

Physiological Assessment of Left Coronary Artery with Anomalous Origin from Right Coronary Cusp And Moderate Stenosis in Mid Portion Using Dobutamin Stress Test

Yoshimi Numao*, Jun Yamashita**

Yasuyuki Sugishita*, Takashi Yoshitama*, Fumiko Tabei*,
Nobuhiko Ito*, Akira Nozaki*, Hiroshi Yamashita*

* Kanto Central Hospital

** Tokyo Medical University

Sixty Six Year-Old Female

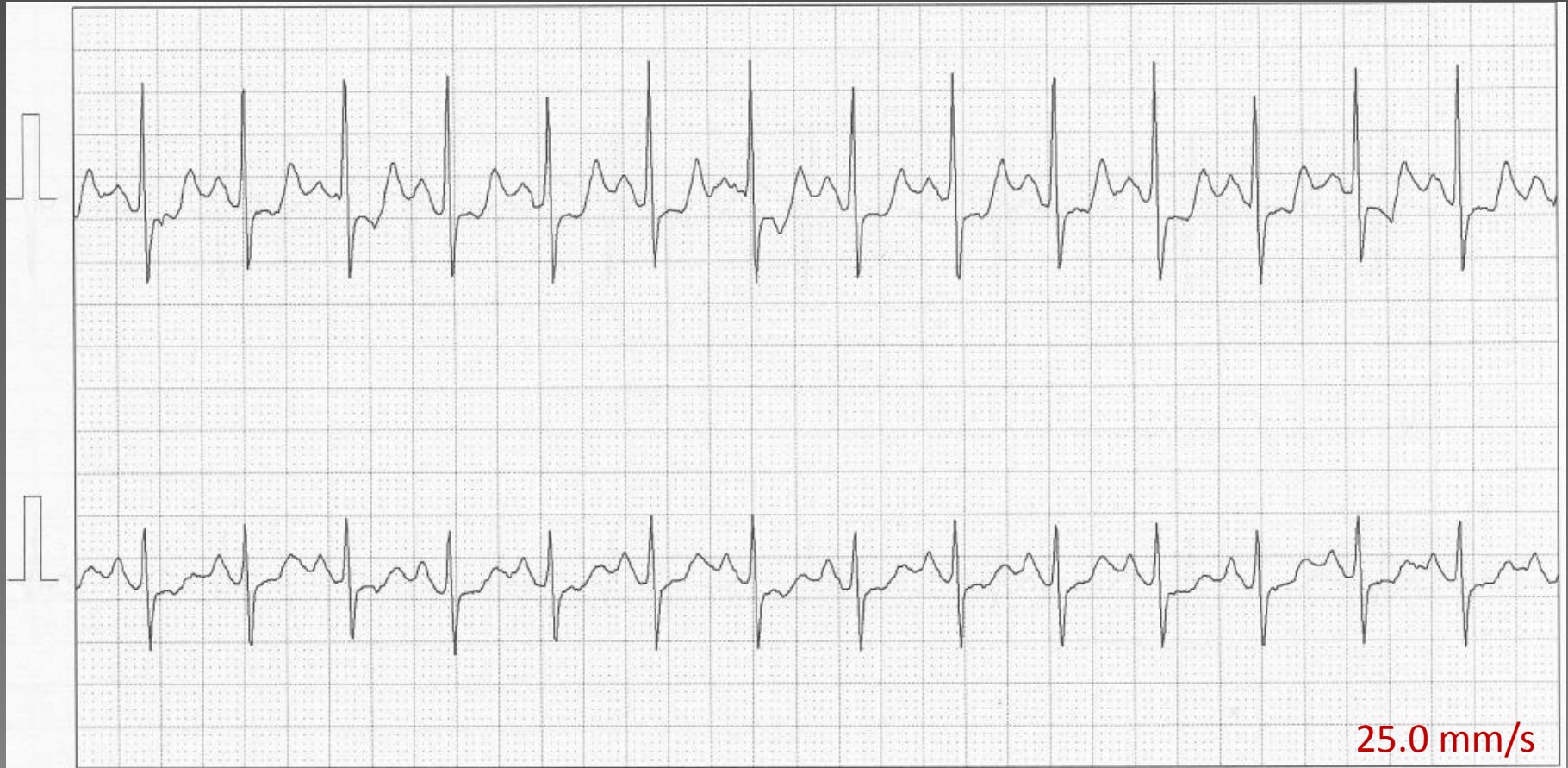
Present Illness

- She visited our emergency room with syncope after drinking , which she had experienced three times during the last three years.
- There were no particular findings on her physical examinations, laboratory data, ECG, or head CT scan.
- Also, she had had the intermittent chest pain sporadically, sometimes during physical effort. Observing these symptoms, we decided to perform the Holter DCG.

Sixty Six Year-Old Female

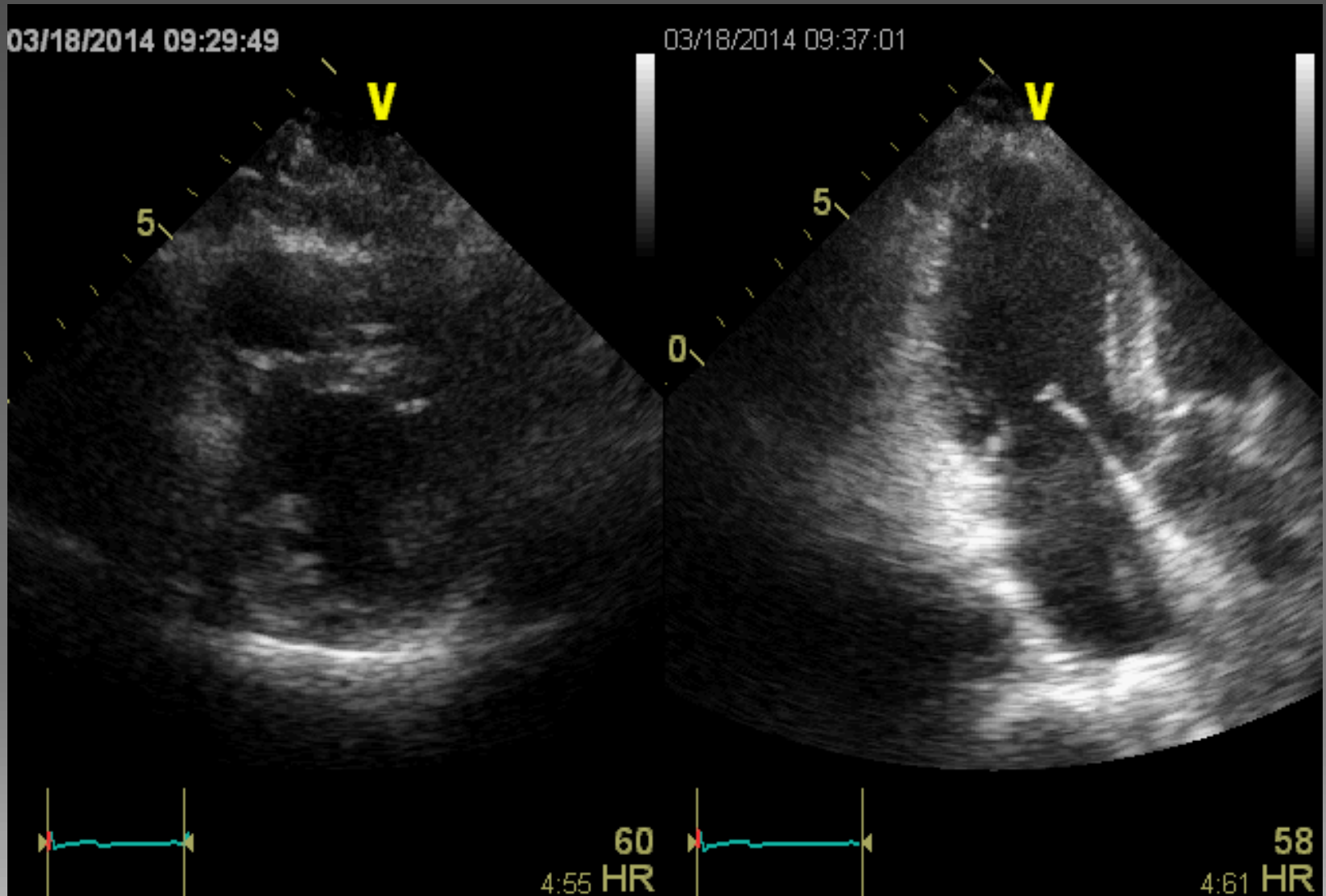
- Past History
 - Dyslipidemia
(Rosuvastatin 2.5 mg/day)
- Family History
 - Father : myocardial infarction
 - Brother : myocardial infarction
- Social History
 - Teacher, non-smoker, moderate alcohol

Holter DCG



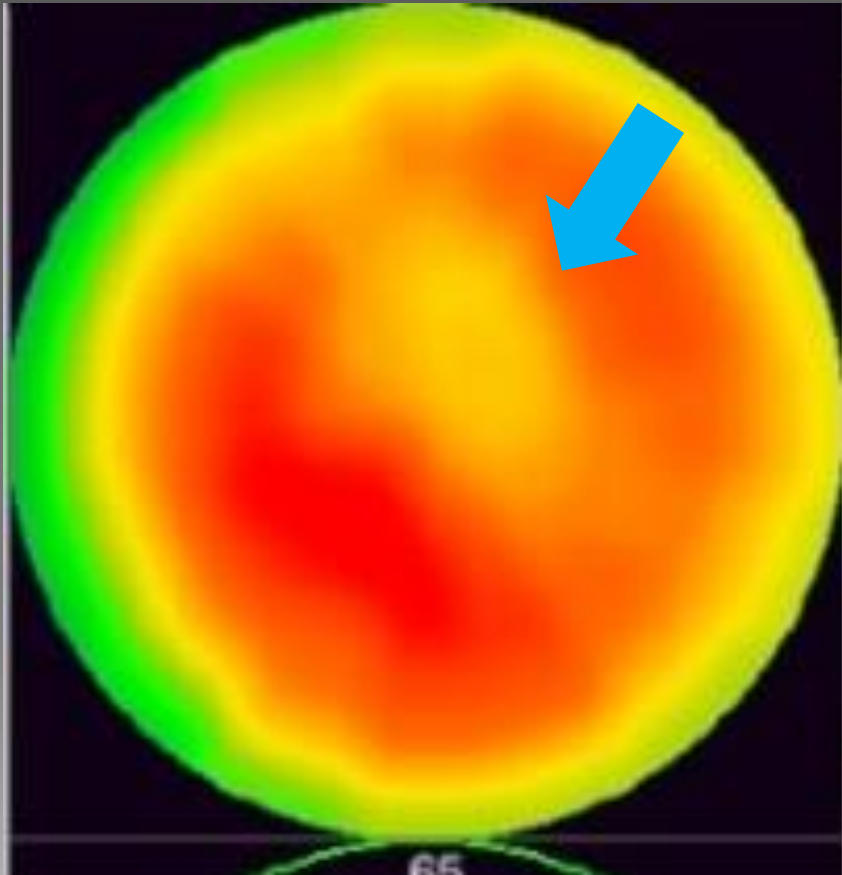
- ST-segment depressed with a horizontal or sagging pattern during tachycardia.

TTE

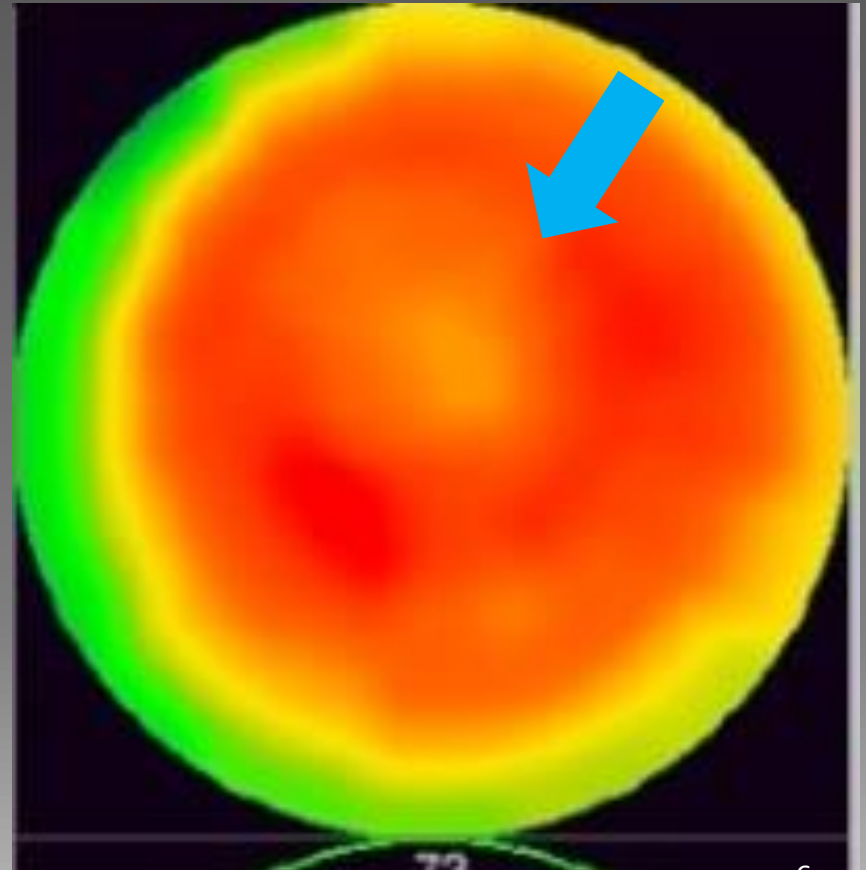


SPECT

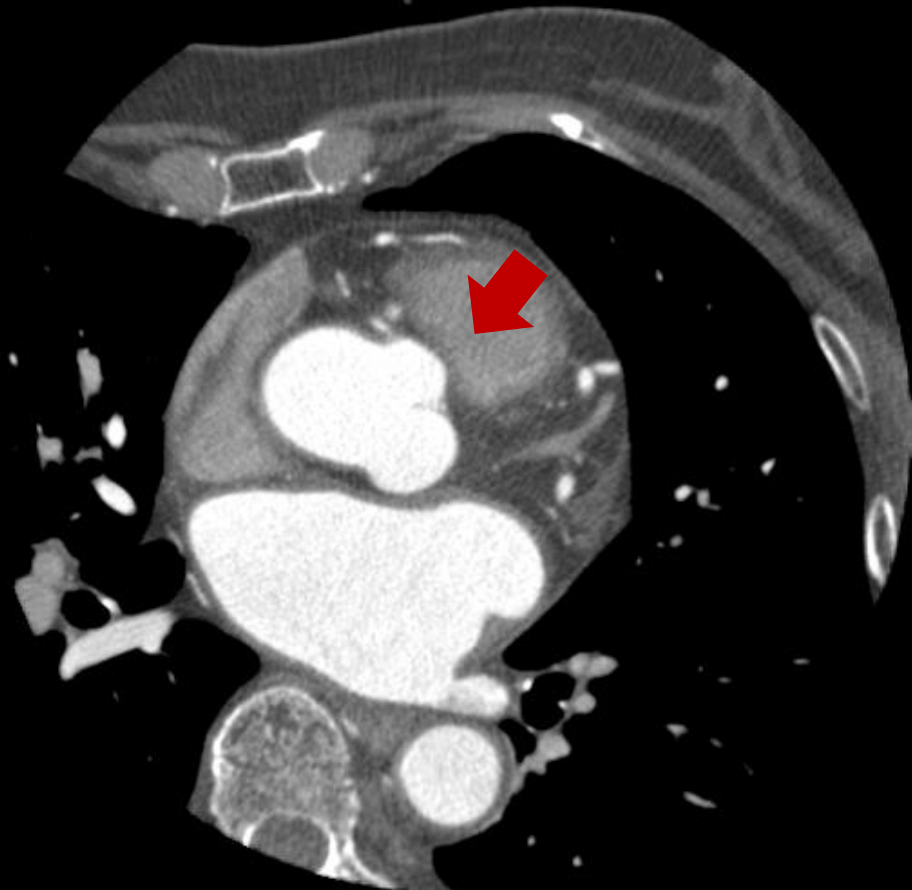
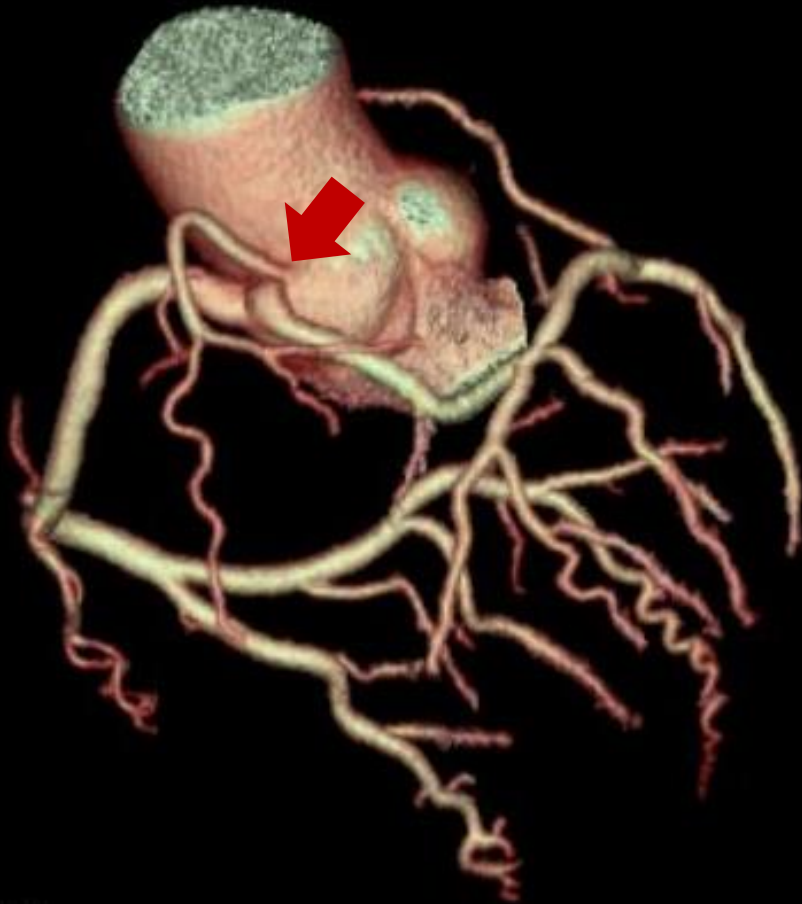
Tl Stress



Tl Rest



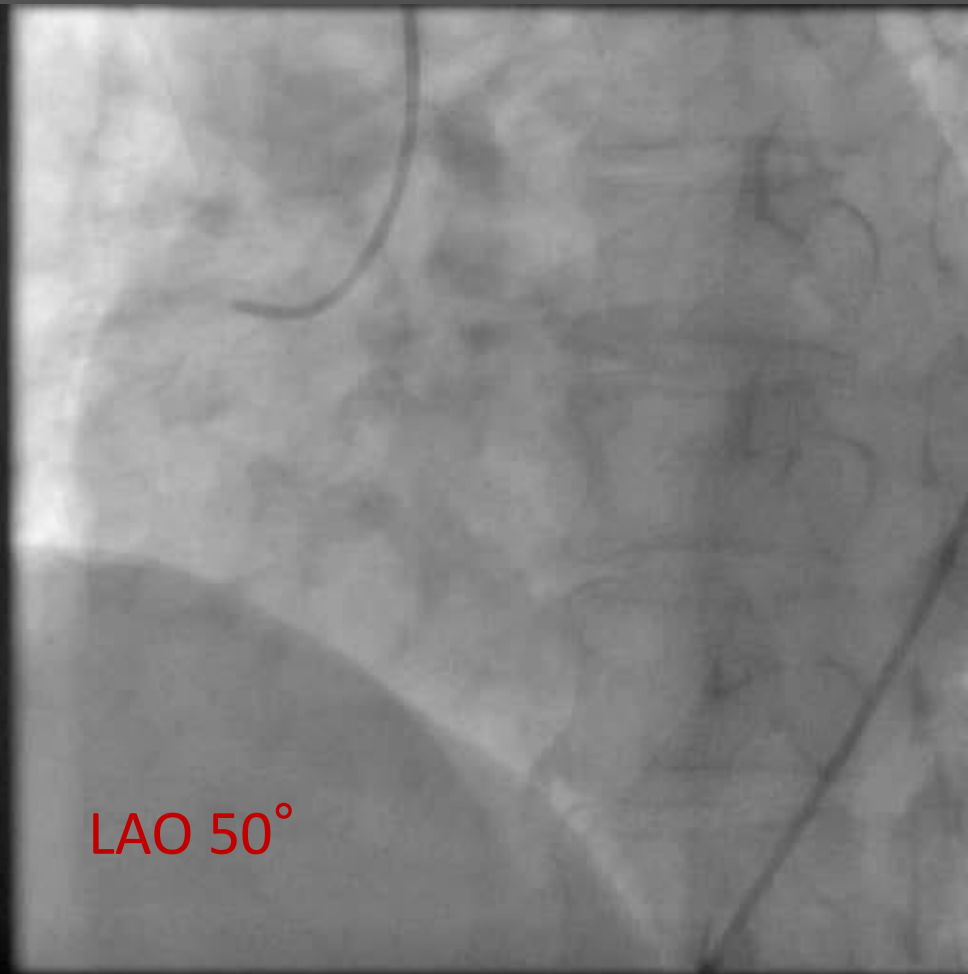
CCTA



CAG



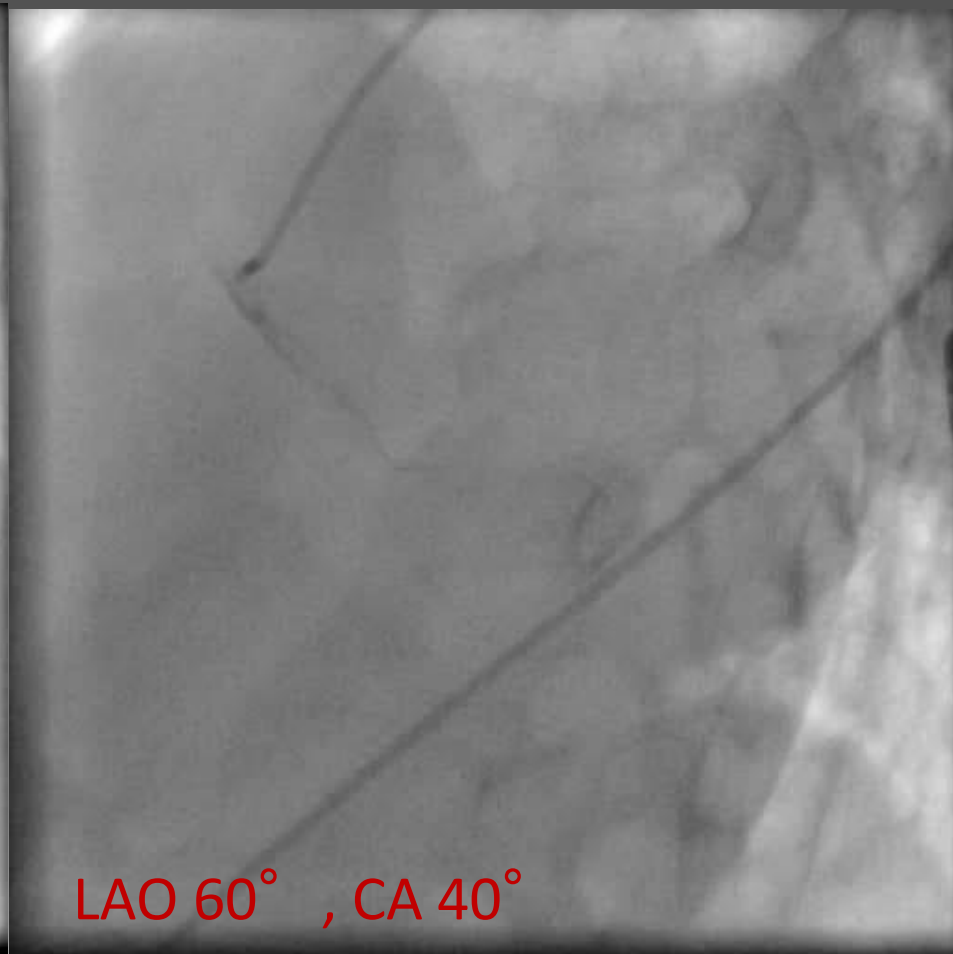
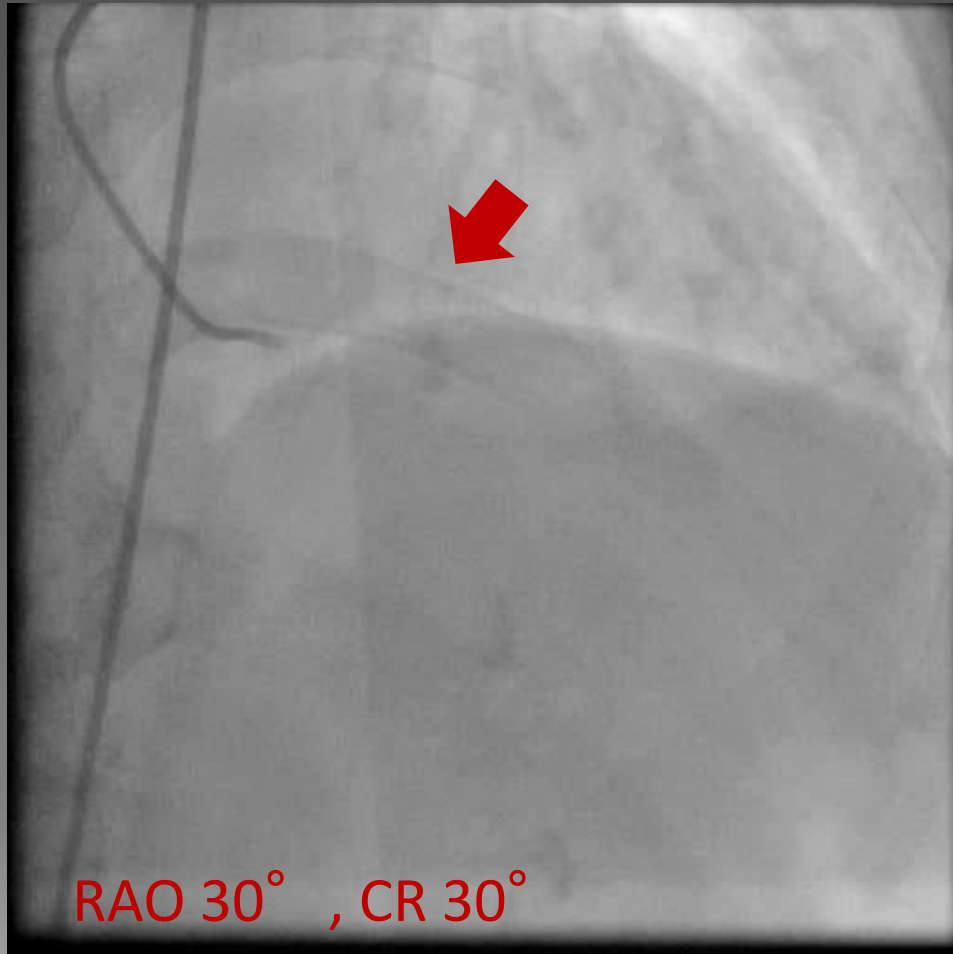
RAO 30°



LAO 50°

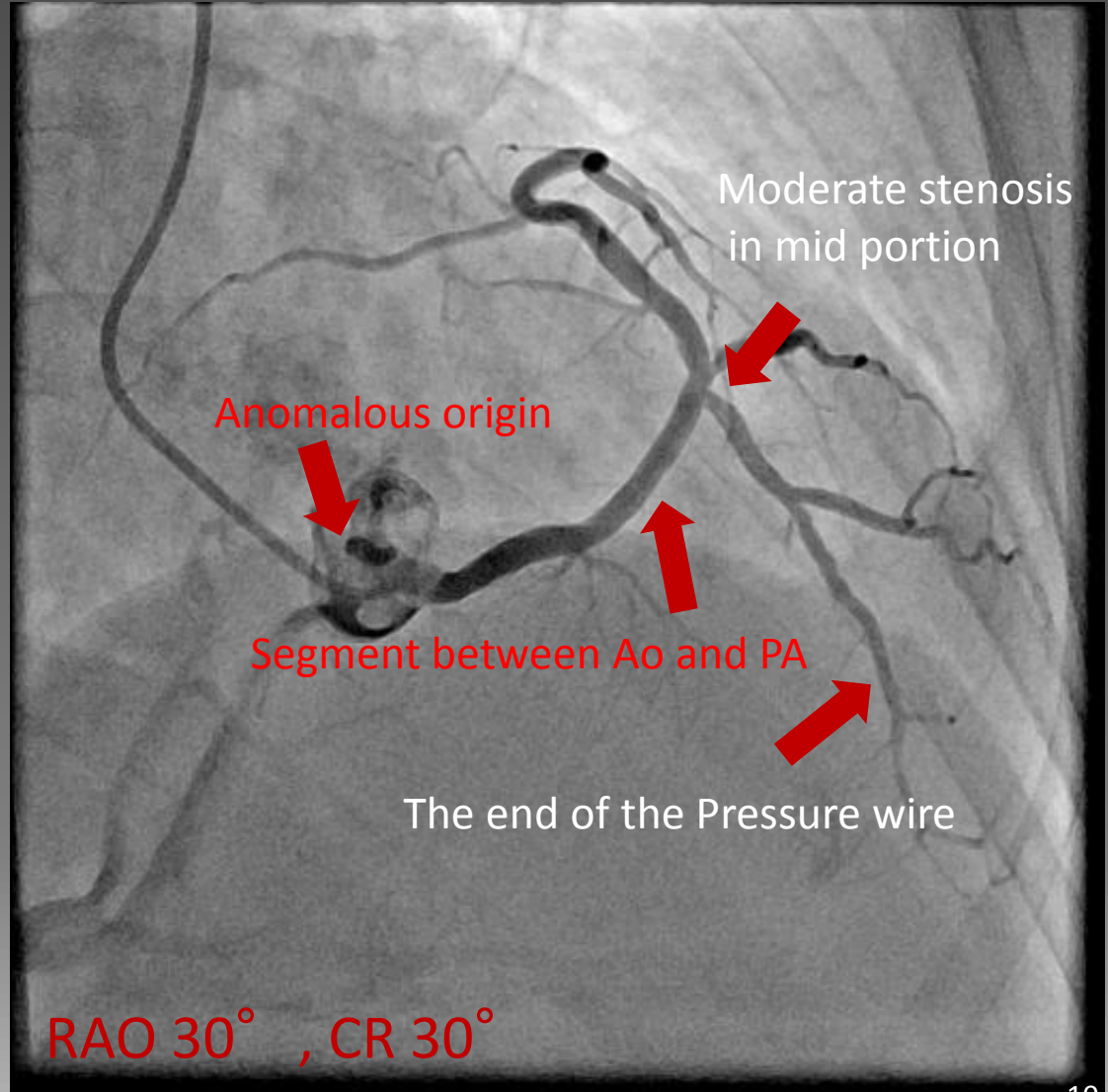
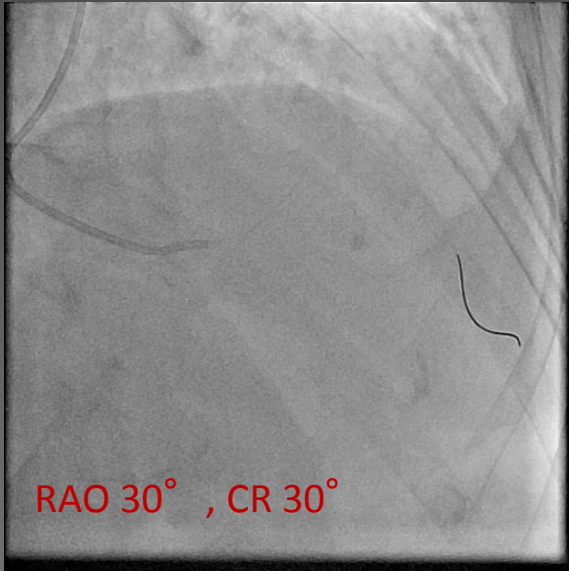
RCA: JR 4.0

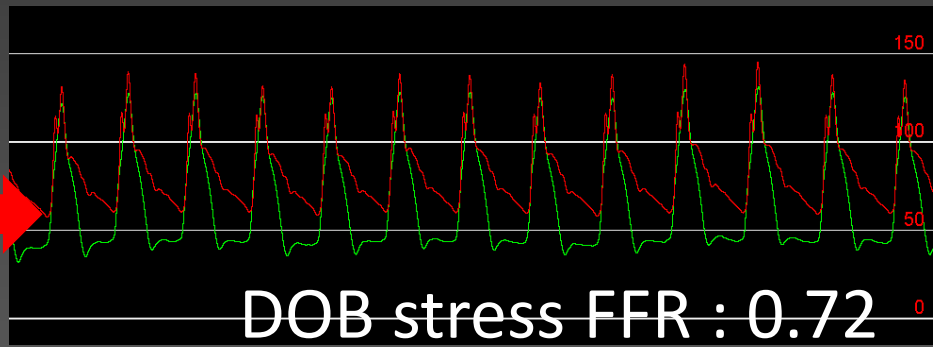
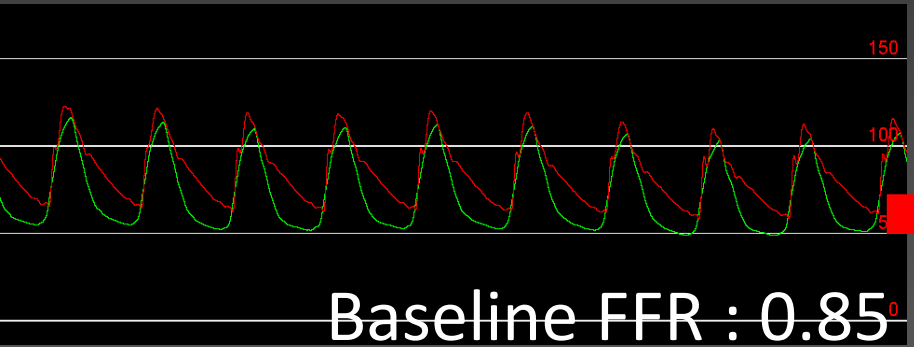
CAG



LCA : Bilateral catheter (Mitsudo[®])

Functional Assessment





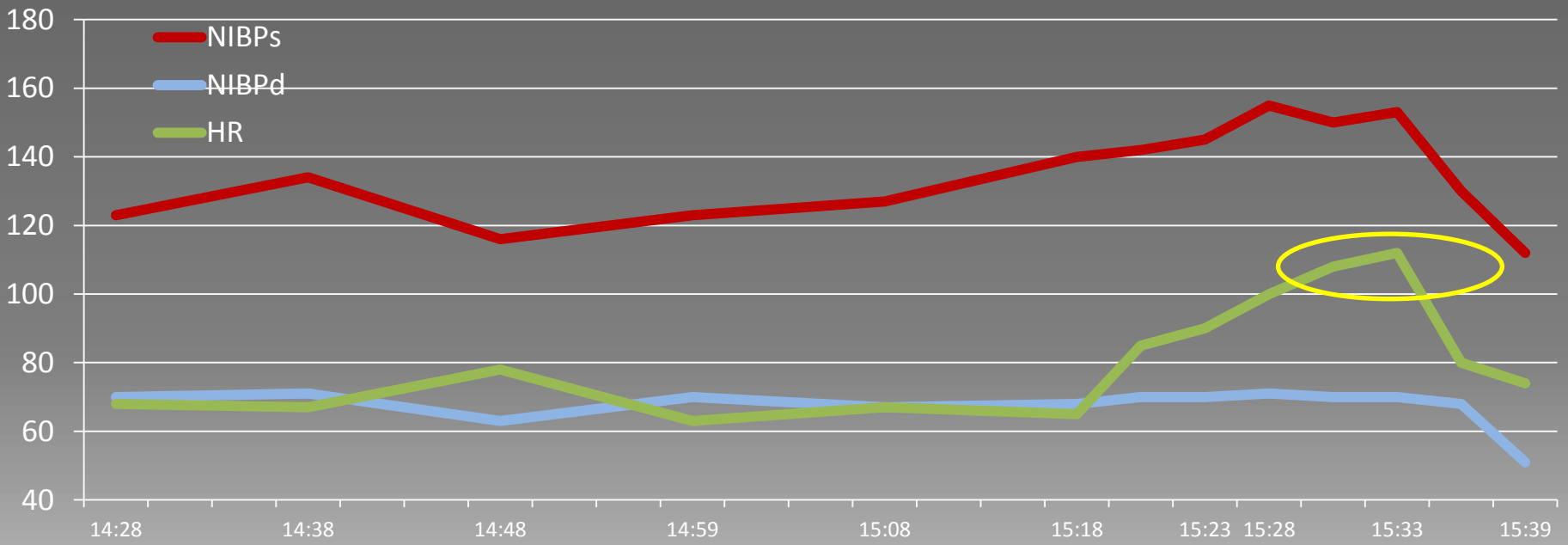
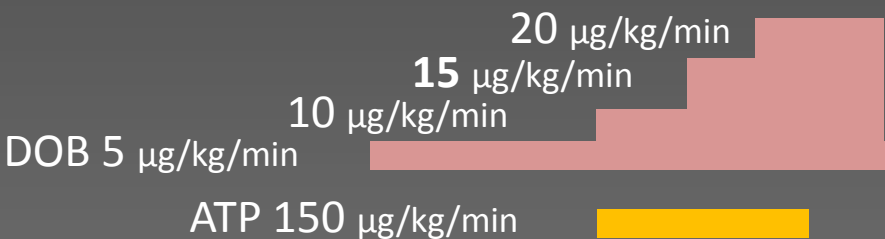
Pressure wire to distal LAD



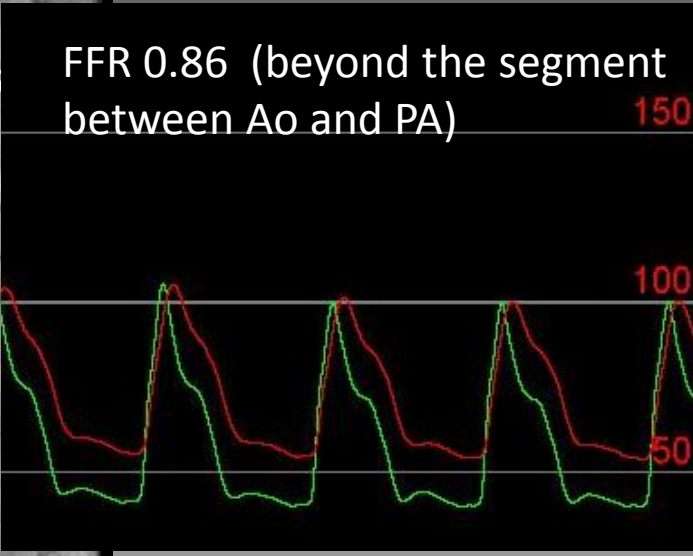
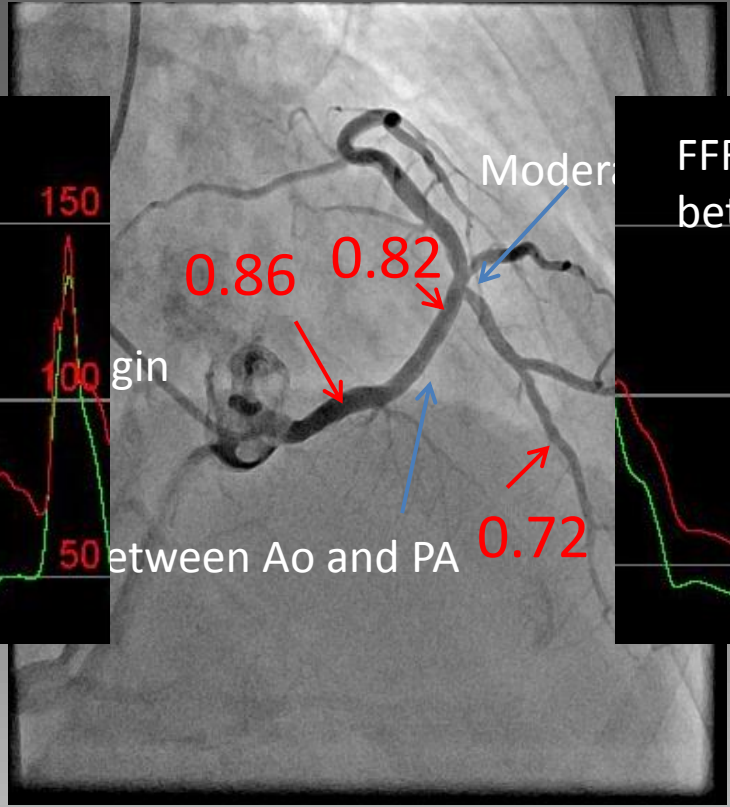
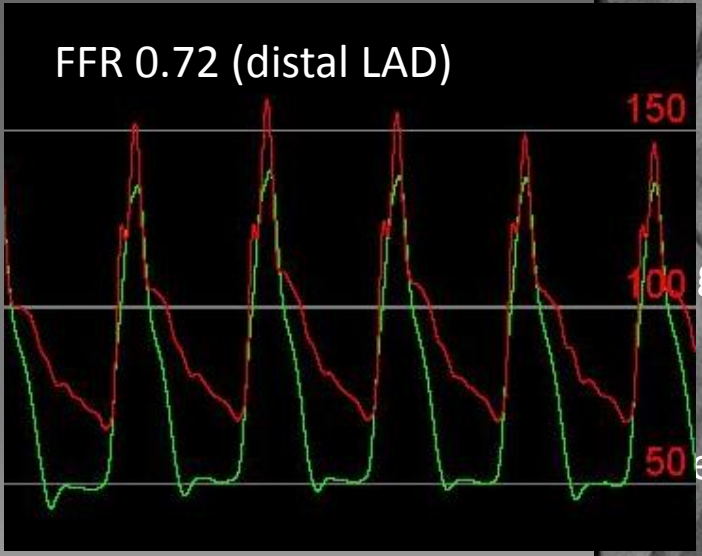
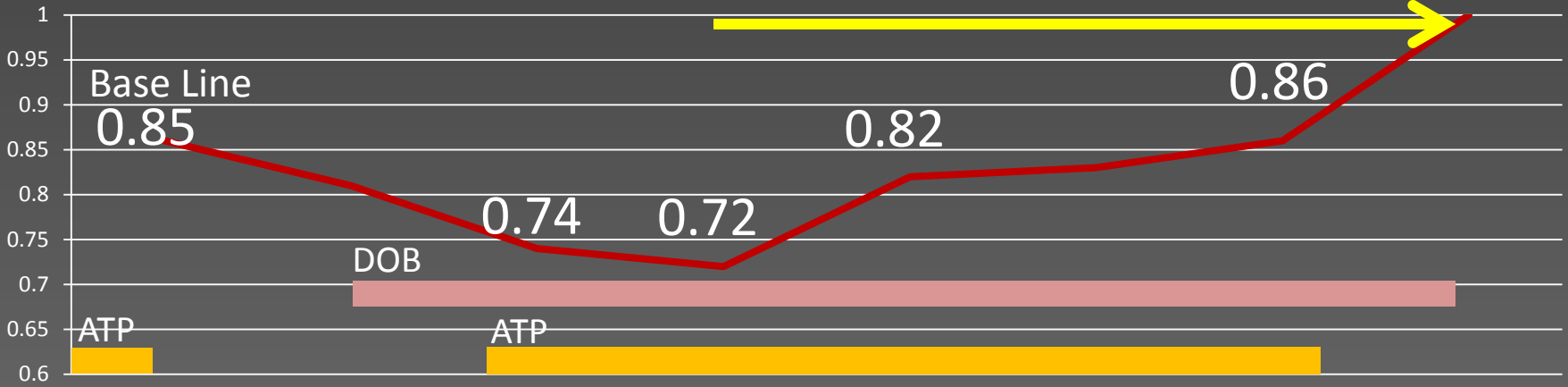
Baseline FFR



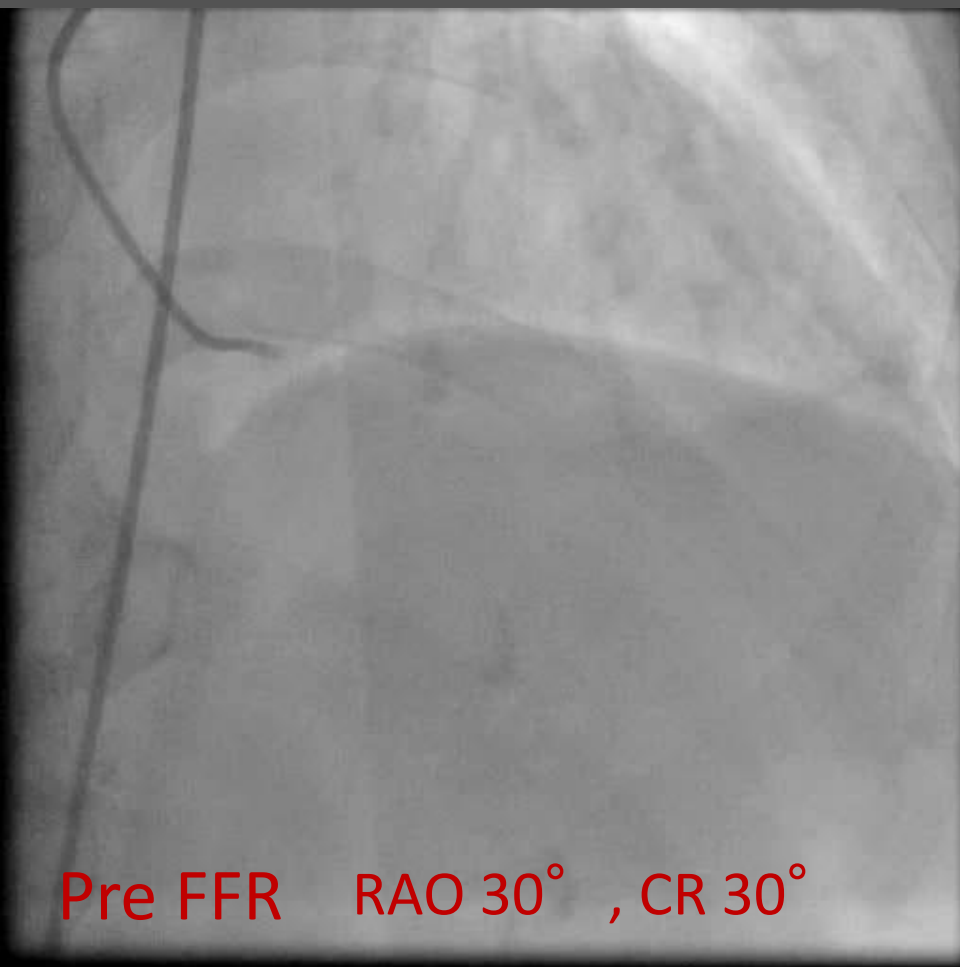
ATP 150 $\mu\text{g}/\text{kg}/\text{min}$



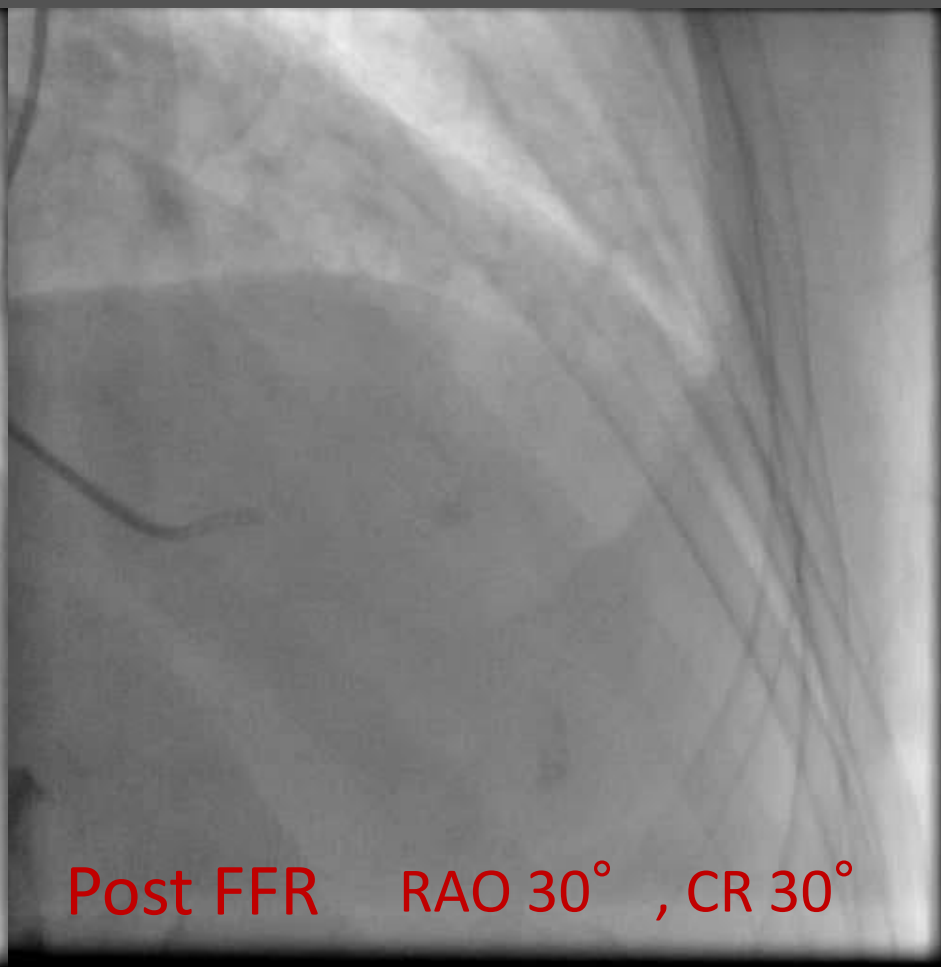
Pullback recording of Pd/Pa



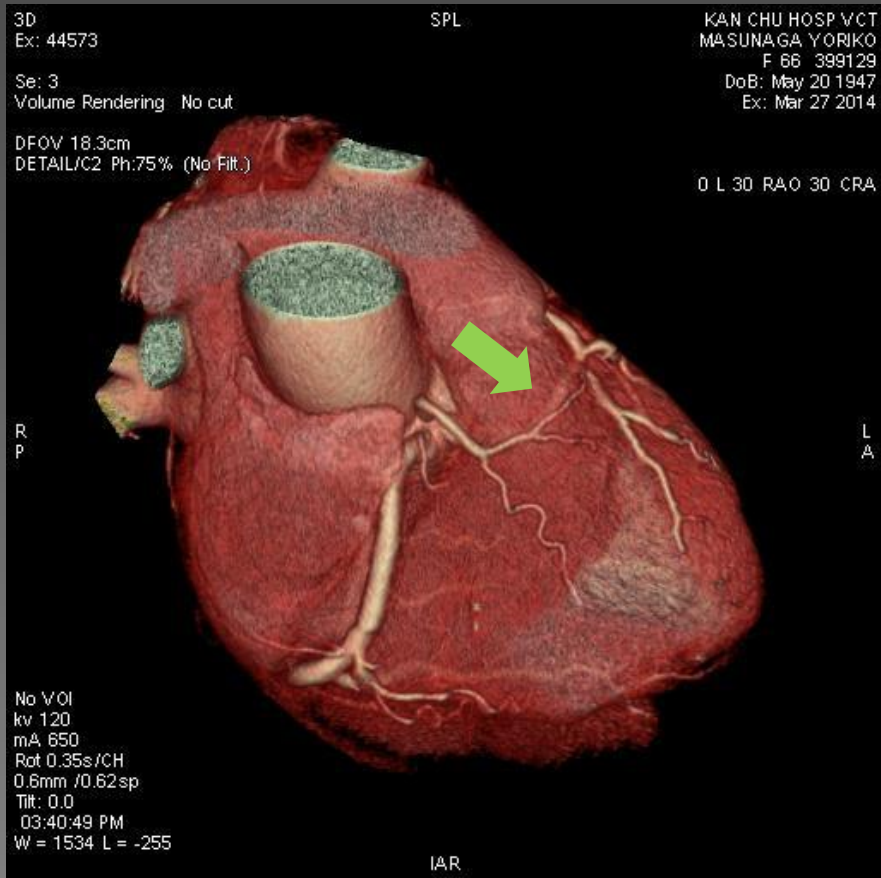
CAG Before and After DOB Stress Test



Pre FFR RAO 30° , CR 30°



Post FFR RAO 30° , CR 30°



The intramural artery between the Ao and the PA could be aggravated by the lateral compression.

- We chose the medication of β blocker for her therapy and succeeded in reducing the symptoms.

Discussion

Incidence of Coronary Anomalies and Patterns, as Observed in a Continuous Series of 1950 Anigiograms

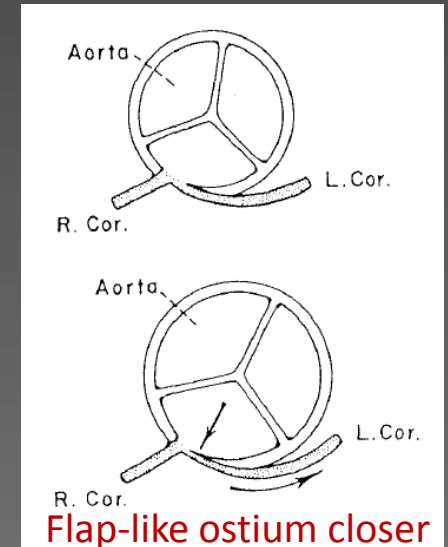
Variable	N (%)
Coronary anomalies (total)	110 (5.64)
Split RCA	24 (1.23)
Ectopic RCA (right sinus)	22 (1.13)
Ectopic RCA (left sinus)	18 (0.92)
Fistulas	17 (0.87)
Absent left main coronary artery	13 (0.67)
Circumflex arising from right sinus	13 (0.67)
<u>LCA arising from right sinus</u>	<u>3 (0.15)</u>
Low origination of RCA	2 (0.1)
Other anomalies	3 (0.27)
Coronary dominance patterns	
Dominant RCA	1641 (89.1)
Dominant LCA (circumflex)	164 (8.4)
Codominant arteries (RCA, circumflex)	48 (2.5)

Angelini P, Villason S, Chan AV, Diez JG. :
Lippincott Williams &Wilkins; 1999:27–150.

The proposed pathological mechanisms

- An acute angle origin or occlusion at the emergence of the coronary arteries.

(Cheitlin MD, DeCastro CM, McAllister HA : Circulation 50: 780-787, 1974)



- Coronary spasm from twisting motion.

(Denis Machado de Oliveira, Vitor Gomes, Paulo Caramori. : J Invasive Cardiol 2012; 24(6): E 131-134)

- Mechanical compression of the anomalous artery between the aorta and the pulmonary trunk during physical effort.

(Angelini P, Velasco JA, Ott D, Khoshnevis GR. : J Invasive Cardiol. 2003; 15(9): 507-514)

Conclusion

- Mechanical compression could decrease blood flow with physical effort in the anomalous arteries we have observed, therefore FFR measurement under dobutamin stress test may be useful to assess the physiological severity in these cases.