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Acute myocardial infarction pathophysiology: New insights from modern imaging techniques

Rajiv Gulati, MD PhD

Advances in Cardiac Arrhythmias & Great Innovations in Cardiology
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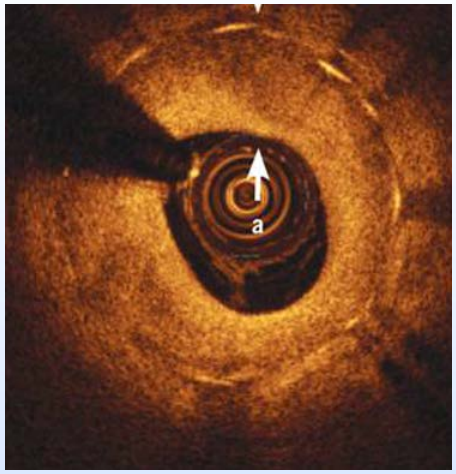
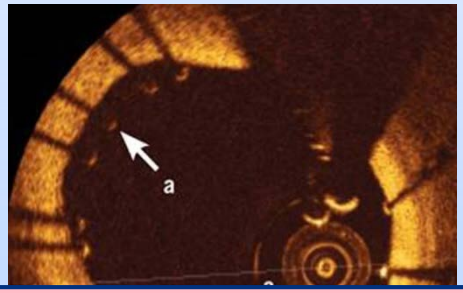
Intravascular Imaging
The interventionist's view

- Should I stent it?
- Do I need more stents?
- How are my stents doing?





But OCT can be a useful diagnostic tool

What is the underlying cause of MI?

Case #1

- 42 year old female realtor
- Smoker, HTN, hyperlipidemia
- Mitral valve replacement aged 25 for degenerative MR
- Presents with 2 hours of chest pain
- Troponin 0.12, INR 3.0

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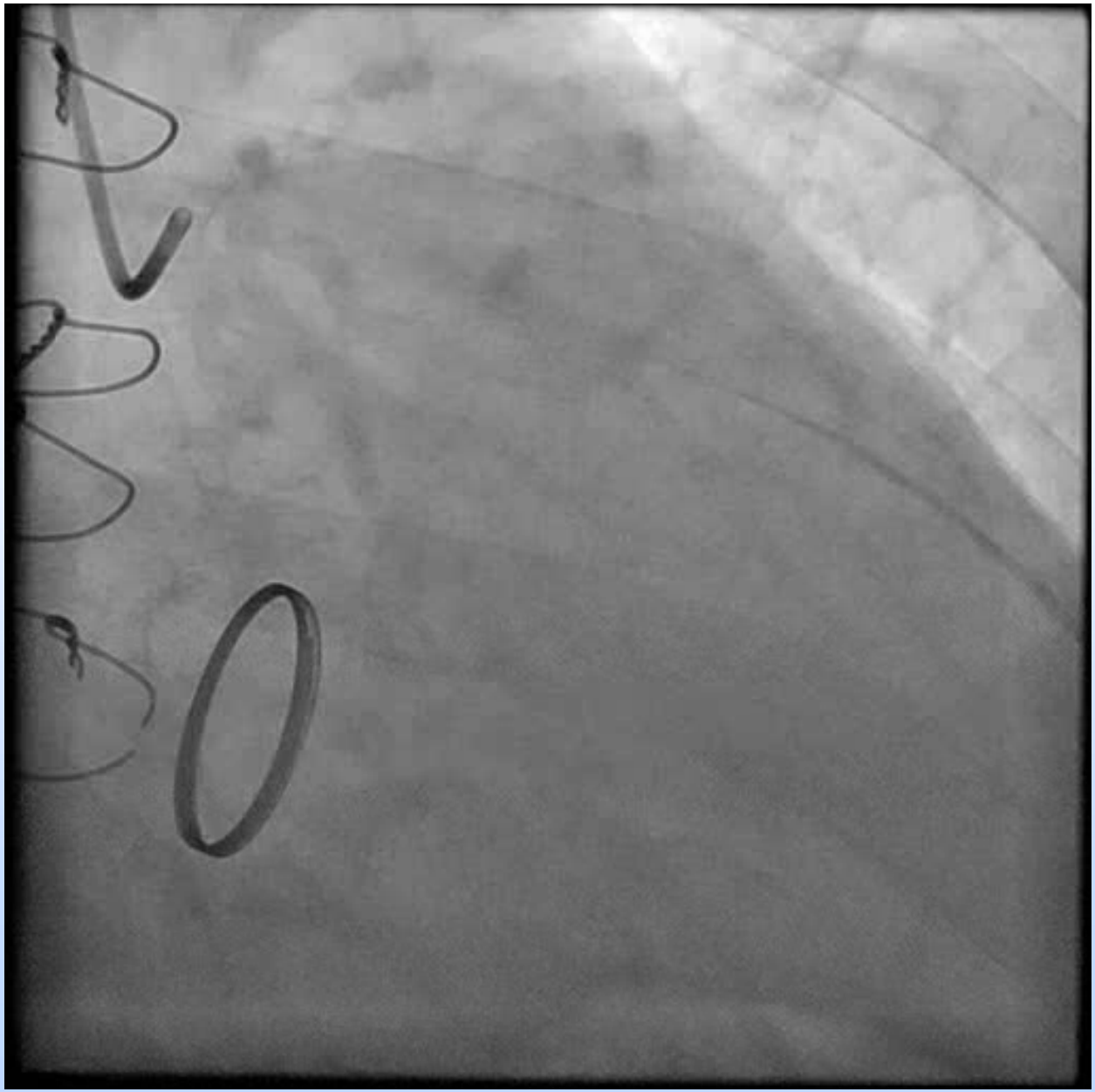

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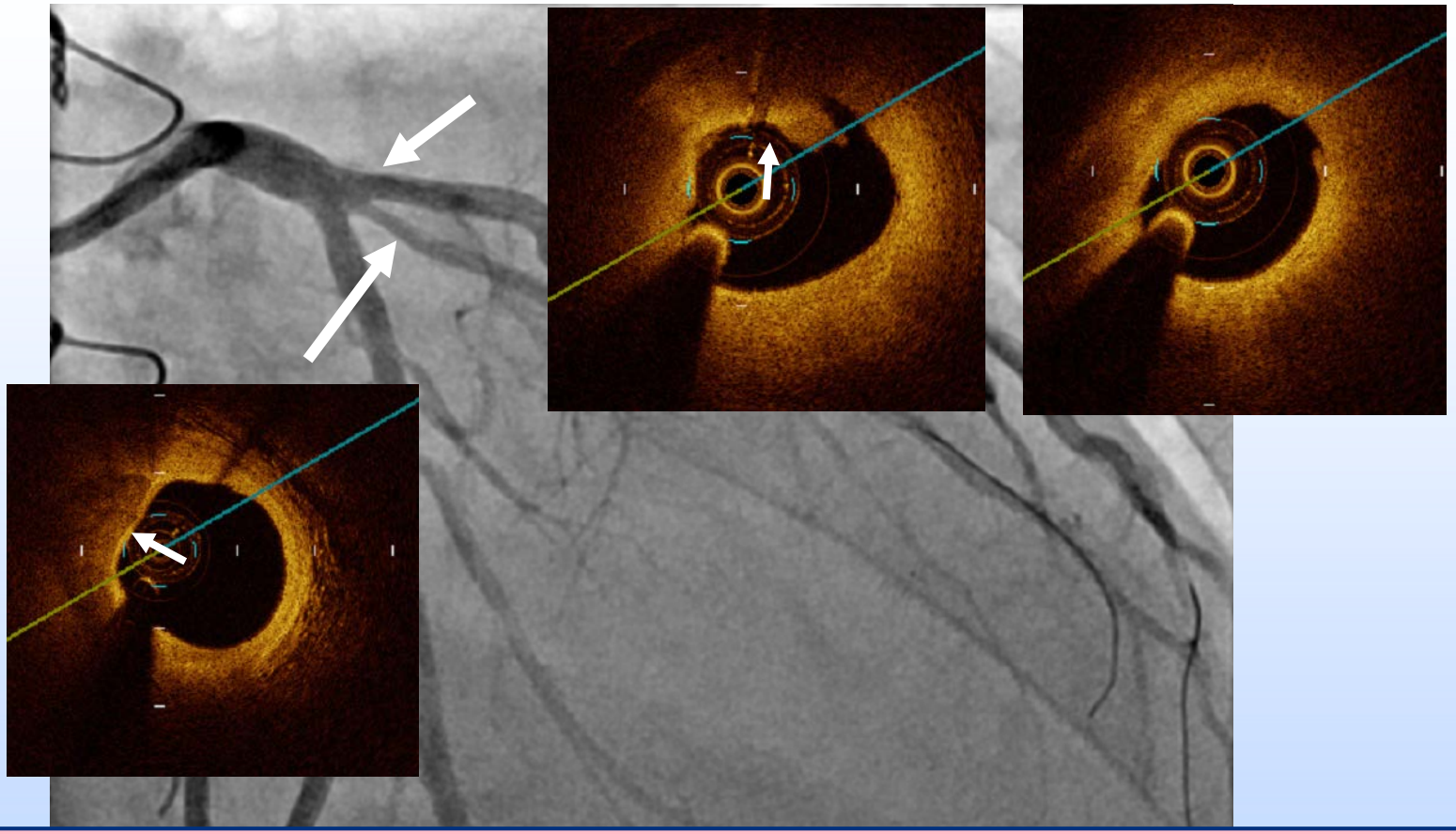
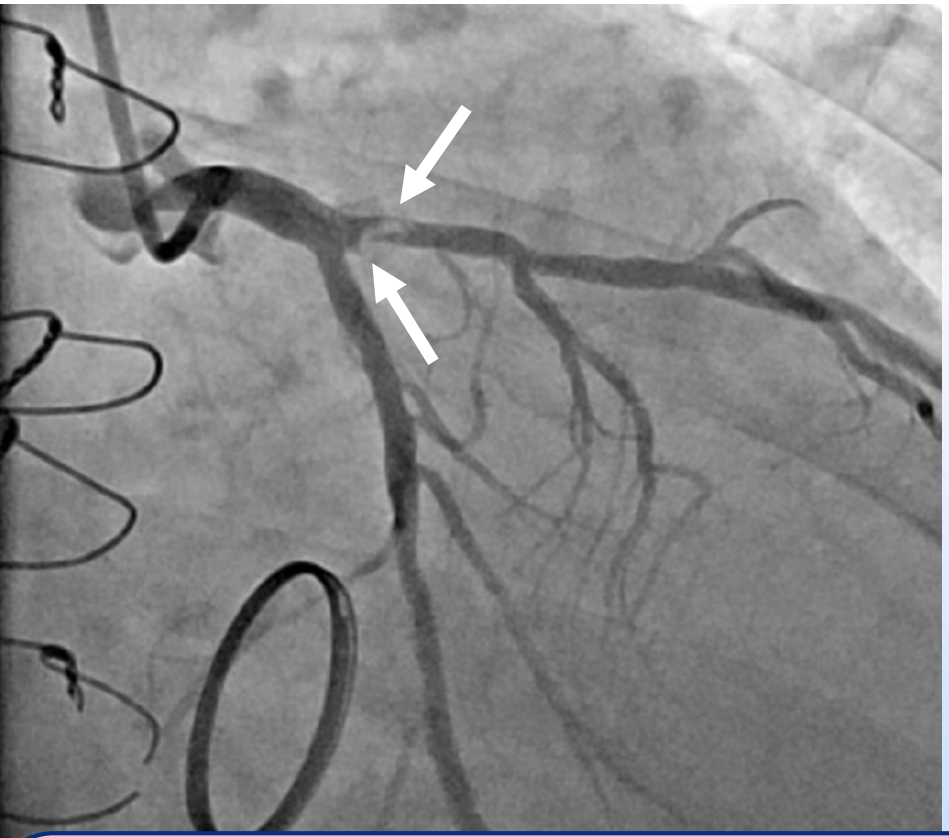
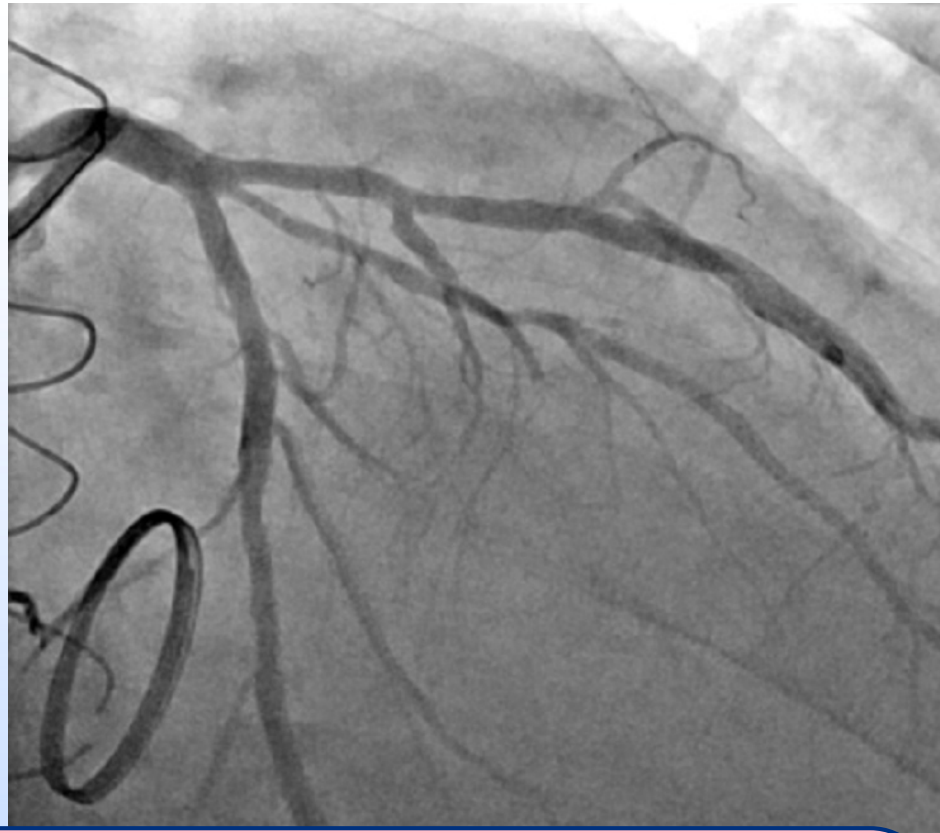


OCT: Thrombus, TCFA, but no acute intrinsic lesion
Trans-esoph echo: MVR vegetation
Diagnosis: Septic Embolus

Presentation



3 mths



Intravascular OCT → <u>Avoided</u> placement of stent, and consequent risk of stent infection, bleeding from DAPT etc

Case #2

- 41 year old female
- Previously well
- Non-smoker
- Chest pain during sexual intercourse

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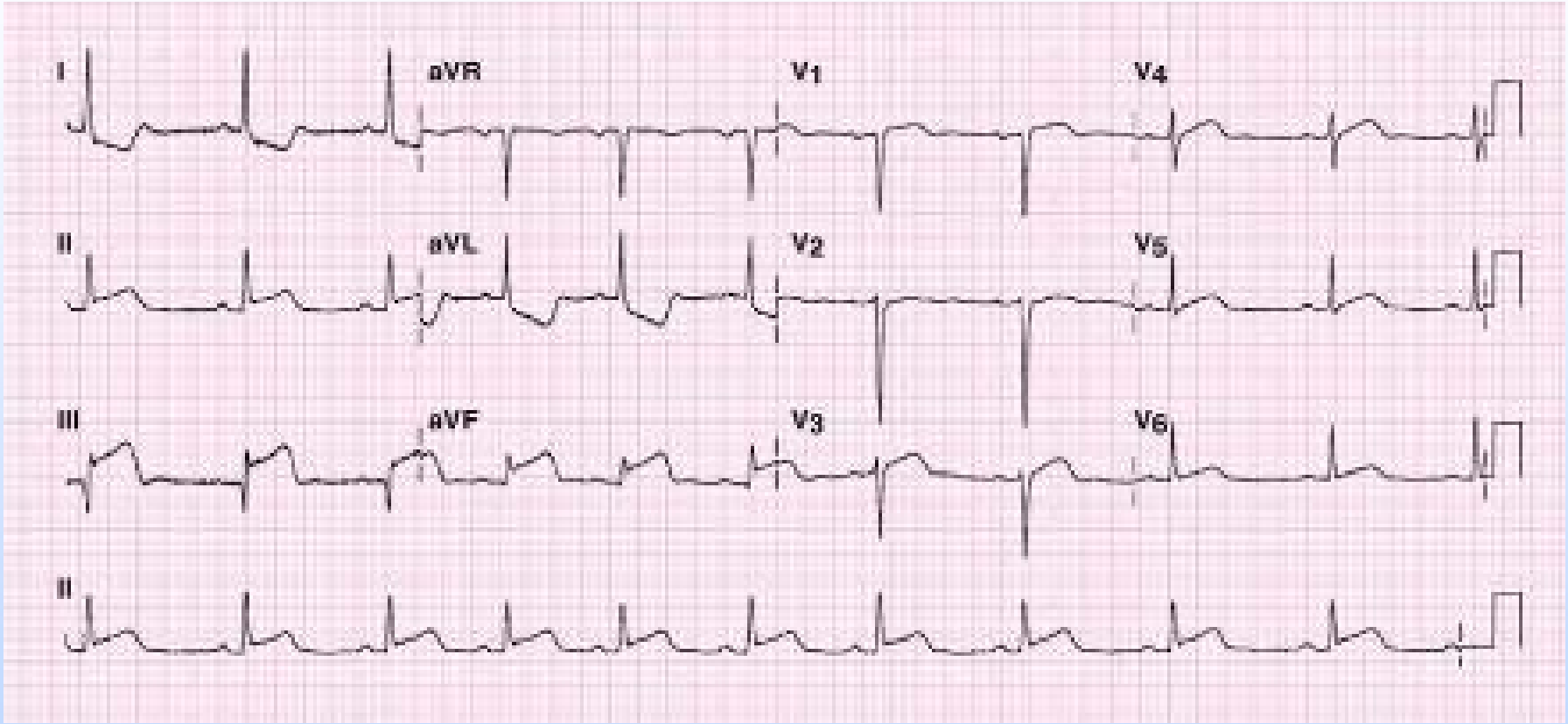
Case #2



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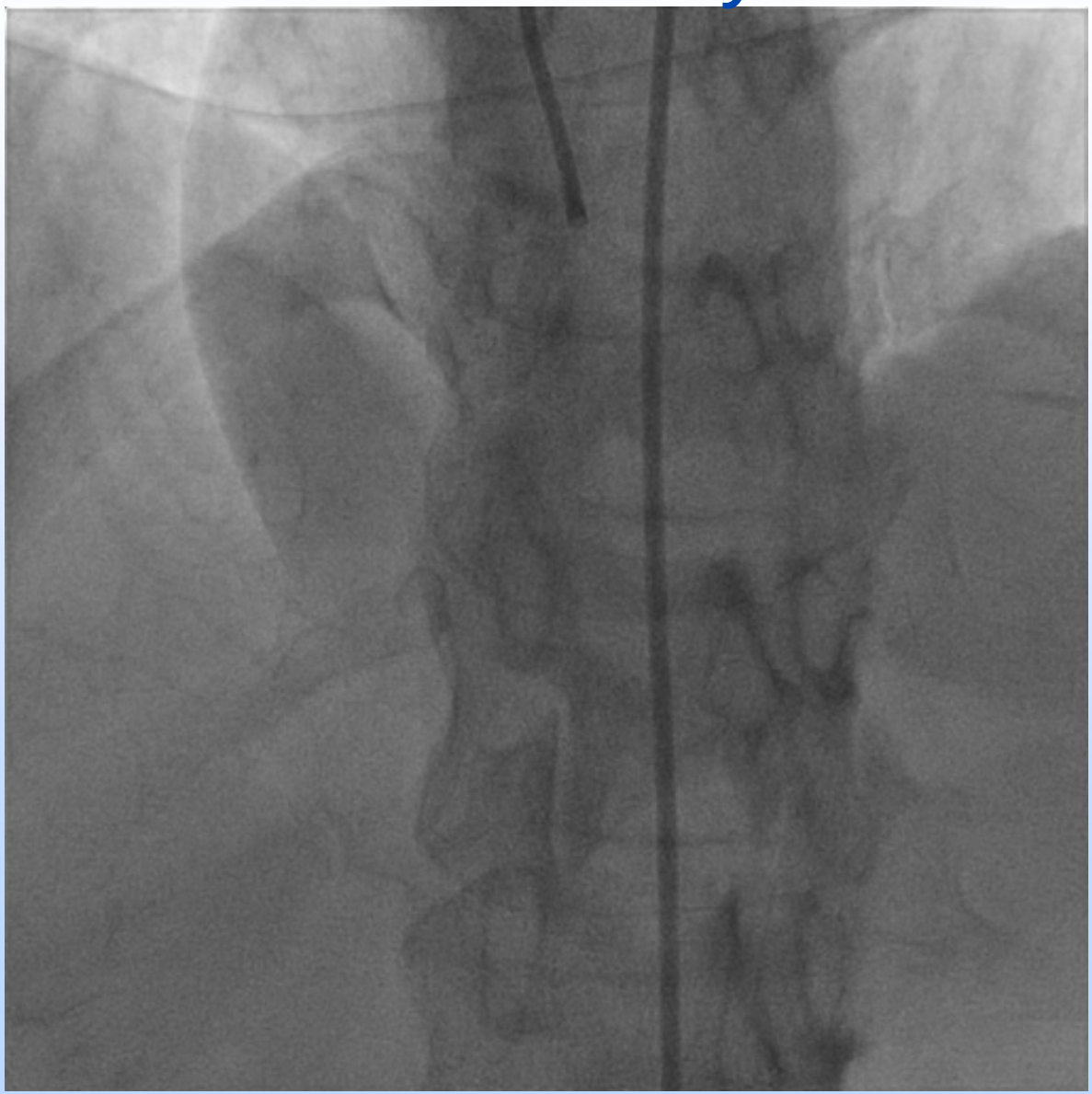
After intracoronary nitrates



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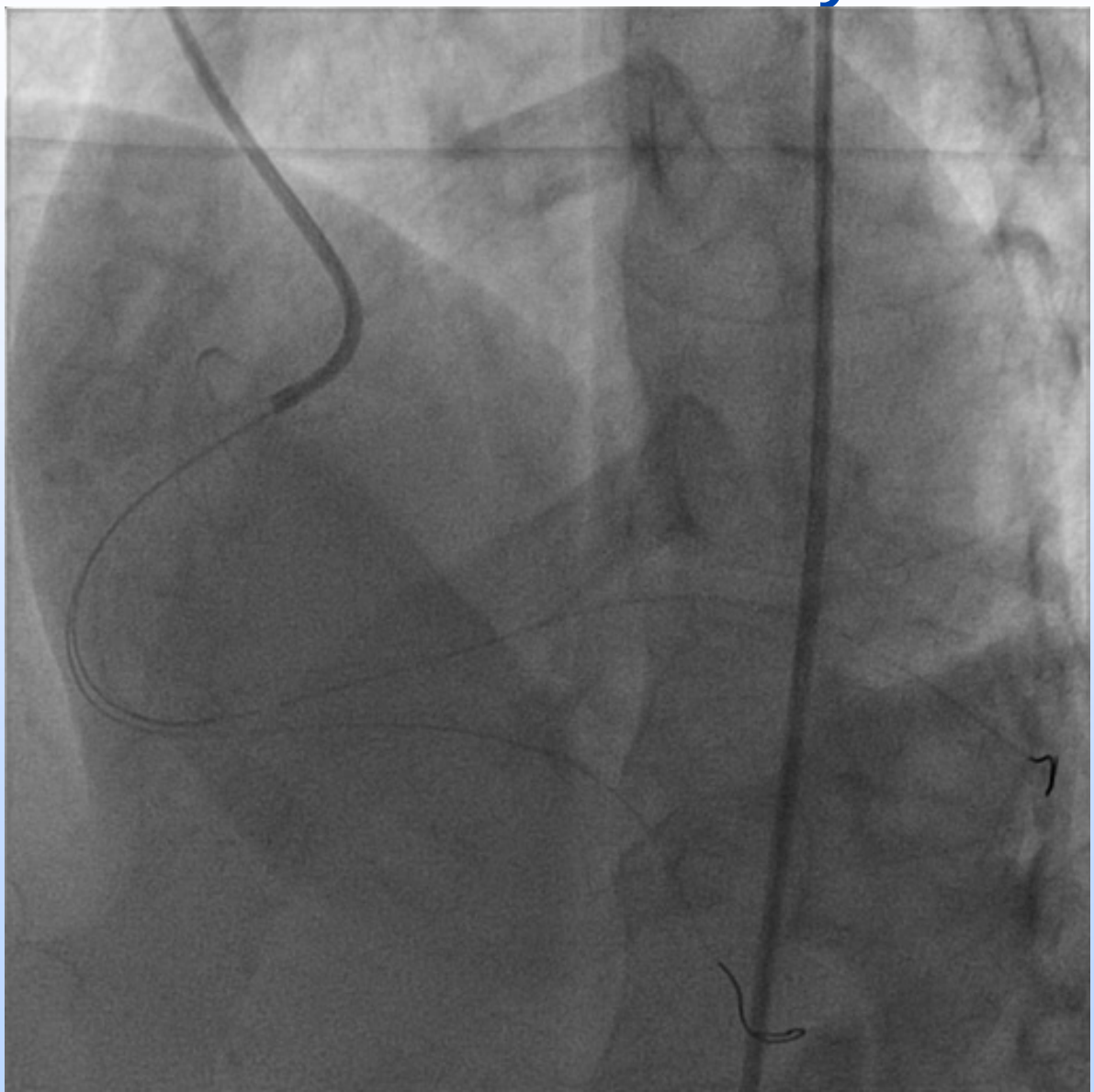
Case #2
Thrombectomy



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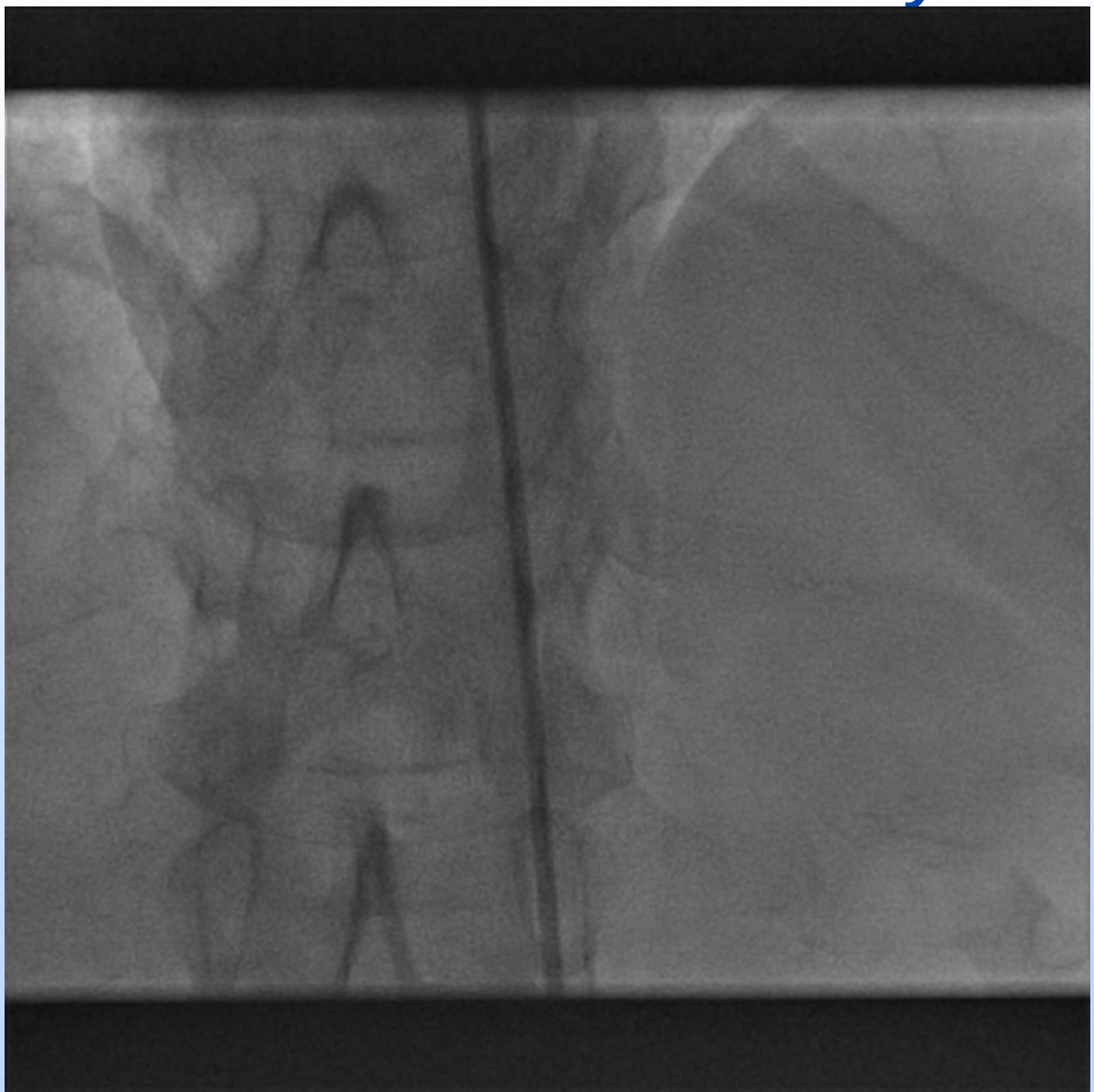
Case #2
After thrombectomy



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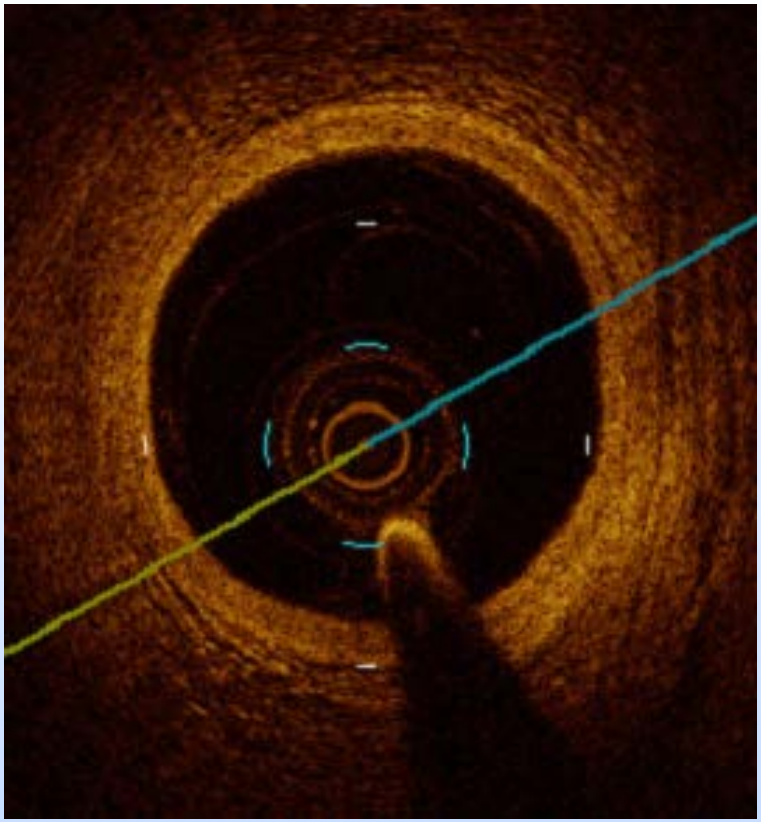
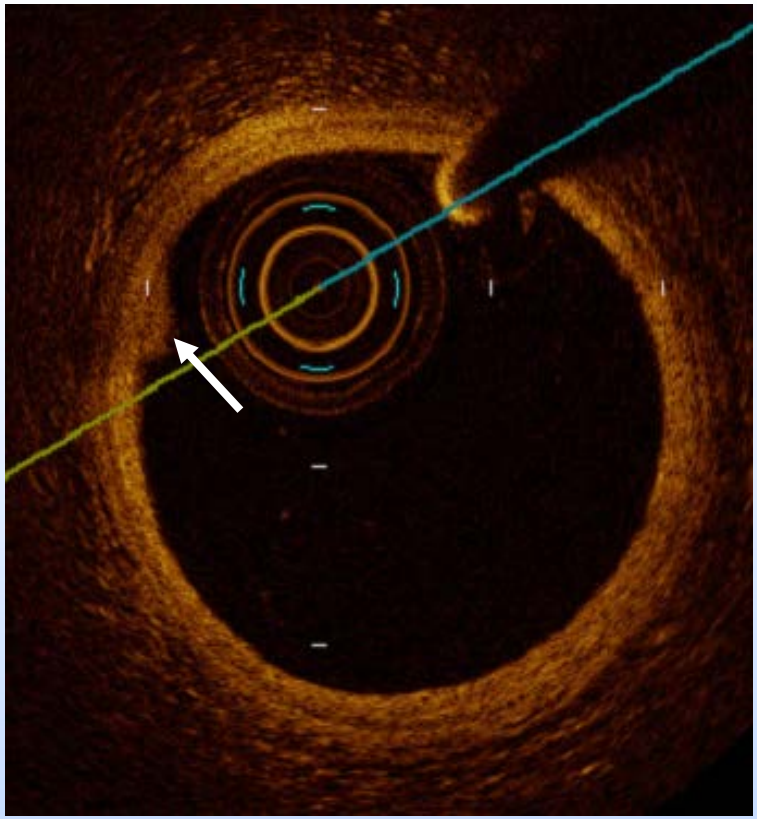
OCT





Echo: Large PFO, R→L shunt
Possible recent DVT
Diagnosis: Embolus

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Case #3

- 52 year old female bank teller
- Previously well
- Non-smoker
- Anterior NSTEMI at work

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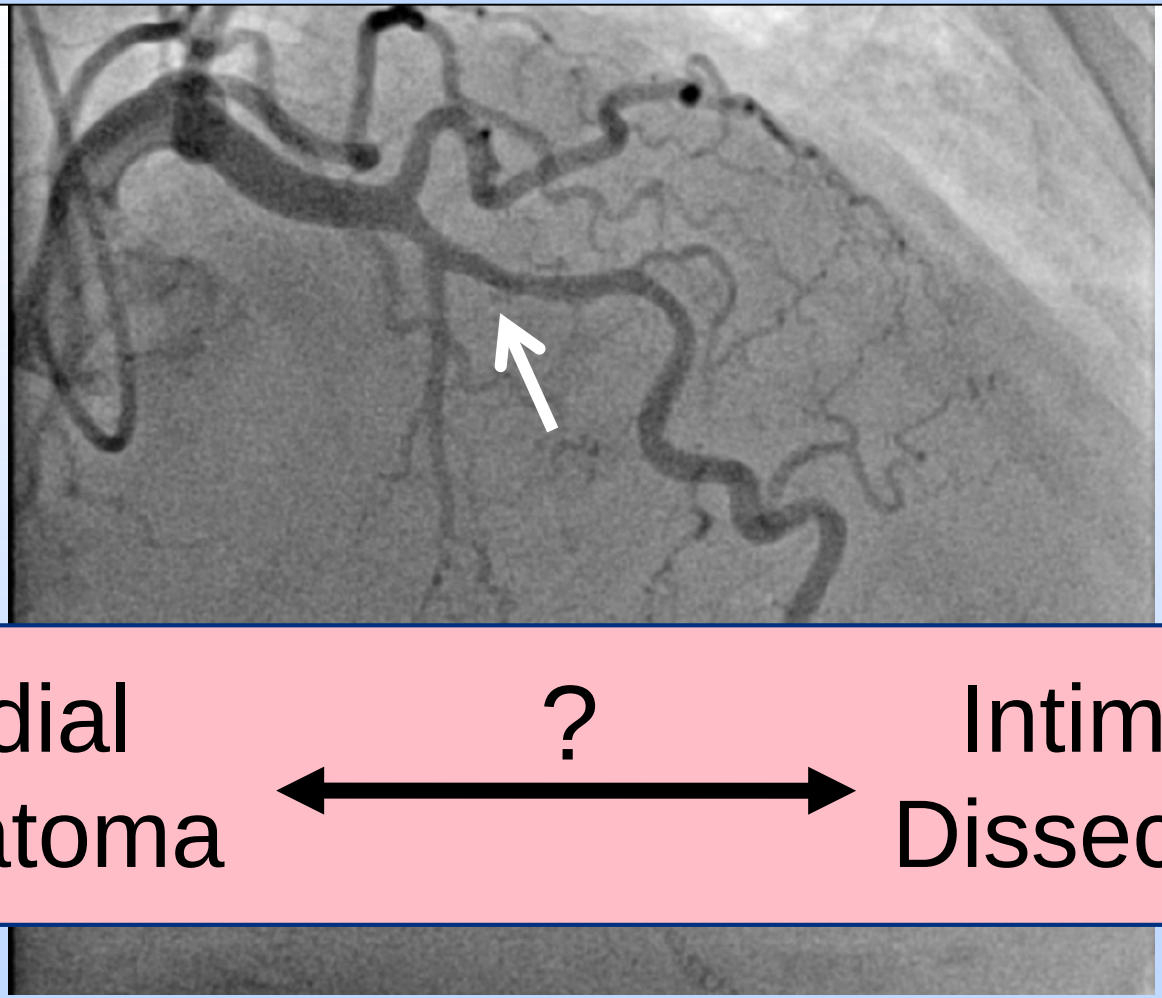
Spontaneous Dissection



Medial Hematoma ? Intimal Dissection

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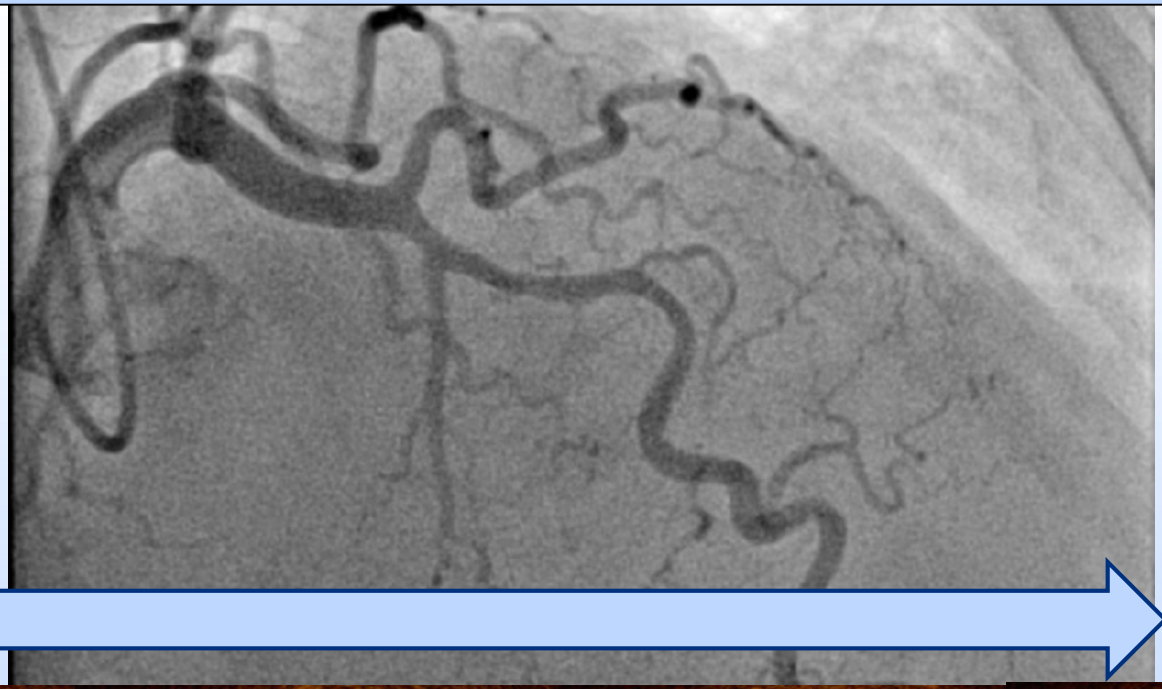
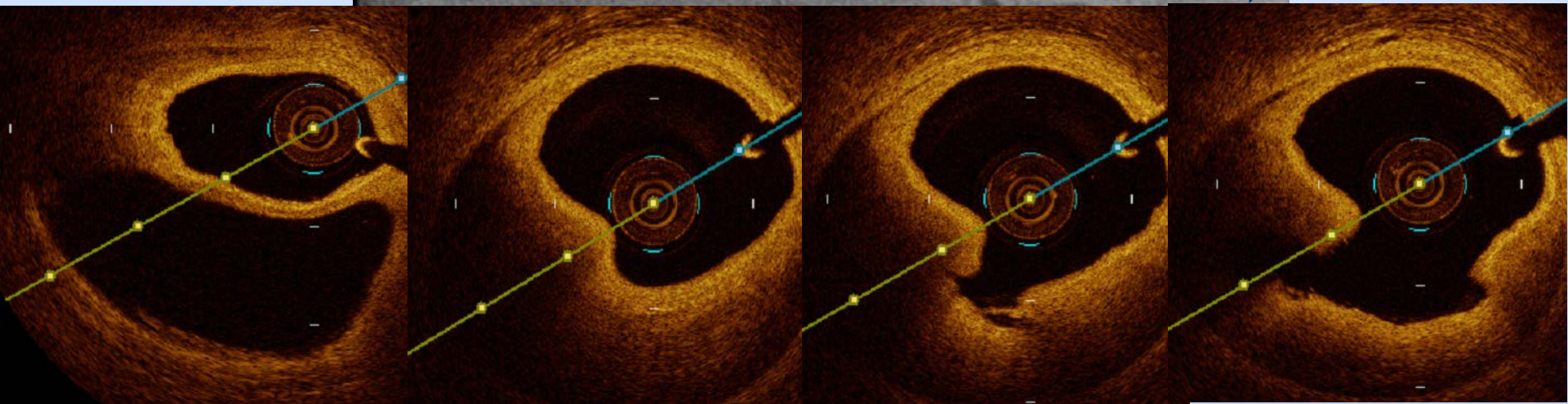
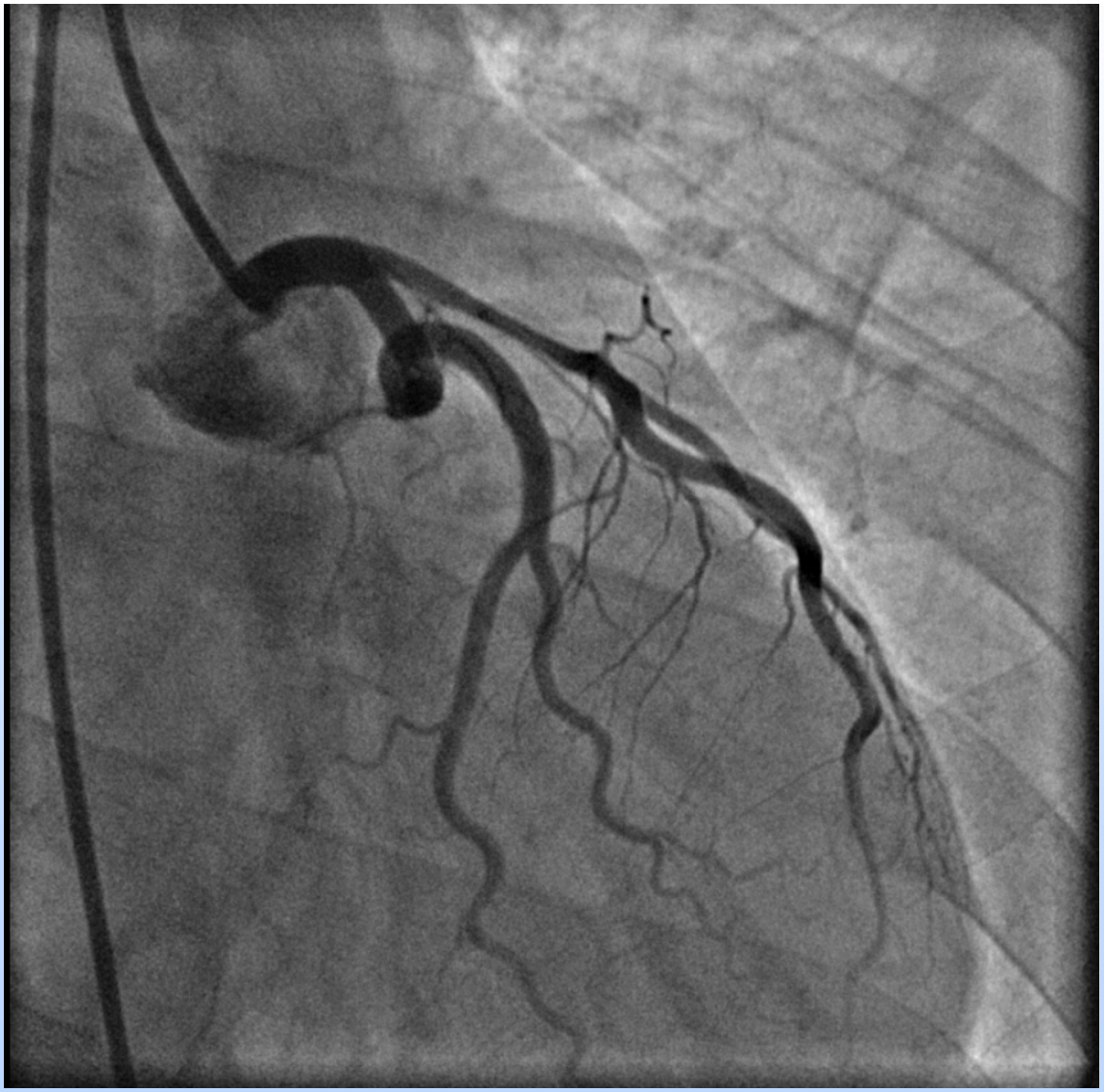
Spontaneous Dissection



Prox → Dist



Different patient
SCAD (hematoma) prox LAD



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Next day
Hematoma → Intimal dissection

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Stents placed

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But prox hematoma progresses "Nowhere to go"

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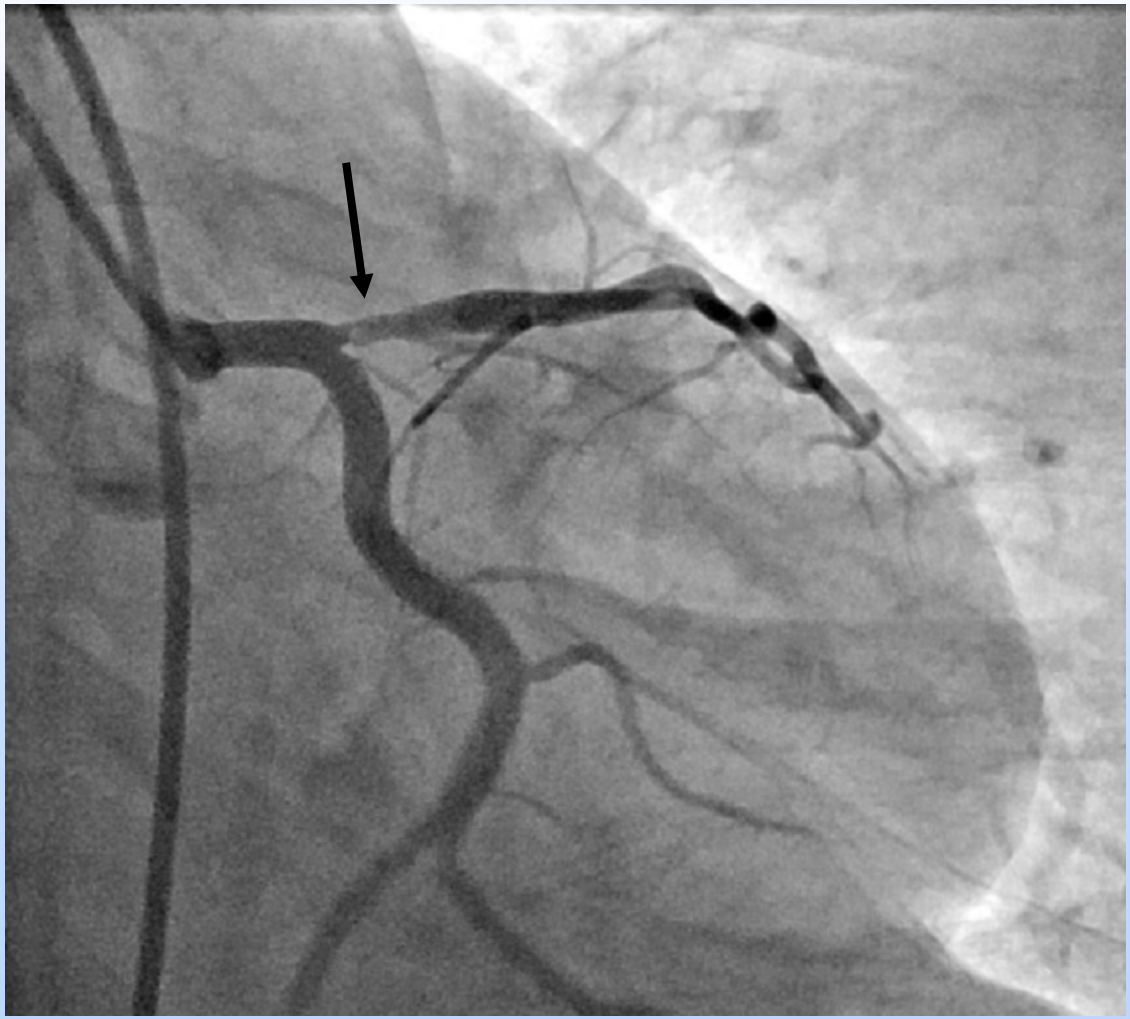
Final case
39 yr old female NSTEMI
Managed conservatively “SCAD”



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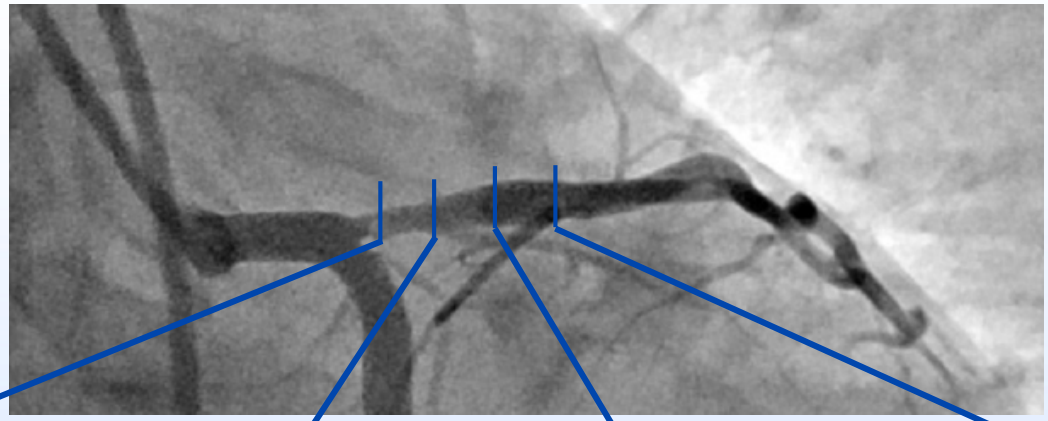
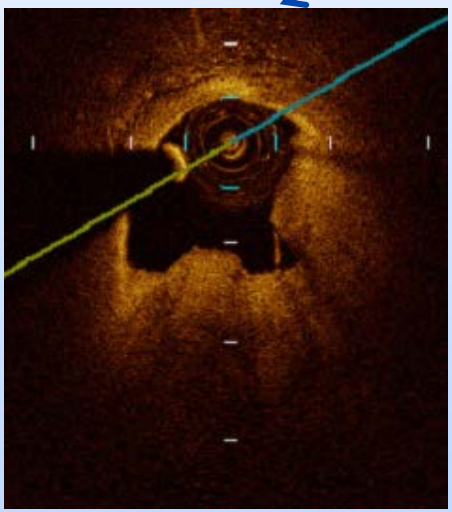
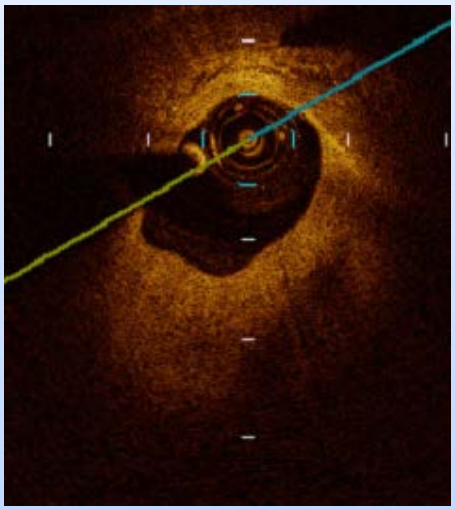
OCT of LAD

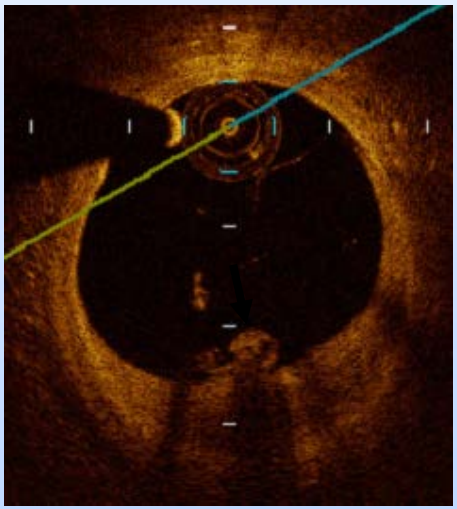




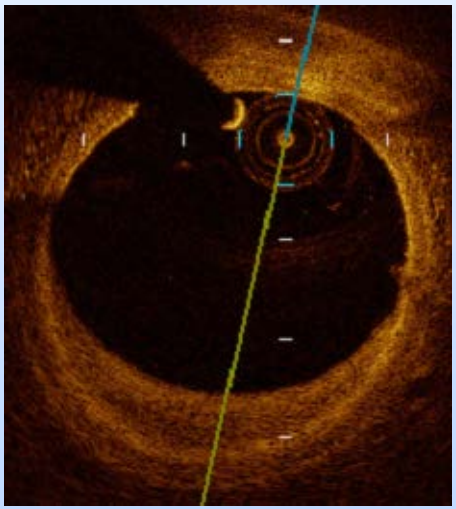
Plaque rupture
+ thrombus



Severe atheroma



Small thrombus



Mild atheroma

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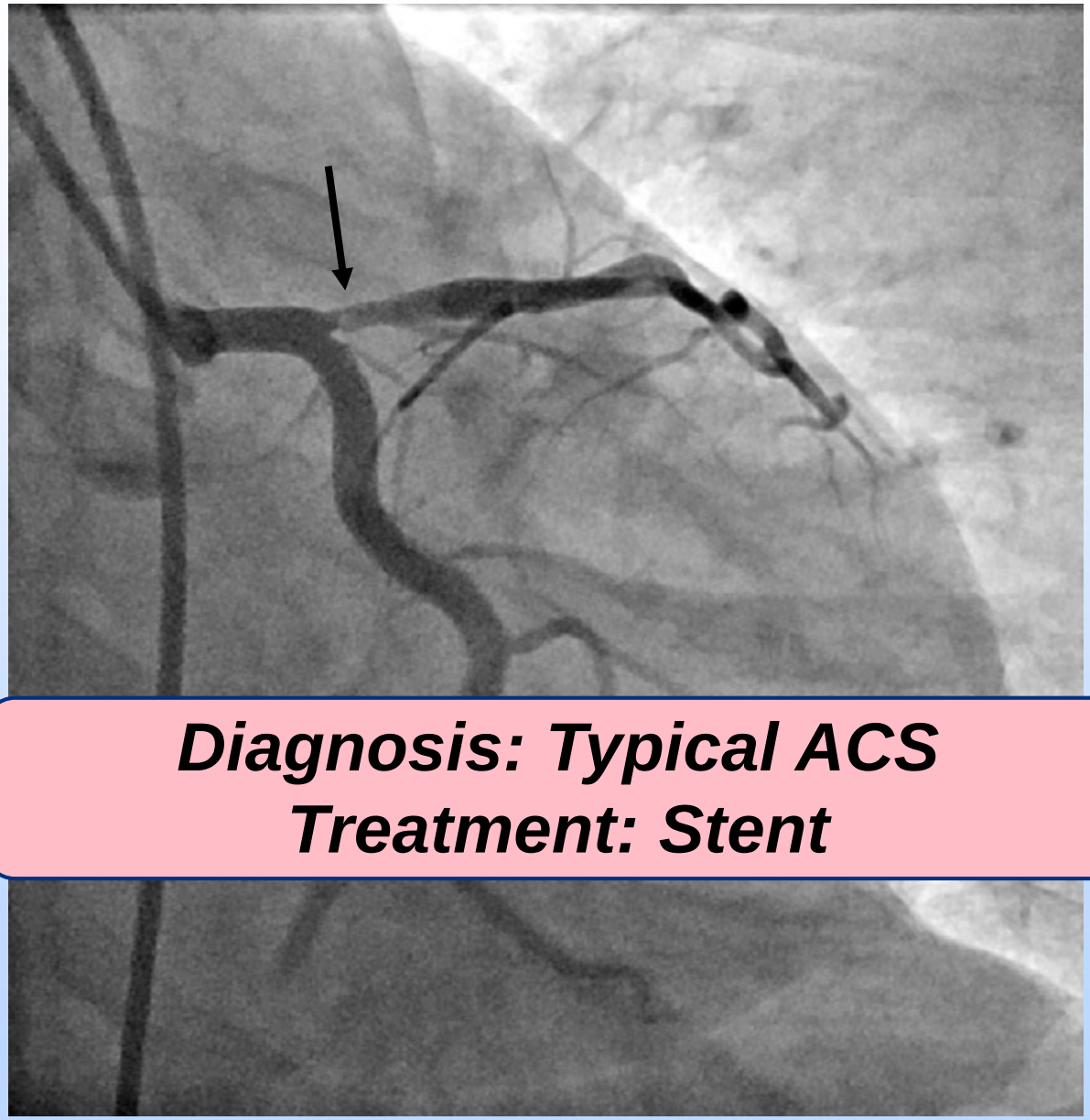
LAD lesion



Diagnosis: Typical ACS
Treatment: Stent

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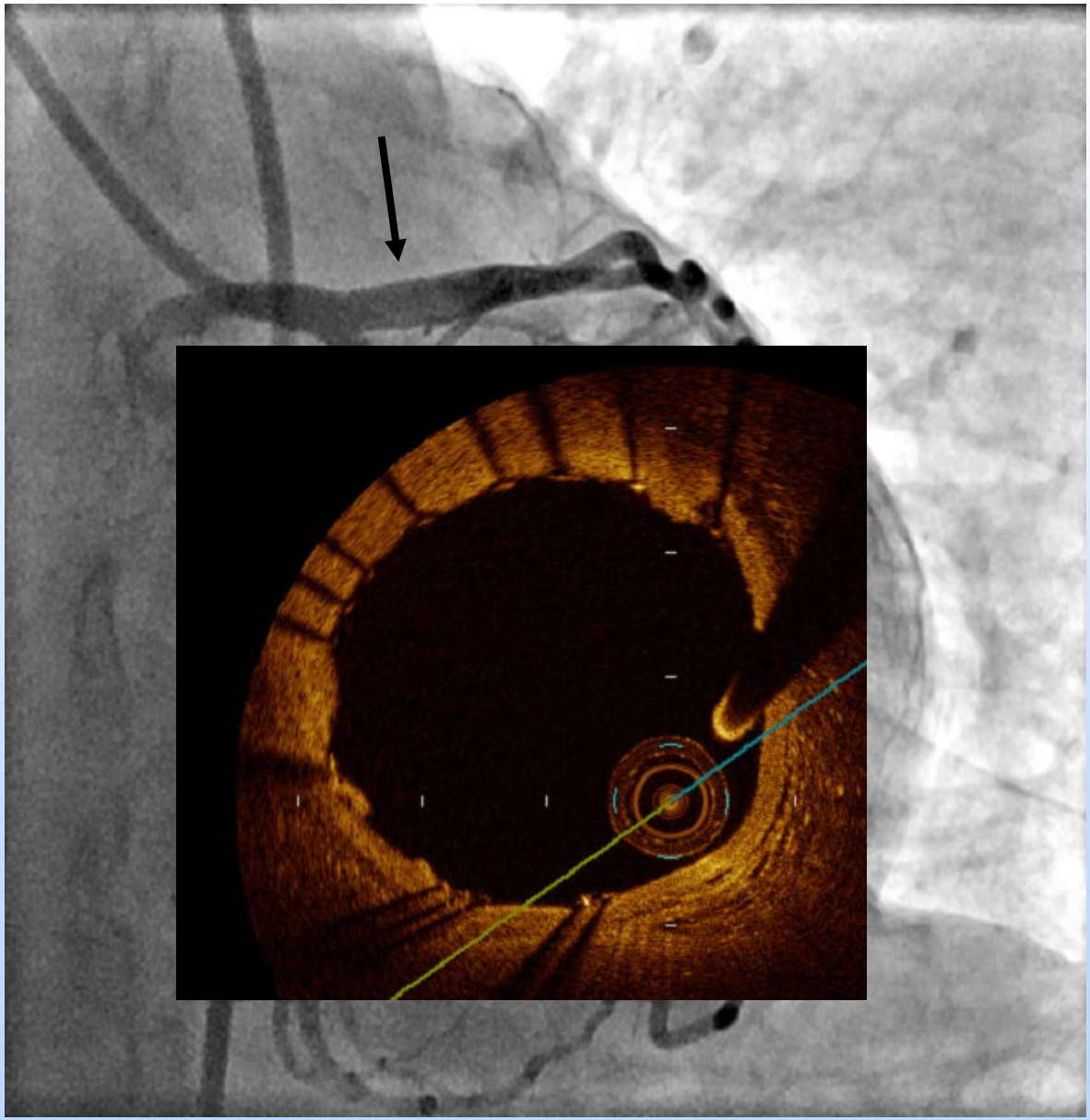
LAD stent



Intravascular OCT as a diagnostic tool in acute MI

- Helps identify the underlying vascular abnormality
  - Non-atherosclerotic causes of MI are under-recognized with angio alone
- Stents may not be needed
- Complications can be avoided
  - Acute, DAPT, missing correct diagnosis

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Thank you

gulati.rajiv@mayo.edu