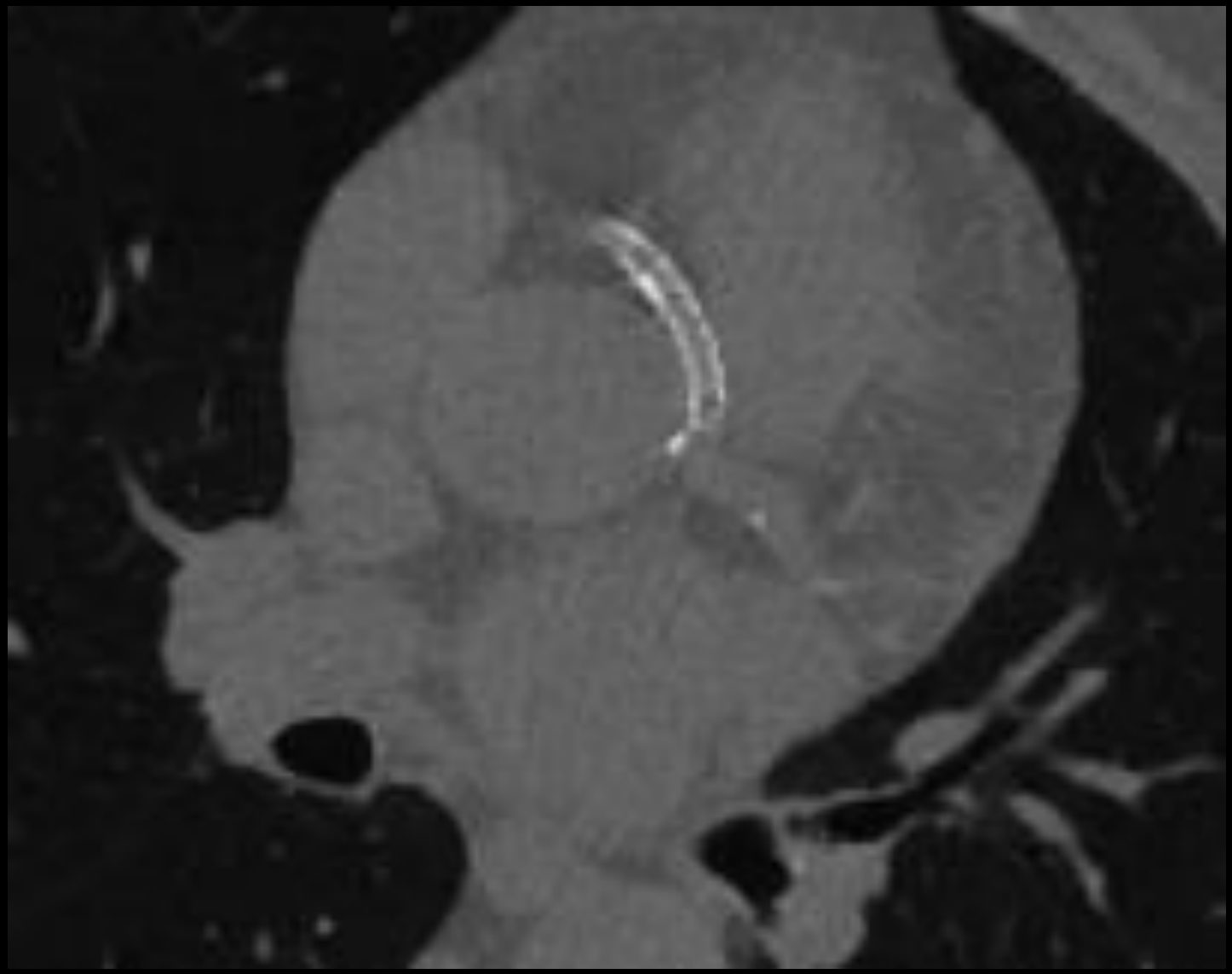
Post-PCI





CT scan – 6 months



Baseline characteristics

	N=11
Mean age (years)	54 (35-81)
Presentation	
ACS (%)	2 (18)
Stable angina (%)	6 (55)
Silent ischemia (%)	2 (18)
Syncope (%)	1 (9)
Intramural segment (%)	6 (55)

Presented at TCT congress 2017, JACC 2017

Results

	N=11
Successful stenting (%)	11 (100)
DES use (%)	10 (91)
Mean fluoroscopic time (min)	18
IVUS/OCT guidance (%)	8 (73)
Mean troponin (microg/L) at day 1	0.58
Periprocedural complications (%)	0 (0)
MACE at 6-month follow-up (%)	0 (0)

Presented at TCT congress 2017, JACC 2017

Conclusion

- Preaortic segment stenting of ARCA with interarterial course appears feasible and safe in this preliminary experience
- A longer follow-up and a more important population are needed to know whether this technique is suitable for a next therapeutic algorithm