Aorto ostial dissection..

Ad hoc treatment or wait?

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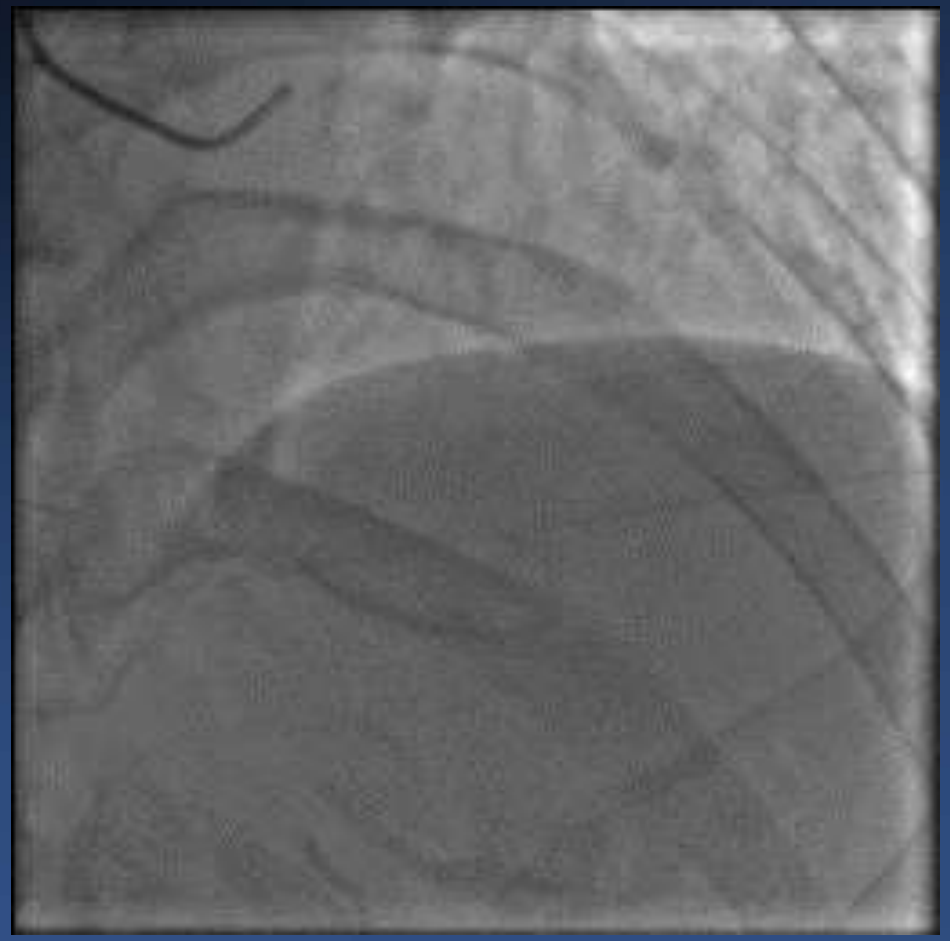
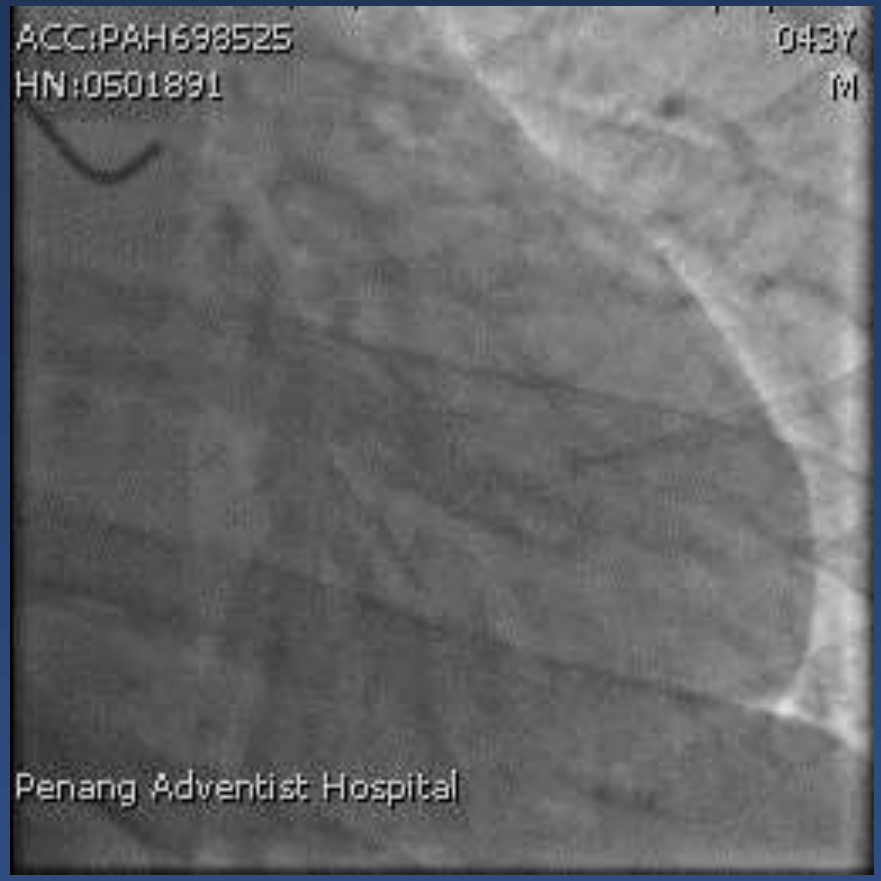
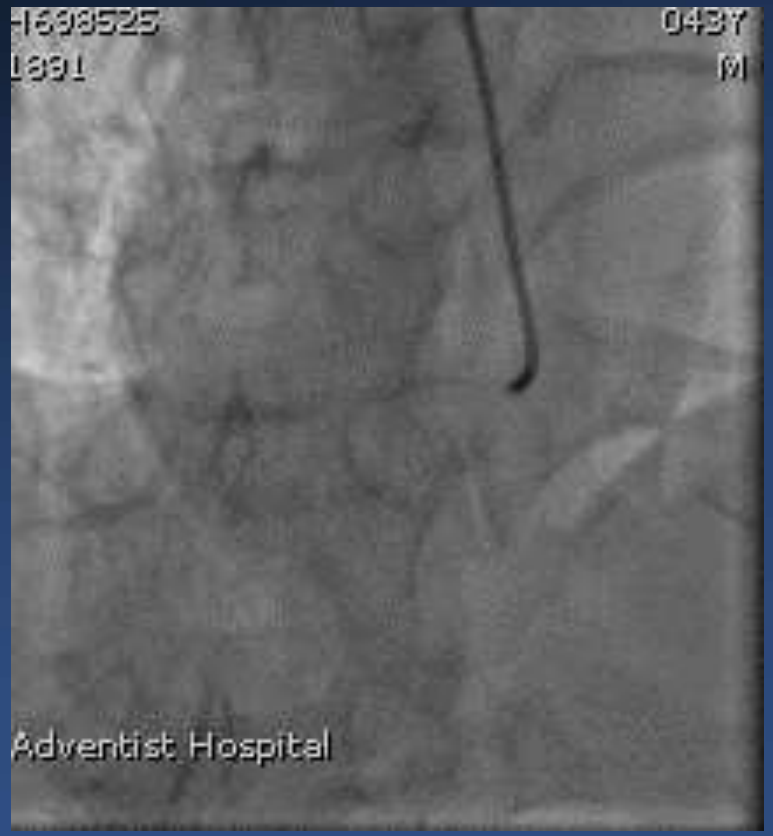
- 43 years old gentleman
- AUG 2018 worsening effort angina
- NYHA II hypertension (poor control)
- Smoker, non diabetic
- Pink, not in heart failure
- BP 160/90mmHg
- LDL>4mmol/L
- Normal renal function
- Proteinuria 1+
- LVH on ECG
- Exercise ECG positive at moderate workload

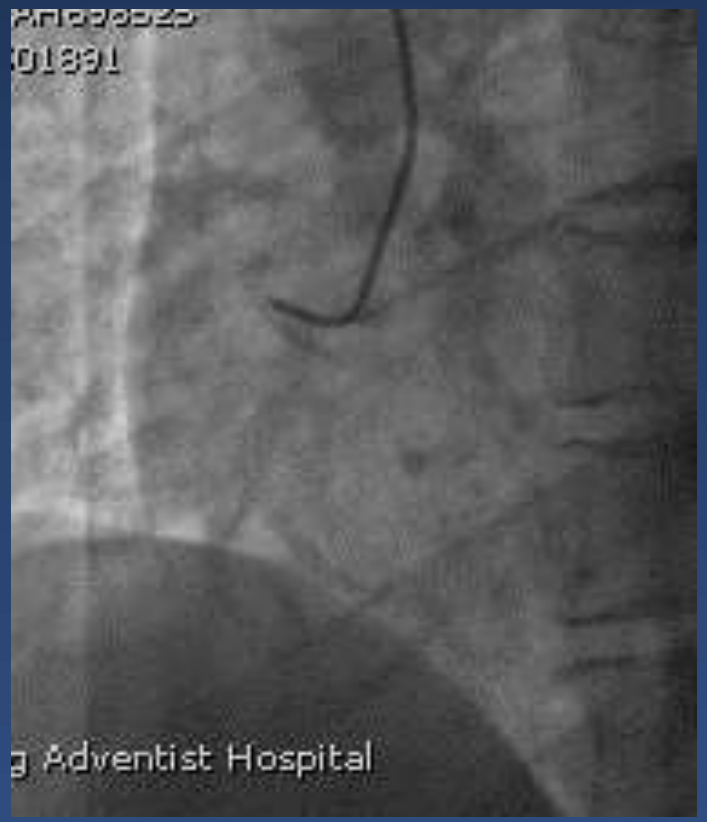
Left system…



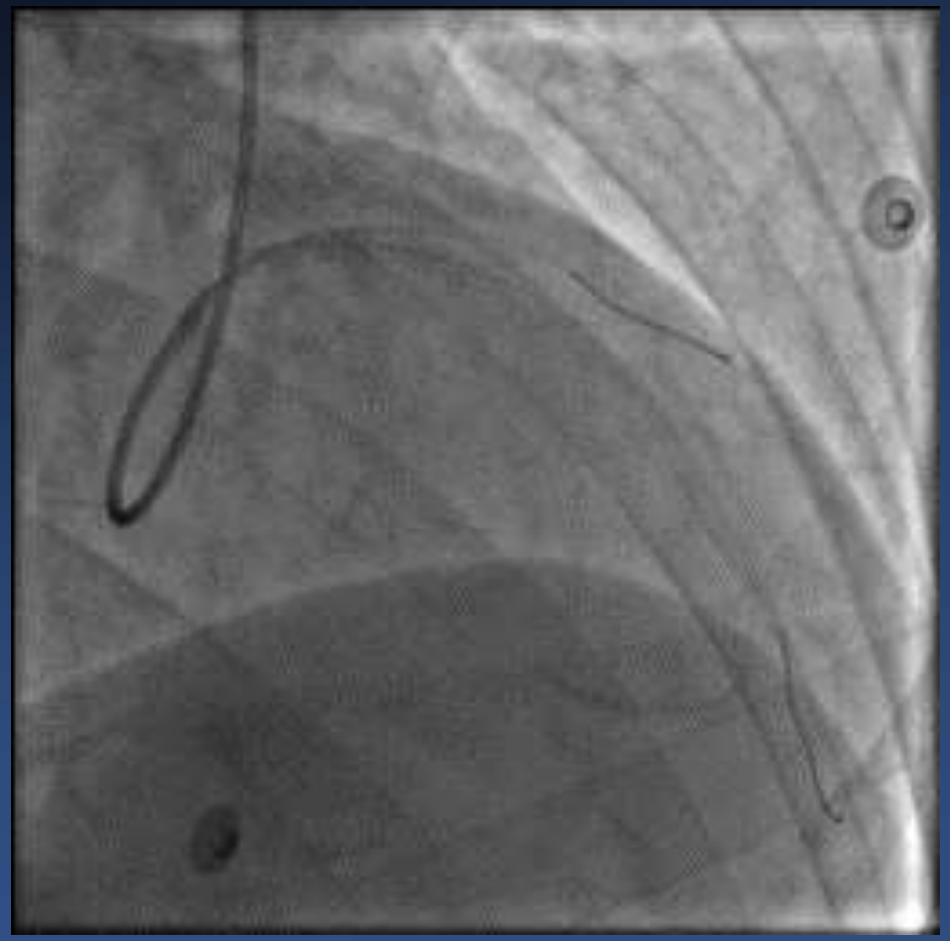


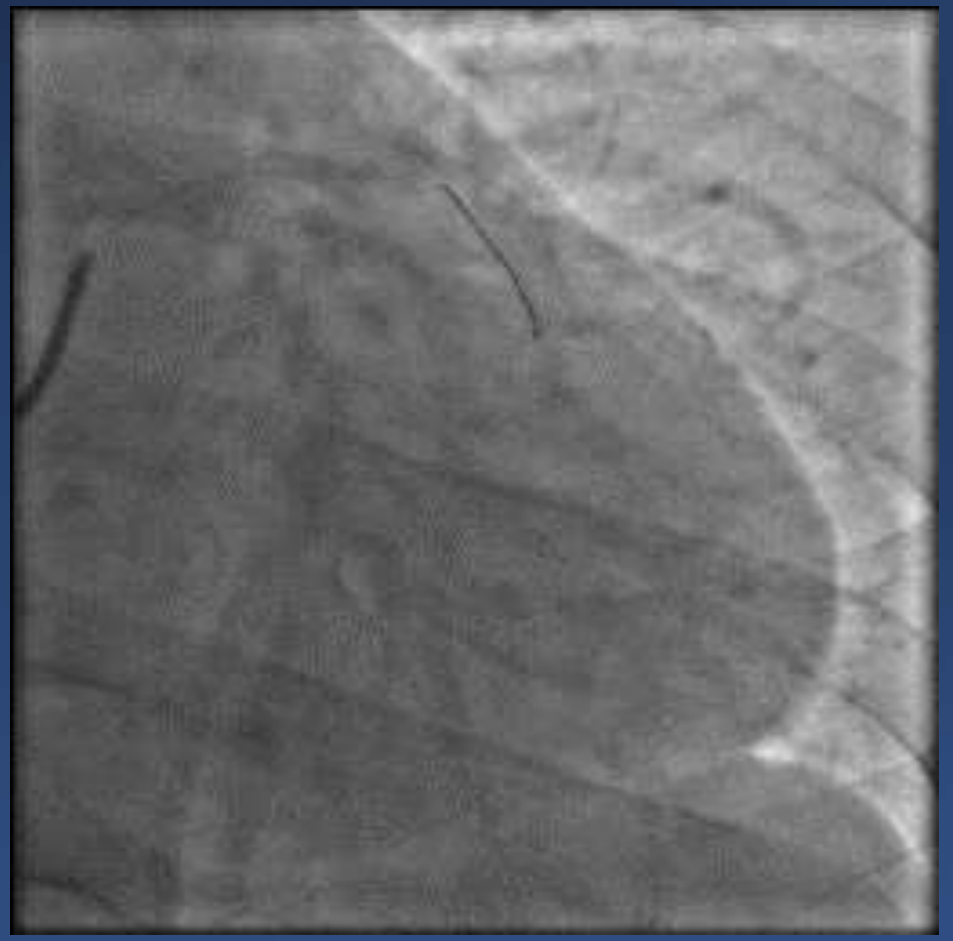
Study of the Right system





Planned PCI





Flow of procedure…

- ® radial
- 6F sheath 6F EBU
- Versaton guidewire

- Sapphire 2.5x15 14 atm
- **ULTIMASTER 3.0 x 24 16 atm**

- POSTDILATION.. Sapphire NC 3.5mm x 10 20 atm

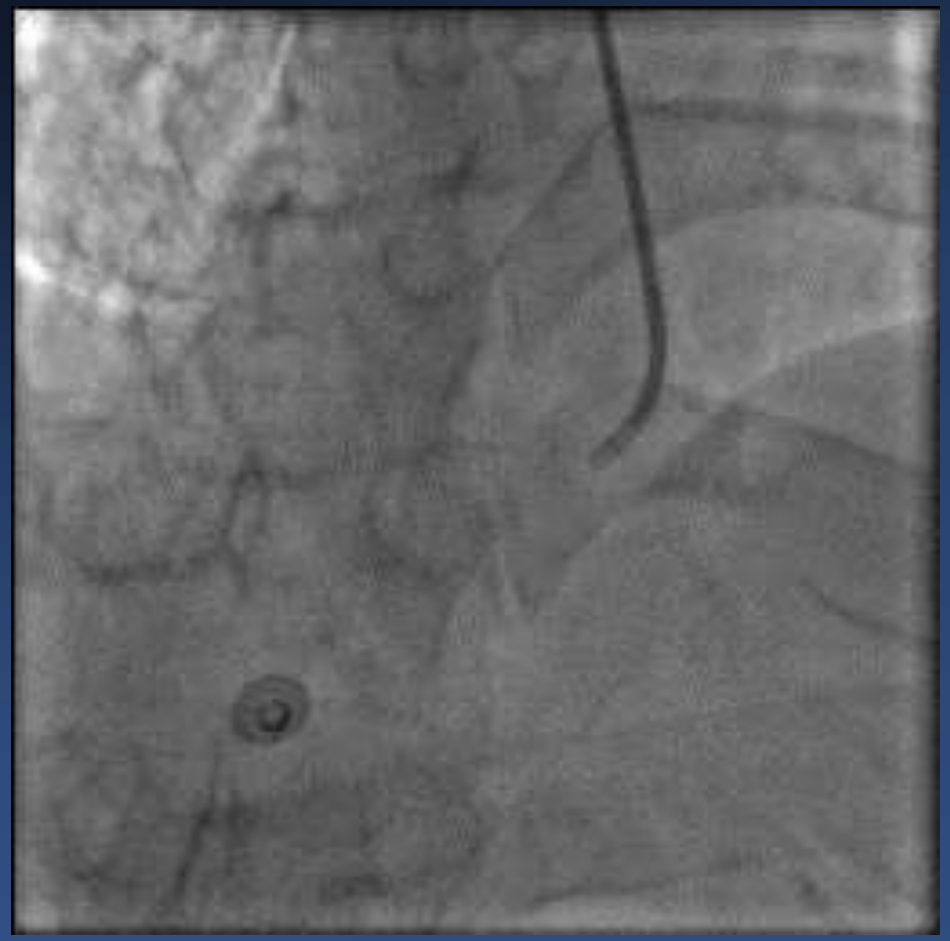
- All looks good… until engagement of the right coronary With 6F JR4…..

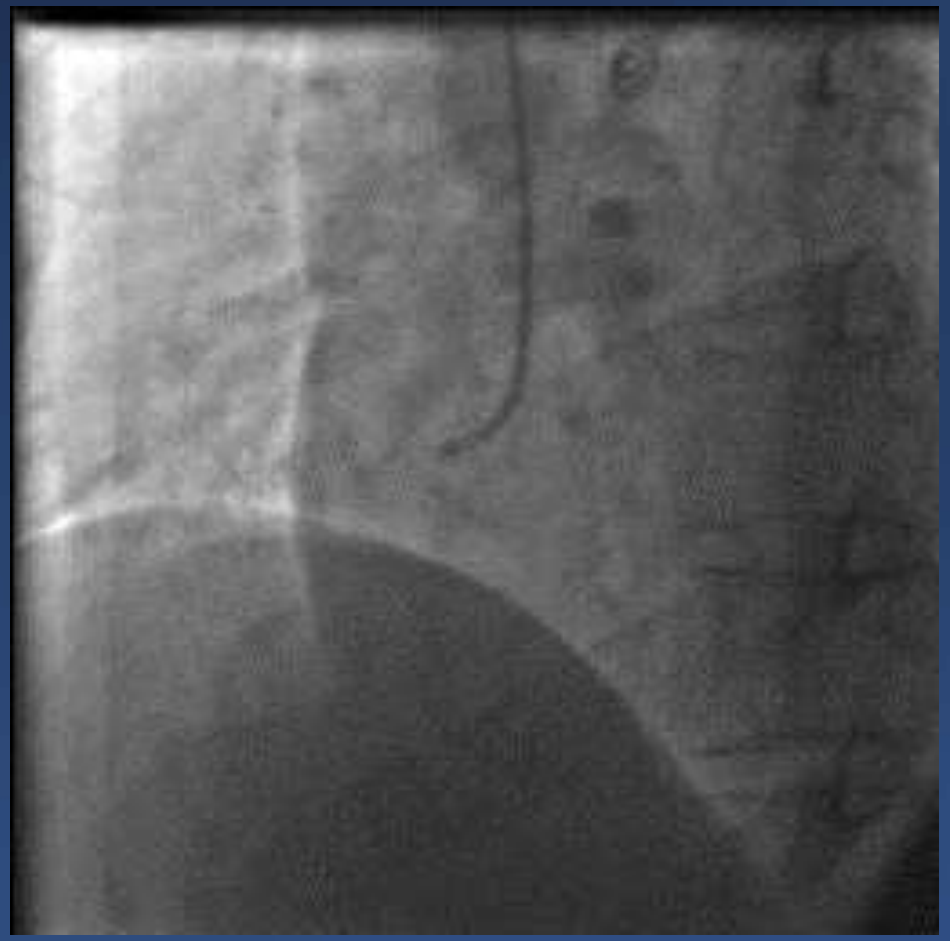
- No pressure damping,

- JR appear coaxial and

- no forceful contrast injection

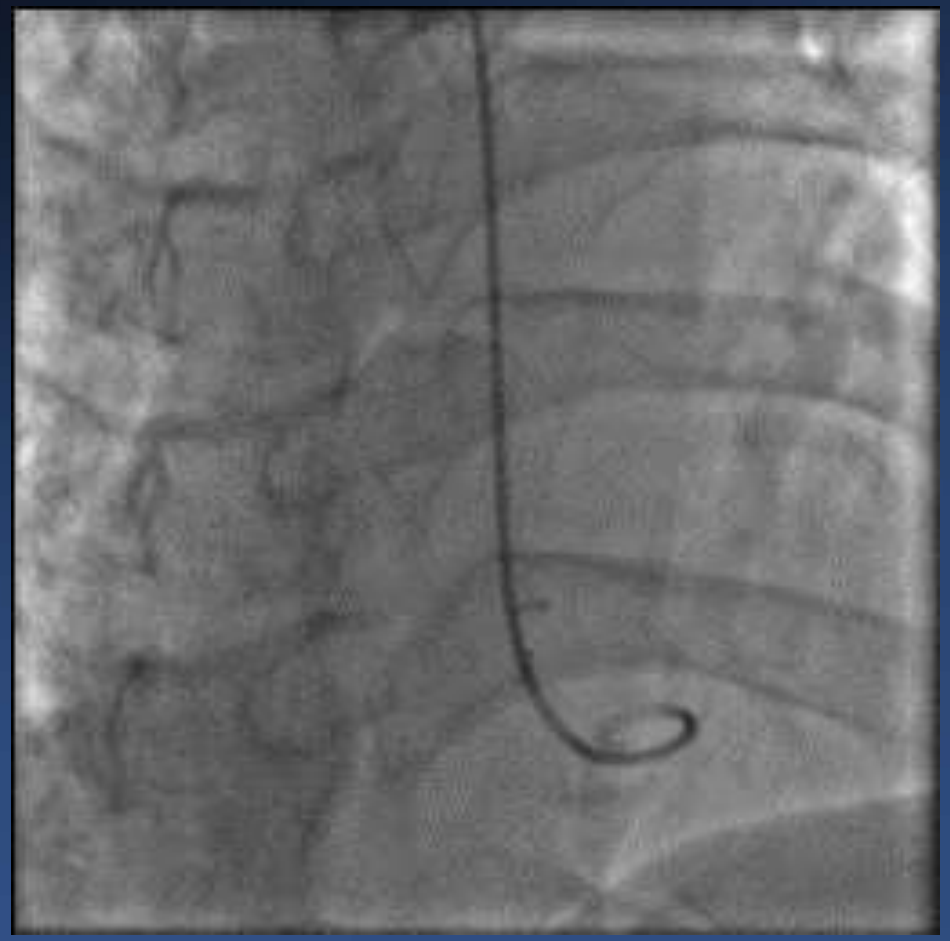
Right system should be straight forward but…





Ostial RCA dissection with localized right aortic root involvement.

Current problems…



- No angina
- Hypertensive but not tachycardic
- ECG: no ST changes.
- Bedside echo: NO aortic regurgitation, no pericardial effusion

Options

- Conservative treatment… “wait and see”
- Salvage of RCA and seal the entry point of the aortic dissection to prevent further aortic extension. (DES or covered stent?)
- Surgical management..

Tanasie C, Chandonnet M, Chin A, *et al.* Catheter-induced aortic dissection after invasive coronary angiography: Evaluation with MDCT. AJR Am J Roentgenol 2011; 197(6): 1335-40.
[http://dx.doi.org/10.2214/AJR.10.6133] [PMID: 22109287]

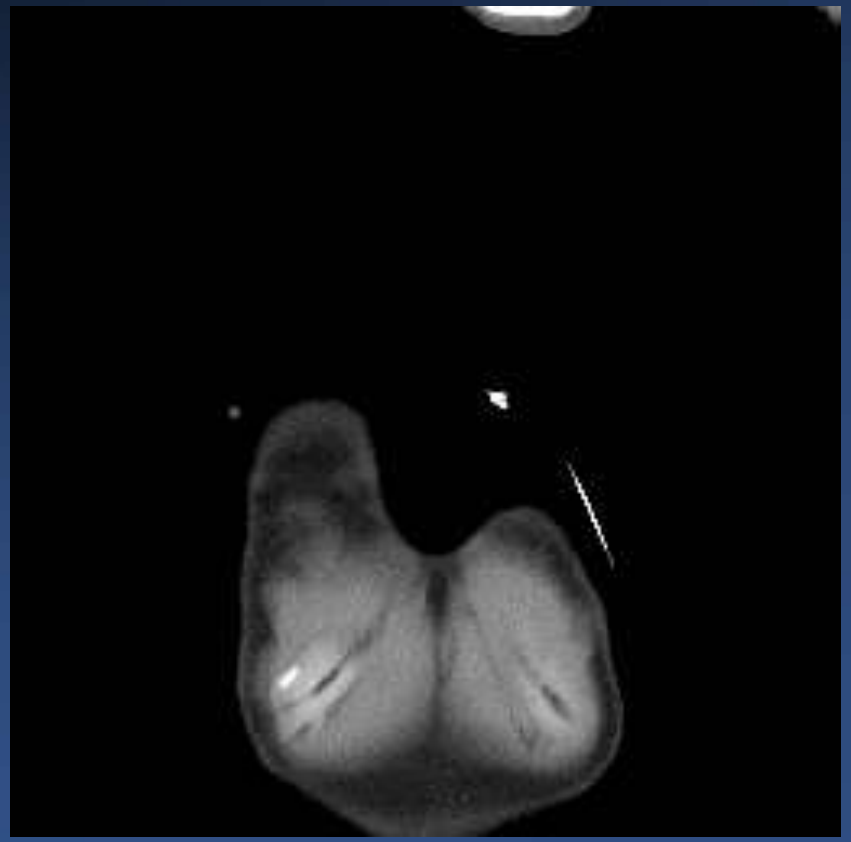
Doyle B, Juergens CP. Conservative management of ascending aortic dissection caused by percutaneous coronary intervention. J Invasive Cardiol 2004; 16(2): 92-4.
[PMID: 14760202]

After discussing with patient/family and CT surgeon

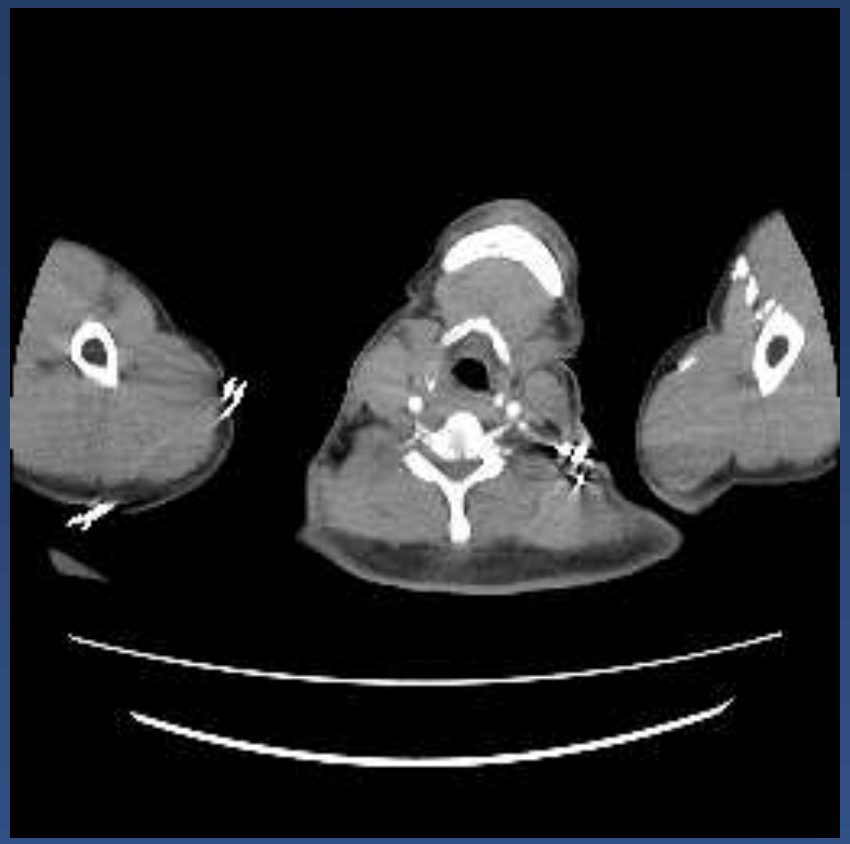
DECIDED TO STOP AND MANAGE CONSERVATIVELY….

In ICU, stable with well controlled BP and HR

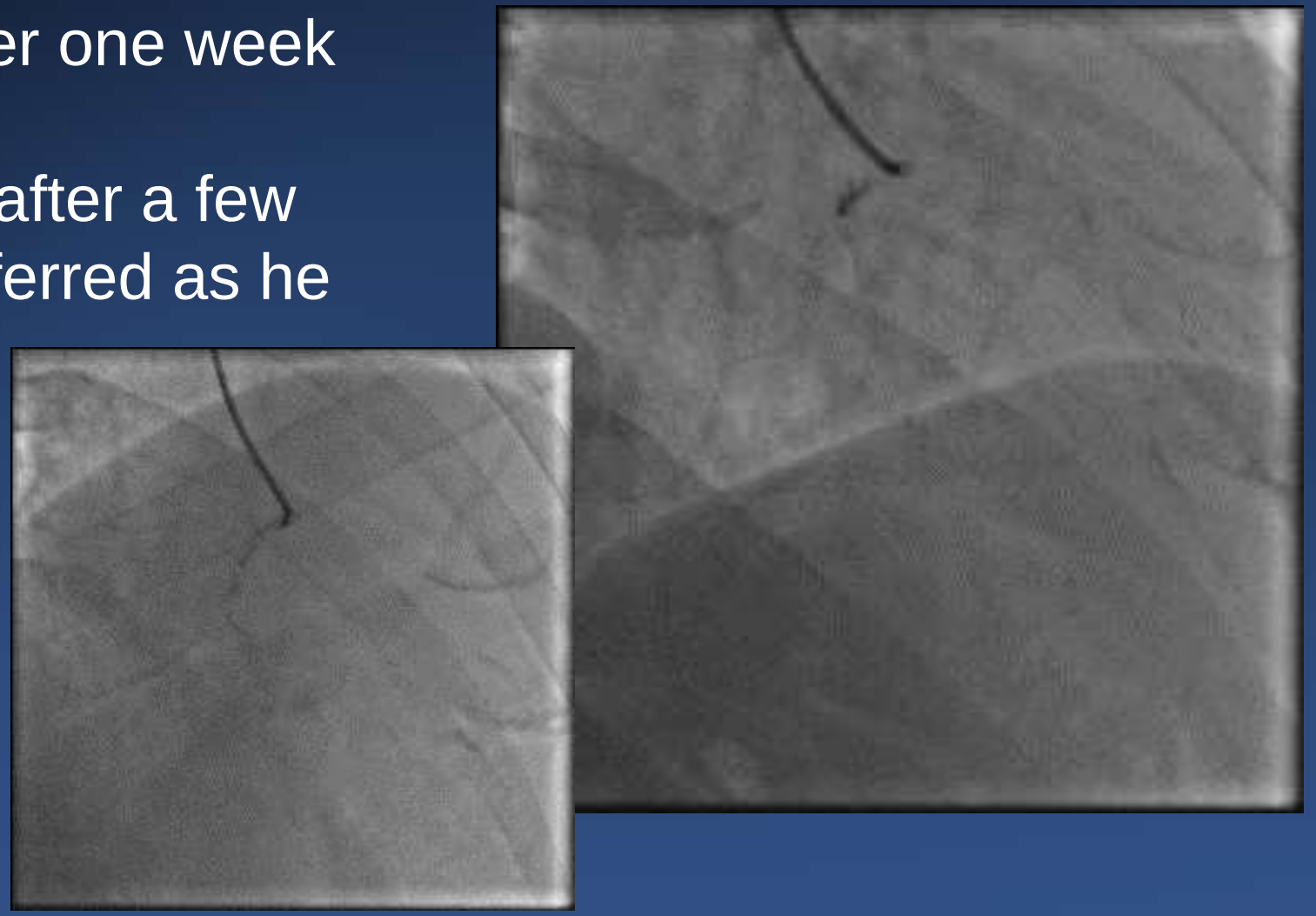
No obvious aortic dissection even a t the root level..



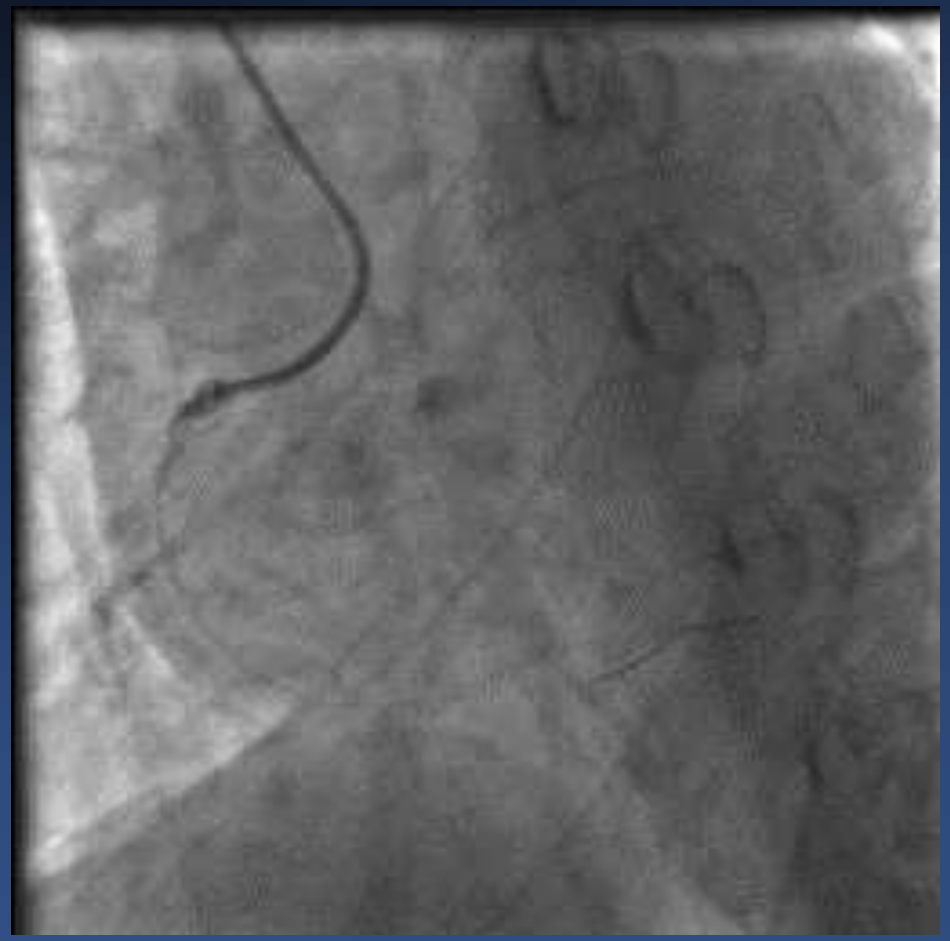
No progression…

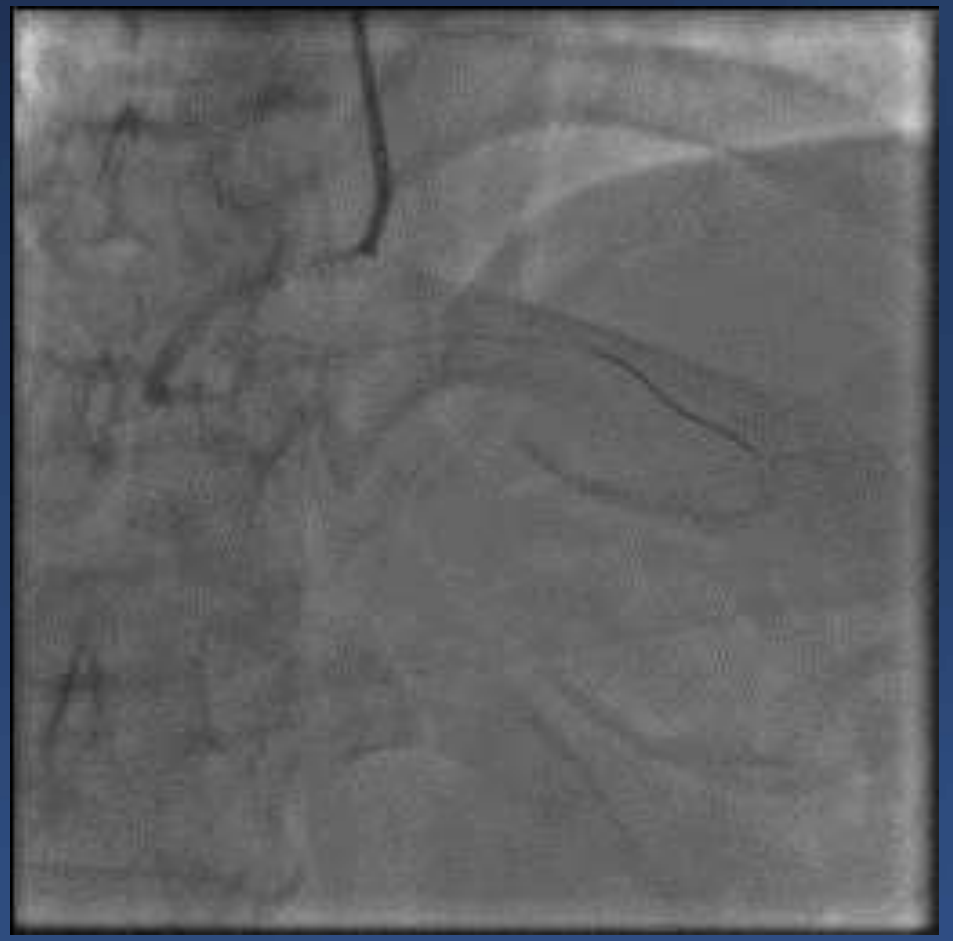


- Discharged well after one week
- Planned to restudy after a few weeks but patient deferred as he remained well

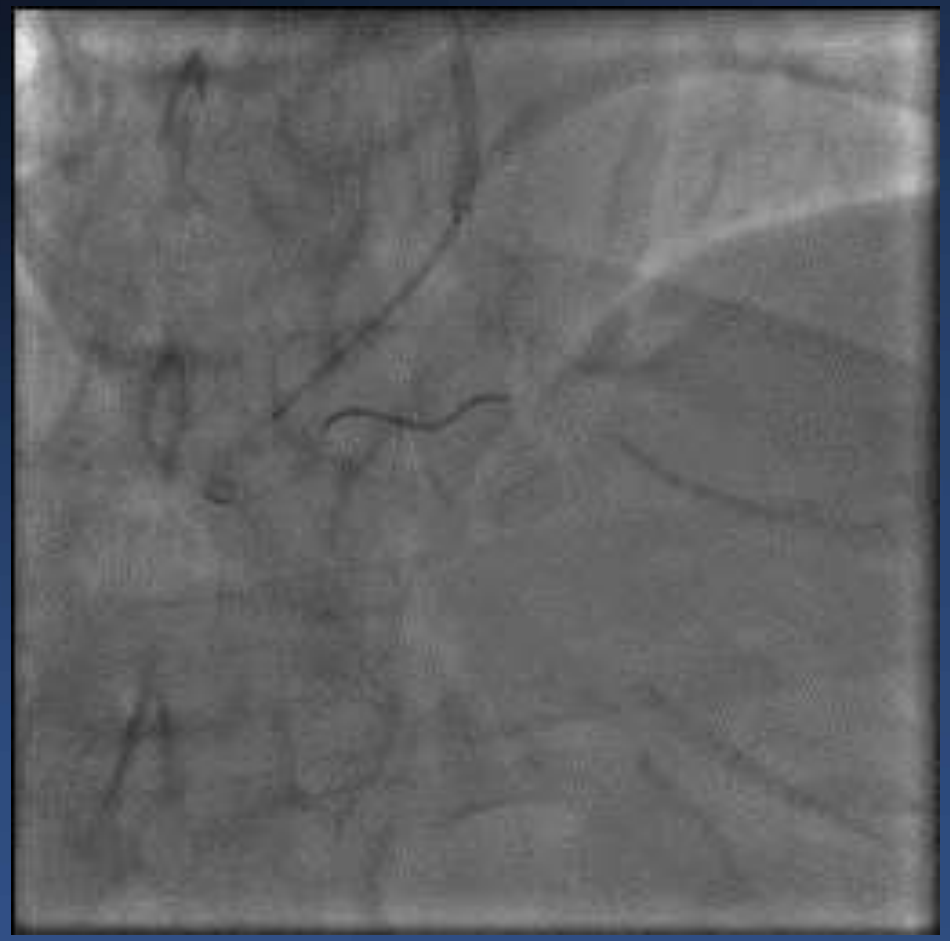


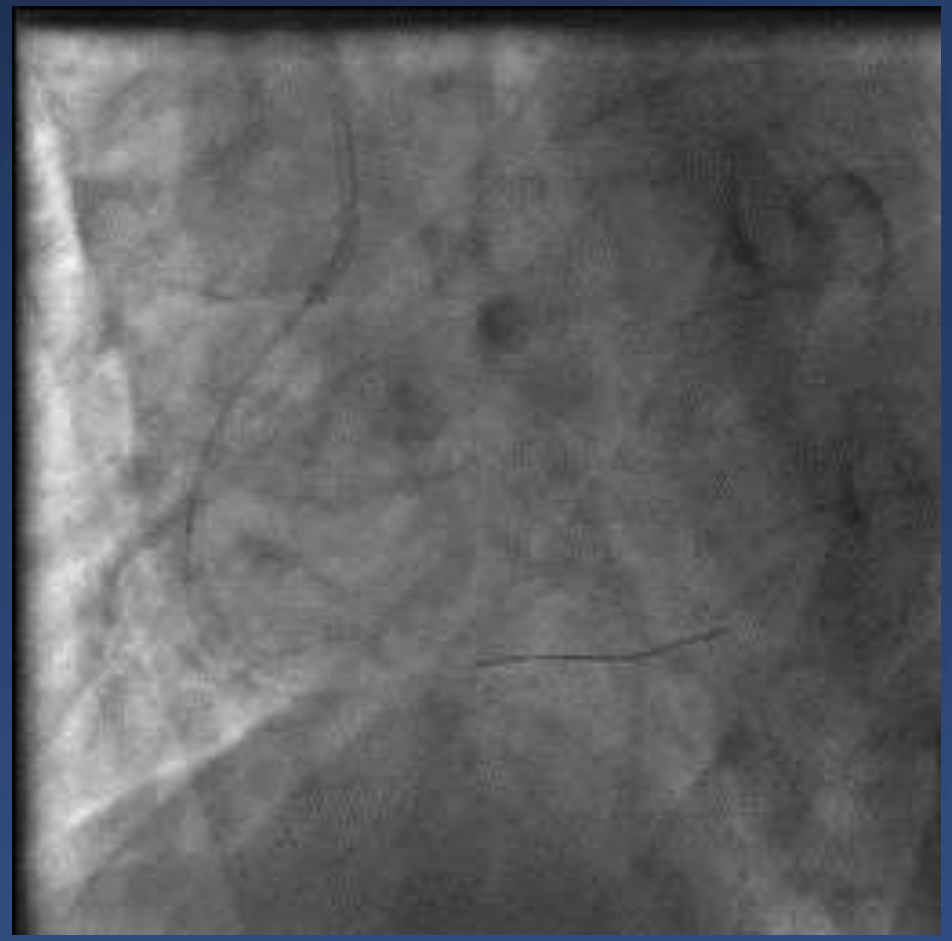
Proceeded



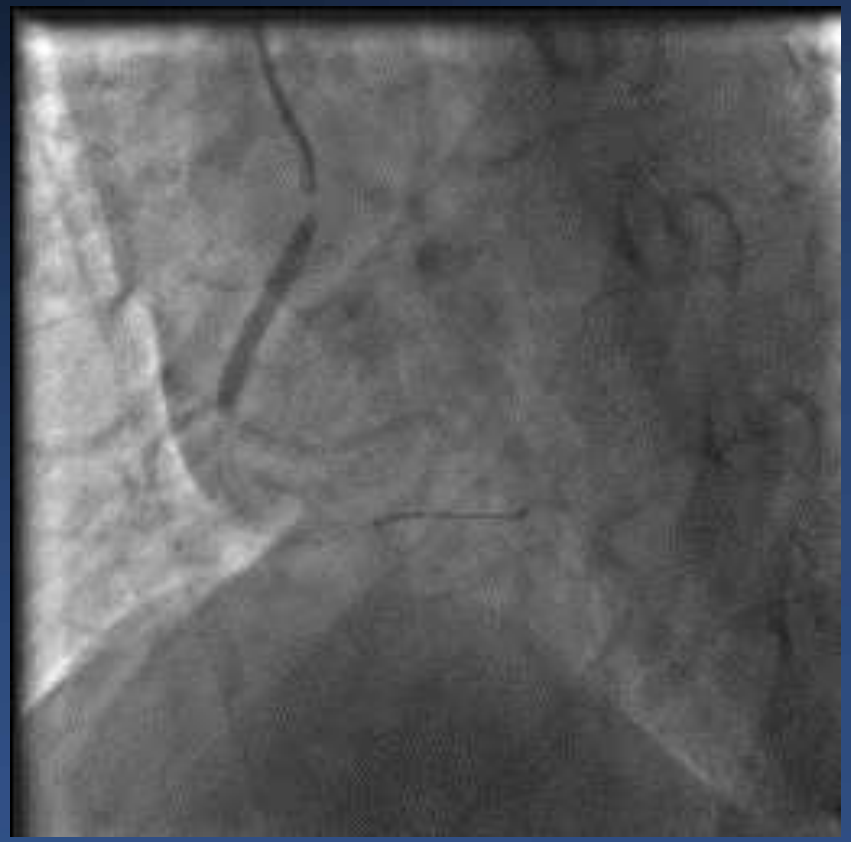


Ostial positioning….



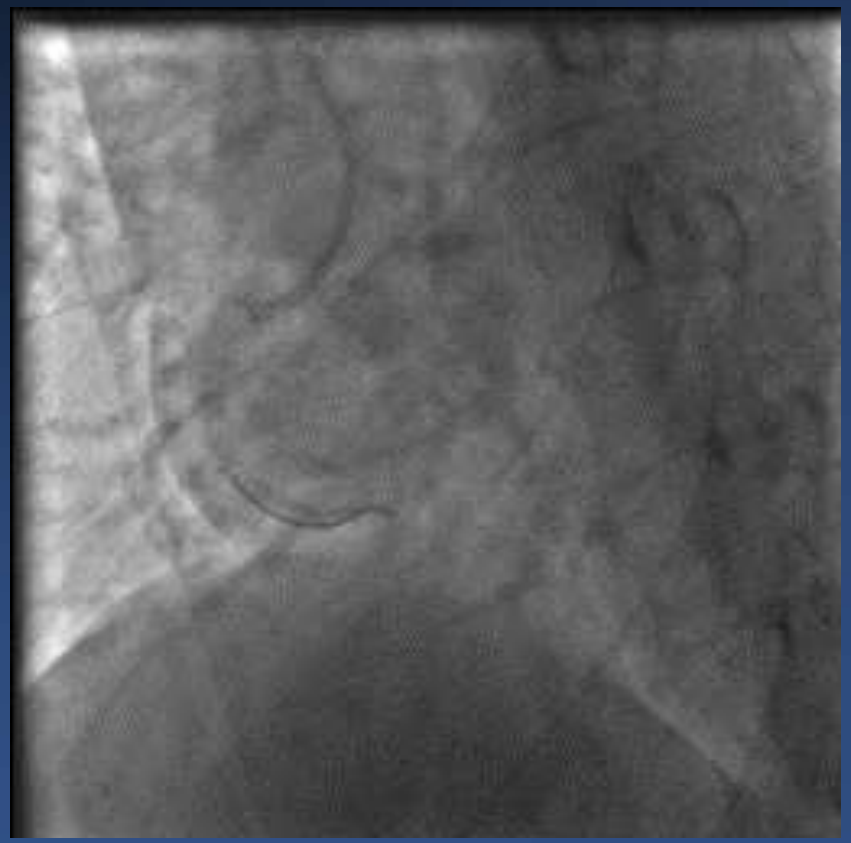


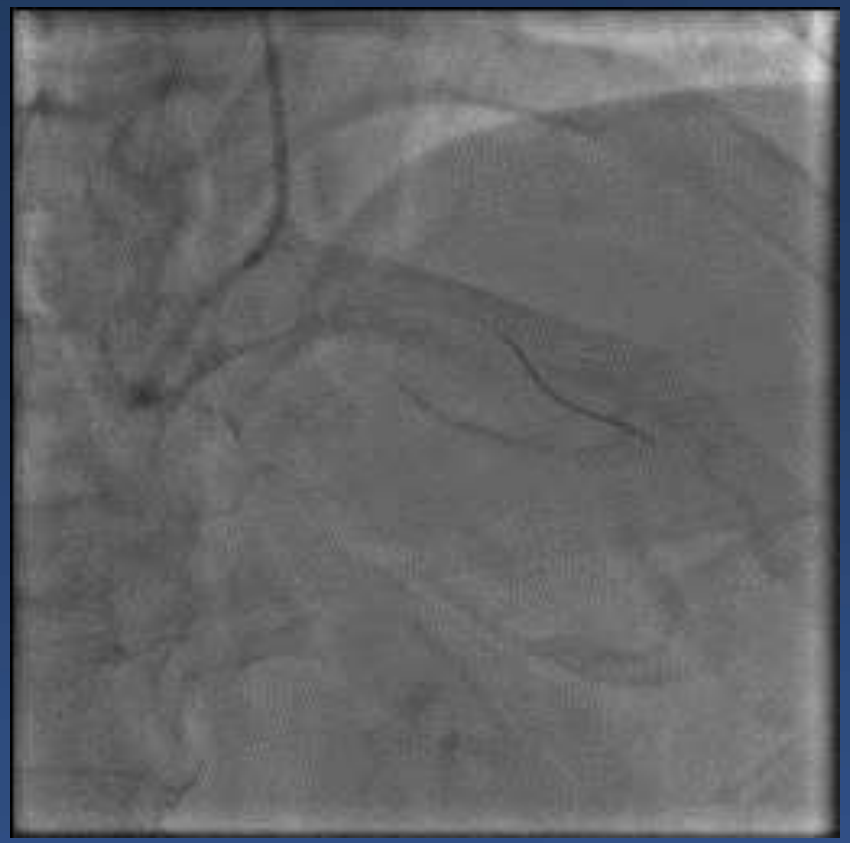
Ostial flaring



- 6FR Ikari 4.0,
- R radial
- Runthrough Floppy/hypercoat
- Panthera Pro 2.5 x 20mm
- **Combo 3.5 x 28mm 16atm**
- Sapphire NC 3.75mm x 15mm 20 atm

Final result….





Discussion points…

Aorto-ostial coronary dissection (PCI induced)

- Rare but potentially life threatening.. Incidence 0.062% (0.006% during coronary angiogram and 0.098% during PCI)

Boyle AJ, Chan M, Dib J, Resar J. Catheter-induced coronary artery dissection: Risk factors, prevention and management. J Invasive Cardiol 2006; 18(10): 500-3.
[PMID: 17015916]

- **Aetiology**: “coronary dissection with retrograde extension of the subintimal space into the aortic root.

- Most are confined to the **coronary sinus**, almost all are limited to the ascending aorta

- **Dunning et al classification** of iatrogenic aortic dissection into 3 grades:

✓ Type 1: dissection limited to the sinuses of Valsalva
✓ Type 2: dissection of asc. Aorta beyond sinuses but < 4cm
✓ Type 3: dissection >/= 4cm of ascending aorta.

Dunning DW, Kahn JK, Hawkins ET, O'Neill WW. Iatrogenic coronary artery dissections extending into and involving the aortic root. Catheter Cardiovasc Interv 2000; 51(4): 387-93.
[http://dx.doi.org/10.1002/1522-726X(200012)51:4<387::AID-CCD3>3.0.CO;2-B] [PMID: 11108666]

RCA or LCA?

- RCA ostium commonly involved (**89% vs. 11%** LCA), most often induced by aggressive guiding catheter manipulation.

7. Goldstein JA, Casserly IP, Katsiyiannis WT, Lasala JM, Taniuchi M. Aortocoronary dissection complicating a percutaneous coronary intervention. J Invasive Cardiol 2003;15:89–92.

- RCA has fewer smooth muscle cells and matrix type-1 collagen fibrils than LCA at the level of coronary ostium and sinotubular junction.

- ® coronary cusp is smaller than (L) coronary cusp and the angle at which the artery stems from the aorta is almost 90 degrees.

Which catheter is the culprit?

- Most frequent shape of catheter involved:

Amplatz followed by JR (transradial) and Judkins followed by A mplatz (transfemoral)

Núñez-Gil IJ, Bautista D, Cerrato E, *et al.* Incidence, management, and immediate- and long-term outcomes after iatrogenic aortic dissection during diagnostic or interventional coronary procedures. Circulation 2015; 131(24): 2114-9. [http://dx.doi.org/10.1161/CIRCULATIONAHA.115.015334] [PMID: 25888682]

- In few of its rarity..no randomized control trial (evidence based) to guide treatment….

Almost 50% stenting and 21.5% conservative treatment

a systematic literature review of 107 published cases of aortocoronary dissection during PCI, and showed that this complication were most commonly treated with stenting (49.5%) or conservative management (21.5%) although approximately 29% required surgery. Hence, Shorrock et al.[1] proposed that emergency surgery for aortocoronary dissection is not needed in the vast majority of cases and should only be considered in cases of occlusion of the dissected vessel with cessation of antegrade flow that cannot be restored percutaneously, and extension of the dissection to the descending aorta.

1. Shorrock D, Michael TT, Patel V, Kotsia A, Rangan BV, Abdullah SA, et al. Frequency and outcomes of aortocoronary dissection during percutaneous coronary intervention of chronic total occlusions: a case series and systematic review of the literature. Catheter Cardiovasc Interv. 2014;84(4):670-5.

Surgical indications….

- Indications for surgery…

1. Extension of the disease up to the ascending aorta
2. Significant aortic regurgitation, hemopericadium and
3. Intractable chest pain and hemodynamic compromise

Boyle AJ, Chan M, Dib J, Resar J. Catheter-induced coronary artery dissection: Risk factors, prevention and management. J Invasive Cardiol 2006; 18(10): 500-3.
[PMID: 17015916]

Conclusion

- The best form of management is still “PREVENTION”
- Conservative management is still a reasonable option (hemodynamically stable with localized aortic root dissections)
- In vast majority, PCI of ostial lesion with sealing of the entry site with surgical backup reserved for failures.