LAD Perforation

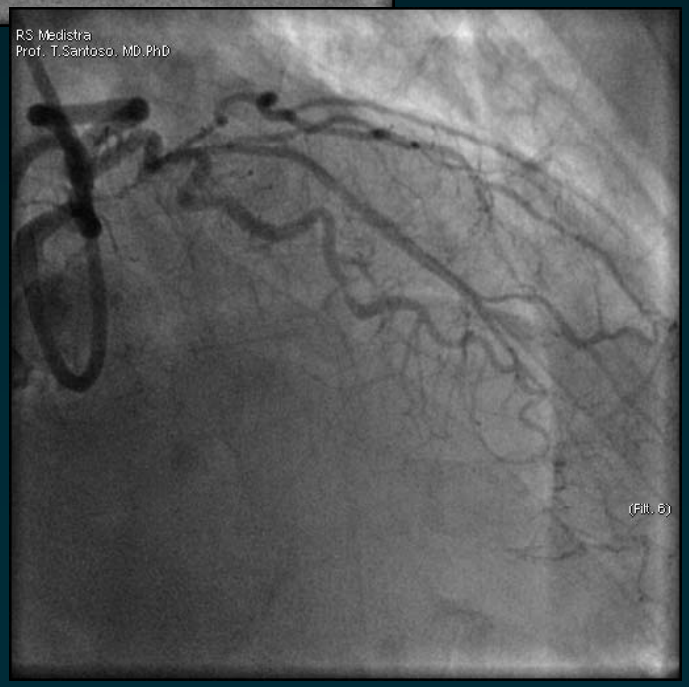
Bagus Ari Pradnyana Dwi Sutanegara
T. Santoso

Dept of Cardiology, Univ of Udayana Medical School,
Medistra Hospital,
Bali & Jakarta, Indonesia

Case: H, male, 67 yrs. old

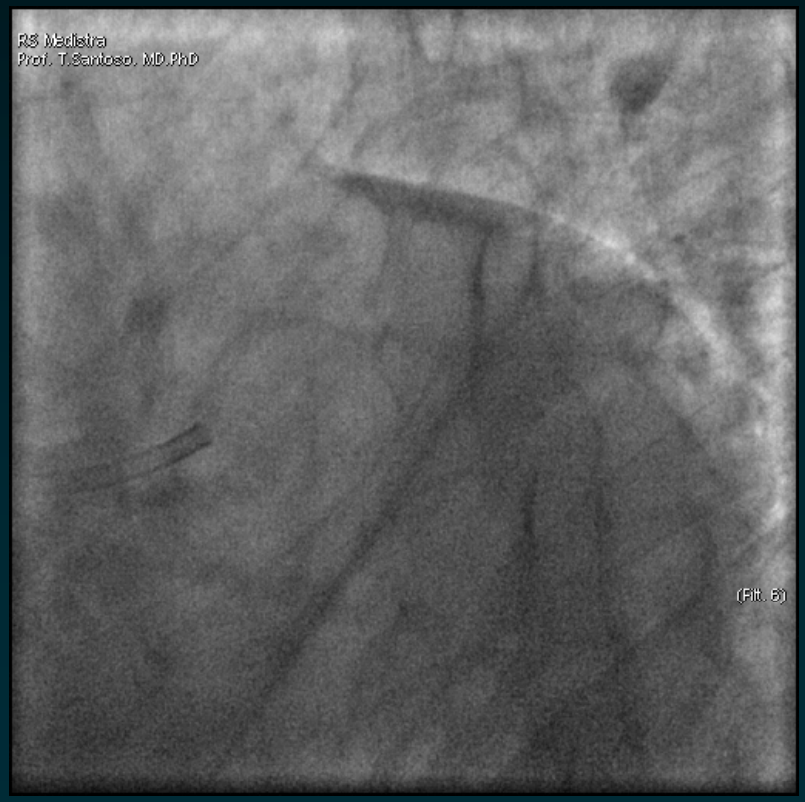
- History:
  - Stable angina since 1 year
  - Risk factors: Hypertension, Dyslipidemia, DM (on treatment)
- PE: BP 120/70
- Lab: normal
- ECG: RBBB, Q waves in V1-3
- Chest film / echo: normal
- Treadmill: positive for ischemia

PA Cr



RSO

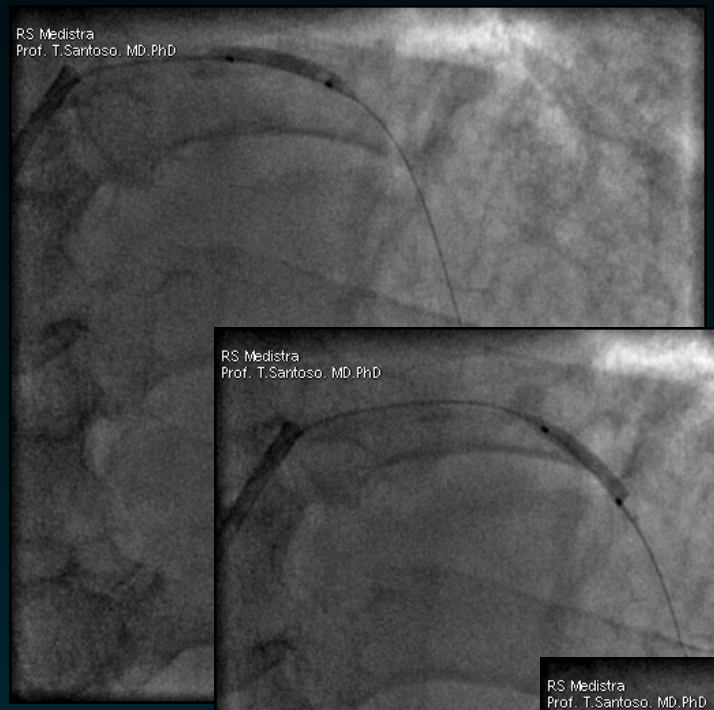
- **95% ostial & LADp stenosis with moderate calcification & 90% diffuse stenosis in the distal LADd with mild calcification.**
- **Small vessel disease.**

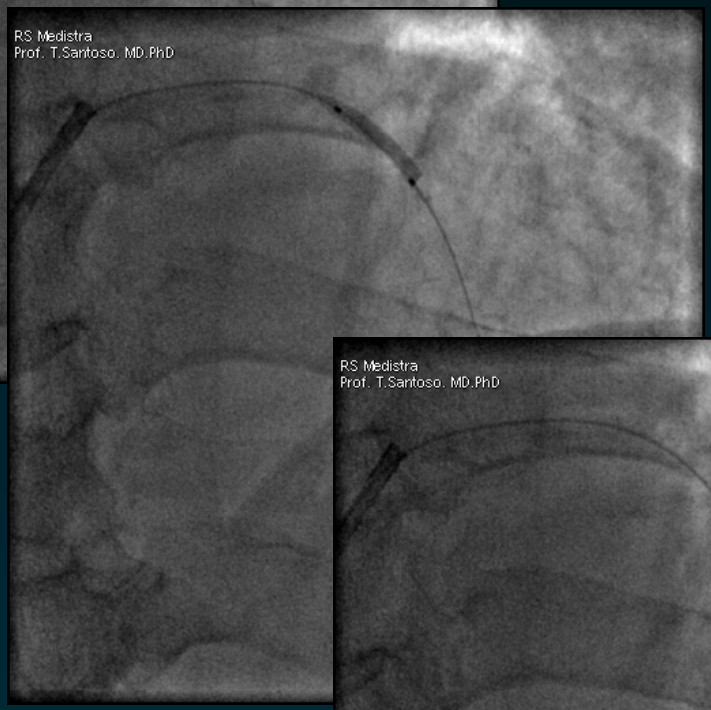


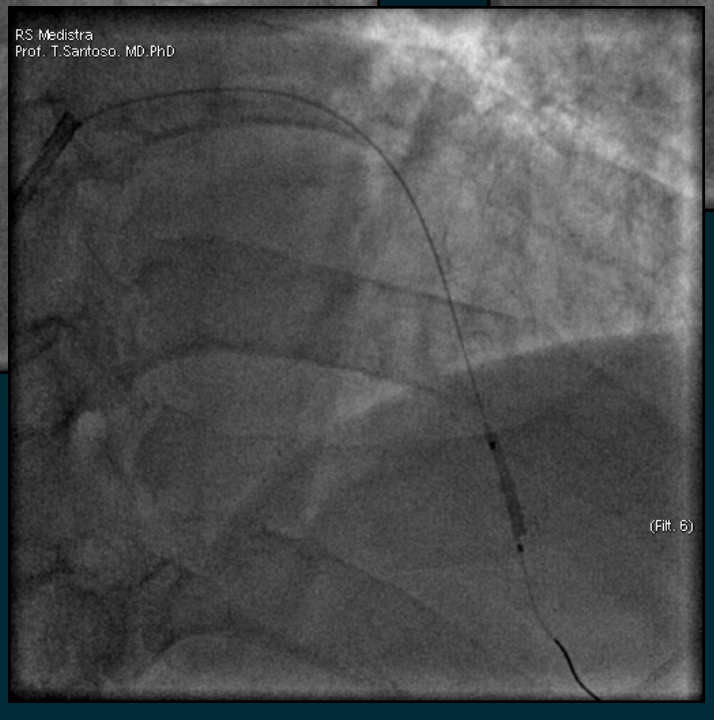
LIO

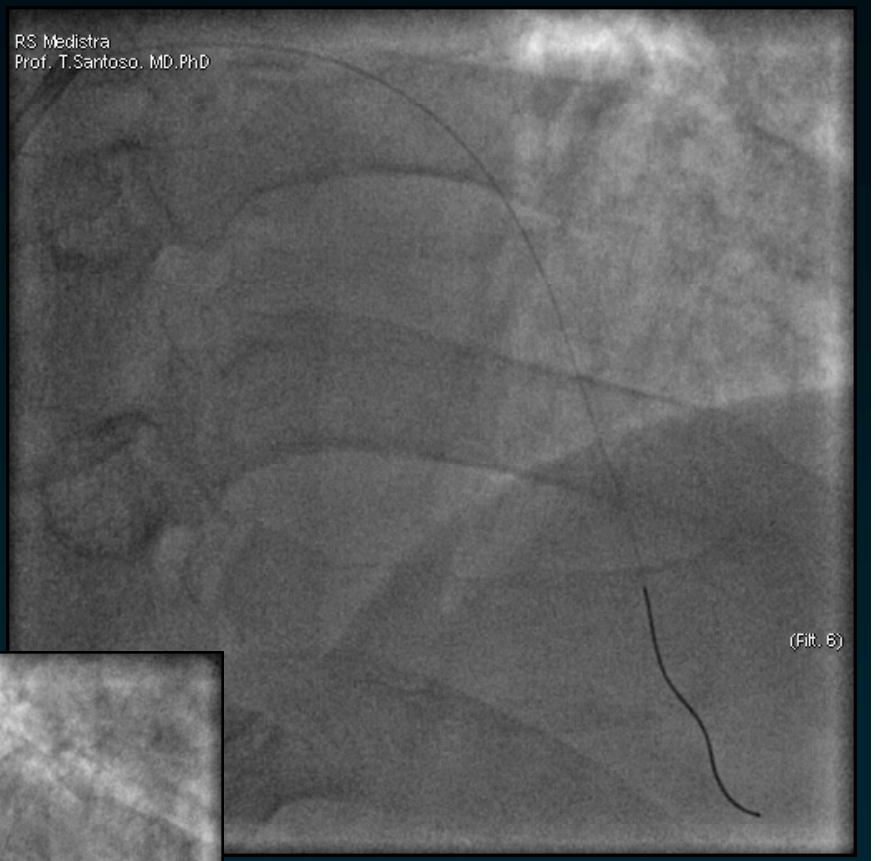
What would you do ?

1. Go straight to PCI
2. IVUS
3. FFR
4. Predilate, then IVUS



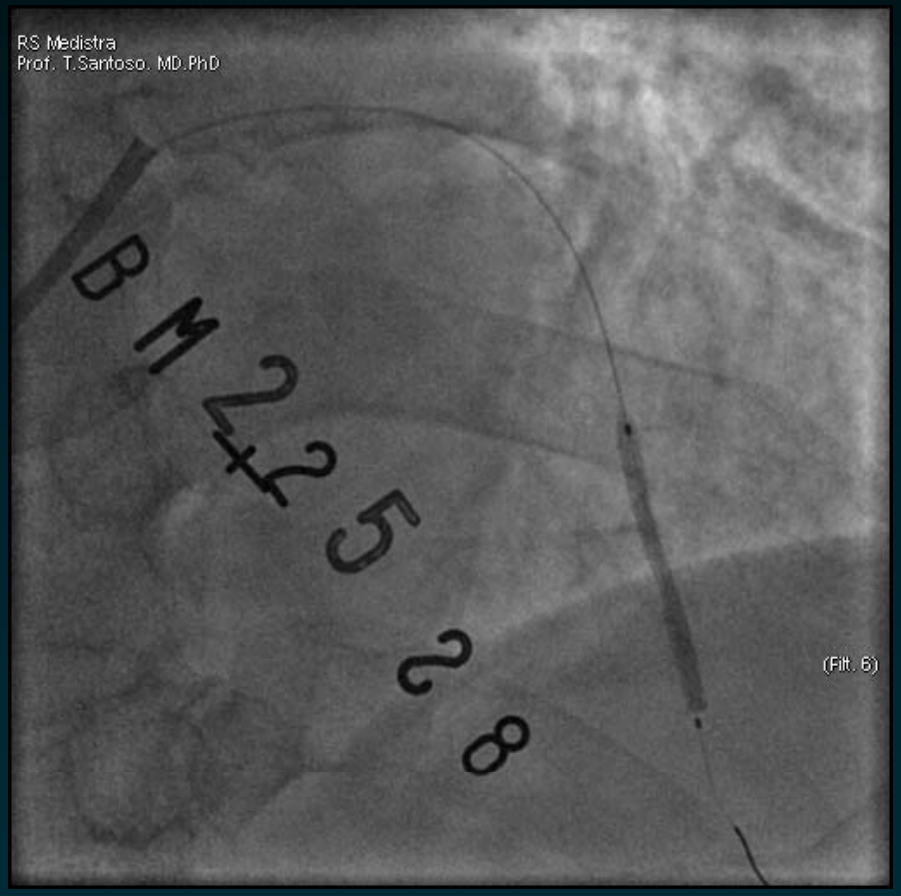






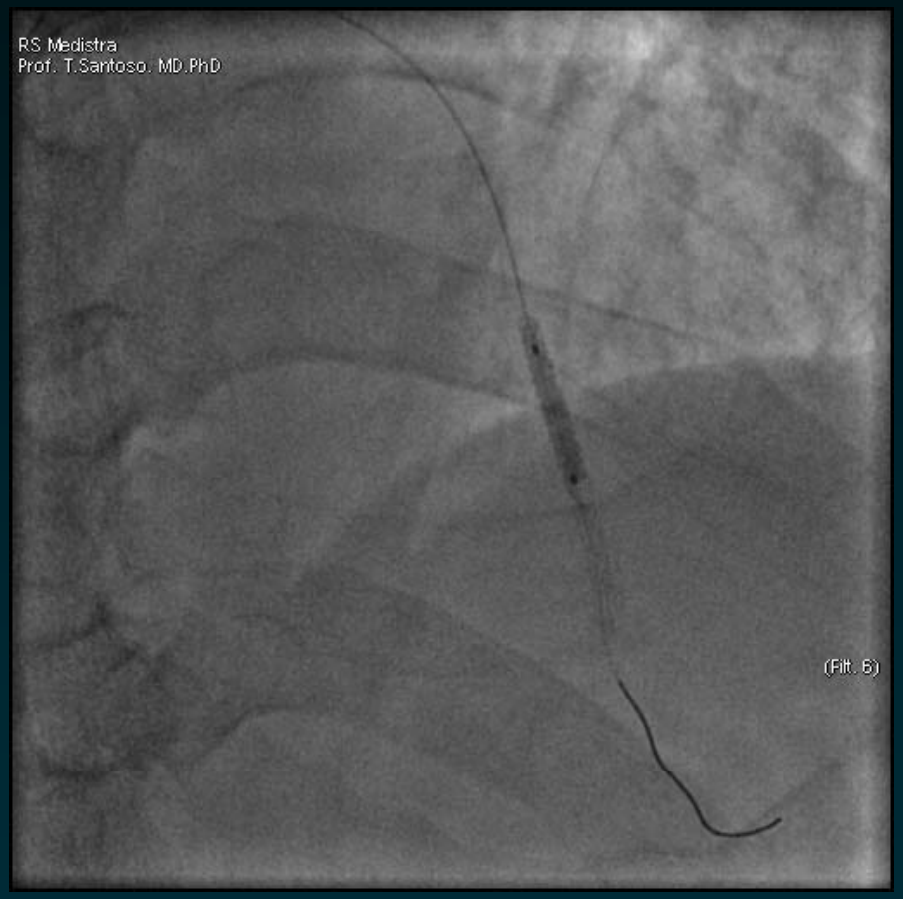
Dilatation of LAD stenosis(2.25/15 mm balloon in LADd & 2.5/12 mm in LADp)

After dilatation, LADp dissection

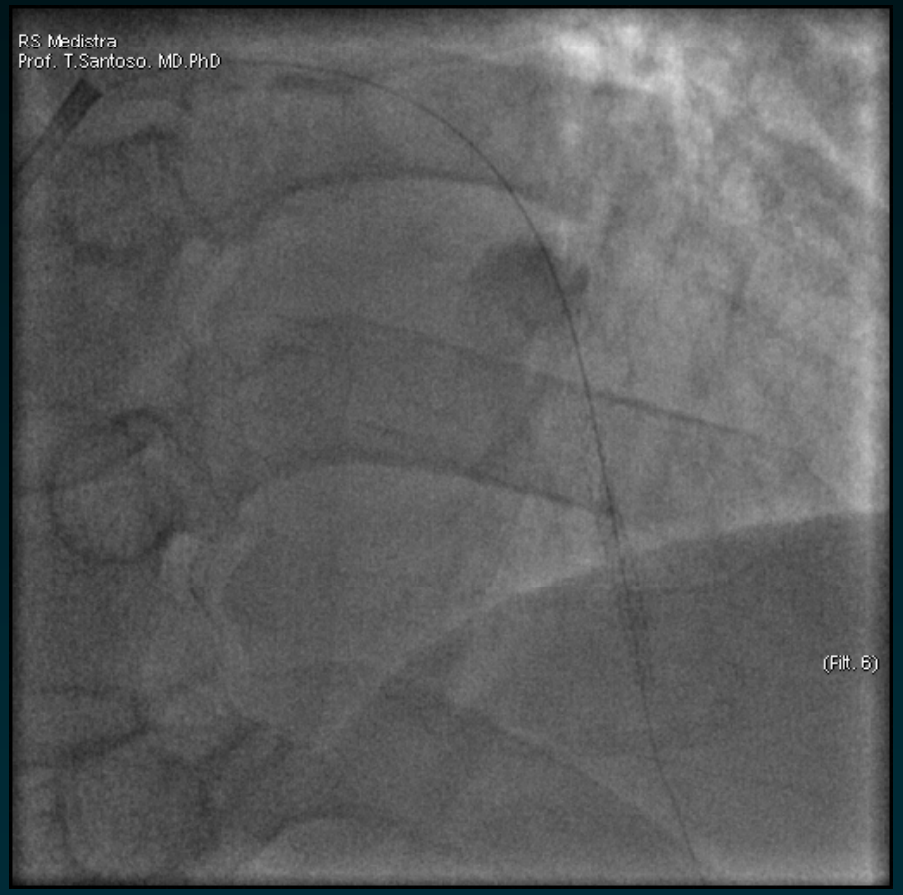


LADd stenting (nominal pressure to avoid distal dissection)

Post-stenting



Postdilatation
(2.25/15 mm balloon)



Type 3 Perforation !!

Ellis' Classification of perforation

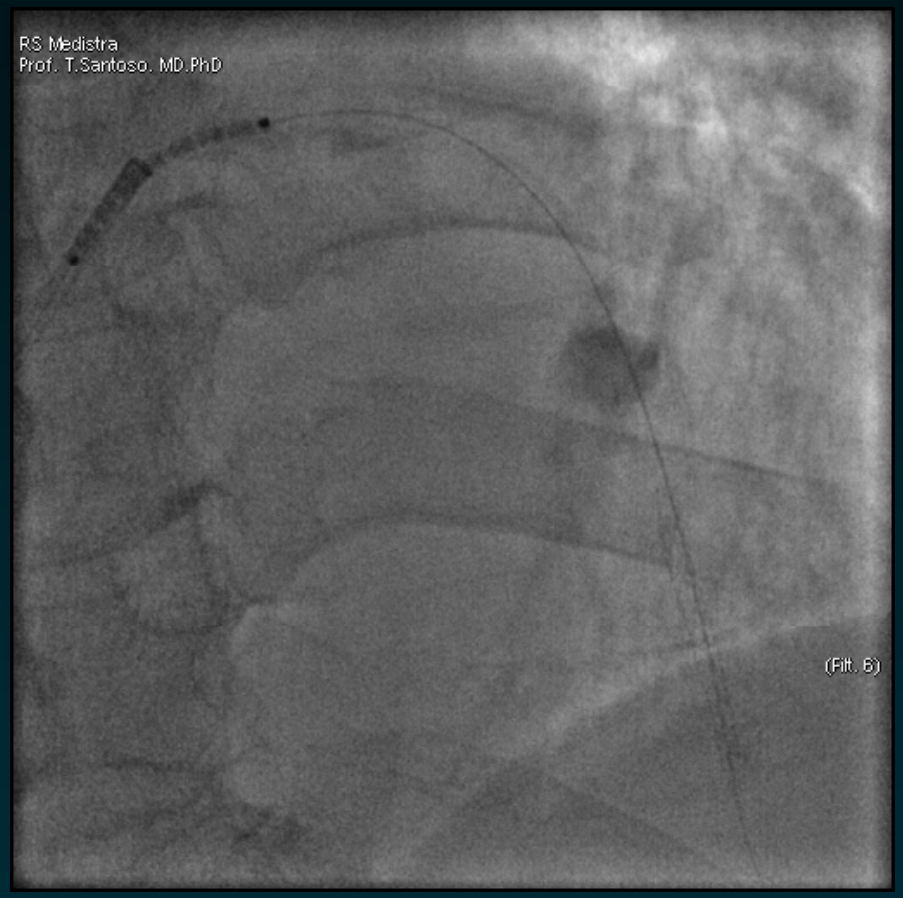
- Type 1: extraluminal crater without extravasation
- Type 2: pericardial or myocardial blush without contrast jet extravasation
- Type 3: extravasation through a ≥ 1 mm perforation
- Type 4: cavitary spilling (in which perforation empties into an anatomic cavity, i.e.: RV. LV, coronary sinus, etc)

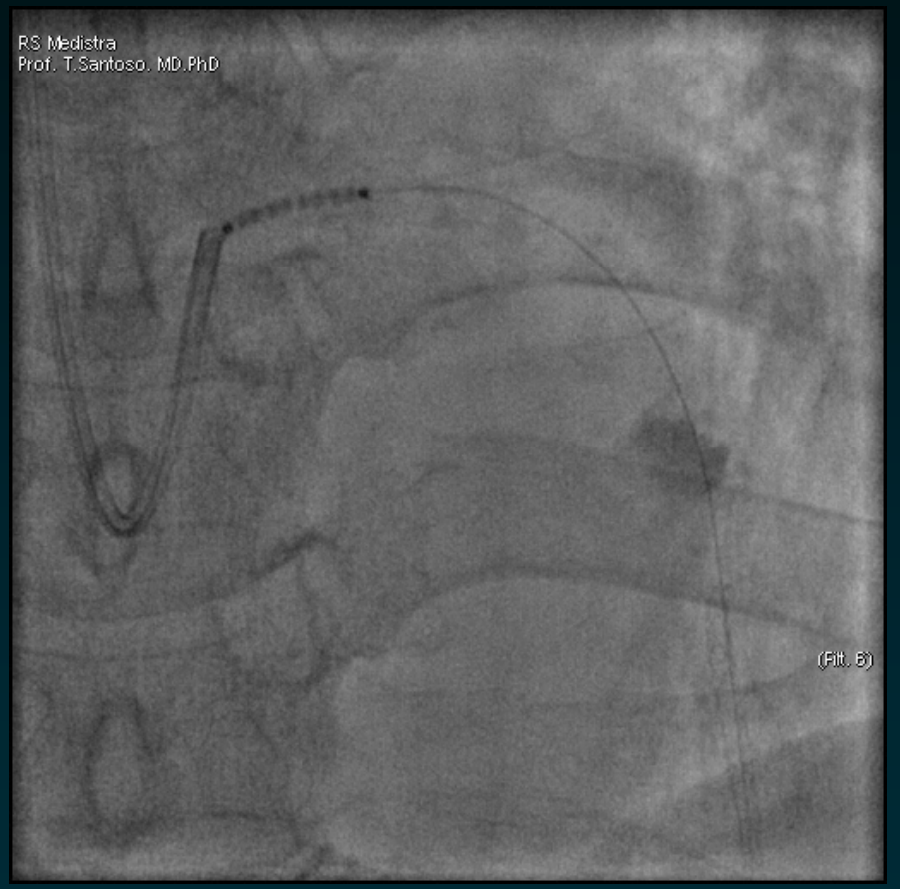
Ellis, S, et al. Circulation 1994;90:2725-30

What would you do ?

1. Neutralize heparin
2. Immediately send the patient for CABG
3. Immediately introduce a balloon to seal the leakage
4. Immediately introduce a stent
5. Immediately introduce a covered stent

- **Patient became restless, chest pain continued**
- **BP rapidly declined to 65/40**



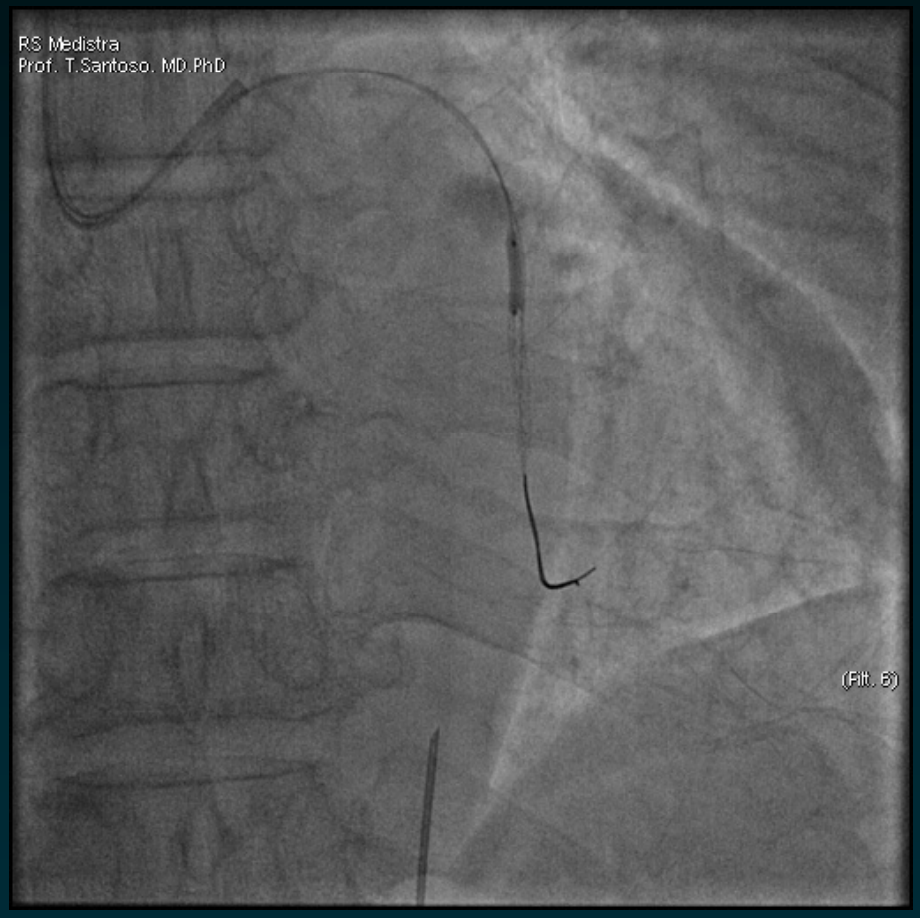


Failure to introduce stent-grafts (Graft Master 3.0/26 mm, then 3.0/16 mm), mainly because of LADp calcification

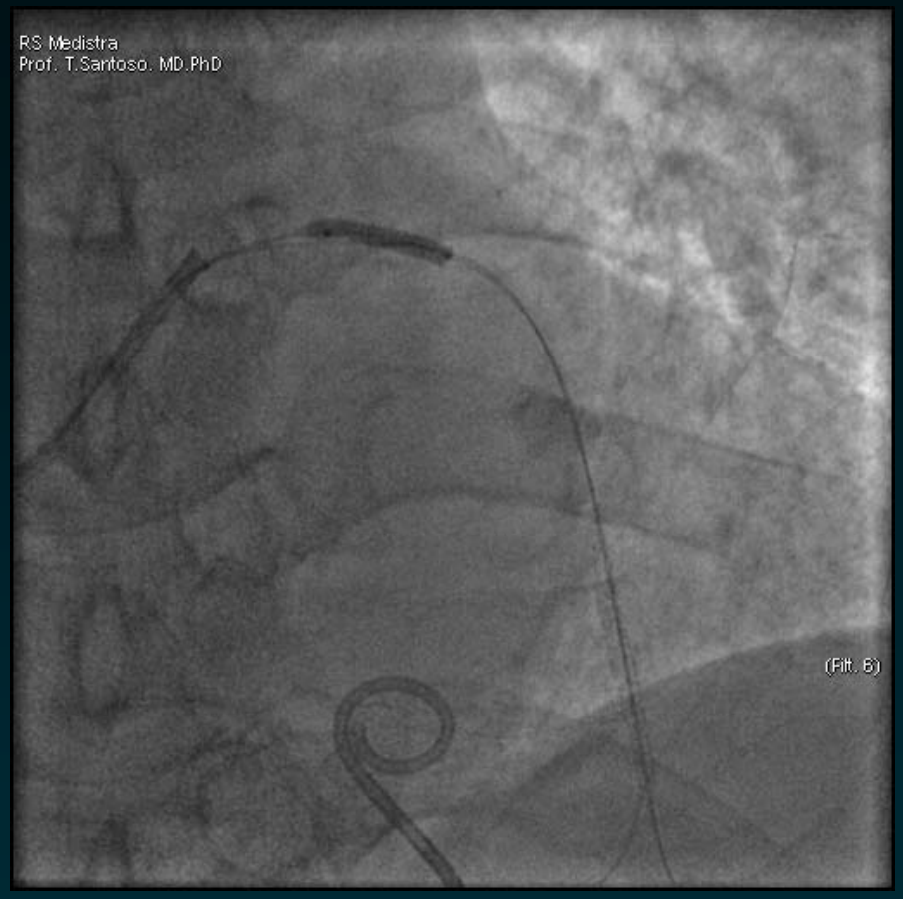
What would you do ?

1. Think of tamponade, ask for an echomachine
2. Immediately send the patient for CABG
3. Immediately administer vasopressors
4. Immediately introduce an IABP
5. Immediately inject local intracoronary thrombin, or coils

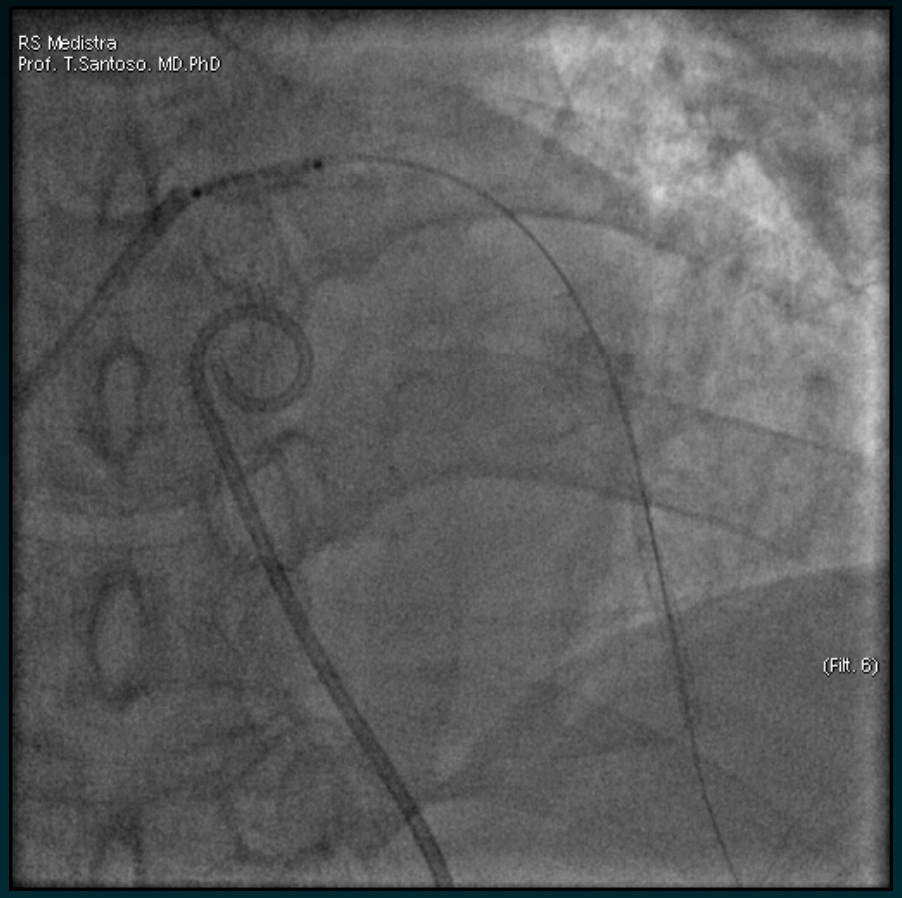
- **Patient became restless, chest pain continued**
- **BP rapidly declined to 65/40**



Temporary sealing of perforation with balloon.
Fluoro-guided pericardiocentesis



Further LADp dilatation with bigger NC balloon (2.75/15 mm)



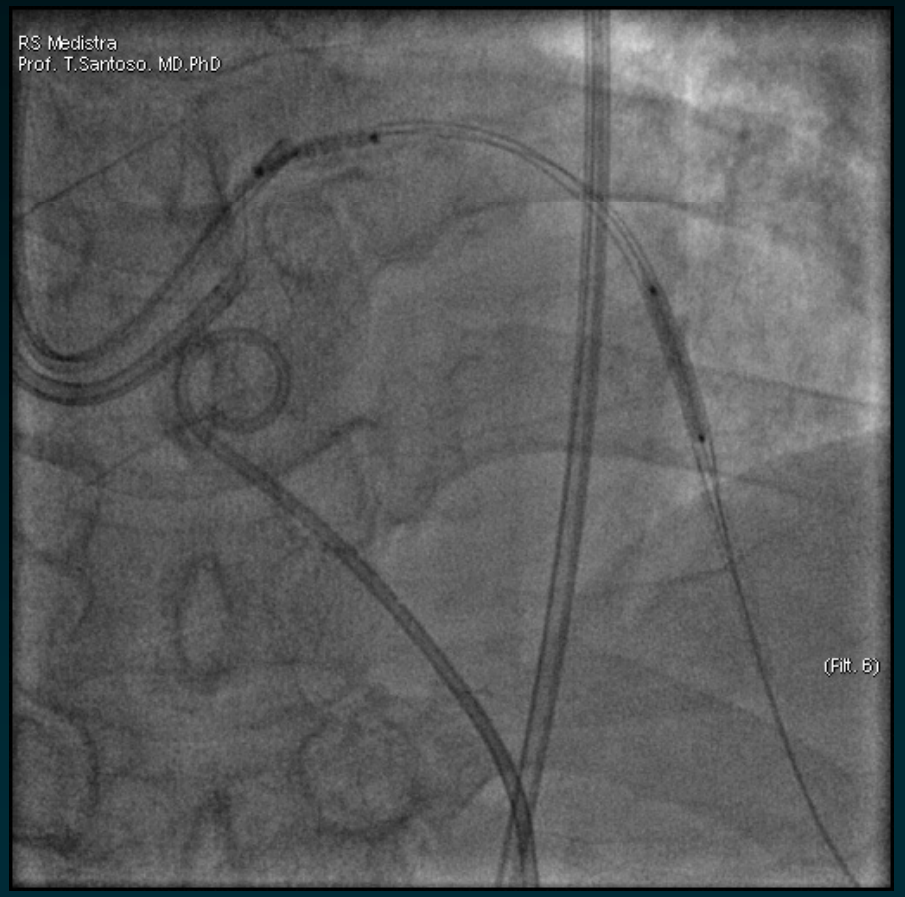
Stent graft still could not be introduced, even with te buddy wire technique

What would you do ?

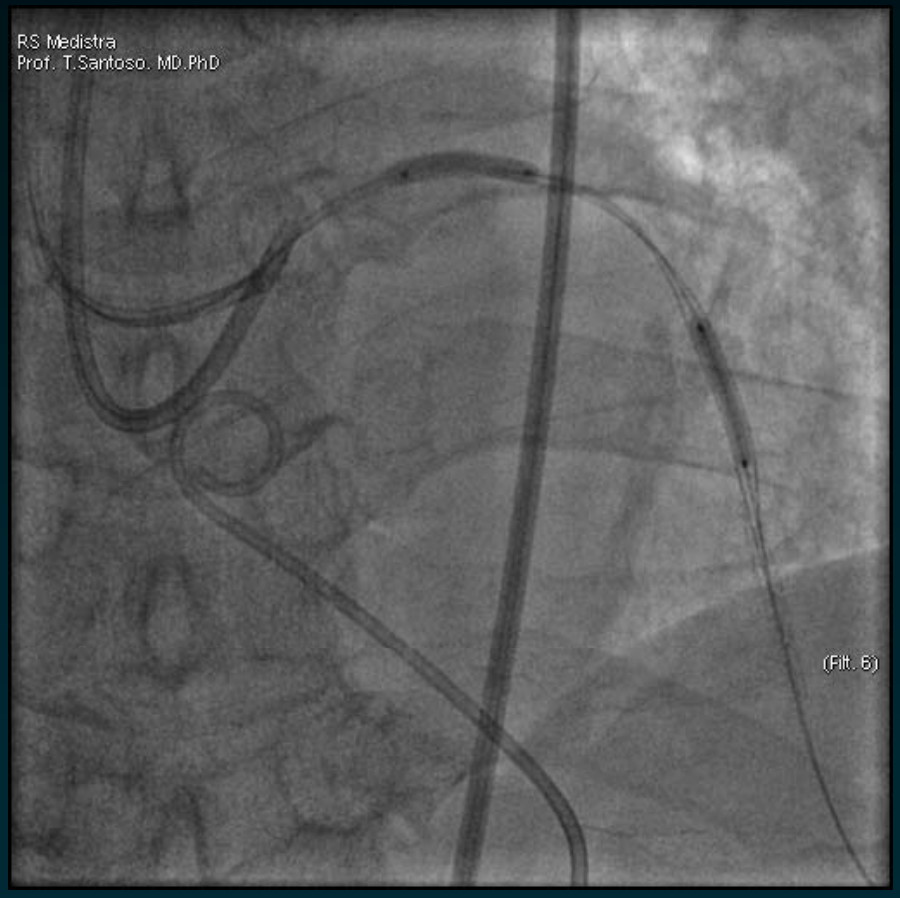
1. Seal the leakage with balloon & send the patient for CABG
2. Seal the leakage wih balloon & ask further advice from your colleague
3. Tell the family that you give up

- **As buddy wire technique failed & buddy balloon technique could not be applied (7F GC could not accommodate one stent graft & one balloon), a second GC was introduced with the femoral approach**

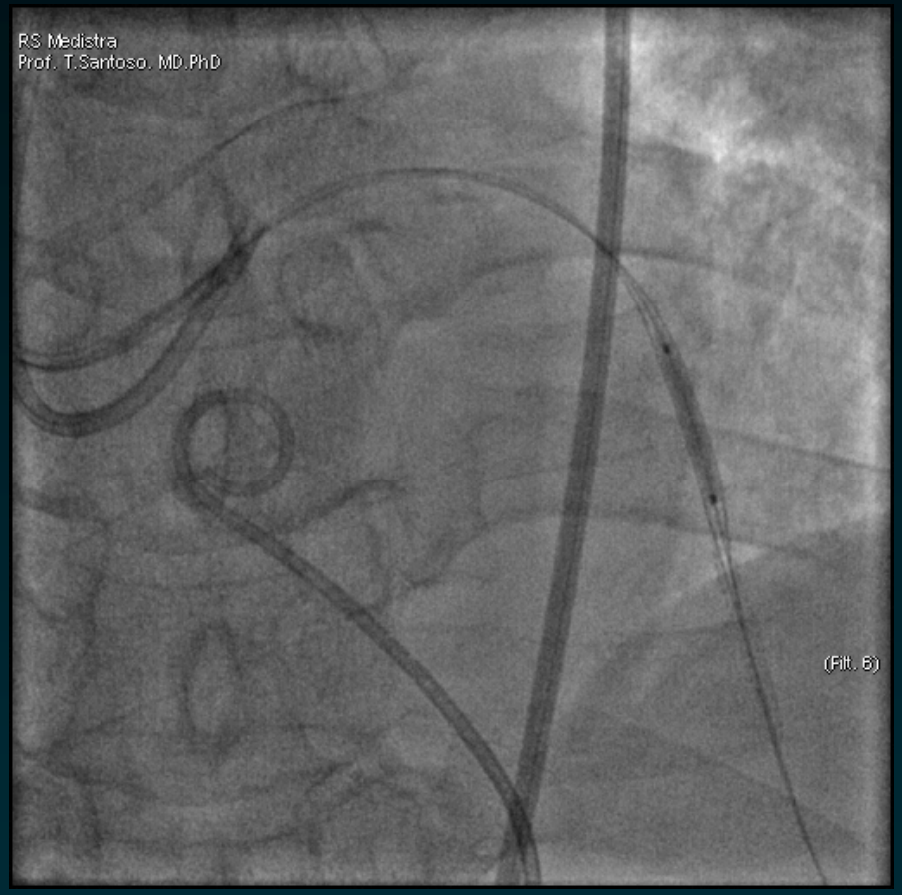
GW from the 2nd GC was trapped with balloon introduced from the 1st GC



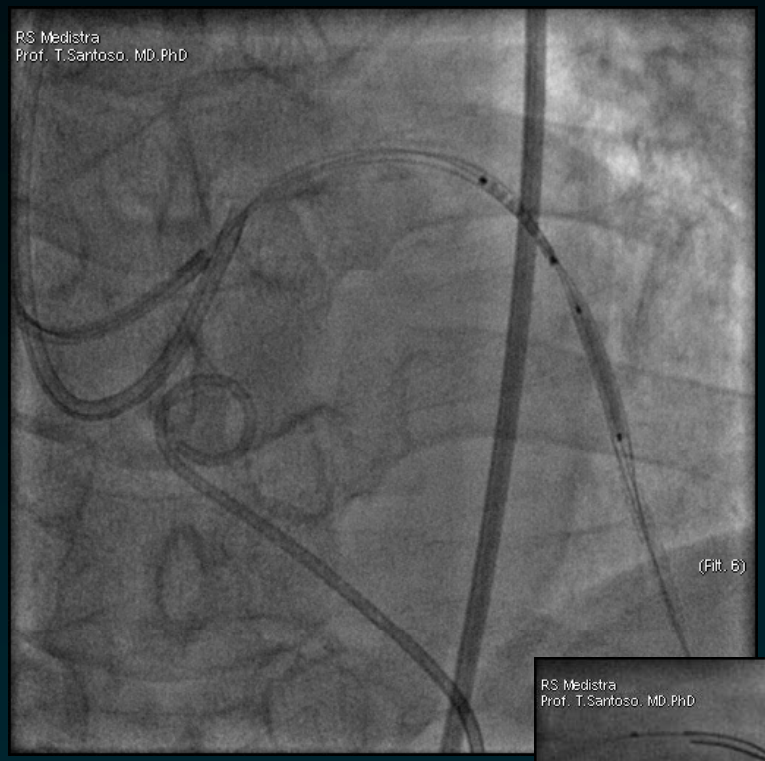
Stent graft still could not be introduced

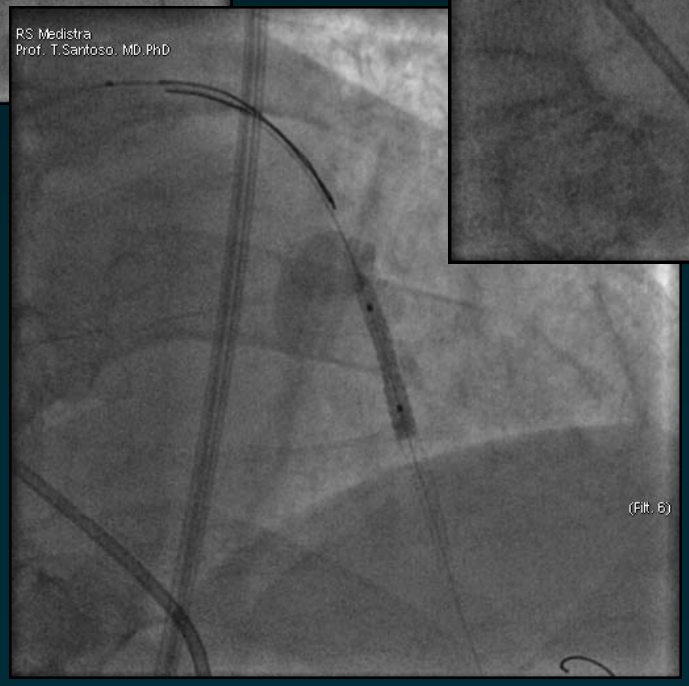


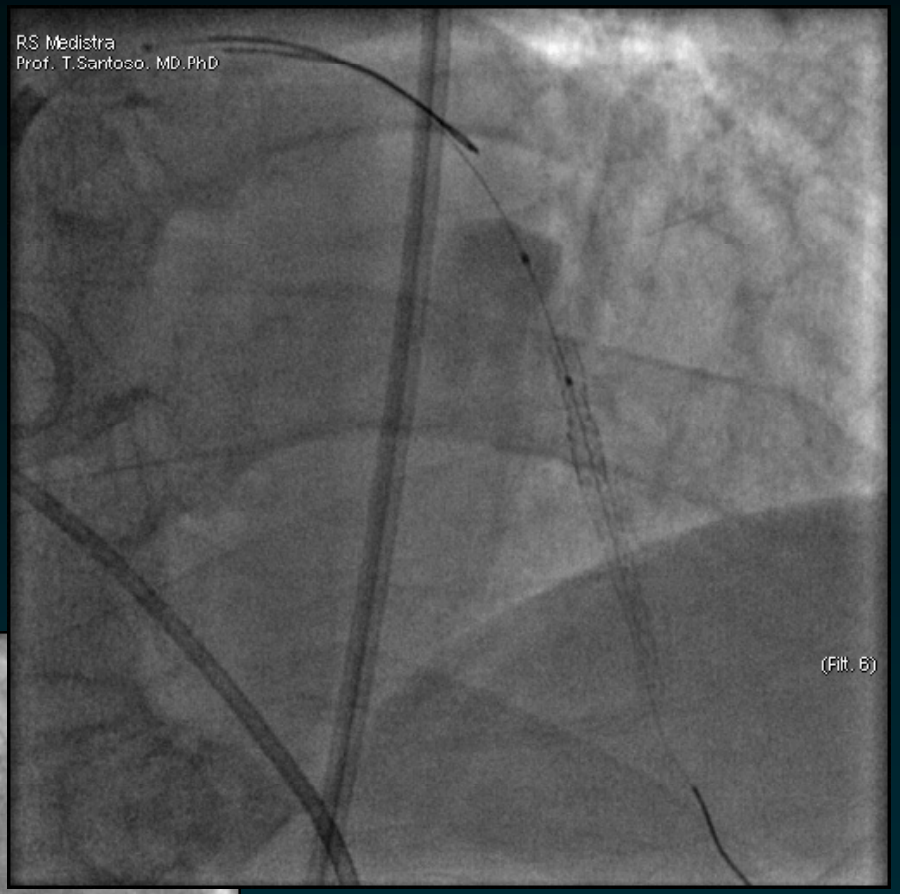
More aggressive LADp dilatation



Worse spiral dissection in LADp

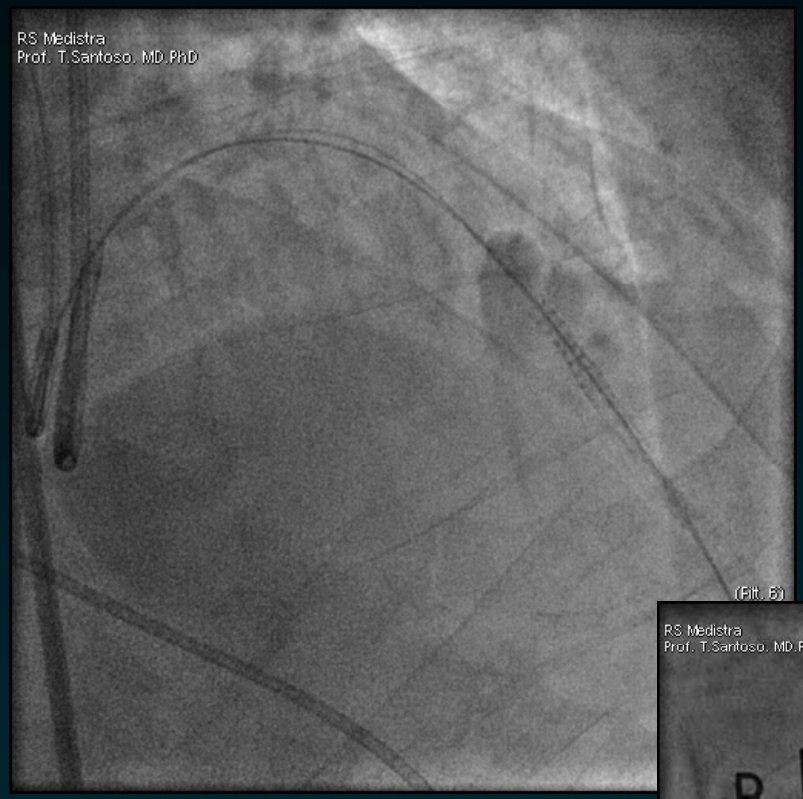




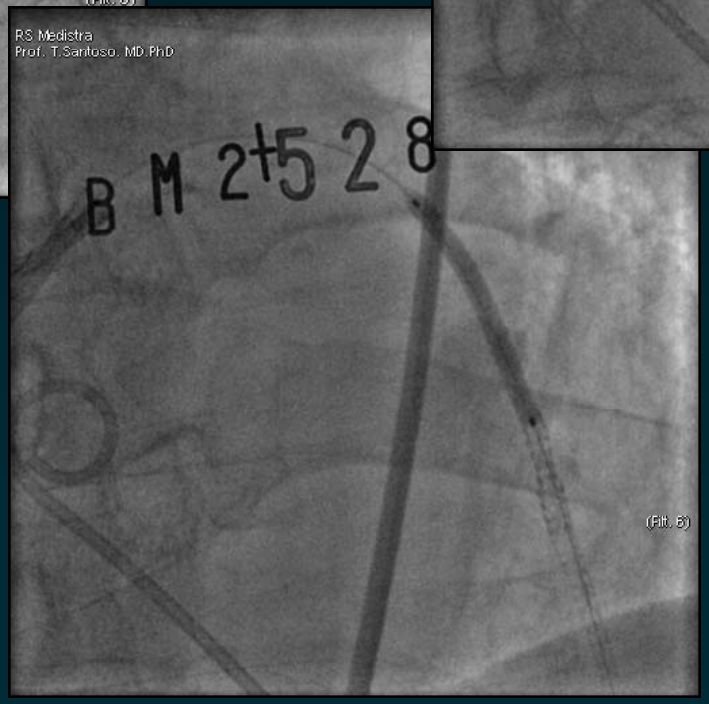


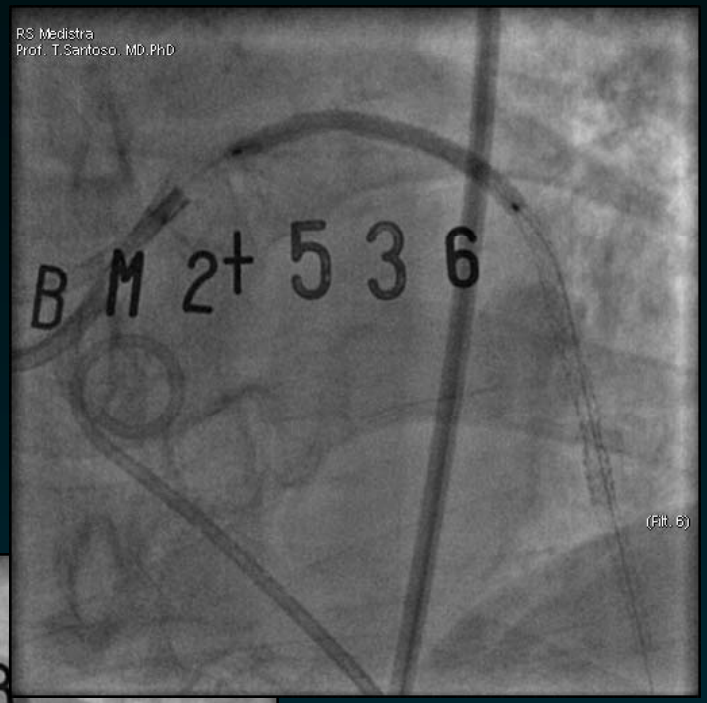
Finally, with this anchor technique, stent graft could be introduced & implanted in the perforated segment

Sealing of perforation



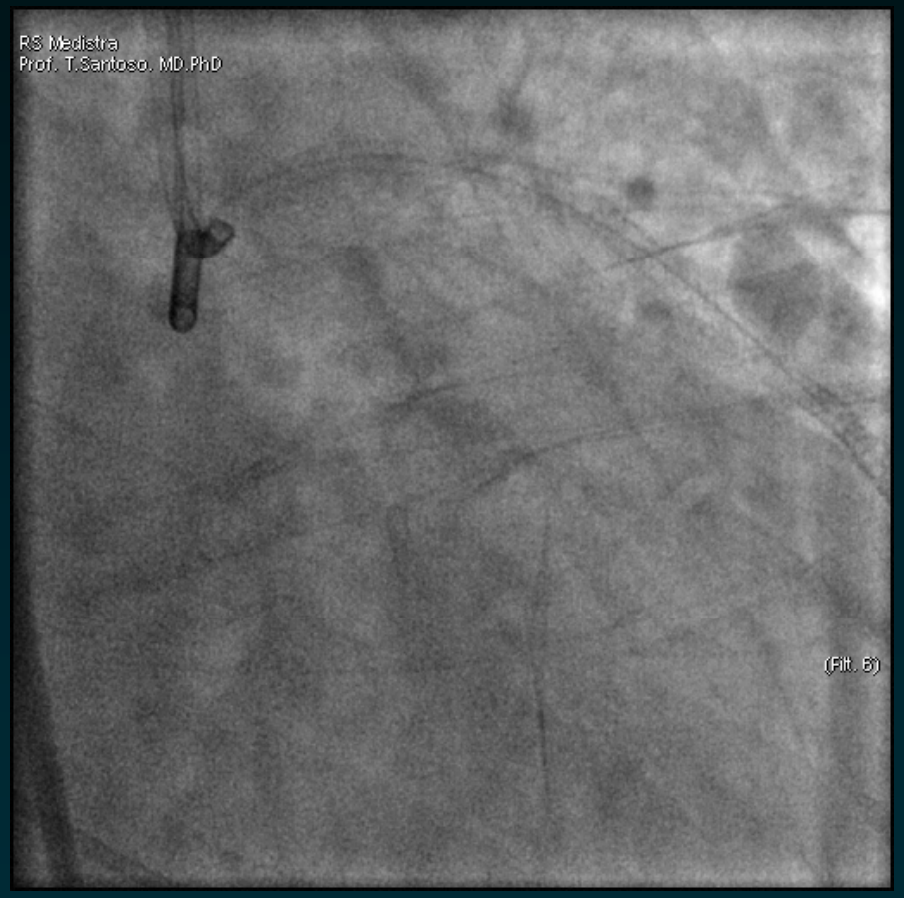
Sealing of perforation





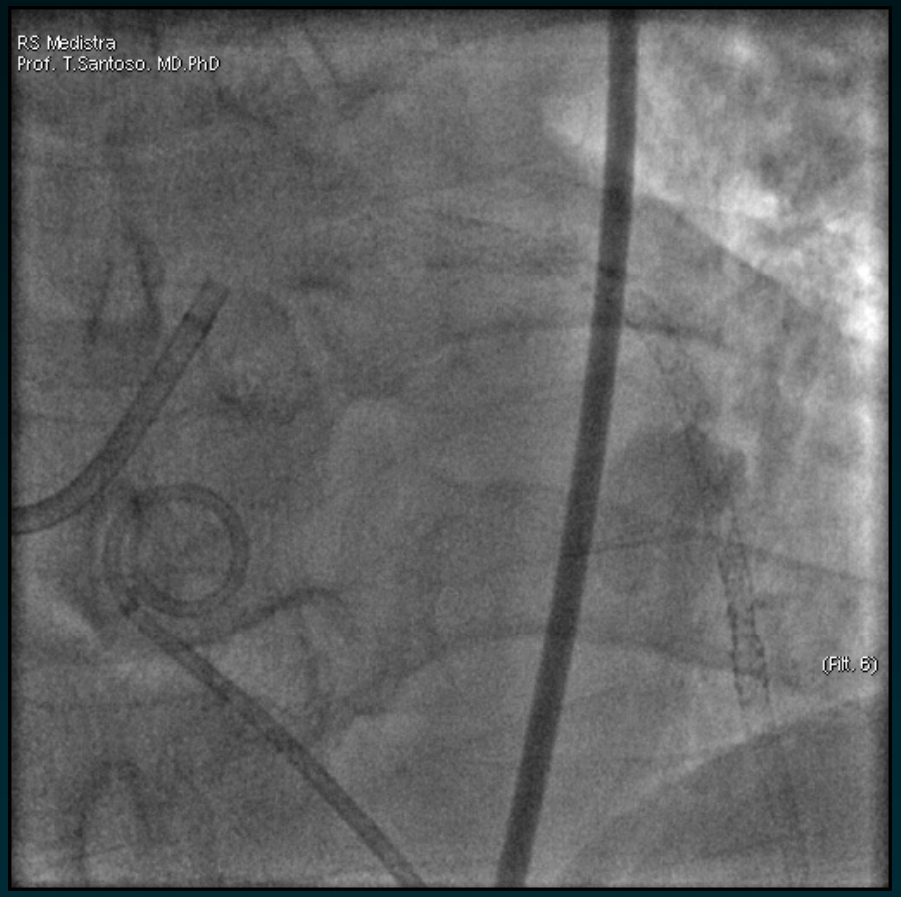
LADm & LAD os/p stenting (all stents were overlapping one to each other)

Final result

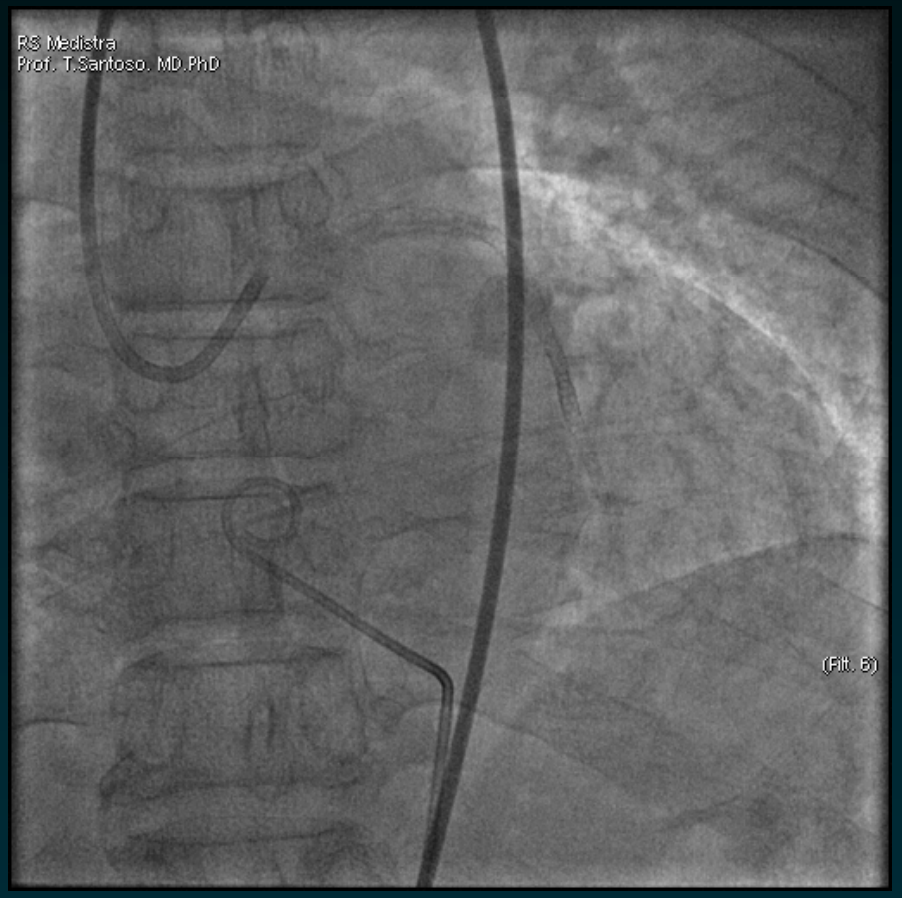


Good result , no perforation

Final result



Good result , no perforation



No pericardial effusion on fluoro (pig tail catheter was withdrawn the next day)

Take home message

- Coronary artery perforation is a serious complication & is inevitable in any high volume center
  - If you never experience perforation, probably you are under-dilating lesions & under-deploying stents
- Over-aggresive stenting is an increasingly common cause of perforation (IVUS is always helpful)
- Be careful if the lesion is calcified & eccentric
- Fluoro-guided pericardiocentesis is better & faster than echo-guided pericardiocentesis
- Covered stent is the treatment of choice
  - However, they require large bore GC, difficult to introduce & deploy & the restenosis rate is high
- Think of using two GC at times