Coronary angiogram interpretation and easily missed findings

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Outlines

- 1. Introduction
- 2. Standard coronary angiographic views
- 3. Cases

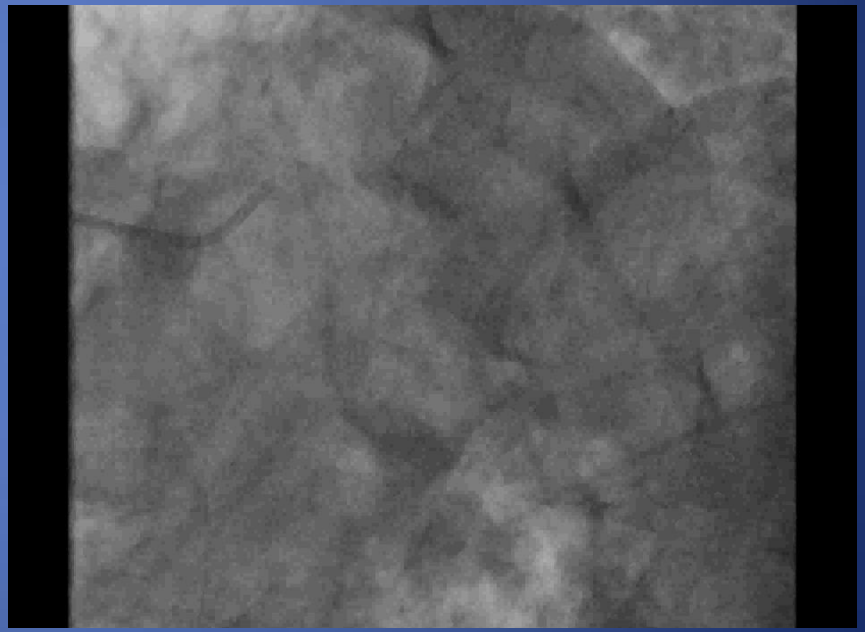
Introduction

- **Coronary angiography should be performed in standard views in orthogonal planes to visualize the lesion and serve as a roadmap for PCI**
- **Goal: To expose the most by showing the least foreshortened coronary artery segment at an angulation that causes the lowest radiation to the operators and by the least no. of XR pictures needed**

Standard views in UCH – Left side (1)

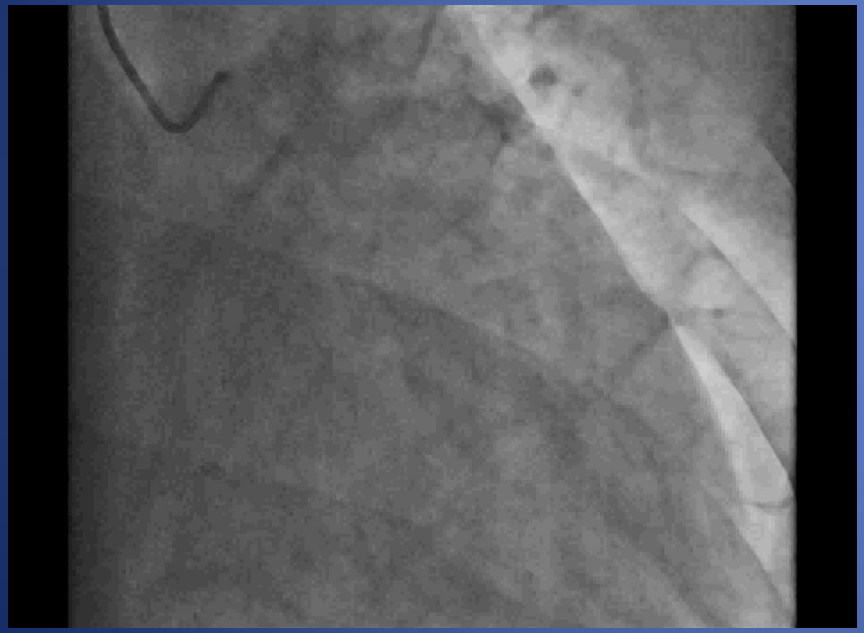
AP Cranial 30

LAO 50 Caudal 25 (spider view)



Standard views in UCH – Left side (2)

RAO 35 Caudal 20



LAO 50 Cranial 20

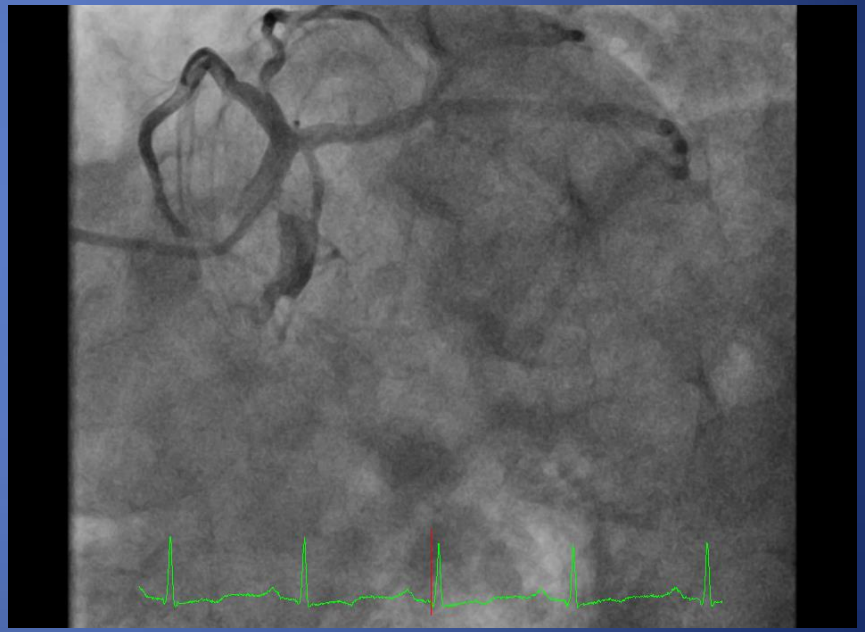
Standard views in UCH – Left side (1)

- **LAO-Caudal view:**

40^0 to 60^0 LAO and 10^0 to 30^0 caudal

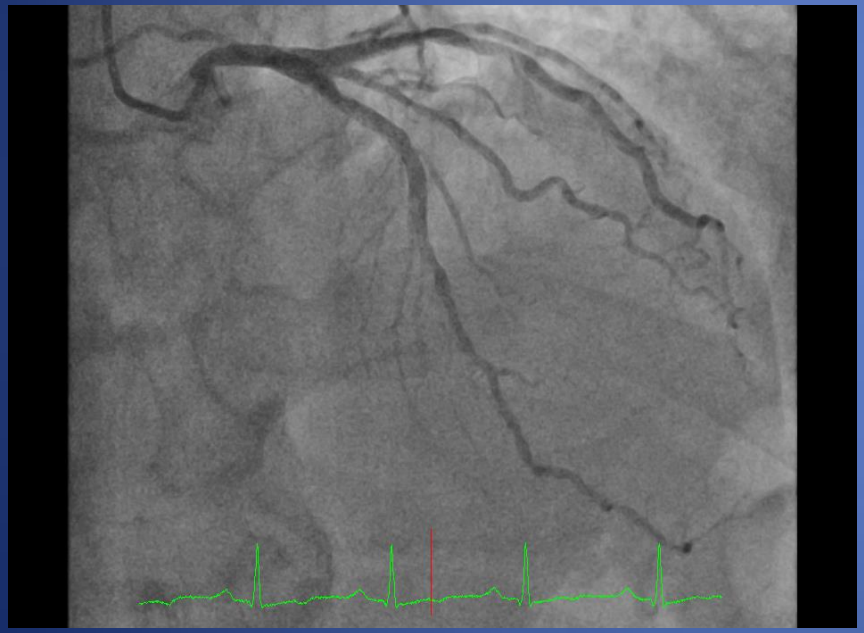
- **Best for visualizing left main, proximal LAD and proximal LCx**

LAO 50 Caudal 25 (spider view)



Standard views in UCH – Left side (1)

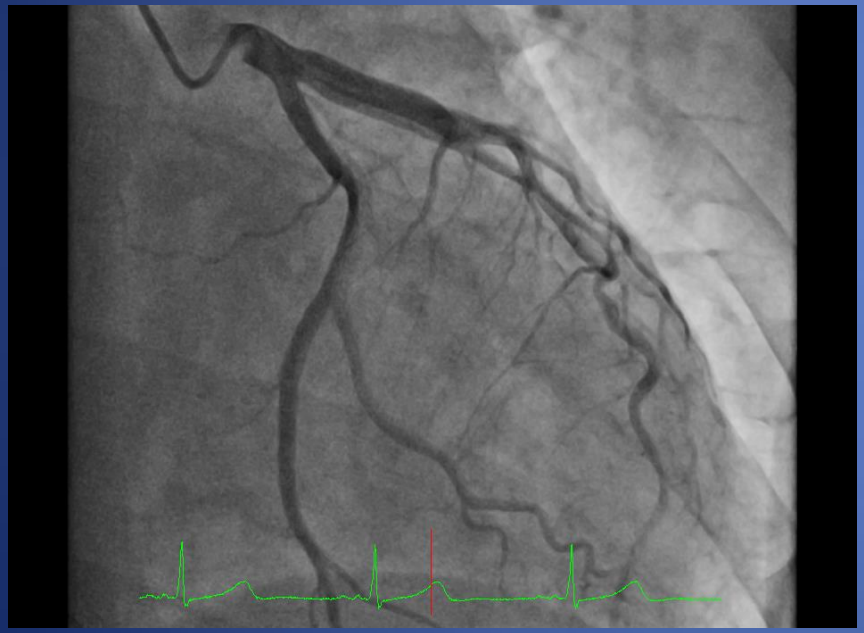
AP Cranial 30



- **Shallow RAO-Cranial view**:
- 0^0 to 10^0 RAO and 25^0 to 40^0 cranial
- **Best for visualizing mid and distal LAD**
- **and the distal LCx (LPDA and LPL)**

Standard views in UCH – Left side (2)

RAO 35 Caudal 20



RAO-Caudal view: **10^0 to 20^0 RAO and 15^0 to 20^0 caudal**

- **Best for visualizing left main bifurcation, proximal LAD and the proximal to mid LCx**

Standard views in UCH – Left side (2)

LAO-Cranial view: **30^0 to 60^0 LAO and 15^0 to 30^0 cranial**

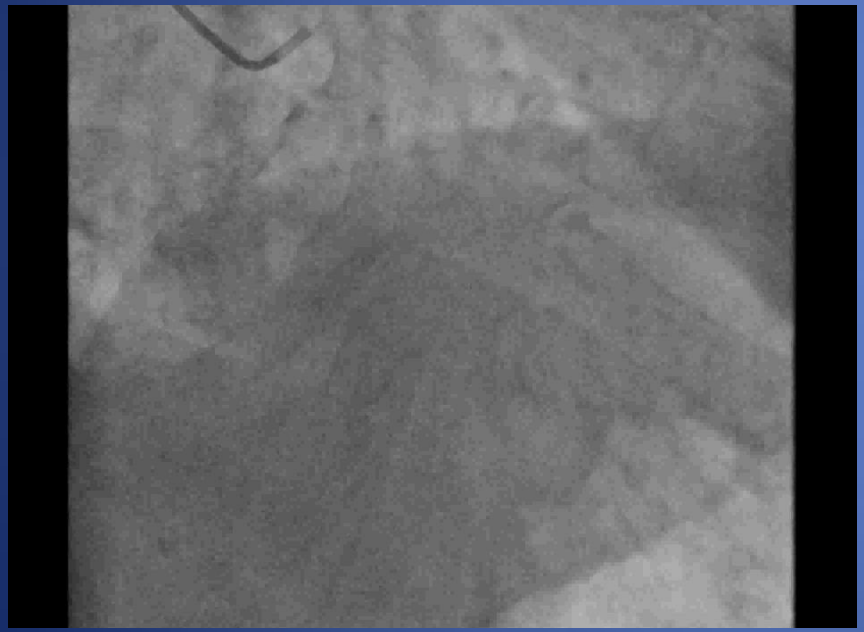
Best for visualizing mid and distal LAD, and the distal LCx in a left dominant system

LAD 50 Cranial 20

- For LCA
- Cranial view: usually better for distal segments
- Caudal view: usually better for proximal segments

Standard views in UCH – RCA

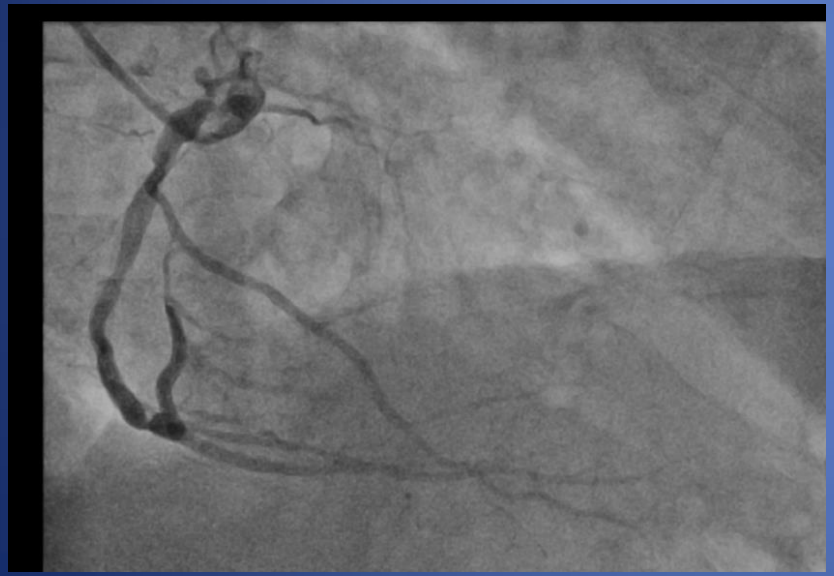
RAO 30



LAO 40

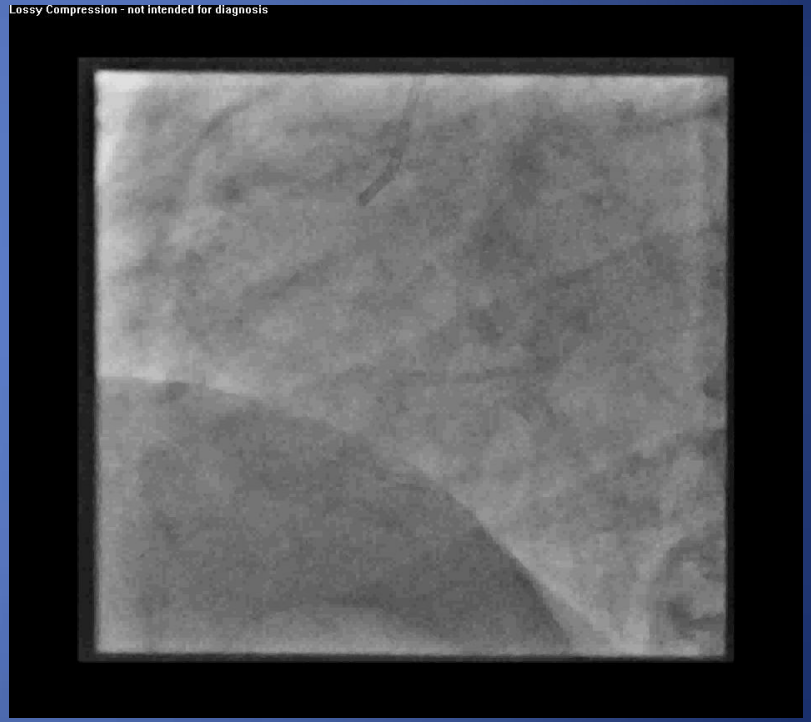
Standard views in UCH – RCA

RAO 30: best for mid RCA and PDA



LAO 40: best for ostial and prox RCA

Case 1. RCA: RAO 30 and LAO 40

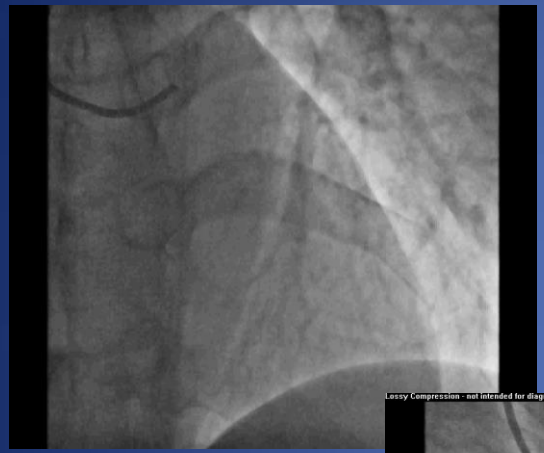


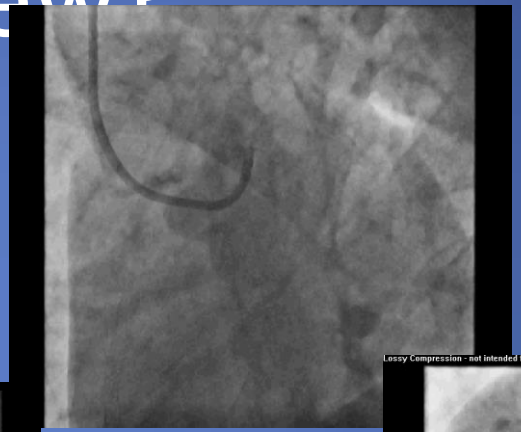
Which view is the best for PDA/PLV bifurcation

- A. RAO
- B. LAD
- C. AP Cranial
- D. AP Caudal

AP cranial: Best for visualizing distal RCA bifurcation and the PDA/PLV branches

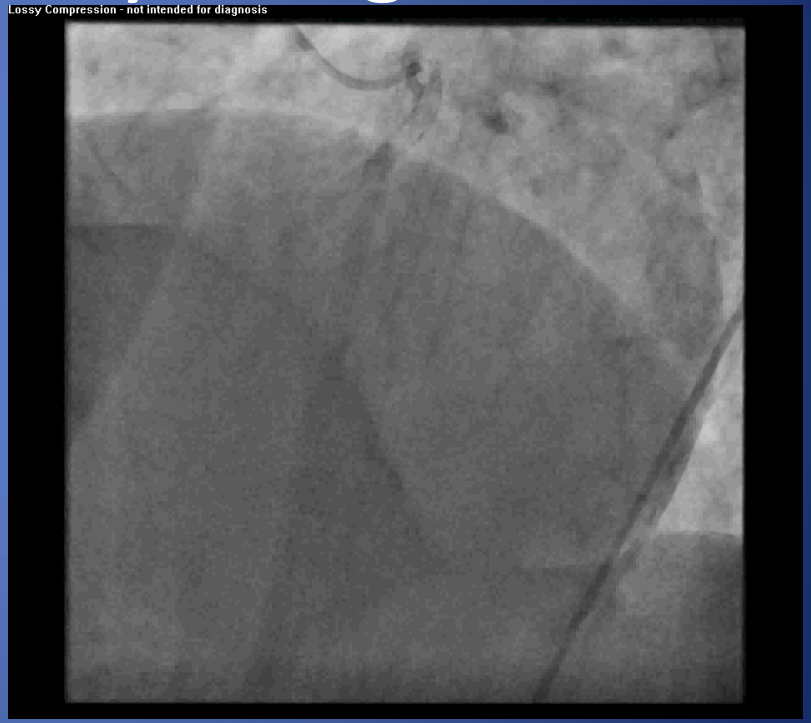
Case 2: ostial LAD/LCx, which view?





Distal LM bifurcation/ostial LAD & LCx – AP Caudal view

Another example of ostial LAD/LCx – cranial views usually not good



Best is AP caudal view

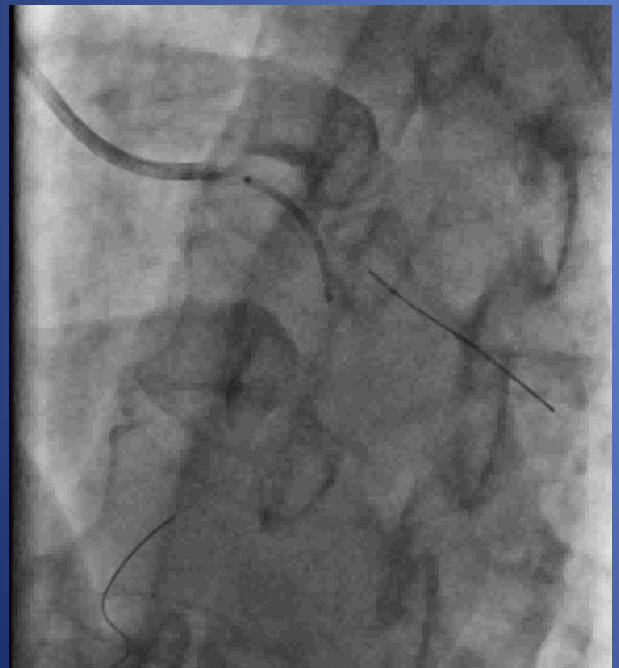
Case 3: ostial LM stenting

LAO 20 Cranial 20

- Caudal views (RAO caudal/spider) → usually not good
- Best is bi-cranial view
- Try LAD 20 Cranial 20

Case example: ostial LM stenting

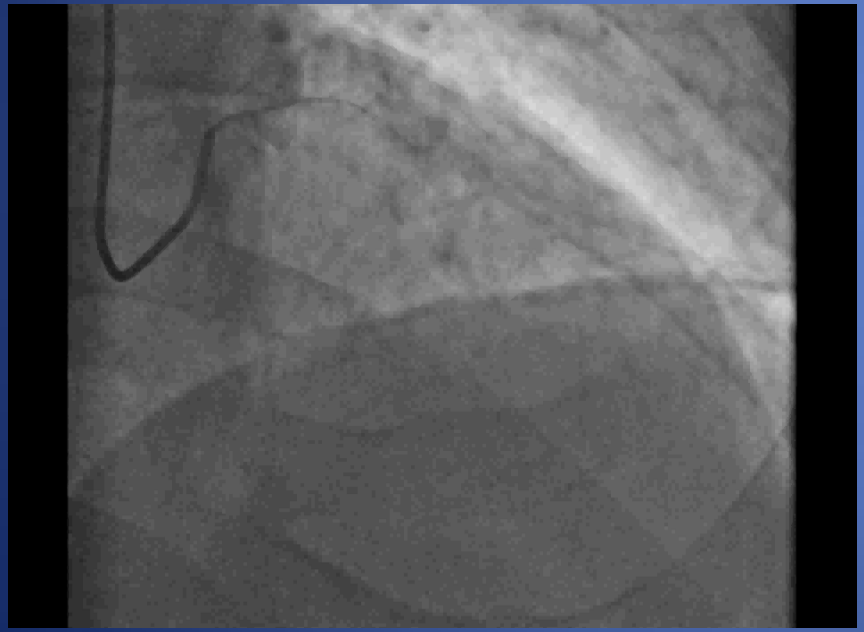
Best view is usually LAO cranial (or bi-cranial view)



LAO 22 cranial 21

Case 4: LAD/Diagonal Bifurcation

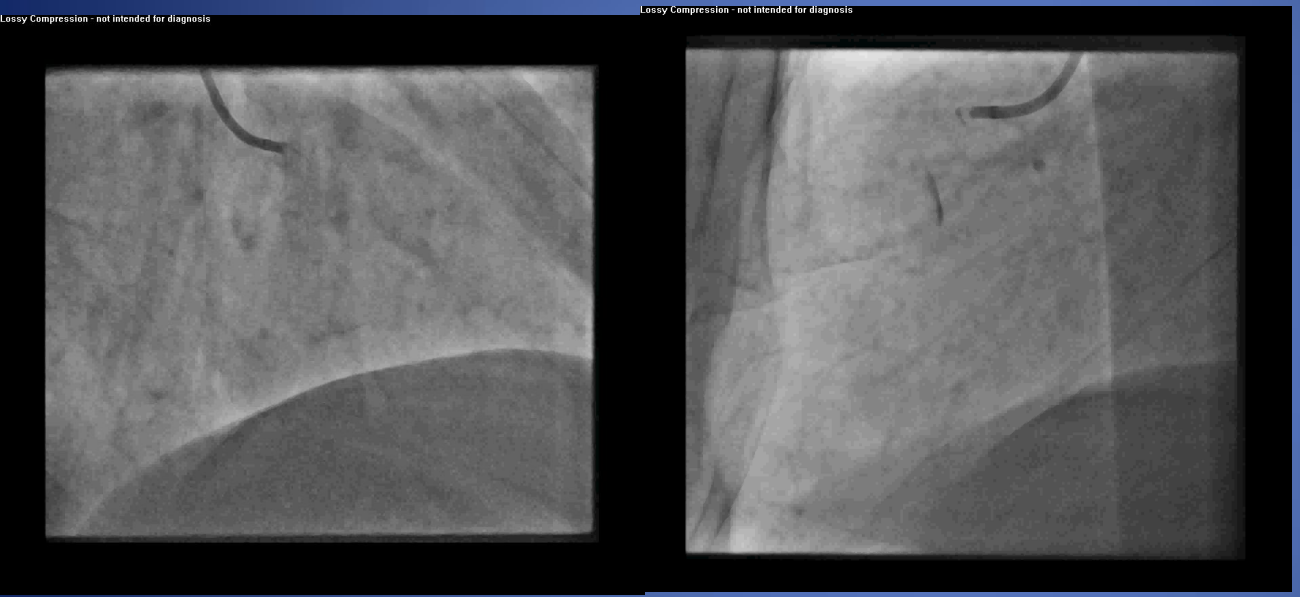
RAO 15 Cranial 35: ostium of diagonal not well seen and overlapping by LCx, ? Which view



Shallow LAO Cranial view
(LAO 10 Cranial 30)

5. M/65, NSTEMI, diagnosis?

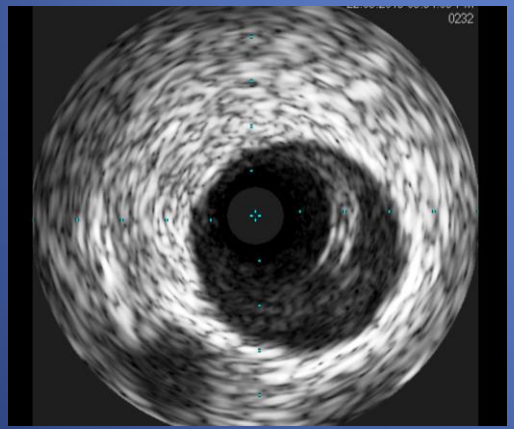
M/65, NSTEMI, diagnosis?

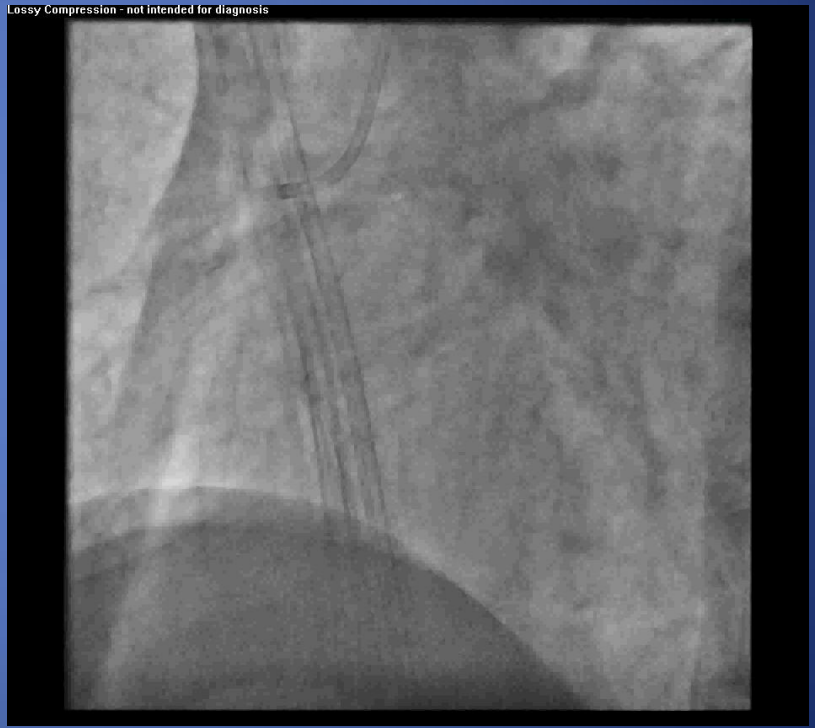


A. Aneurysm
B. Pseudoaneurysm
C. Thrombus
D. Dissection and intramural haematoma

Dissection of plaque with IMH

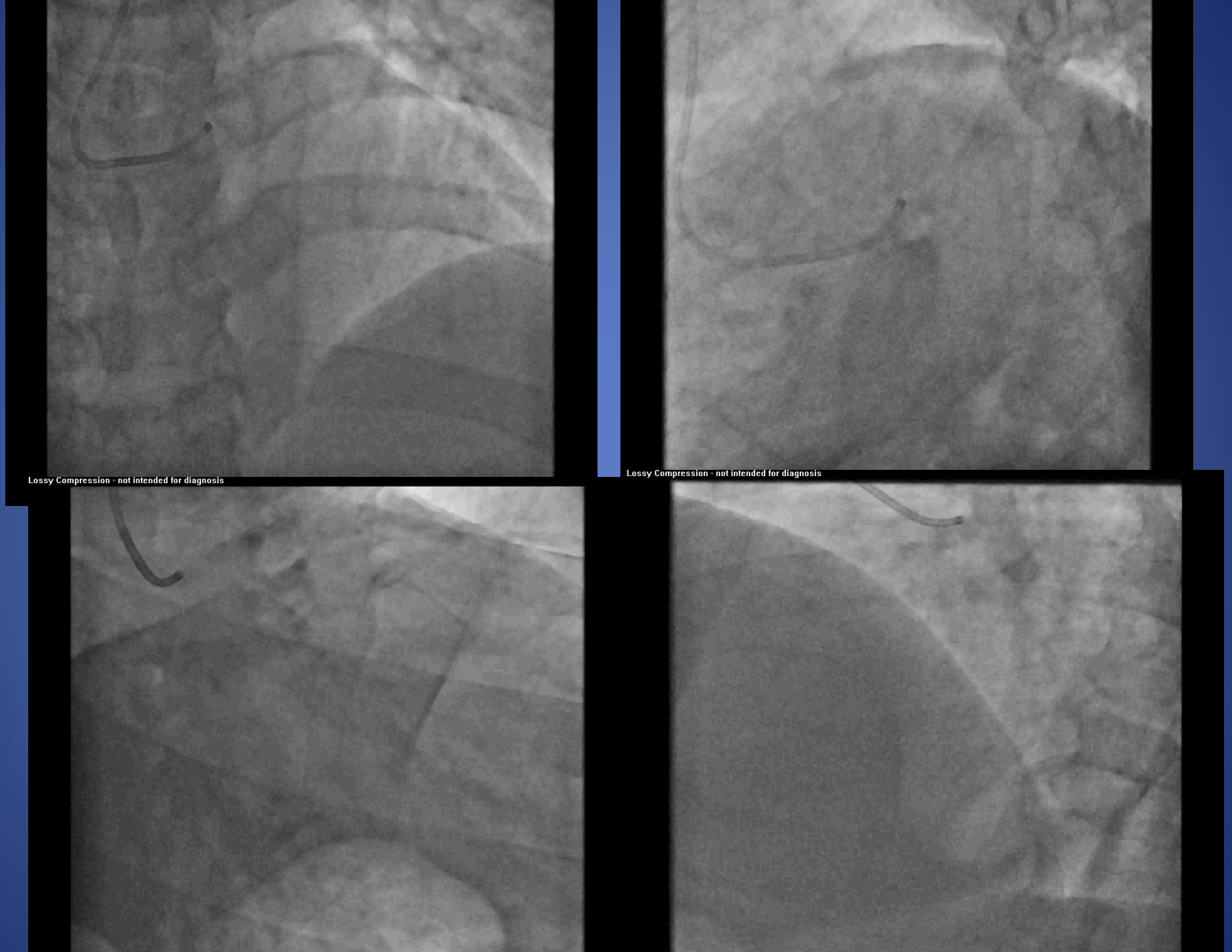
- Confirmed with OCT & IVUS
- PCI with long stents





Case 6

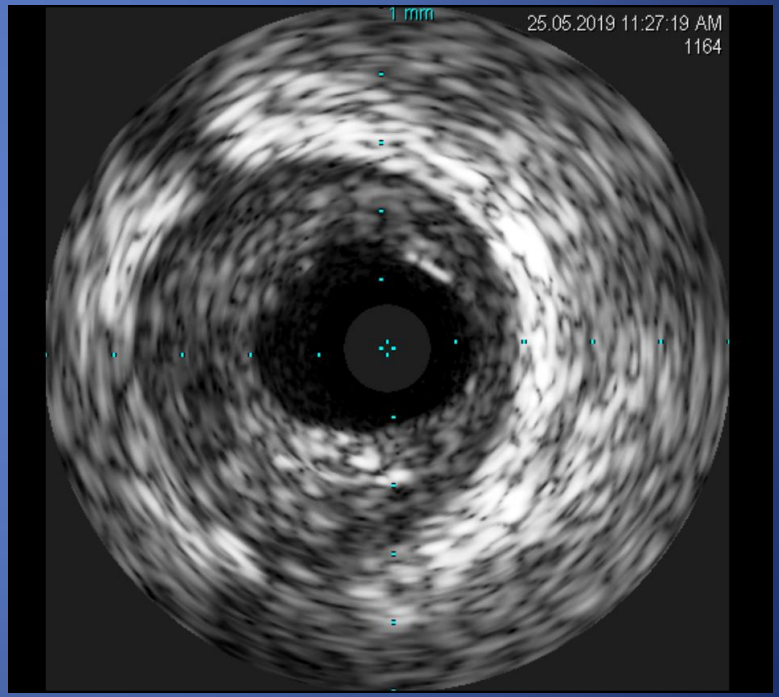
M/75, ischaemic APO



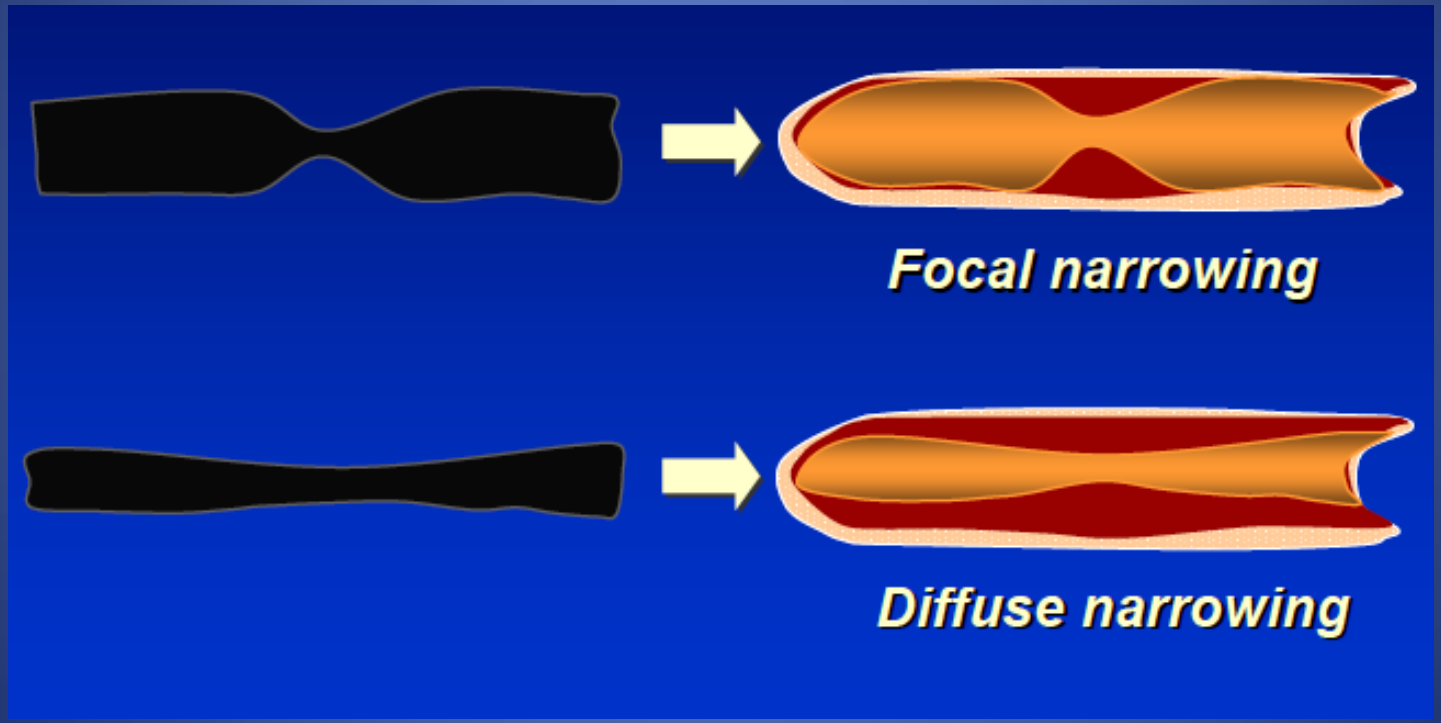
Any LM disease?

- Problems:
- Short LM, “deep seating” of catheter inside LM
- Pitfall: may miss an ostial or LM lesion
- Adequate reflux of contrast back into aorta to ensure that an ostial lesion is not present

Repeat angiogram after disengaging the catheter: any LM disease?



Pitfalls of coronary angiogram: Lumen-o-gram



Pitfalls of coronary angiogram: Lumen-o-gram: how to solve it

- Multiple projections with different angles
- Have a sense of caliber of major coronaries

LMCA 4.5 ± 0.5mm

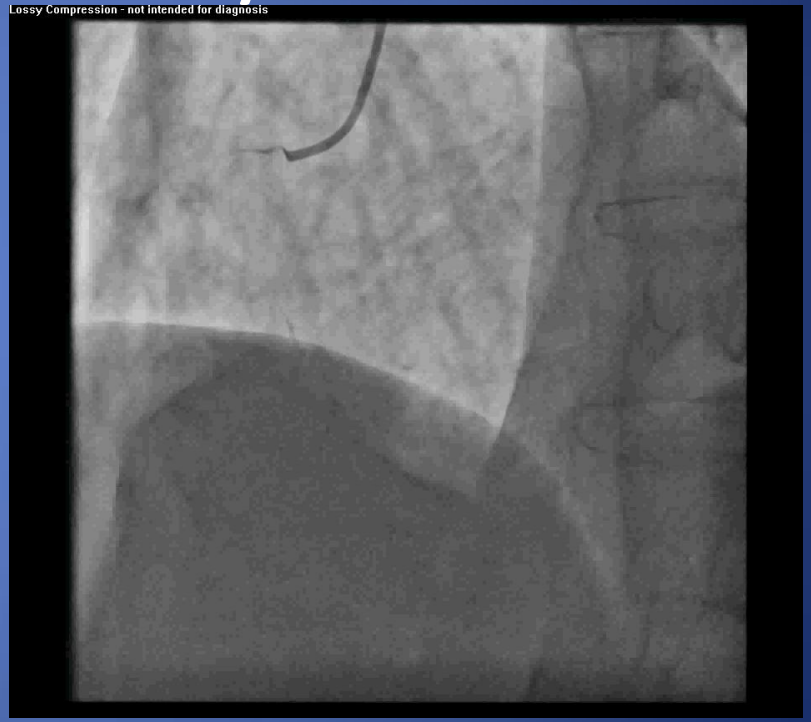
LAD 3.7 ± 0.4mm

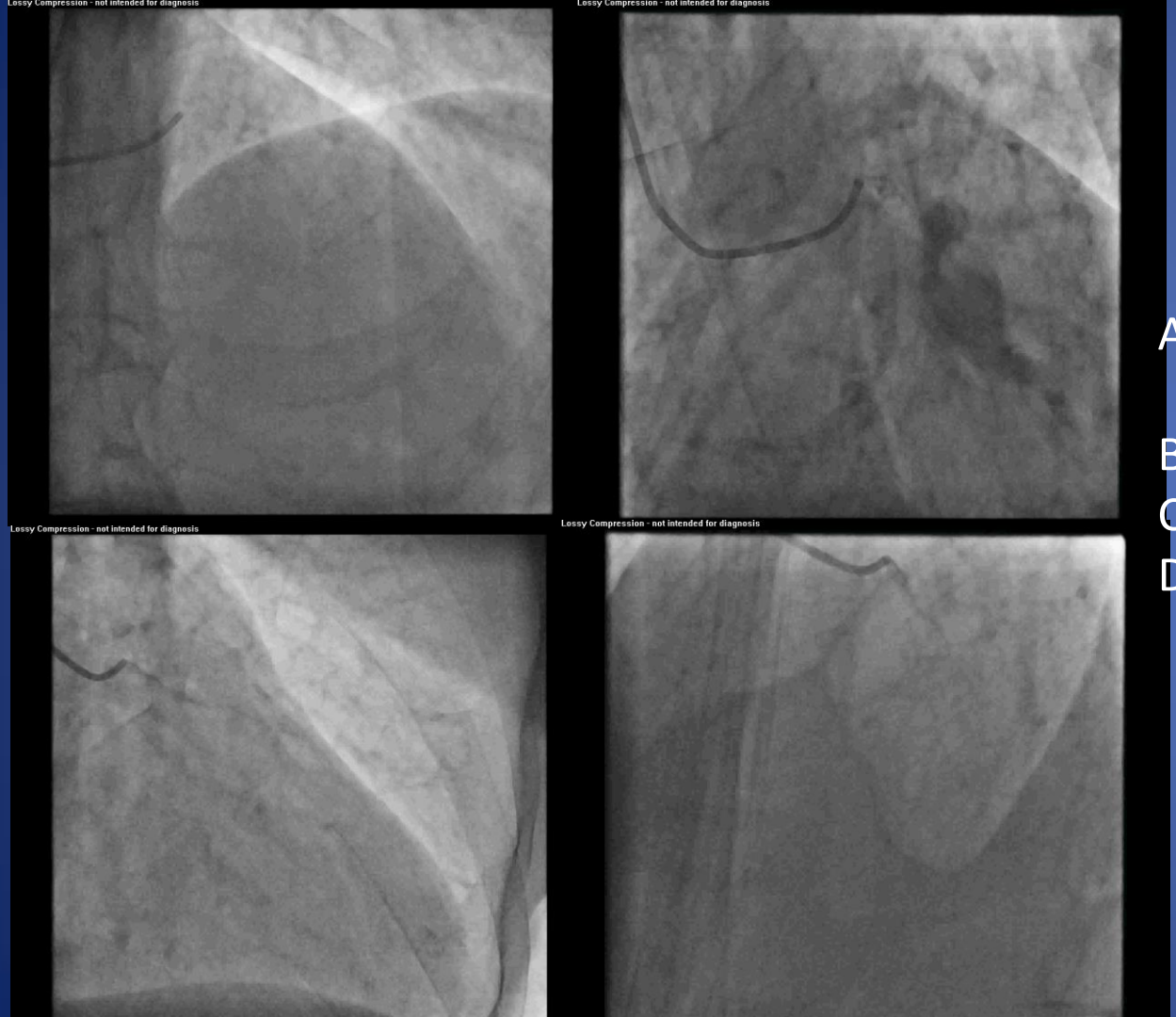
LCx 3.0mm

RCA 3.9 ± 0.6mm for dominant

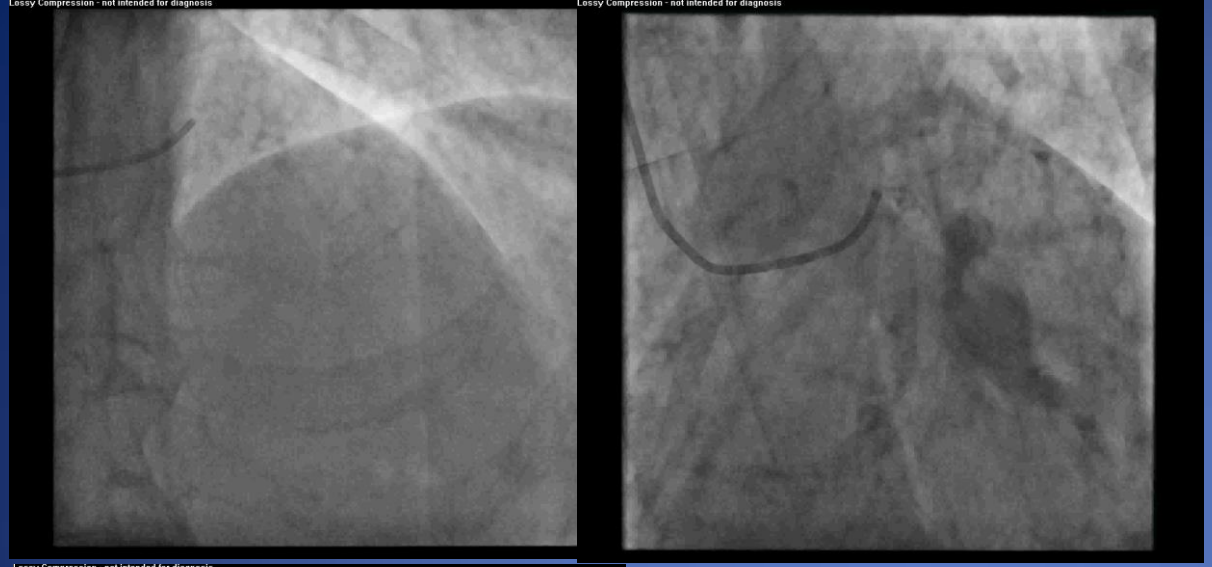
- Compare the size of target vessel with other segments
- IVUS/OCT/functional study

Case 7. M/60, inf STEMI, PCI 24 hrs after successful lytics





A. Anomalous coronary artery origin
B. Coronary artery fistula
C. Ostial LM disease
D. Spontaneous coronary artery dissection



Hints x absence of LCx artery:

1. When you see a very long “left-main” segment
2. Part of the LV is not supplied by any vessels
3. RAO caudal view helpful

When the LCx is absent…

- Total occlusion at the ostium
- Super-selective injection
- Anomalous LCx origin

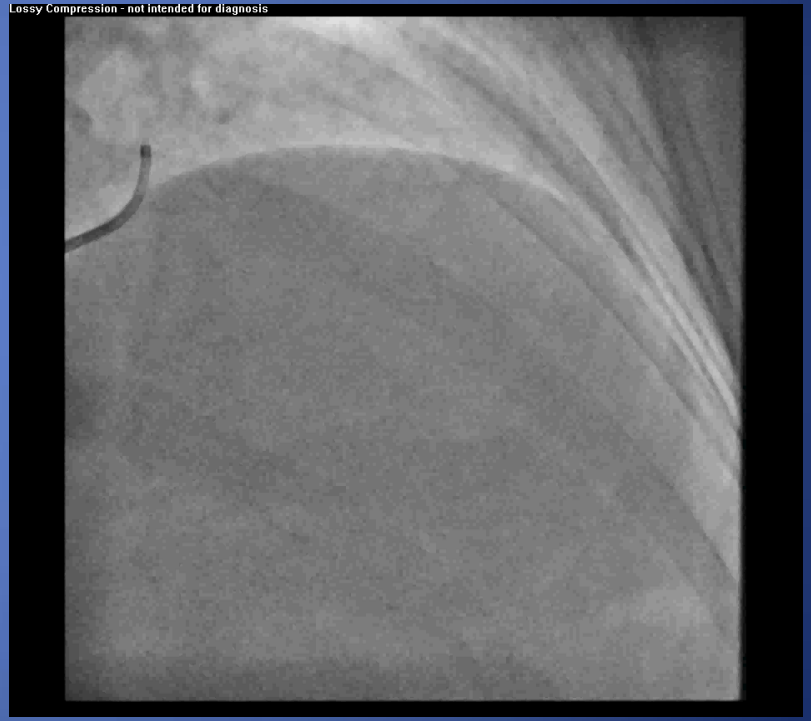
--> what to do when suspect an anomalous LCx origin

Most of time you can find the LCx by non-selective injection at R cusp

- LCx (instead of RCA) was the IRA in this case
- Anomalous LCx origin is a benign variant

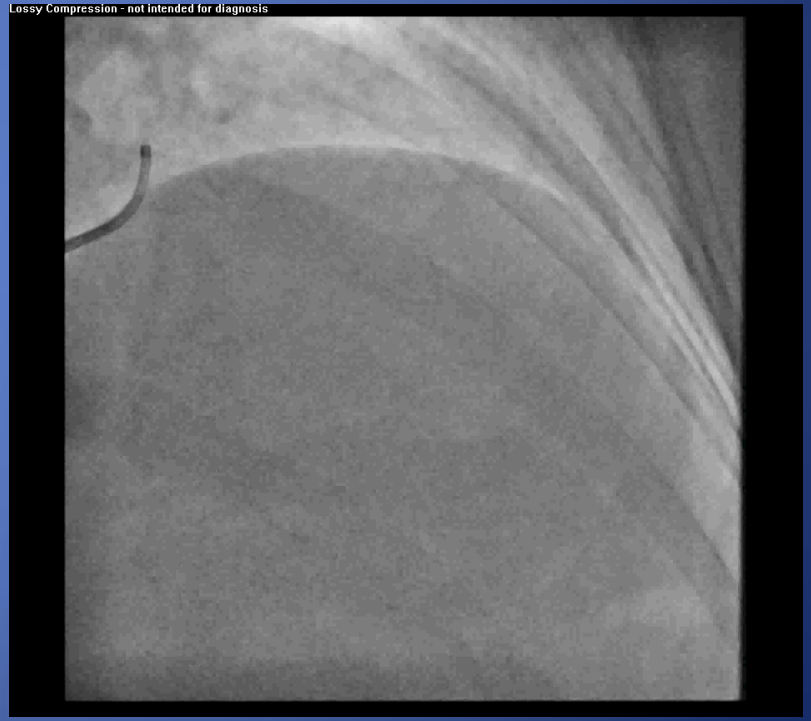
Case 8. F/45, no CV risk factors, NSTEMI, RCA normal

- Diagnosis?
- A. atherosclerotic coronary artery disease
- B. coronary artery spasm
- C. Myocardial bridging
- D. Spontaneous coronary artery dissection

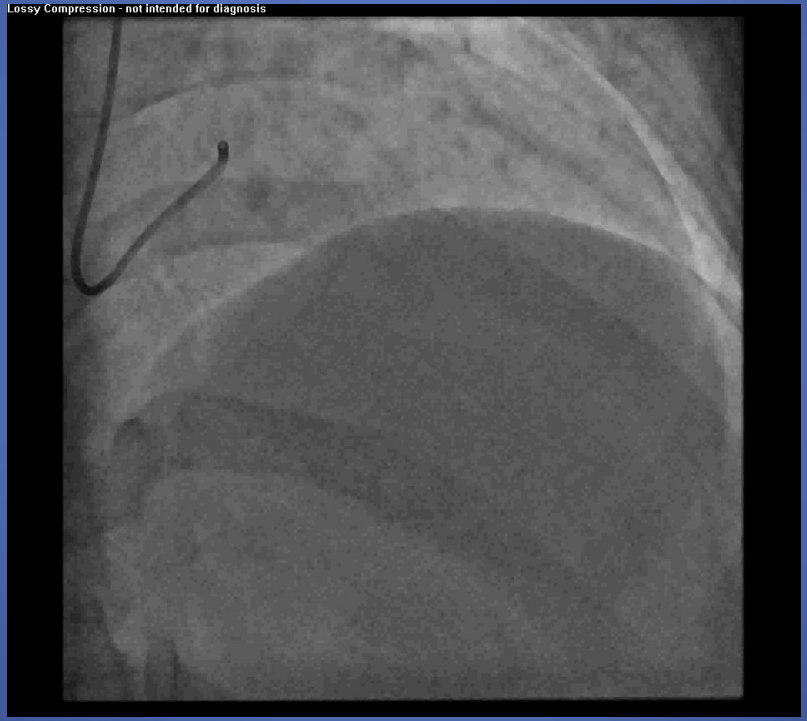


Hints for spontaneous coronary artery dissection

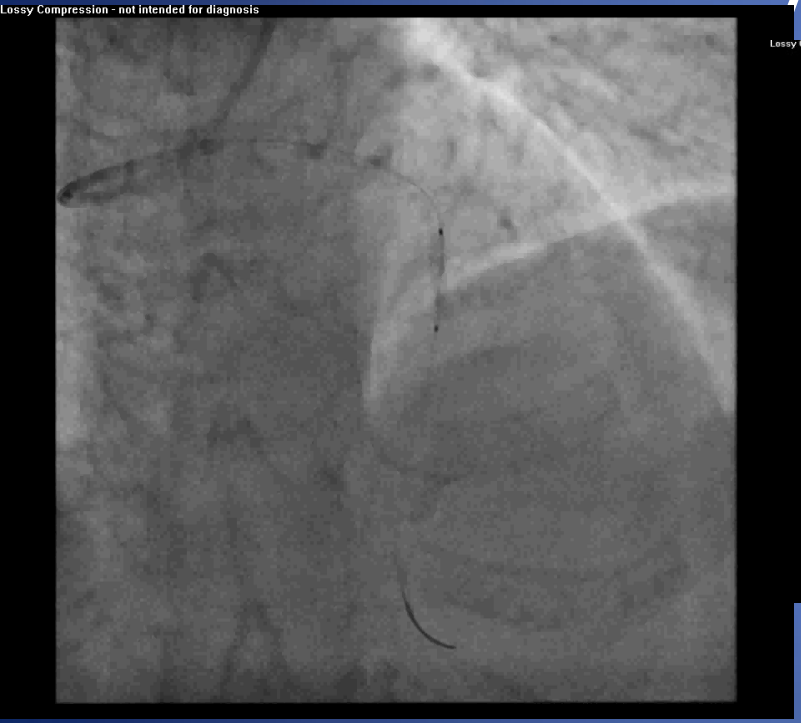
- 1. Clinical history
  - Young female patient
  - Absence of CV risk factors
- 2. Majority of case: long and diffuse narrowing on angiography due to intramural haematoma (dissection plane <30% of cases)
- 3. Absence of coronary artery disease in other vessels

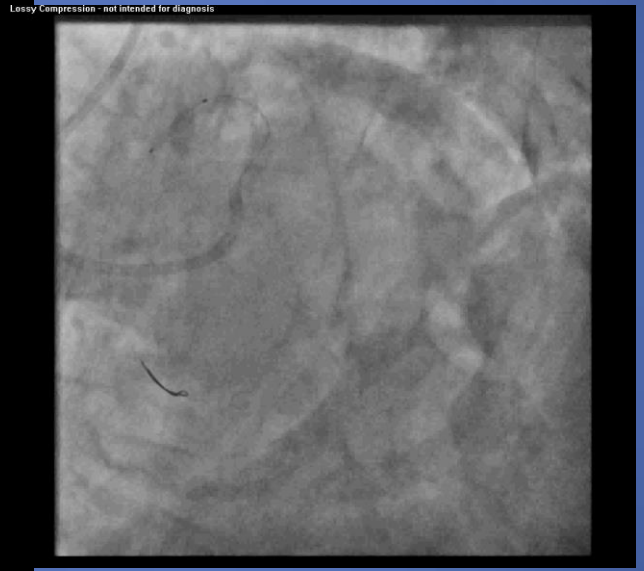


Restudy cc 3 months later



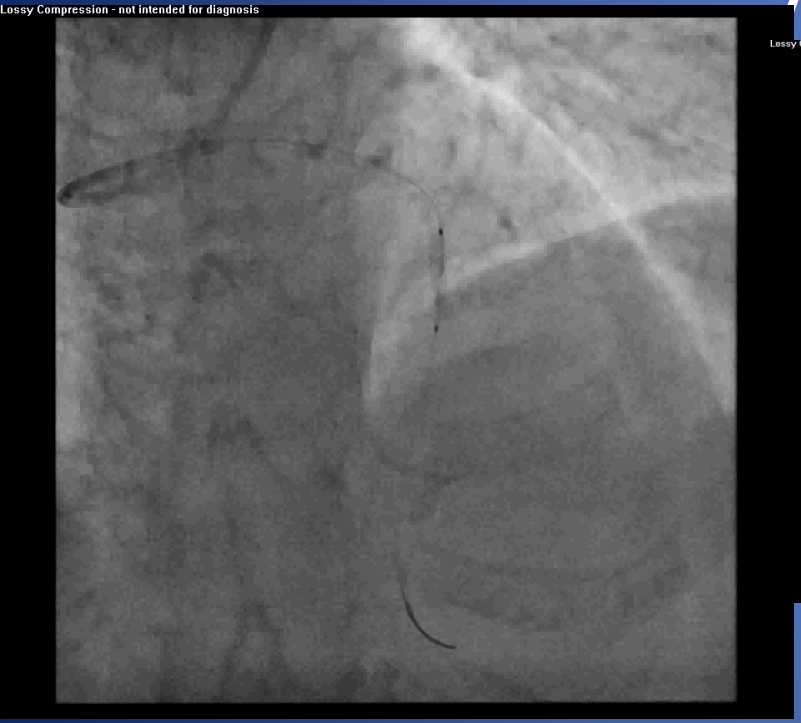
Case 9. What PCI complication(s) can you see?

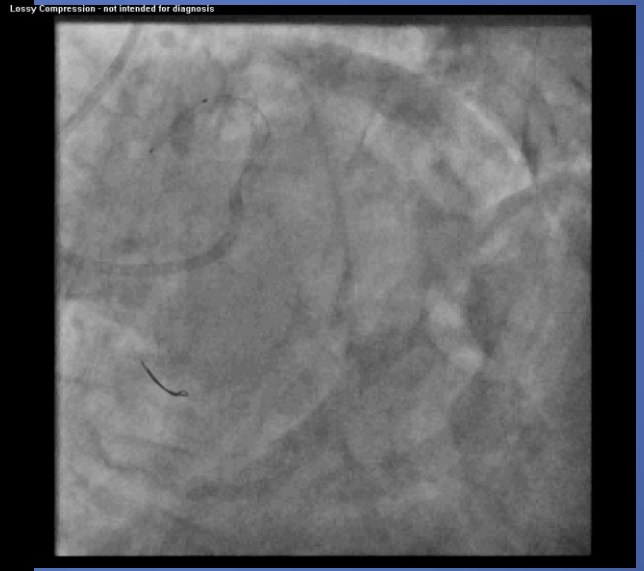




A. Perforation & pericardial effusion
B. Perforation & thrombus formation
C. Perforation & dissection
D. Perforation only

Case 8. What PCI complication(s) can you see?





A. Perforation & pericardial effusion
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Summary

- Case 1 Which view is the best for PDA/PLV/dRCA bifurcation? – AP cranial view
- Case 2 Which view is ostial LAD/LCx / dLM bifurcation – AP caudal view
- Case 3 Ostial LM stenting – use bi-cranial view (LAO 20 cranial 20)
- Case 4 LAD/diagonal bifurcation -- Shallow LAD cranial view

Summary

- Pitfalls in coronary angiogram interpretation
  - Deep seating of catheter may lead an operator to miss an ostial / very proximal lesion
  - Lumen-o-gram
  - Anomalous LCx artery
- Interesting coronary angiograms: spontaneous coronary artery dissection, pericardial effusion

THANK YOU!