

Complications & Management Of Left Main Interventions

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Complications of LM Interventions:

Extremely Rare (< 1-2%), but may be very catastrophic

Type	Prevention	Treatment
LMCA dissection	Careful cath handling, esp. 1. with EBU/AL cath, 2. LM ostial disease, 3. Short LM; 4. Aberant LMCA origin	Stenting, CABG
Aorto-LMCA dissection	Same as above	Stenting (sealing of entry point) w/wo covered stent, surgery
Spasm	Careful cath handling (R/O true stenosis)	Repositioning of cath, nitrates
Thrombosis	Adequate anticoagulation/antiplatelet Rx, avoidance of too much trauma/dissection/stenting	Antiplatelets, lytics, thromboaspiration, stenting, CABG
Perforation	Avoid excessive high pressure dilatation & oversizing (>1.2), esp. in calcific lesion	Prolonged balloon dilatation, covered stent, CABG, pericardiocentesis
Stent / balloon embolization	Use good back up & proper alignment of GC, adequate lesion preparation (predilatation, rotablation, etc), buddy wire/balloon technique,	Retrieval of embolized stent / balloon
Aneurysm / pseudoaneurysm	Not known	Covered stent, if necessary

Case 1: Twisted wire technique for retrieval of stent dislodgement in the LM



One or 2 additional GWs are introduced pass the dislodged stent & the proximal ends of the 3 GWs are fixed with a rotator

All (2-3) wires are rotated 30-40x until they are seen to respond.

Gentle traction is applied to pull the entire GC/GWs/stent as a unit.

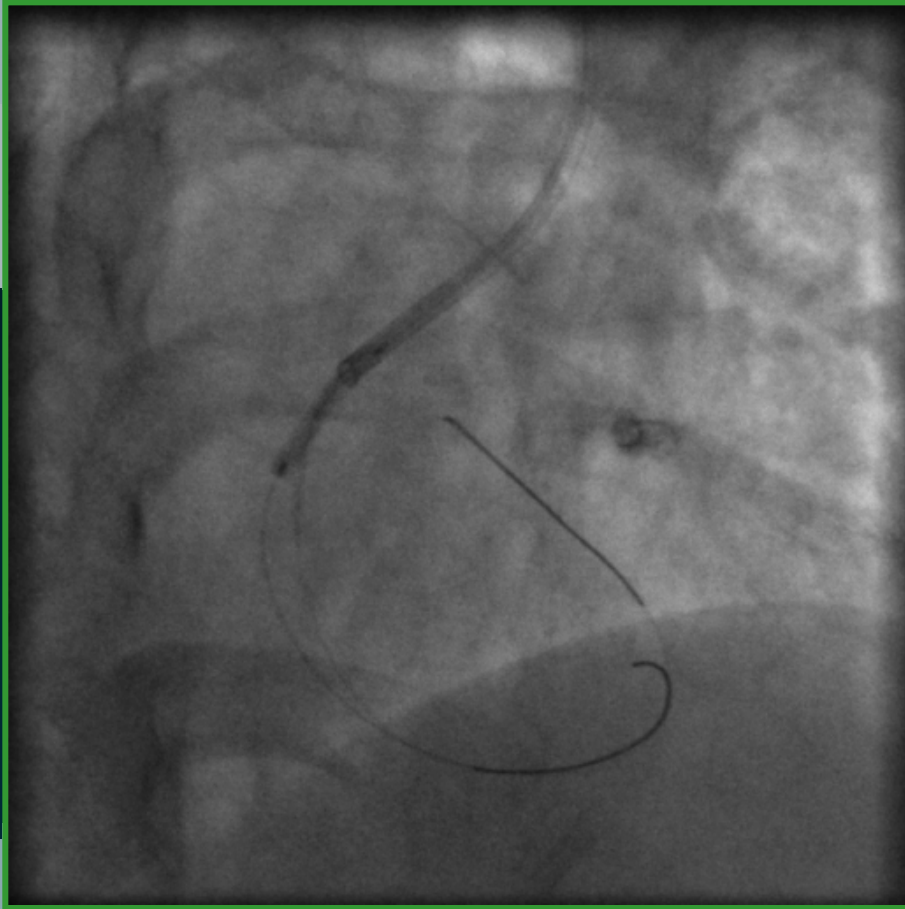
Other removal techniques:

Use of :

- small balloon distally
- snare
- myocardial biopsy forceps



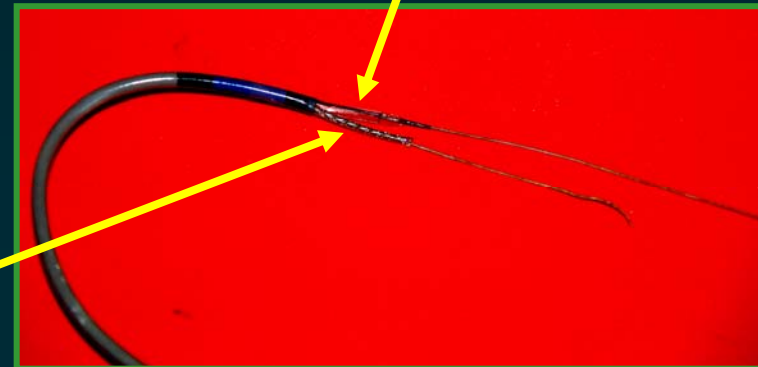
Case 2: Balloon fixation technique for retrieval of stent dislodgement in the Aorta



stent

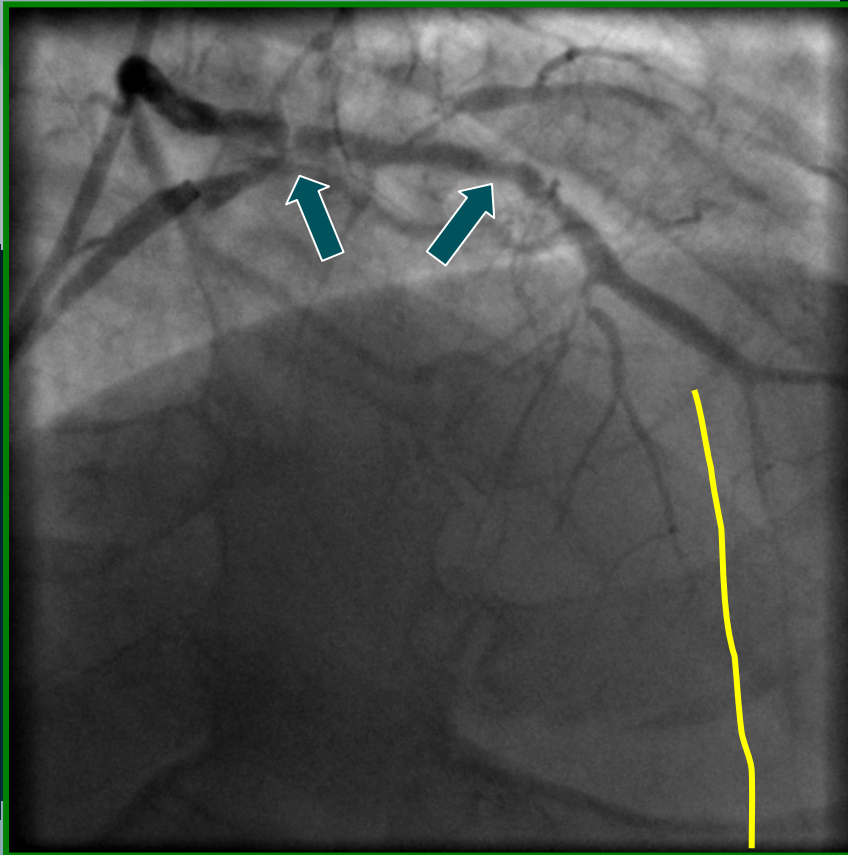
If the **stent is free in the aorta**, it will be embolized to the peripheral circulation & generally there is no serious consequences

If the **stent is still hanging in the GW**, use a balloon to fix it on the tip of the GC, then gently pulled the whole system (GC/GW/stent) as a unit



Case 3: Ruptured & detached balloon fragment in the distal LM

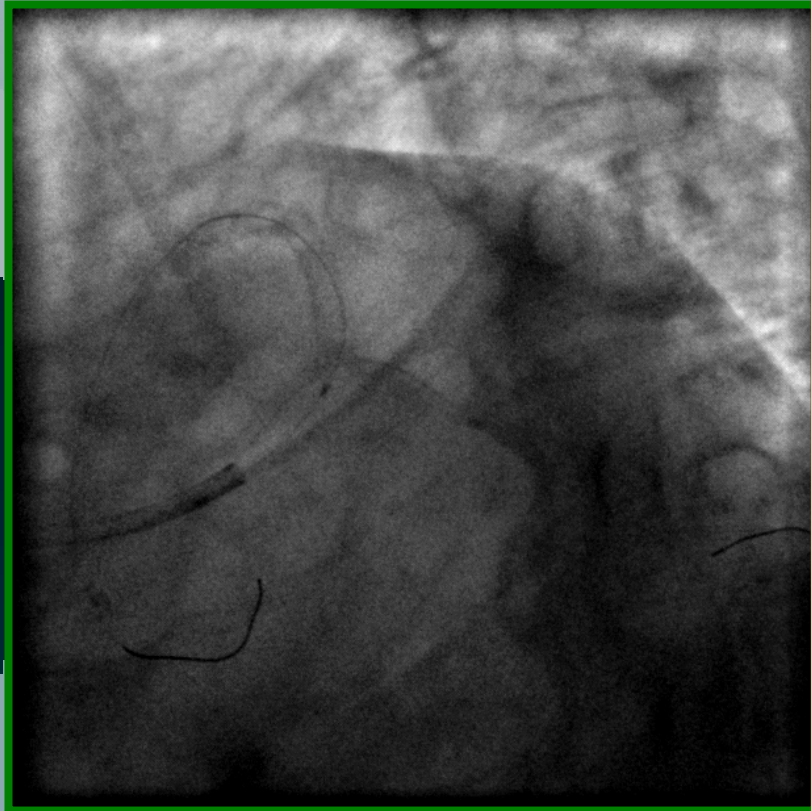
Male, 74 yr.o, progressive angina, old anteroapical infarction



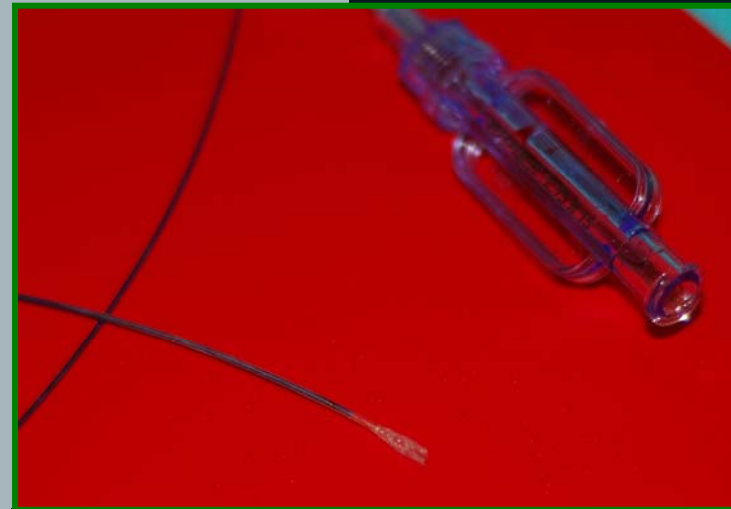
Critical, calcified LM bifurcation stenosis & mild stenosis of LADp followed by diffuse subtotal occlusion in the LADd

Case 3: Ruptured & detached balloon fragment in the distal LM

Sudden severe chest pain with marked ST elevation !!!



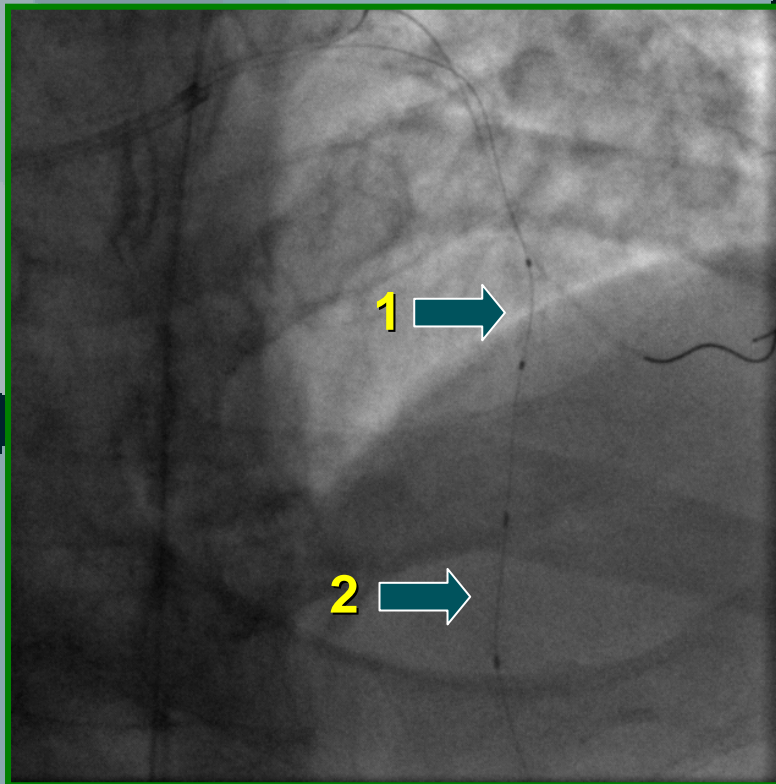
LM lesion was resistant to dilatation.
Balloon ruptured, stuck & was detached during its pulling out



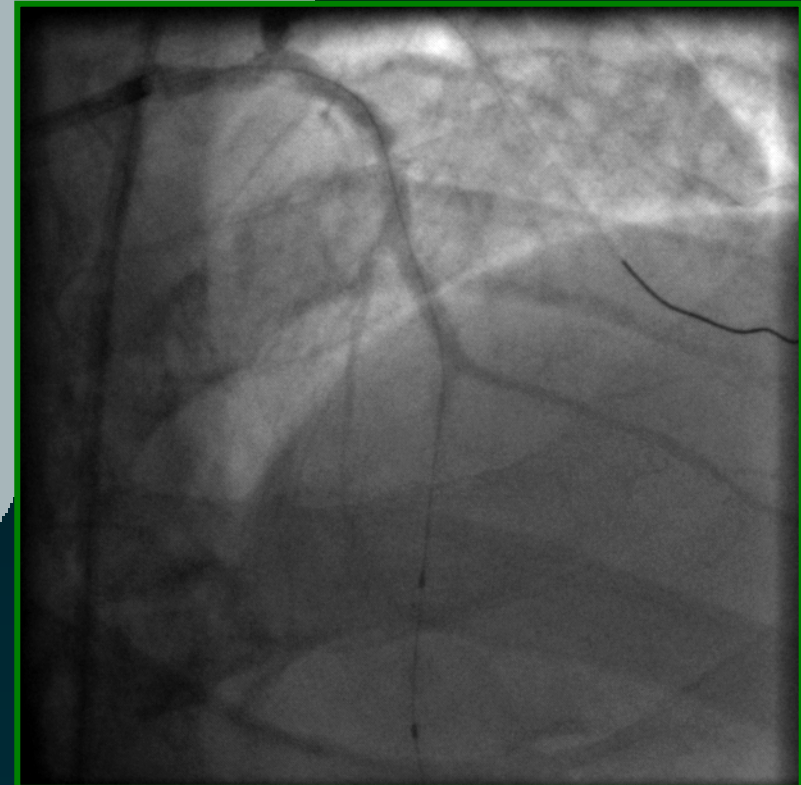
Part of balloon was detached

Case 3: Ruptured & detached balloon fragment in the distal LM

Rapid re-establishment of flow in the LAD/LCX is very important !!!



Another balloon (1) was used to push the detached fragment (2) to the LAD which territory has been infarcted in the past

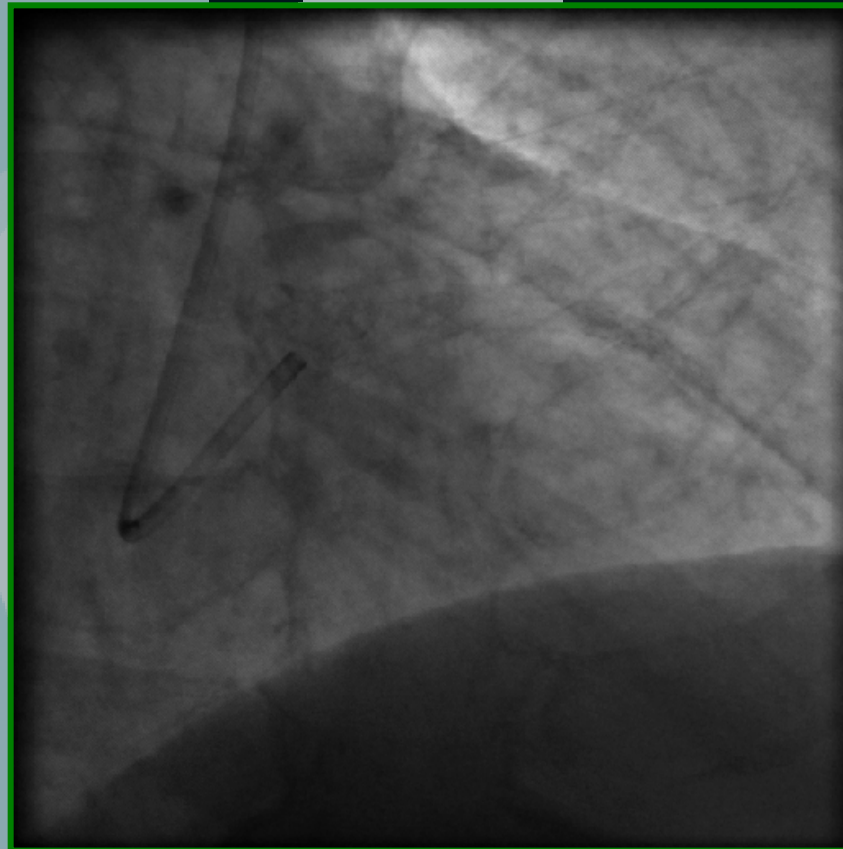


After dilatation of the distal LM with high pressure balloon

Case 3: Ruptured & detached balloon fragment in the distal LM



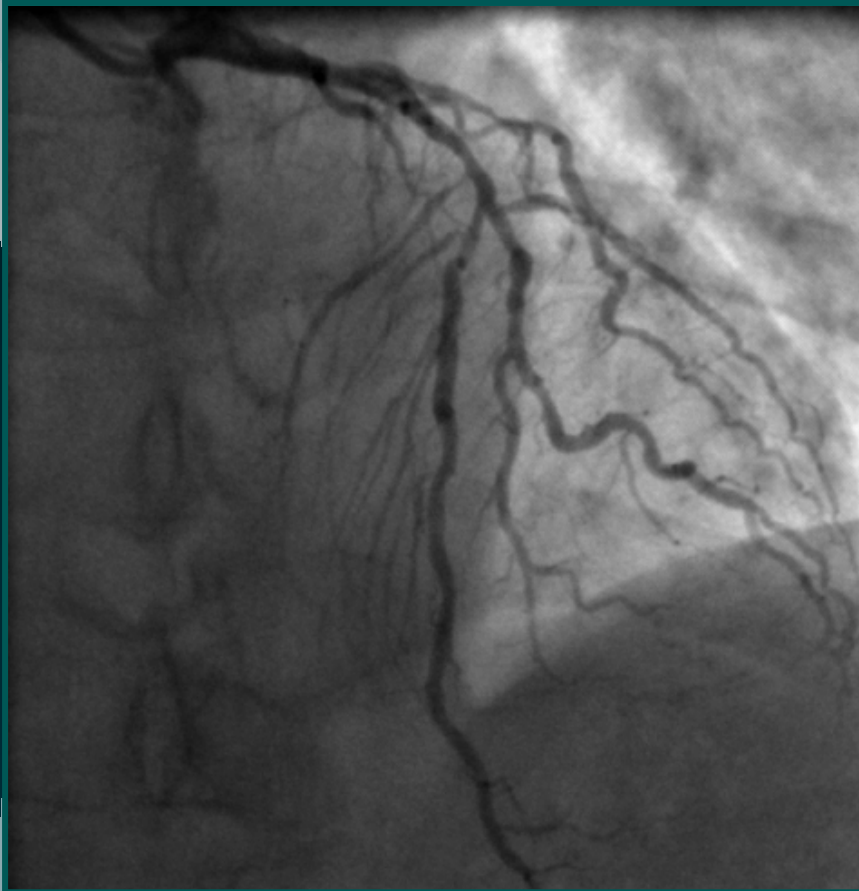
Final result



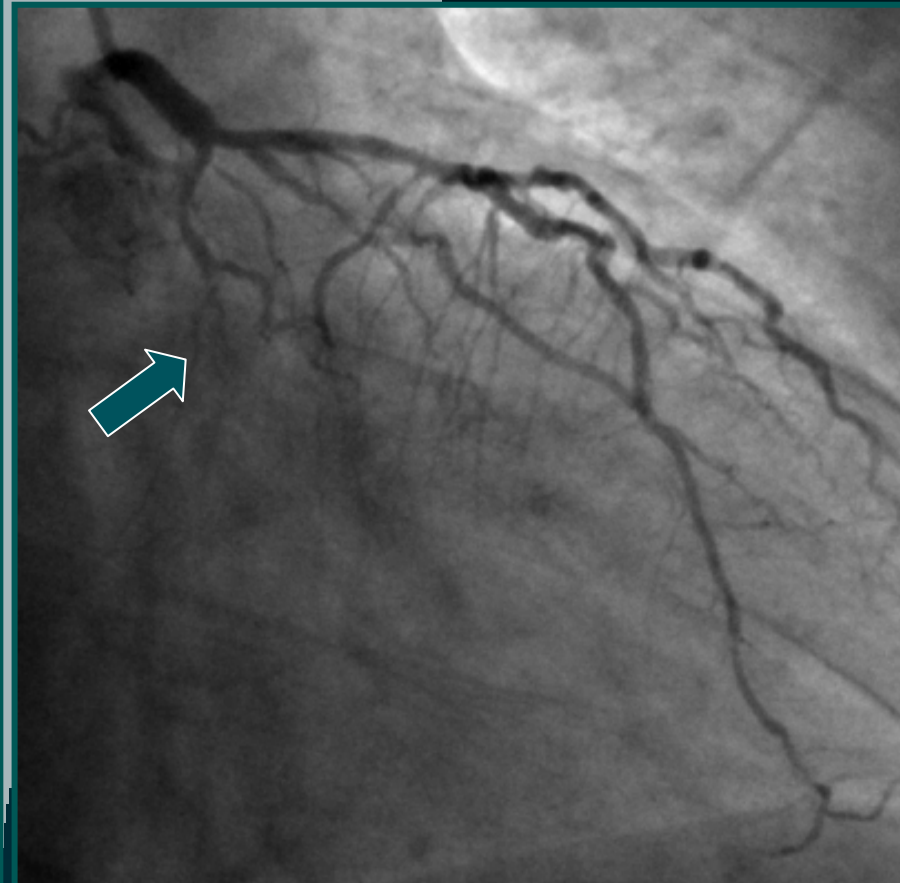
After placement of Cypher 3/18 mm in the LADp & kissing stents in the LM bifurcation (Biomatrix 3/18 in the LM-LAD & Biomatrix 3/14 in the LM-LCX), followed by final kissing balloon dilatation

Case 4: Aortic & LM type F spiral dissection with occlusion of LAD & LCX in a patient with mid-LCX CTO

Male, 51 yr.o, asymptomatic, normal ECG



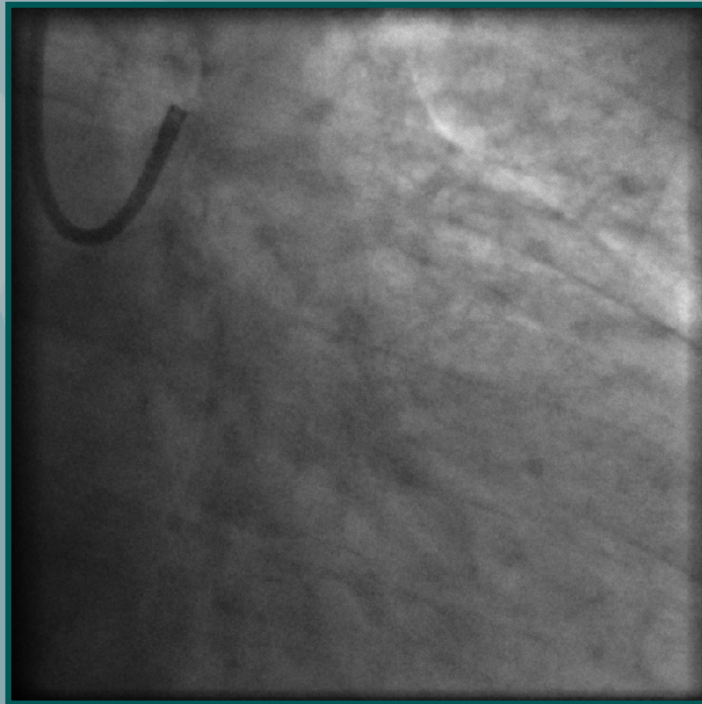
50% stenosis of LADp at the D1 bifurcation



CTO of LCXm (target lesion)

Case 4: Aortic & LM type F spiral dissection with occlusion of LAD & LCX in a patient with mid-LCX CTO

On PCI, performed one week later:
Sudden chest pain with very prominent ST elevation
right after guiding catheter engagement (BL3.5, 7F),



LM type F spiral dissection
extending to the LAD, D1 & LCX



Dissection also involved the aorta

What would you do ???

Case 4: Aortic & LM type F spiral dissection with occlusion of LAD & LCX in a patient with mid-LCX CTO

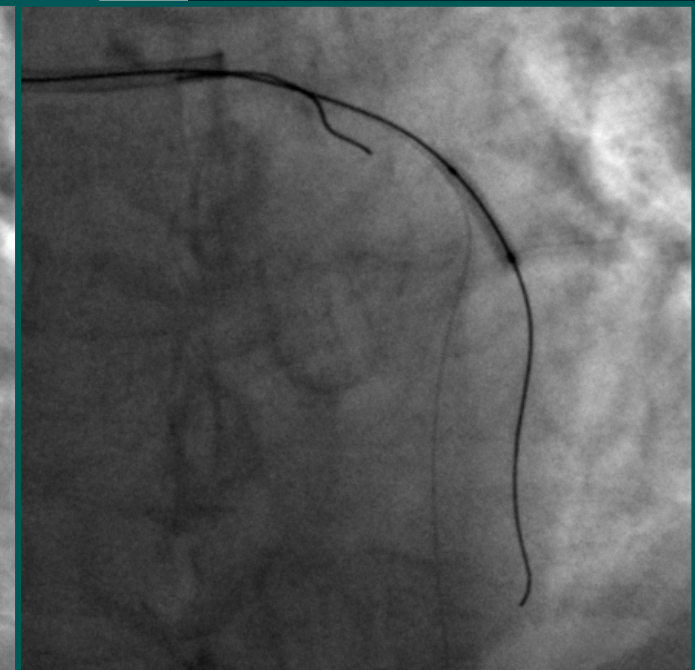
Rapid worsening of spiral dissection leading to total occlusion of the LAD



Successful wiring of the LAD & LCX. **LAD was completely occluded**

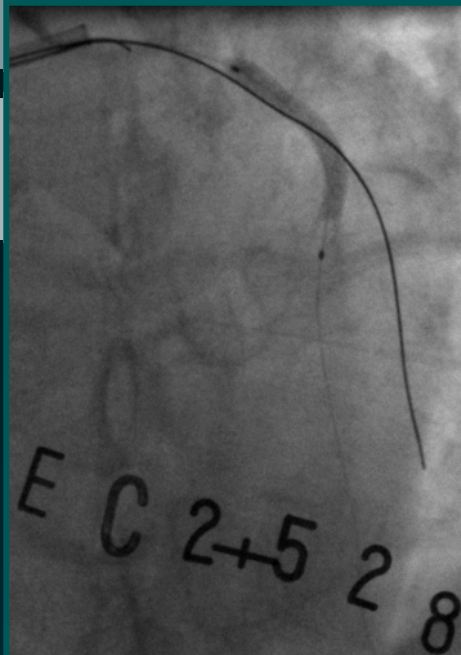


After balloon dilatation of the LAD. **D1, which was an important vessel, was fed from the false lumen**



Miracle 6 wire was used to **puncture the dissection flap to enter D1**, then D1 ostium was dilated

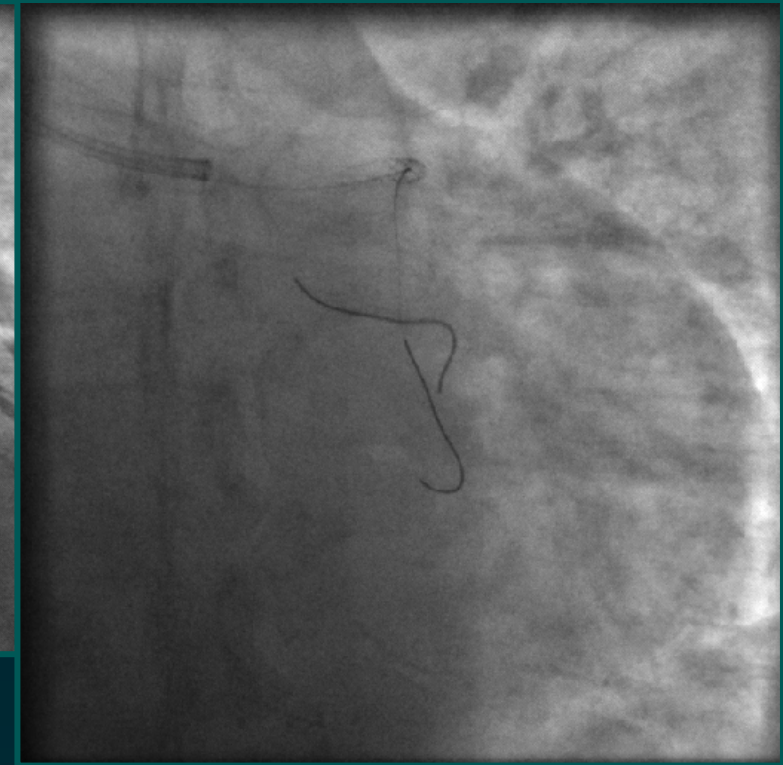
Case 4: Aortic & LM type F spiral dissection with occlusion of LAD & LCX in a patient with mid-LCX CTO



Stenting of LADd
(Excel 2.5x28 mm)

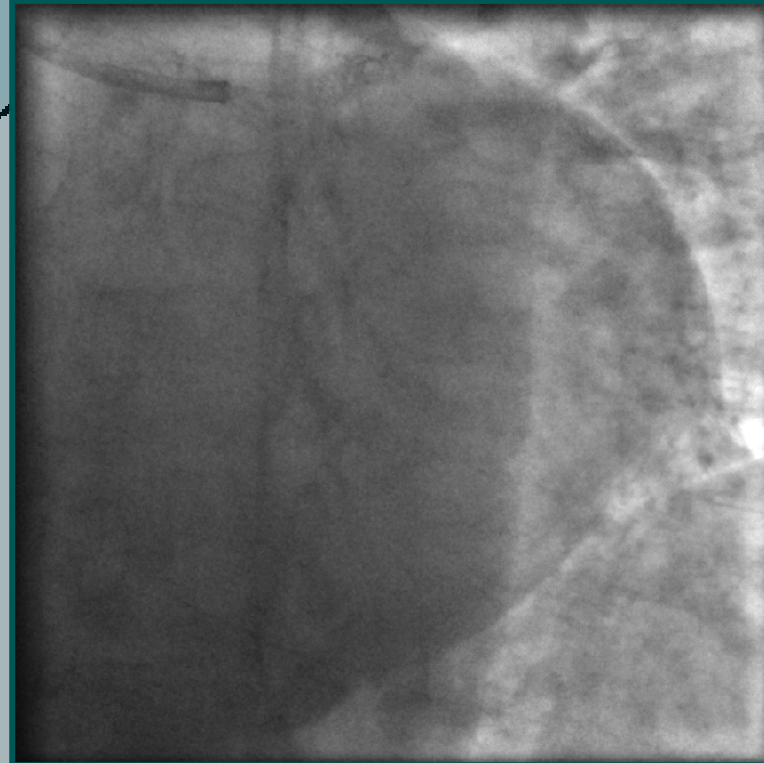
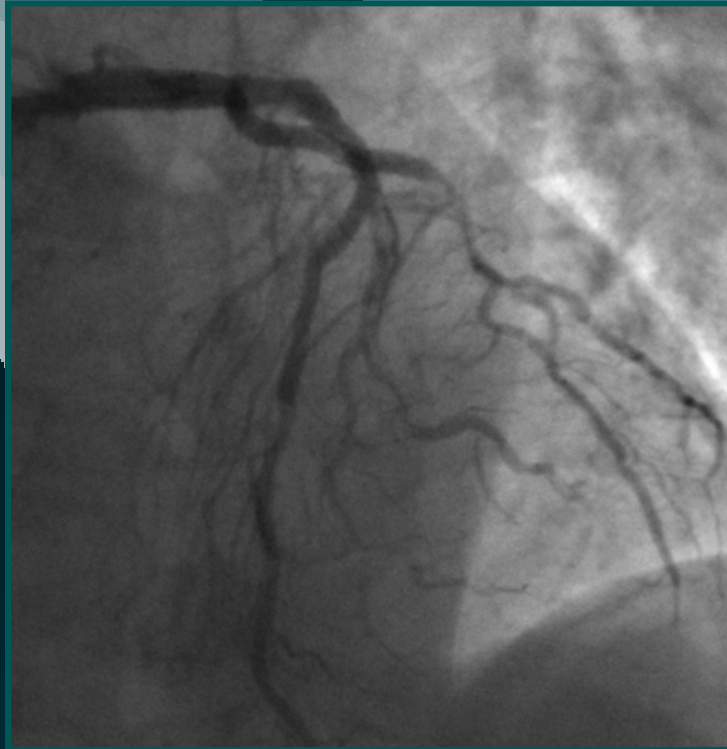


After LADp stenting.
Residual dissection in
D1 was left as vessel
patency & flow were still
maintained



***Should we treat the
LCX CTO ??
Or proceed to fix the
LM/aortic dissection?***

Case 4: Aortic & LM type F spiral dissection with occlusion of LAD & LCX in a patient with mid-LCX CTO



Final Result:

After placement opening & stenting of LCX CTO; placement of **2 stents in the LM-LAD & LM-LCX using the crushing technique** (& kissing balloon dilatation); & one stent of the **LM ostium**.

All stents in the respective vessels were in overlapping one to each other

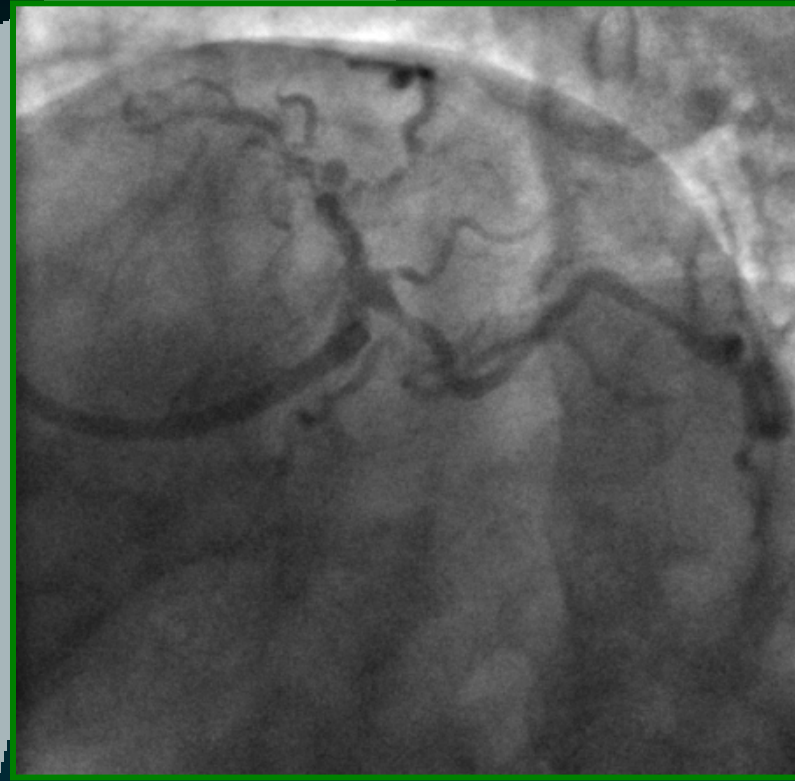
Case 5: LM & LAD Dissection & Perforation

BBG, male, 59 yrs, silent ischemia (CAD detected on MSCT)



TRANS-RADIAL APPROACH (7F GC):

Distal LM stenosis (25%)
Heavily calcified, diffusely stenotic proximal
LAD stenosis followed by CTO

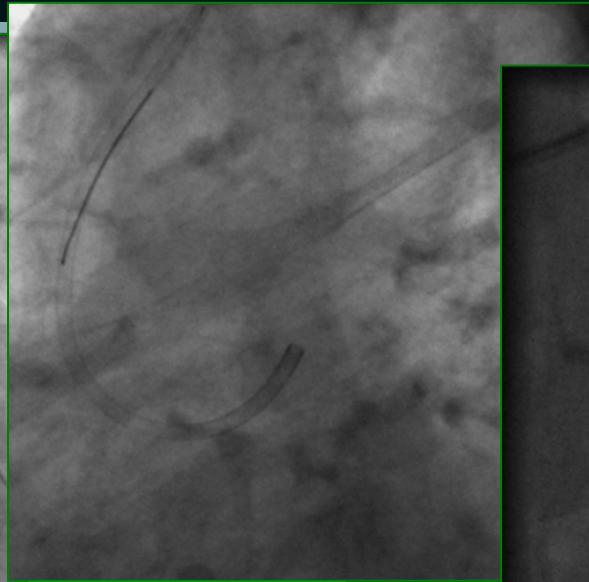


Sharp LCX take off with significant
stenosis in the tortuous, calcified
proximal segment

Case 5: LM & LAD Dissection & Perforation

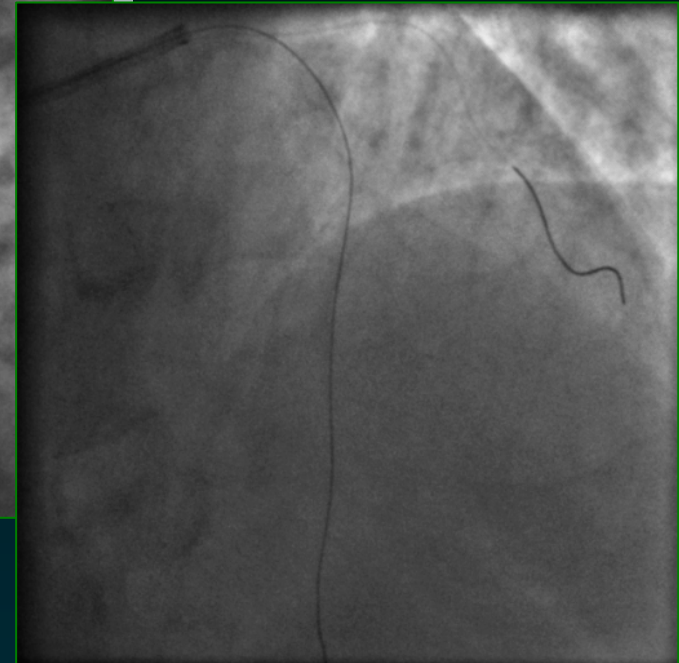


Catheter induced LM & LAD dissection (when forcefully pulling the Tornus out, GC jumped into the LM)



Patient had severe chest pain, became agitated, ST elevation.

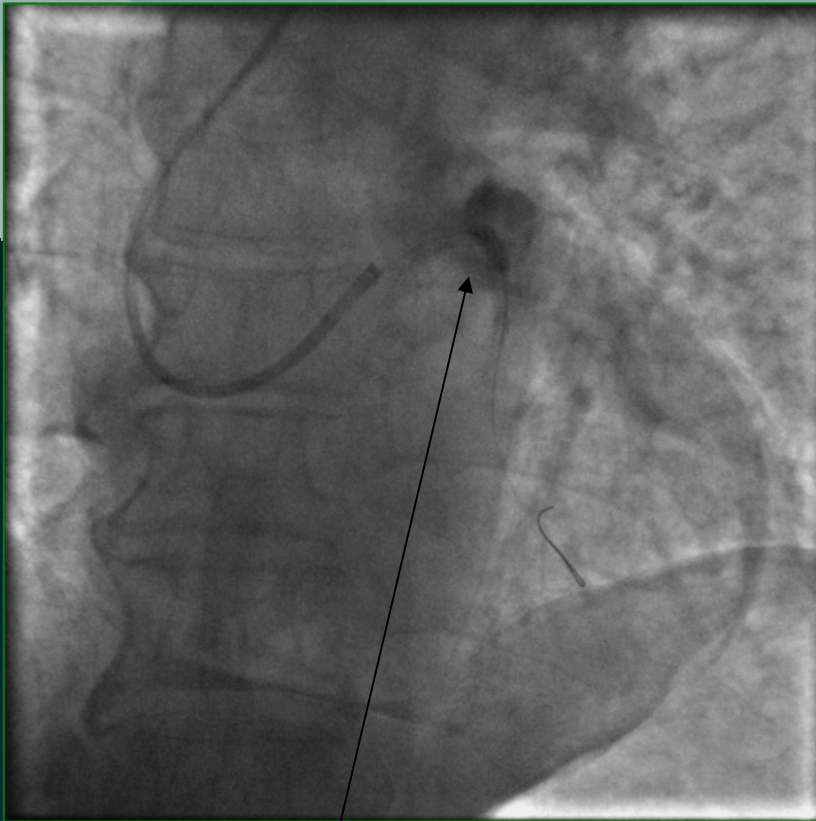
All access lost



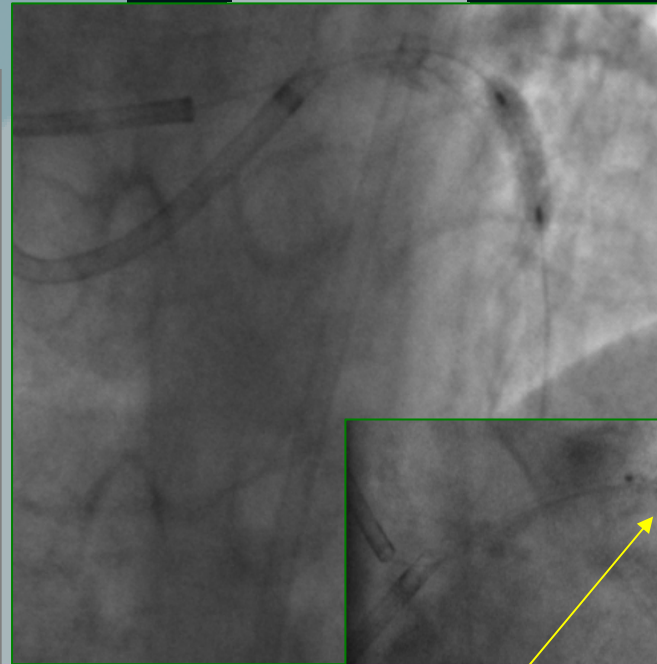
After re-dilatation of the LM-LAD, **with difficulties** (LM & proximal LAD dissection, followed by CTO in midsegment) **GW could cross the whole LAD**

What would you do ???

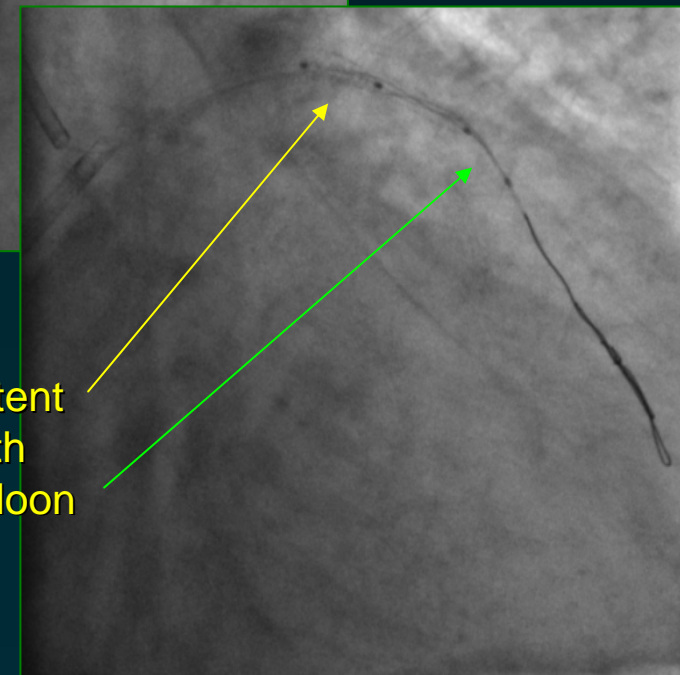
Case 5: LM & LAD Dissection & Perforation



Temporary sealing with balloon.
Pericardial effusion noted to increase.

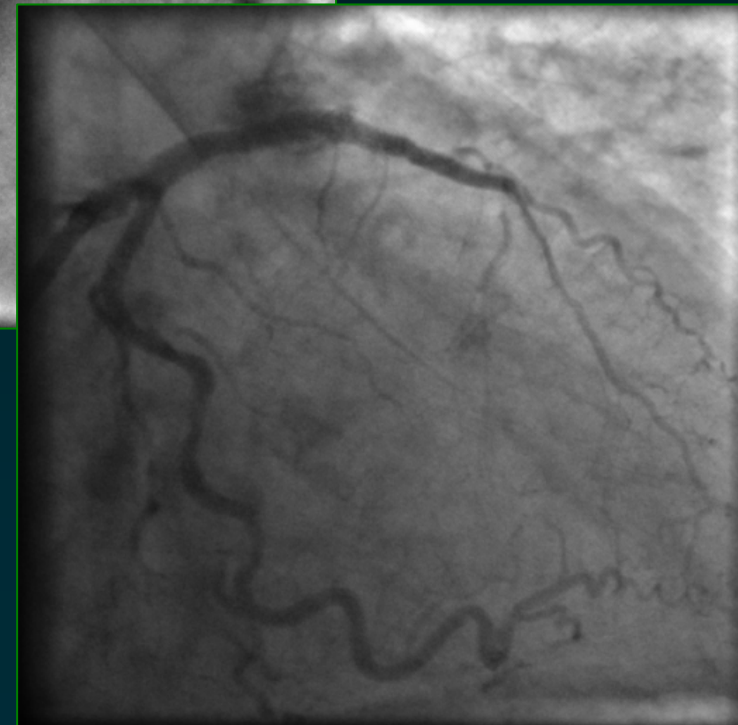
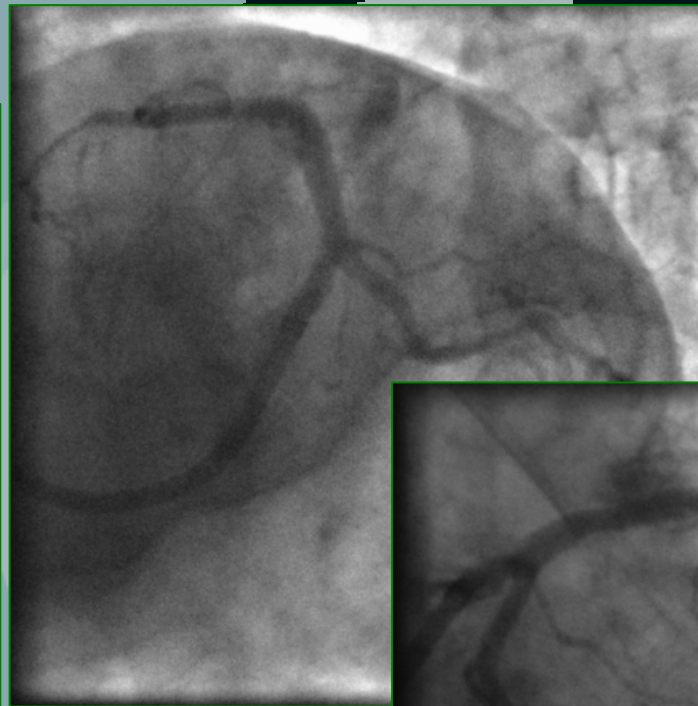


2nd GC introduced via femoral approach



2nd covered stent introduced with the buddy balloon technique

Case 5: LM & LAD Dissection & Perforation



GOOD FINAL RESULT !!!

Minor non-flow limiting dissection in mid-LAD
left alone

Take Home Message: Never, Ever Give Up !!

Good Judgment Comes from Experience,
And Experience Comes from Bad Judgment

(R. Myler)