CARDIOVASCULAR TRENDS 2011:
NURSING SYMPOSIUM

Stress Induced Cardiovascular Disease

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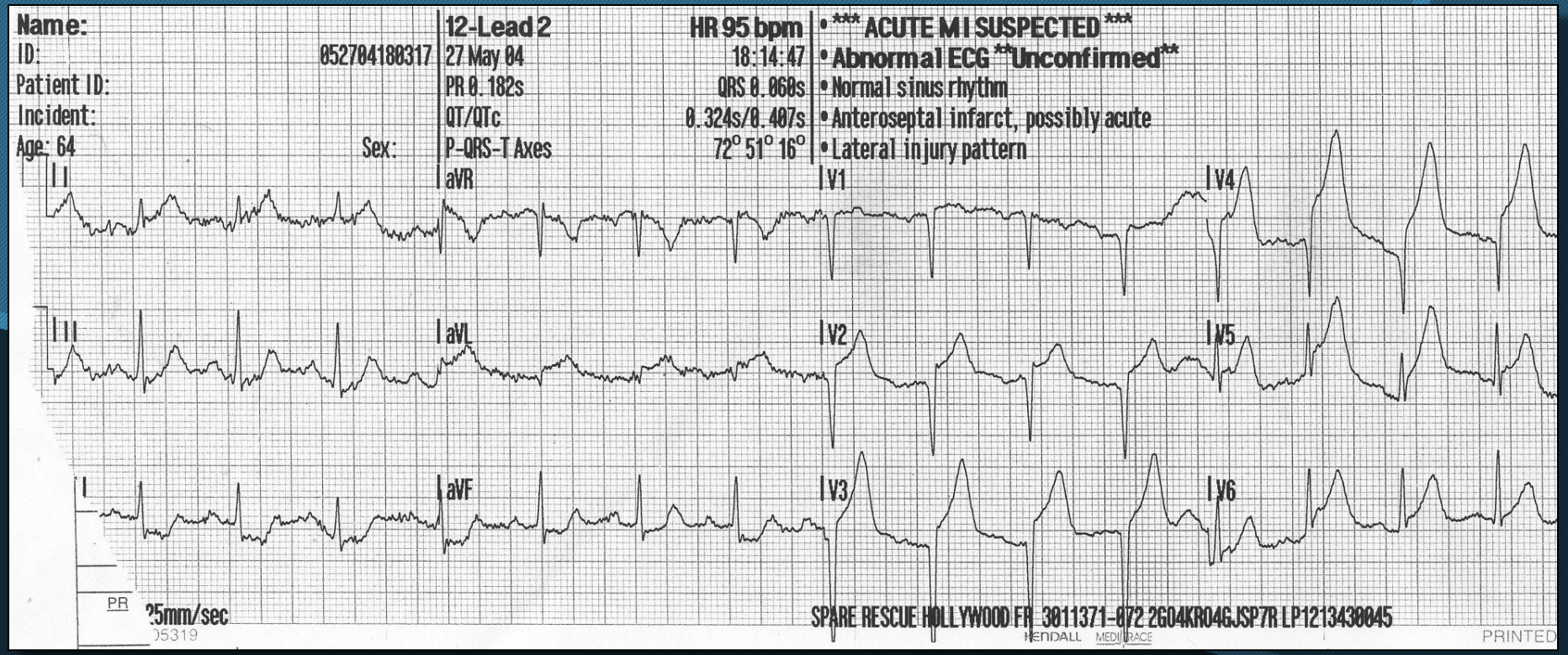
CASE HISTORY

- 64 yr-old women with sudden onset chest pain during episode of emotional upset at work. Office manager at a ENT office close to the hospital.
- Meds: Premarin, progesterone and synthroid supplements
- Prior smoker with underlying COPD
- Obese

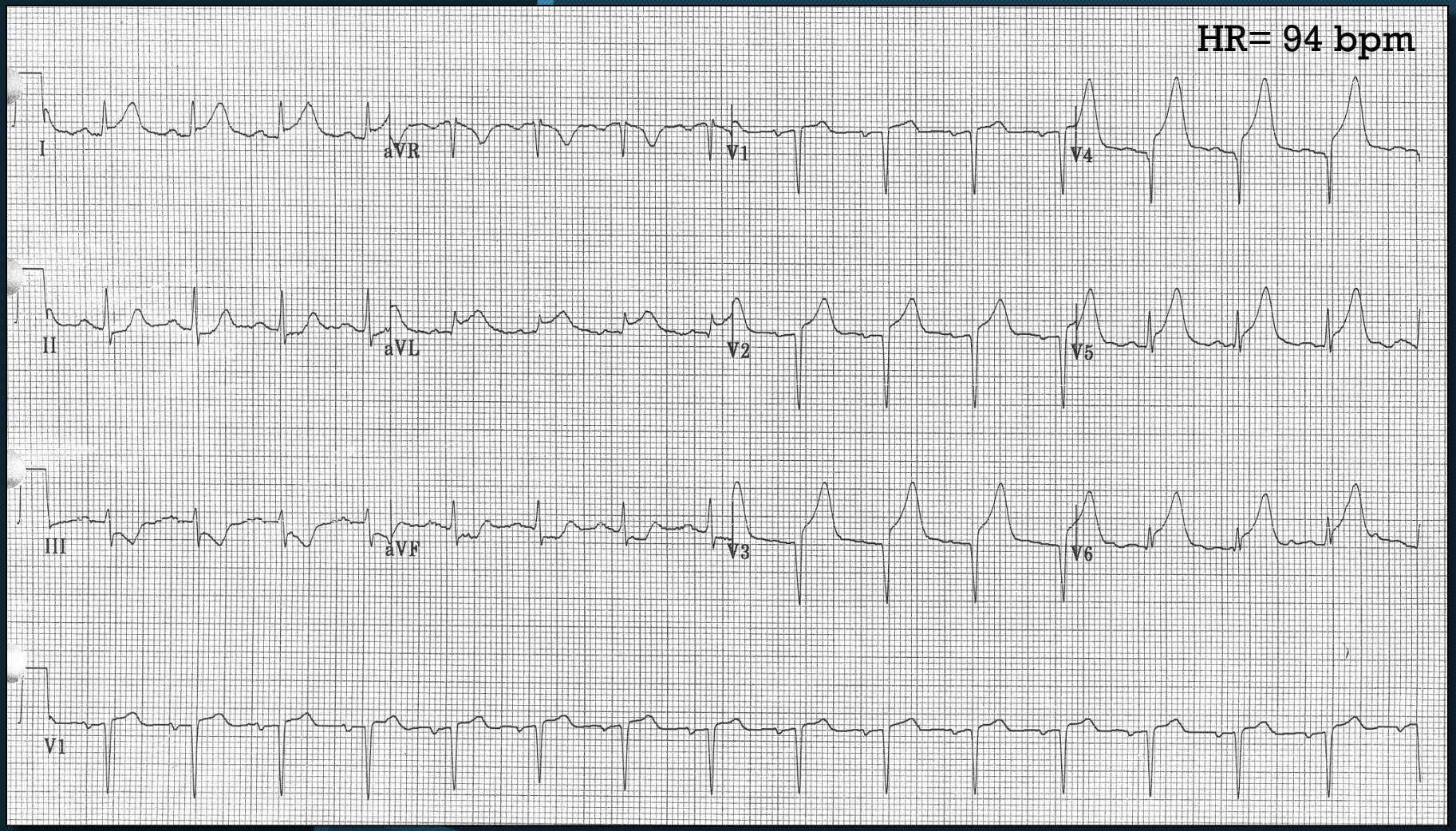
EKG taken by EMS

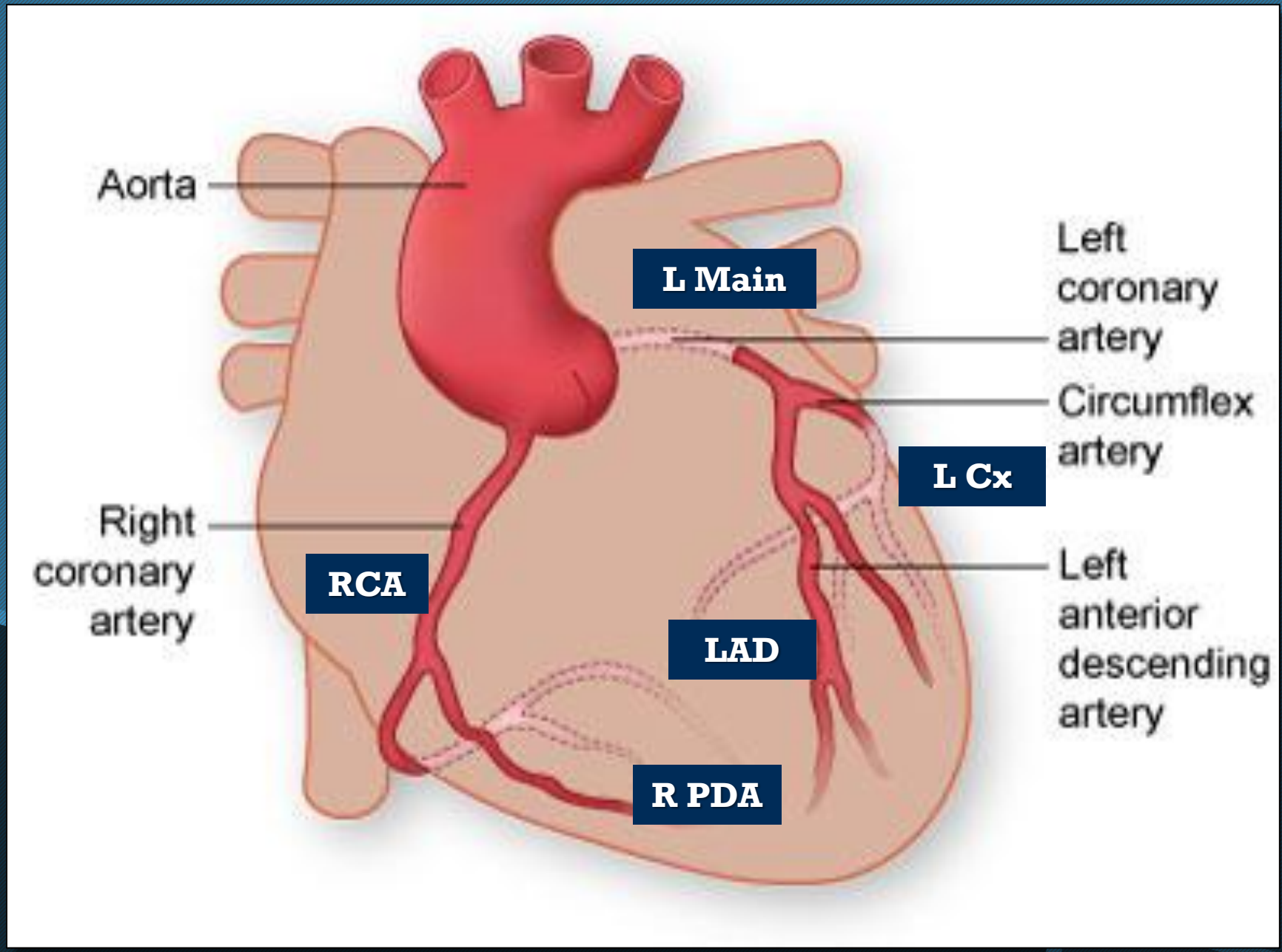
Code Heart called



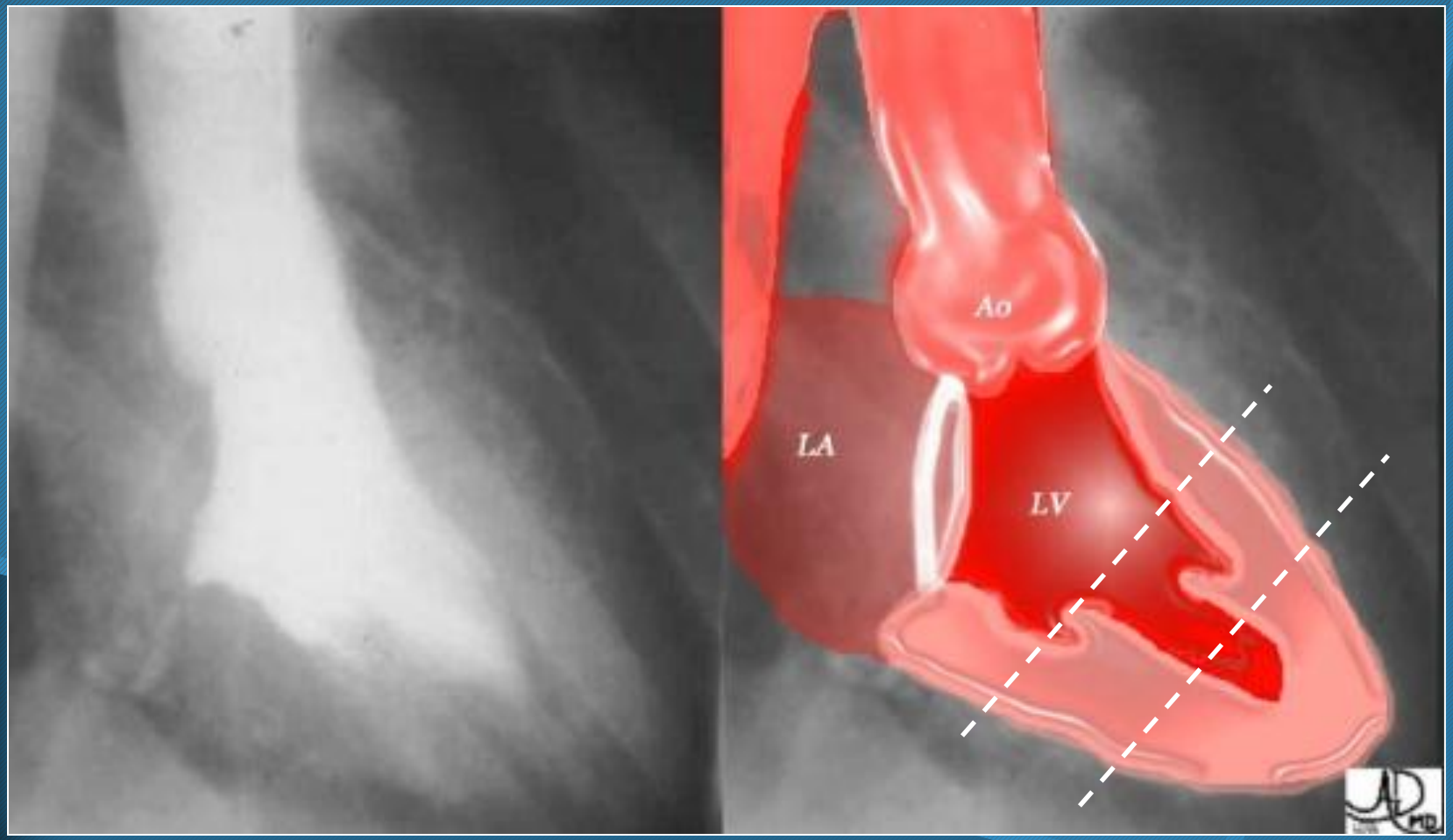
EKG on arrival to MRH ER

Persistent Chest Pain

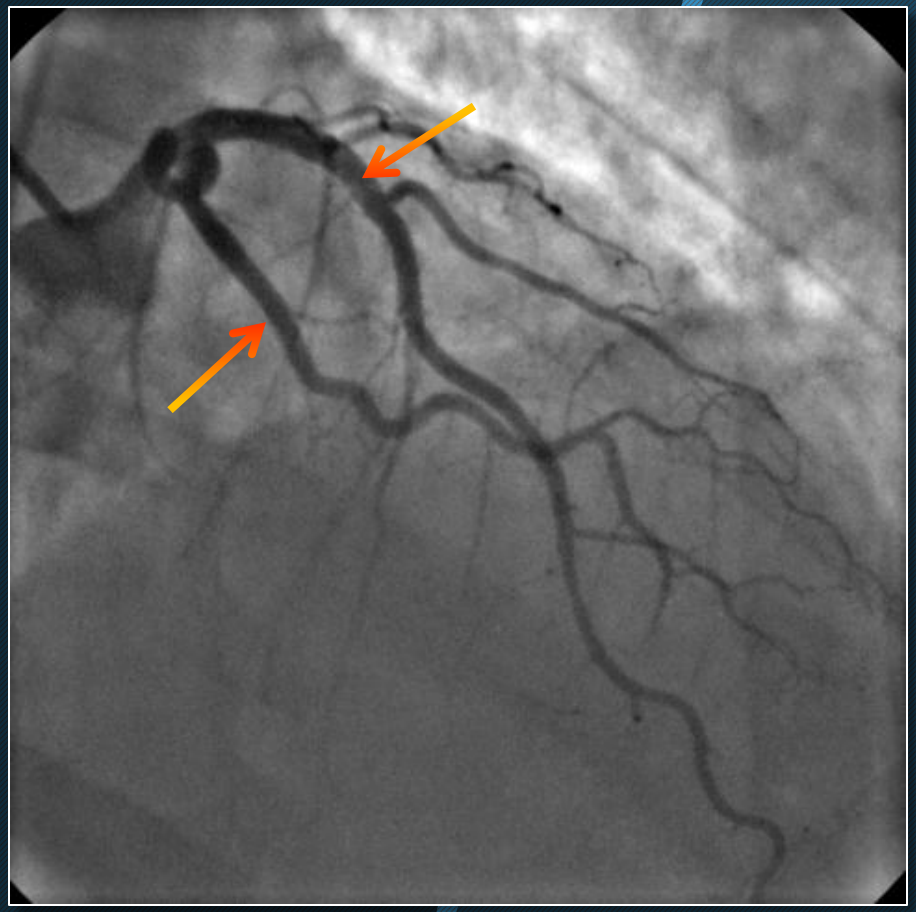


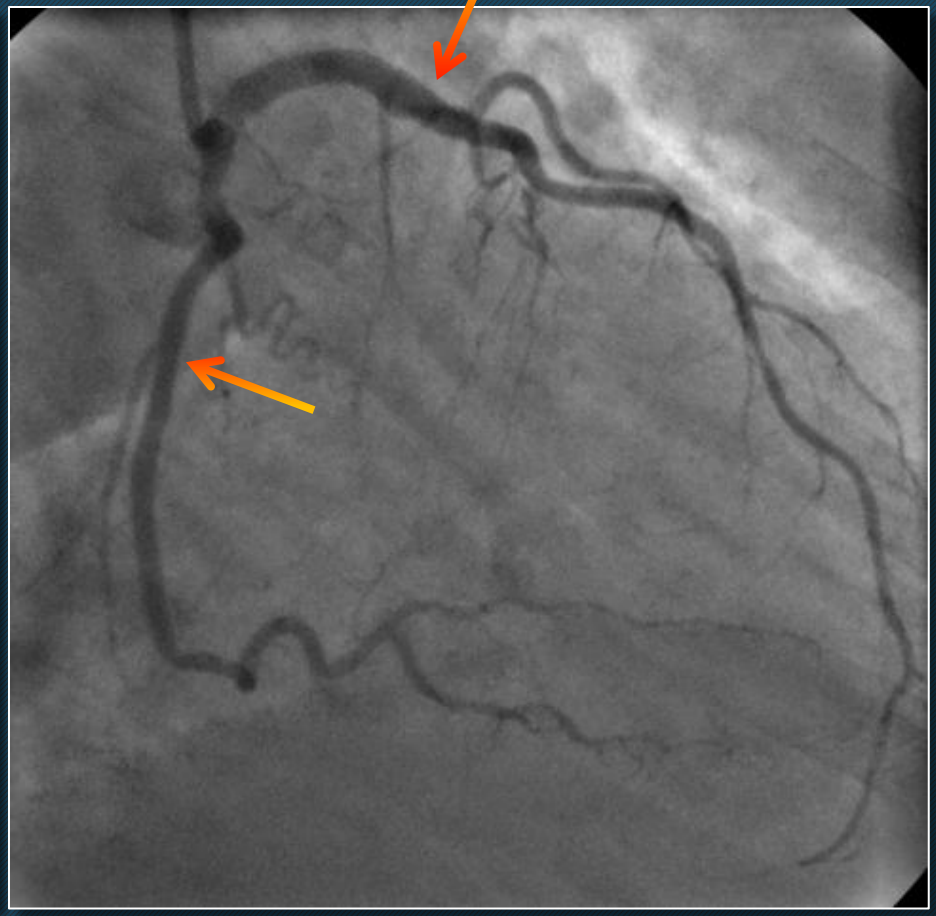

Aorta
L Main
Left coronary artery
Circumflex artery
L Cx
Right coronary artery
RCA
Left anterior descending artery
LAD
R PDA

Left Ventriculogram in RAO Projection

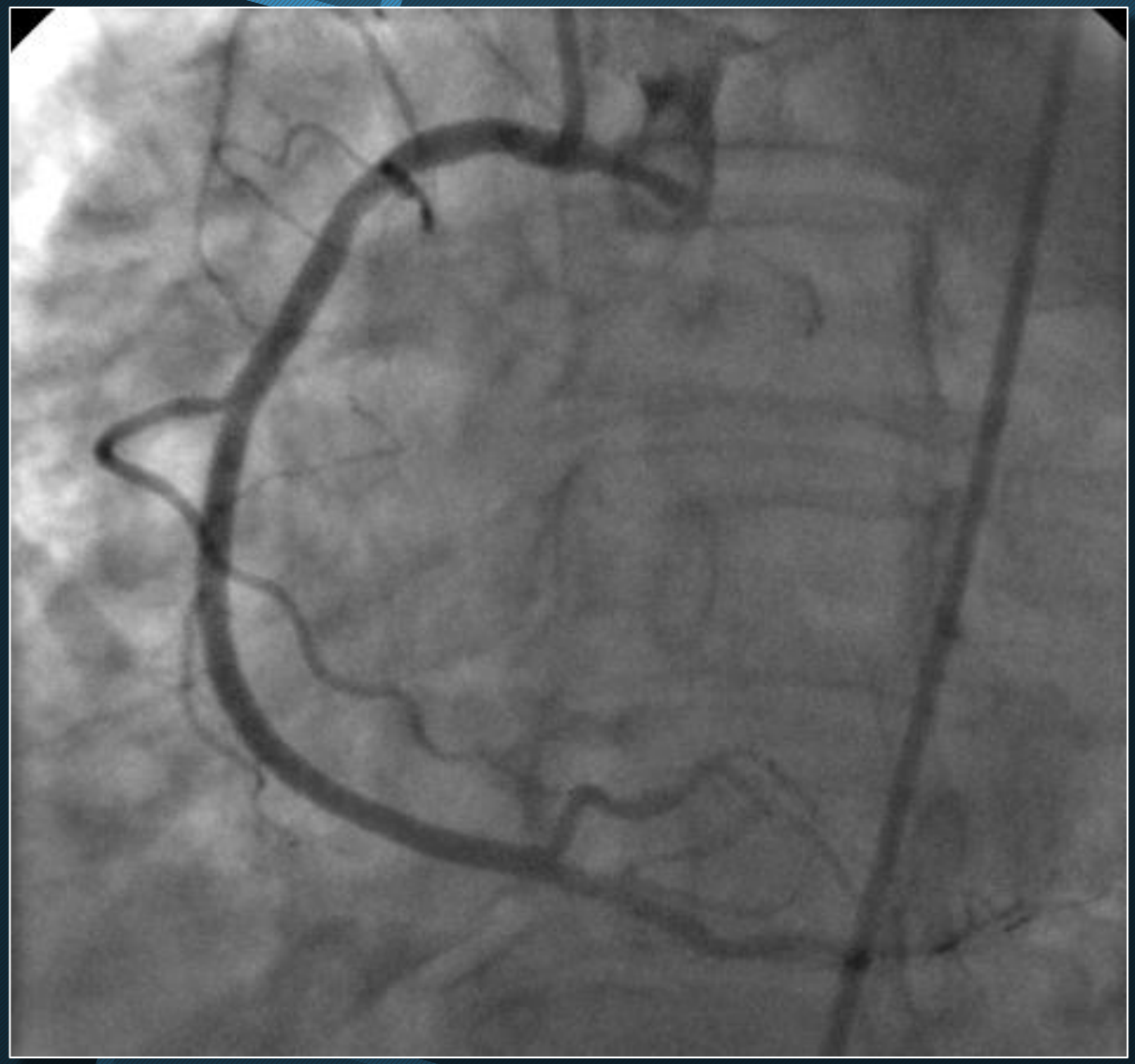


LEFT CORONARY ARTERY

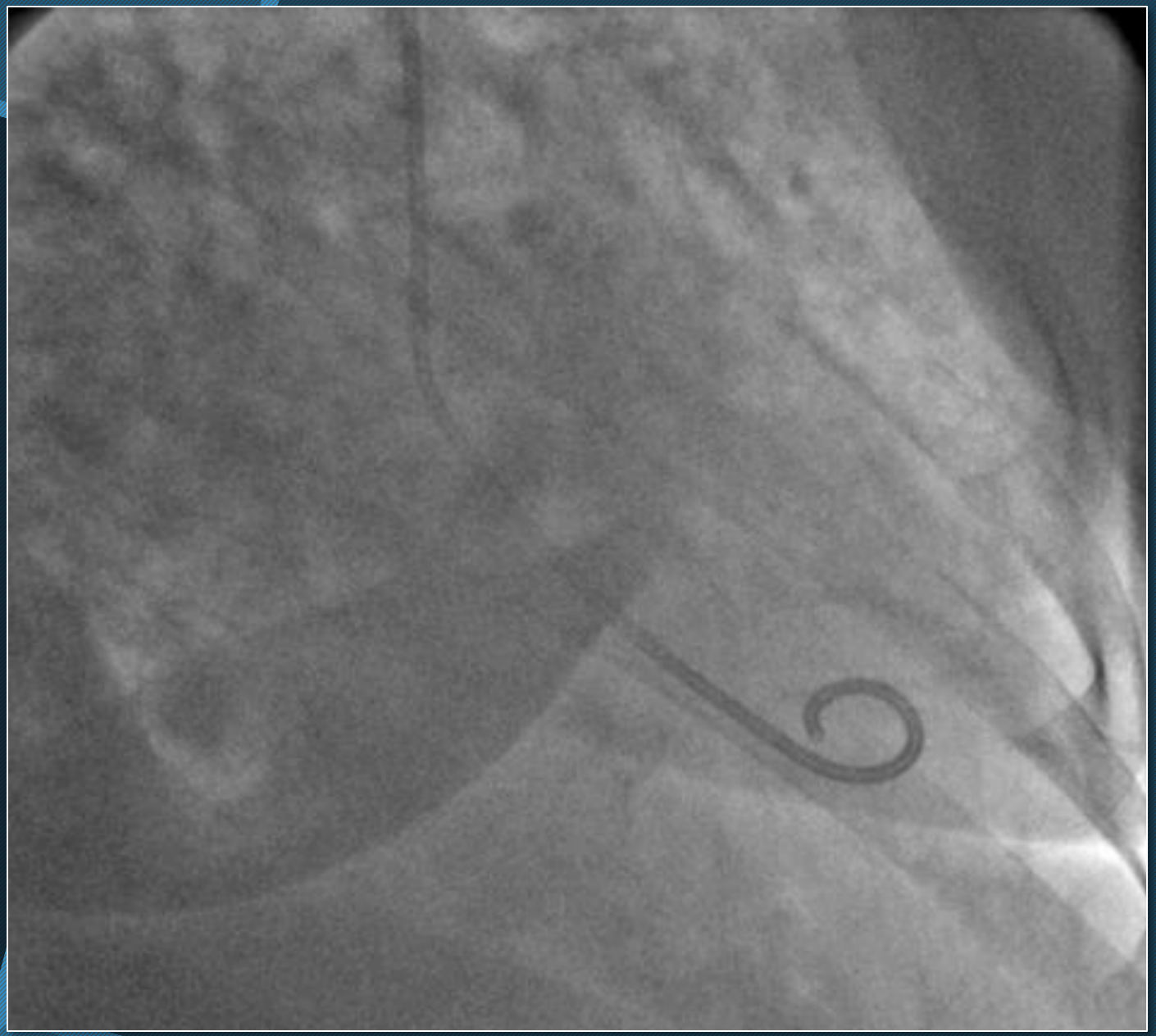




Right Coronary



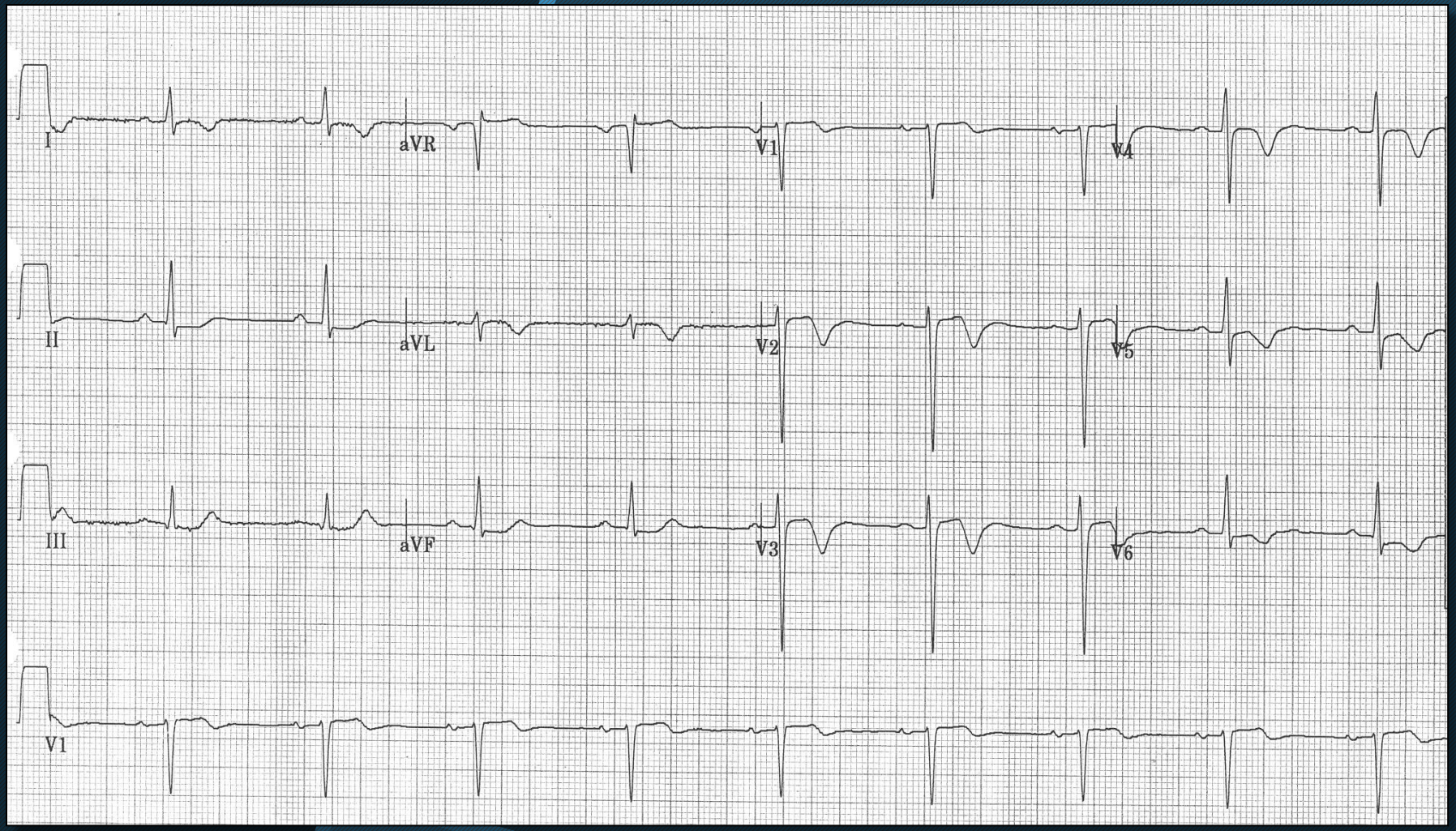
Left Ventricle



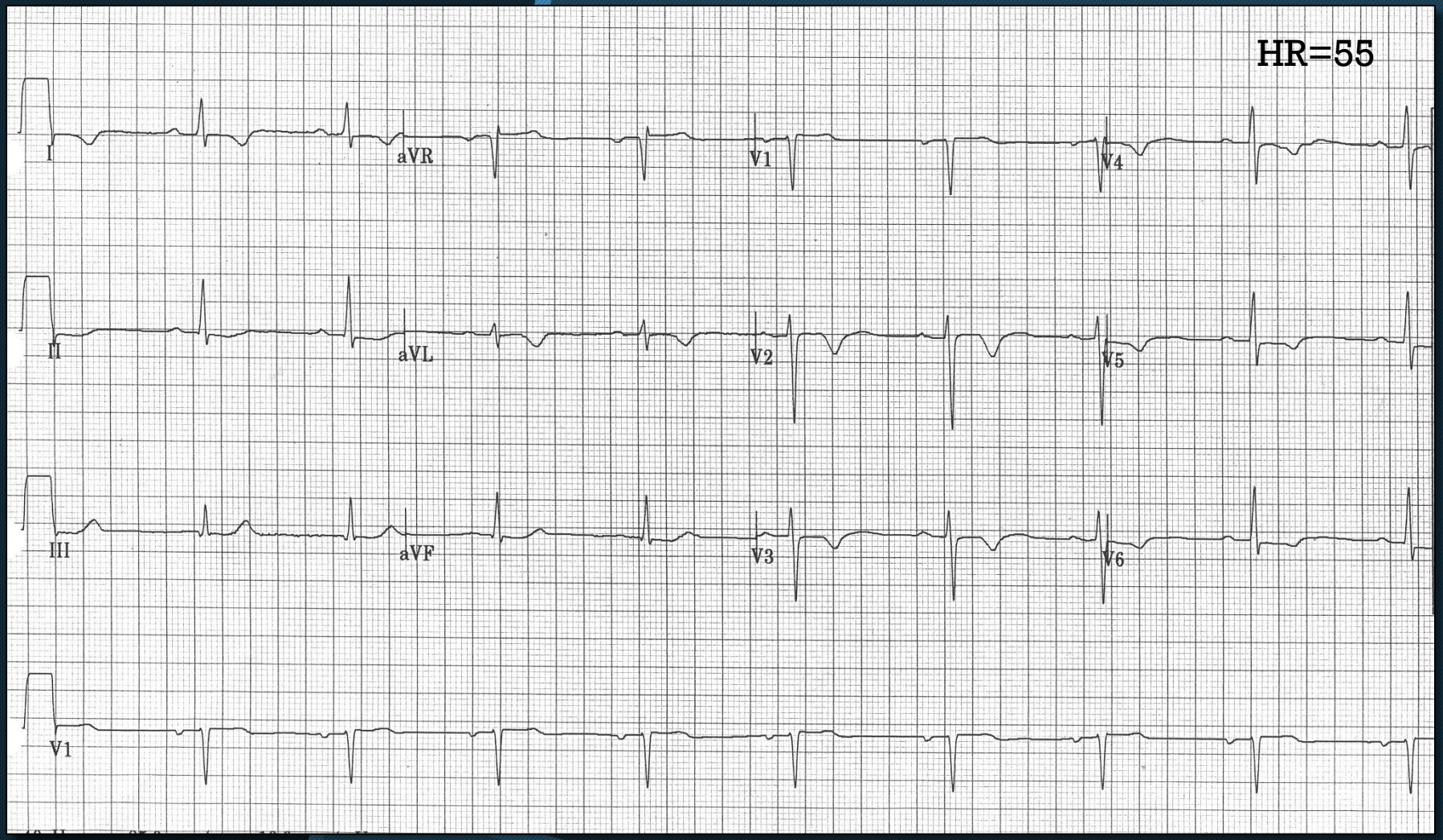
LV CONTRACTION PATTERN

CK 77, peak 116
Trop T 0.01 and peak 0.43
ESR 10

Day 2

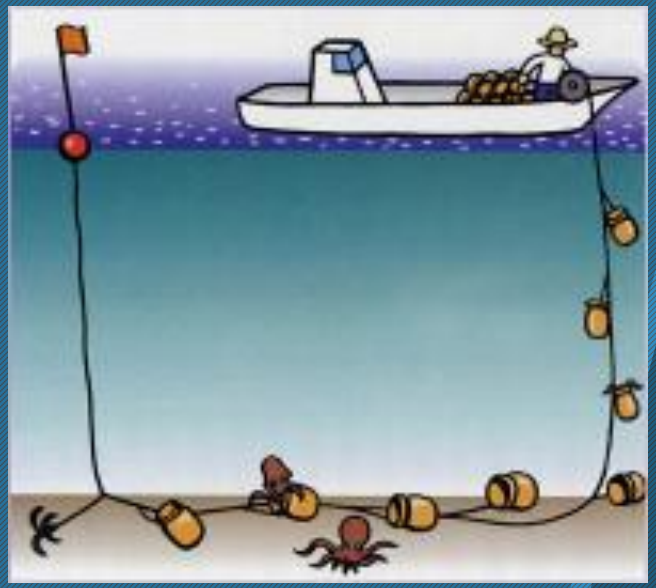


EKG 5 days later (at discharge) …..and full recovery on F/U



"Takotsubo" Cardiomyopathy

- Described in Japan in 1991 by Dr. Sato who named it Takotsubo (because of a similarity of the LV wall motion abnormality to an "octopus catcher" (Tako-tsubo).



Definition

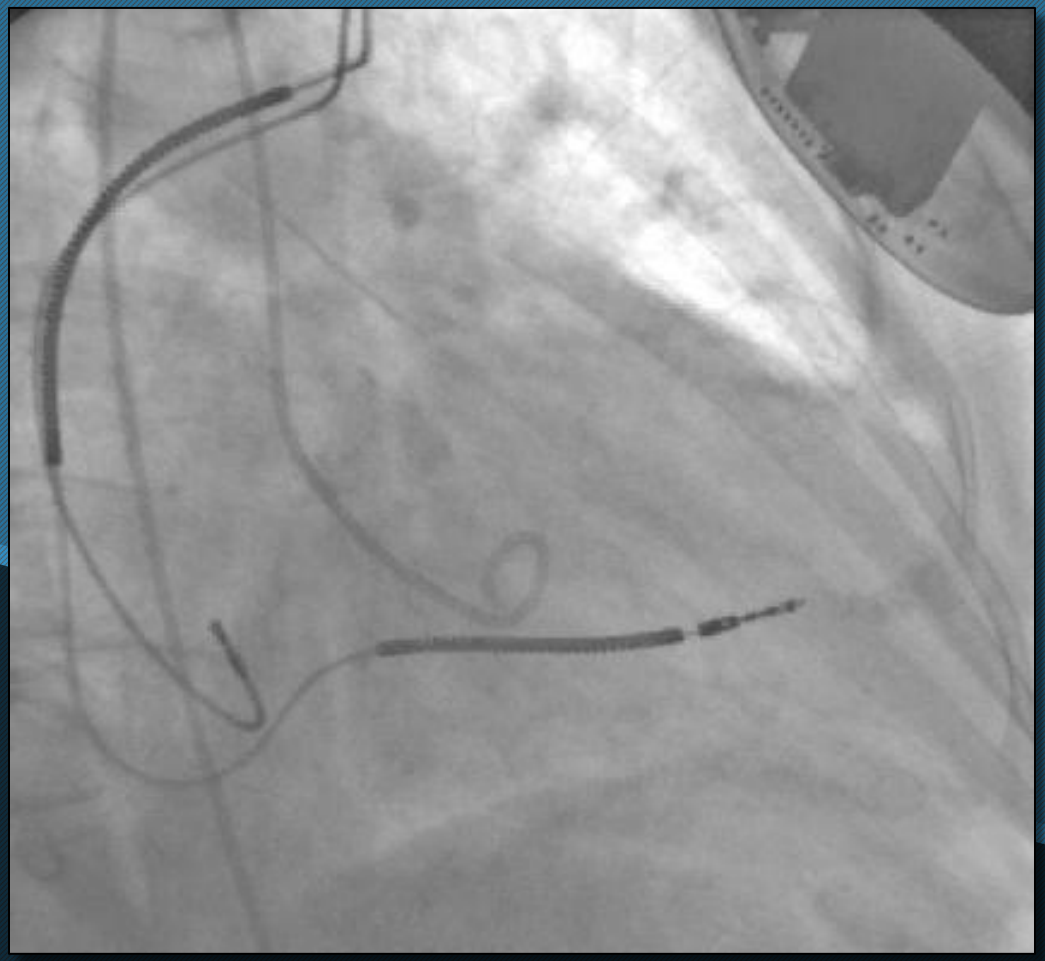
- Transient LV apical ballooning with no significant obstructive CAD
- Often triggered by emotional or physical stress
- Presentation mimics acute MI with EKG ST changes and positive CE at low levels
- Postmenopausal women in > 90% cases
- Totally reversible within 2-3 weeks
- Good prognosis after acute phase

Evolution of Concept

- Initially thought to be present in Asians but subsequently described in Western countries
- Several names have been used: Apical Ballooning Syndrome, Takotsubo Cardiomyoapthy, Ampulla Cardiomyopathy, Stress induced cardiomyopathy…
- Under-recognized for several years… even until today!

Misdiagnosis

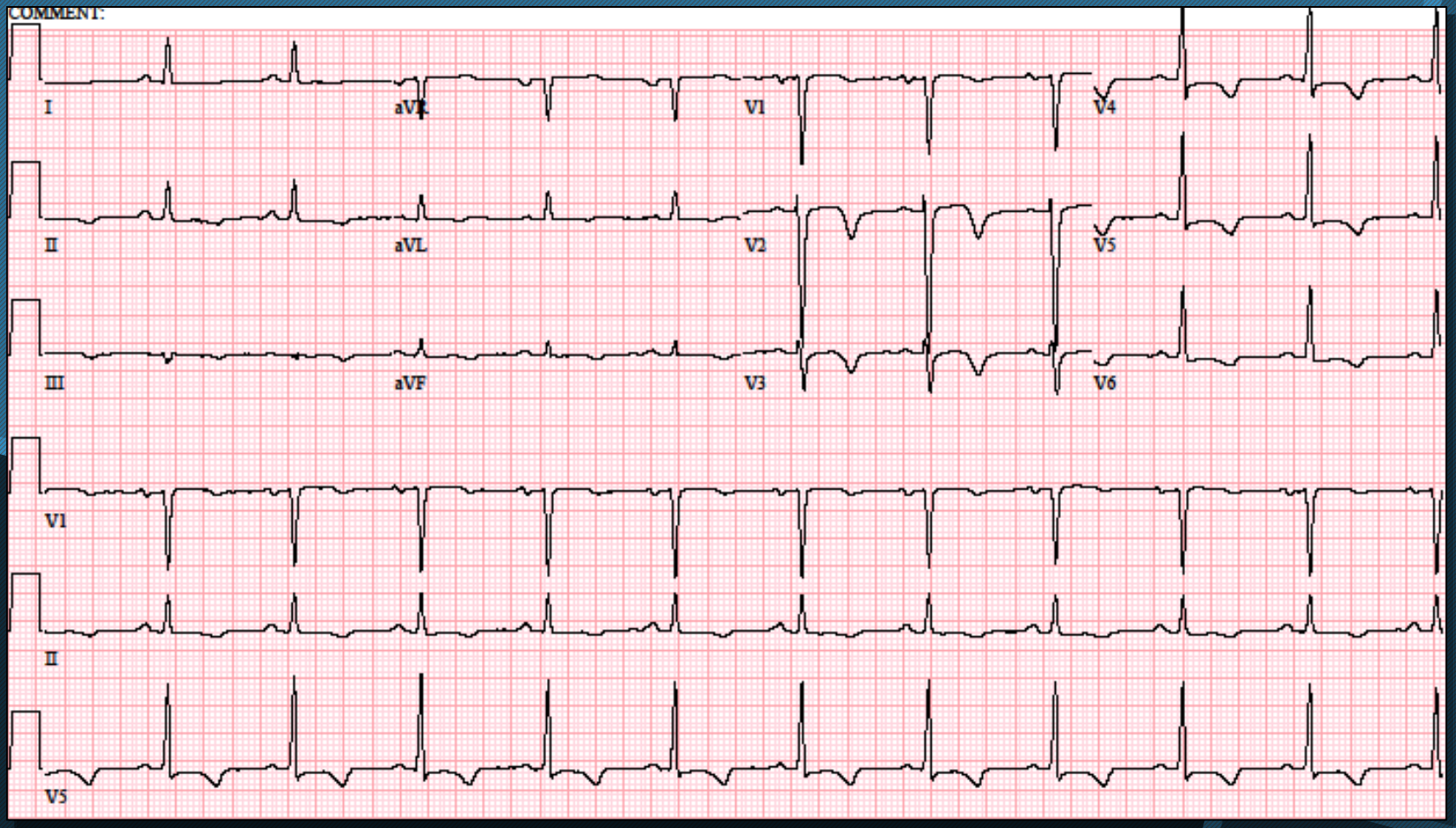
76 yr old woman presented for outpatient cath due to an abnormal stress test done in November 2009. Coronaries showed no obstructive disease.



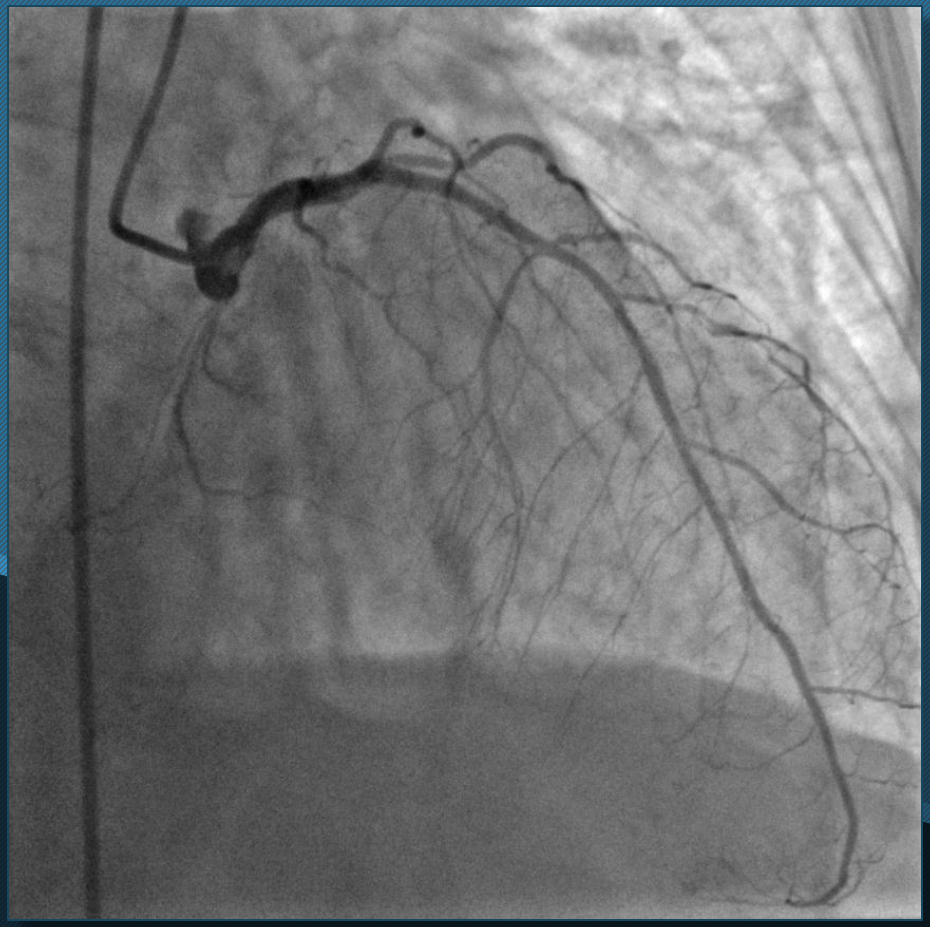
Why patient had an ICD?

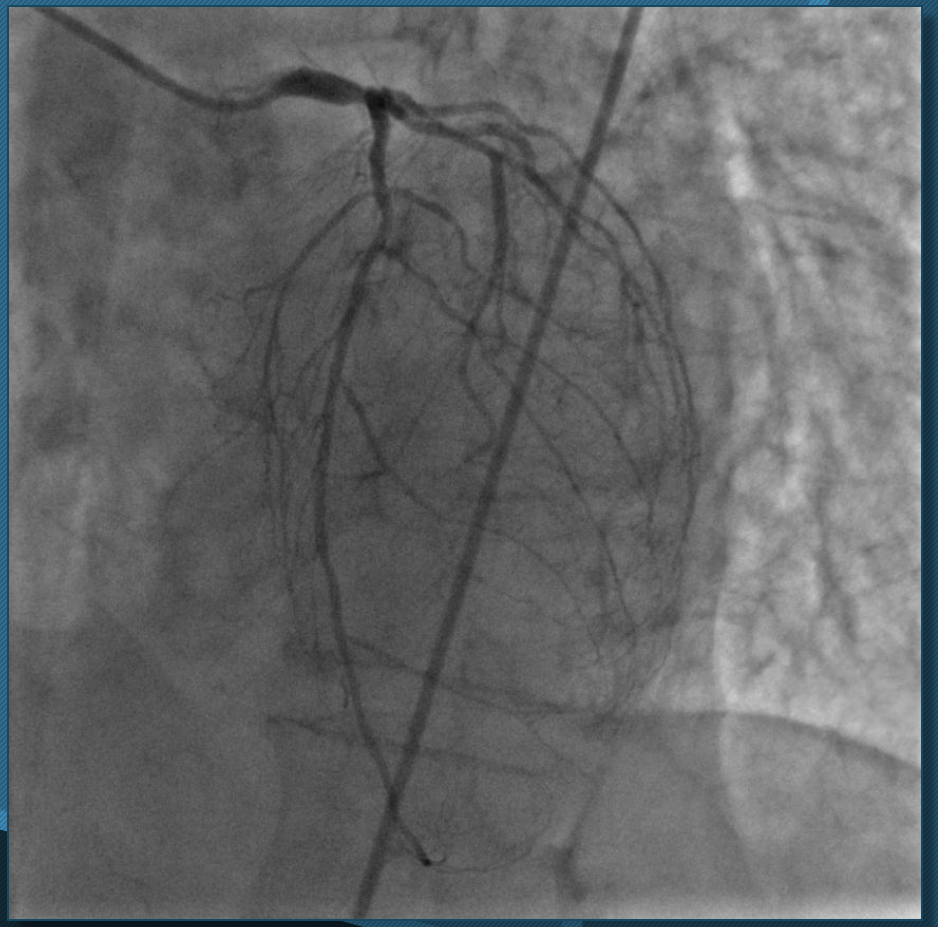
RECORD REVIEW: MARCH 2008

75 yr old with h/o diabetes, PVD, ESRD and hypercholesterolemia admitted with CHF. EKG. Trop T peaked at 0.39 with CK 97 and MB 7%

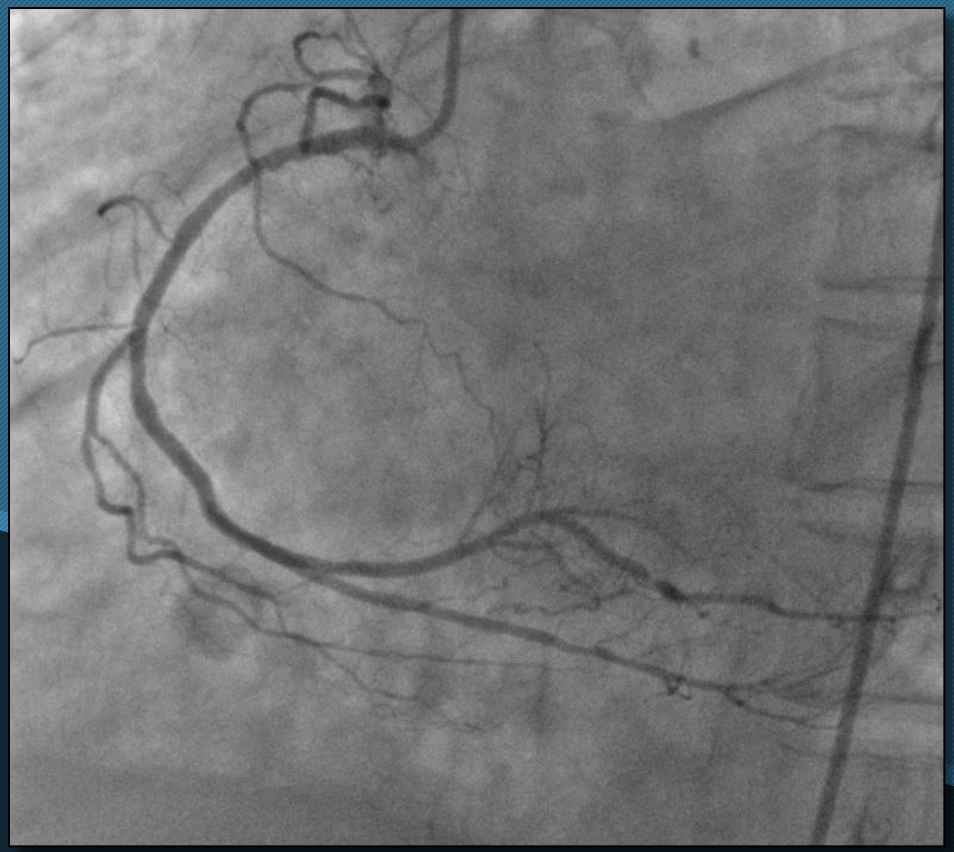


Coronary Arteries



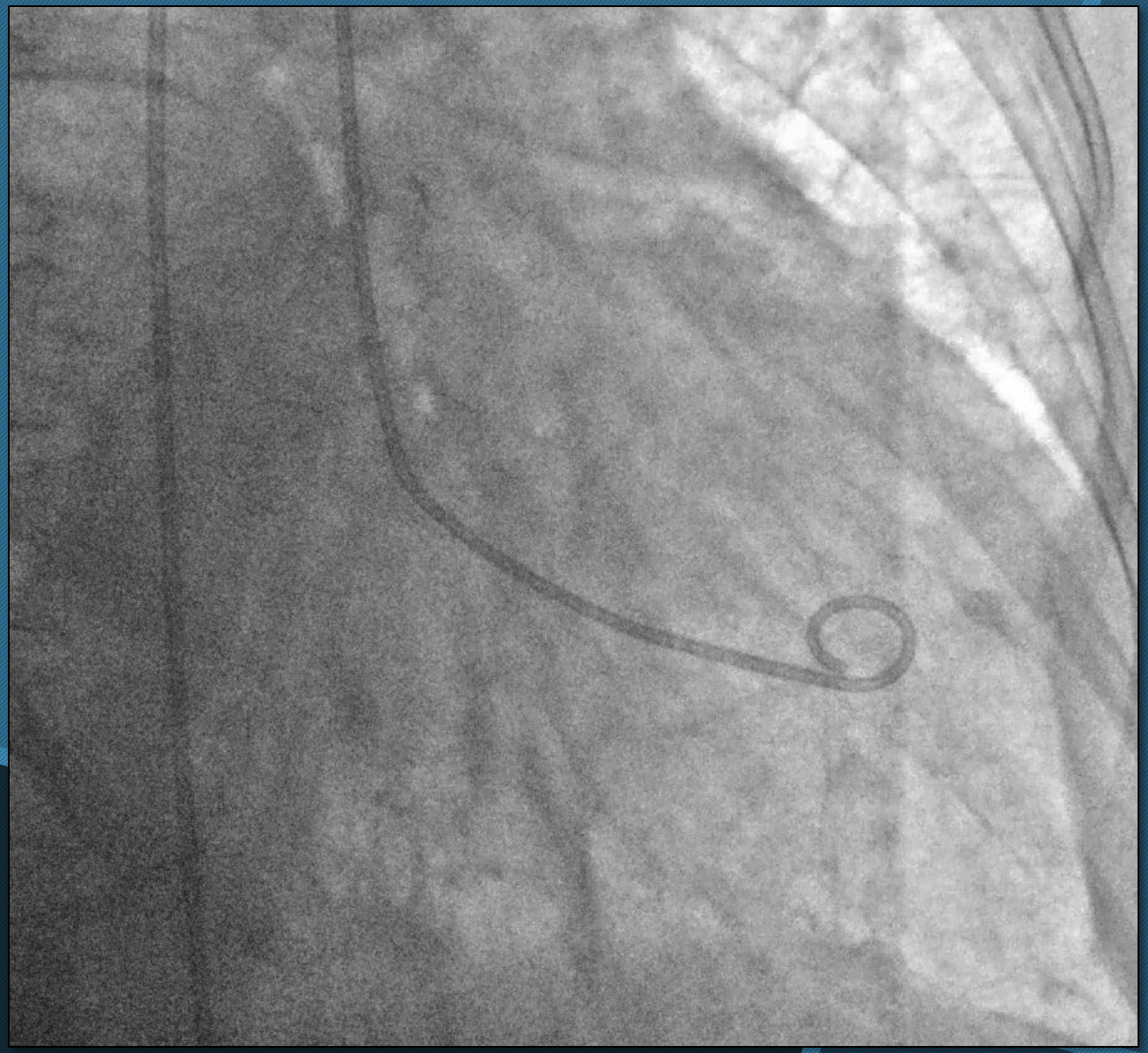


RCA



RECORD REVIEW: MARCH 2008

EF 35%



COURSE

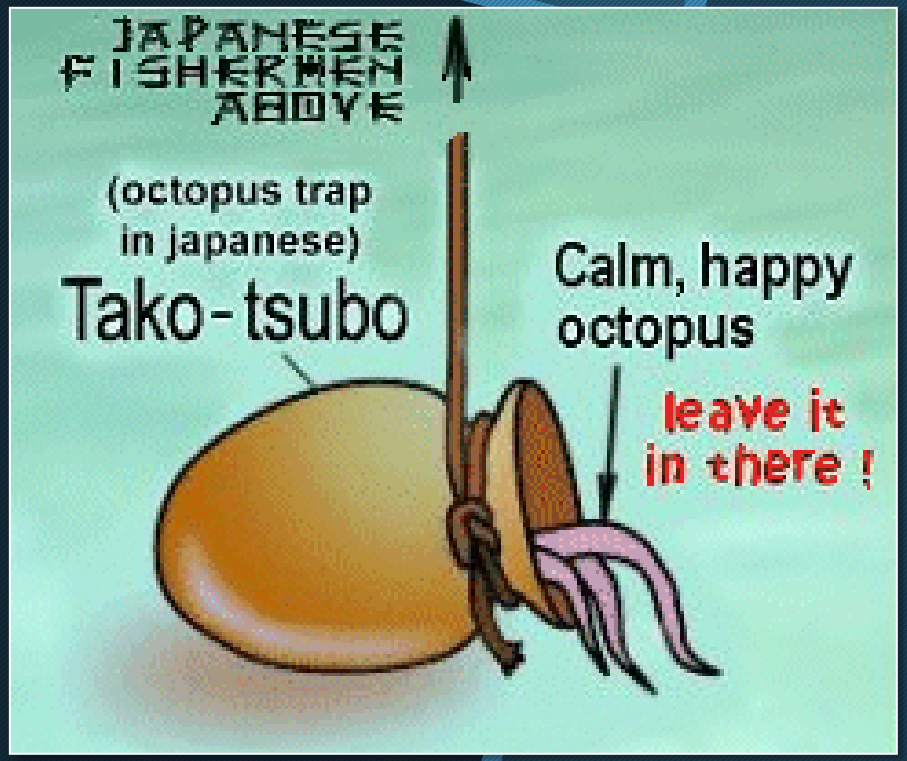
EPS:

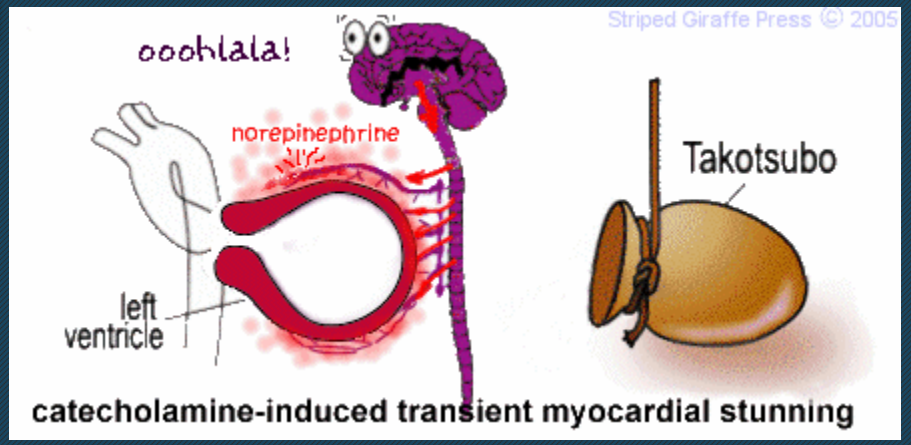
Up to 3 Extra-stimuli: Negative

Isuprel and 3 extrastimuli: VF was induced

Decision of proceed with ICD!!

www.takotsubo.com

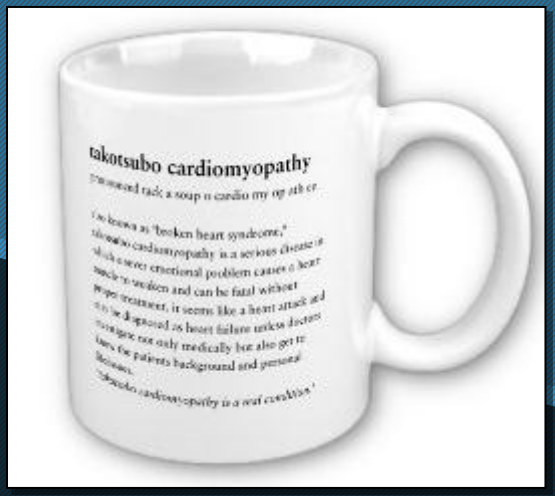


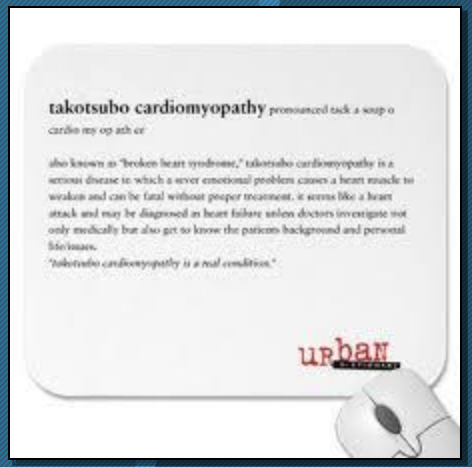


Japanese Takotsubo Speakers

Takotsubo souvenir

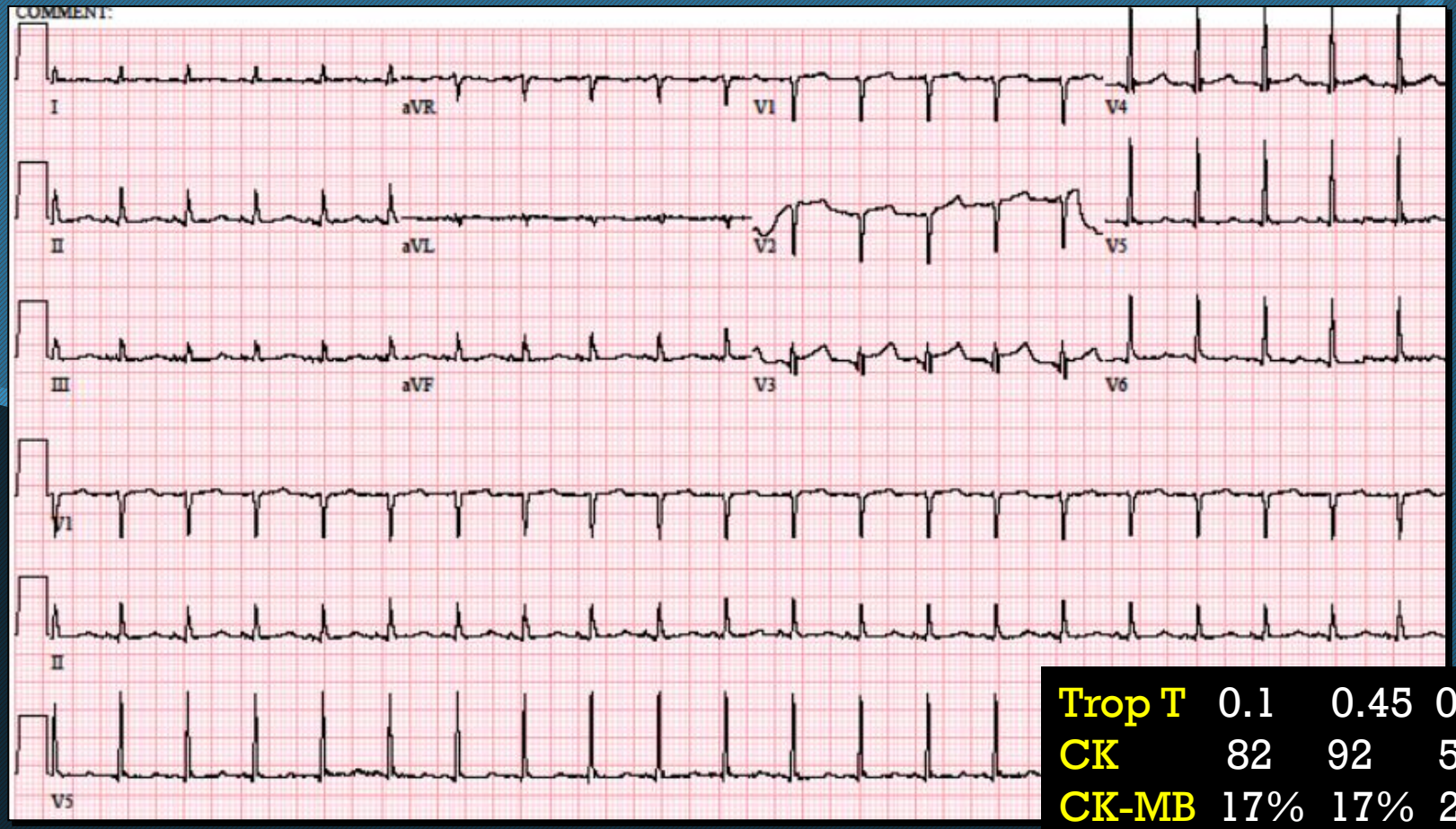
Takotsubo T-shirts



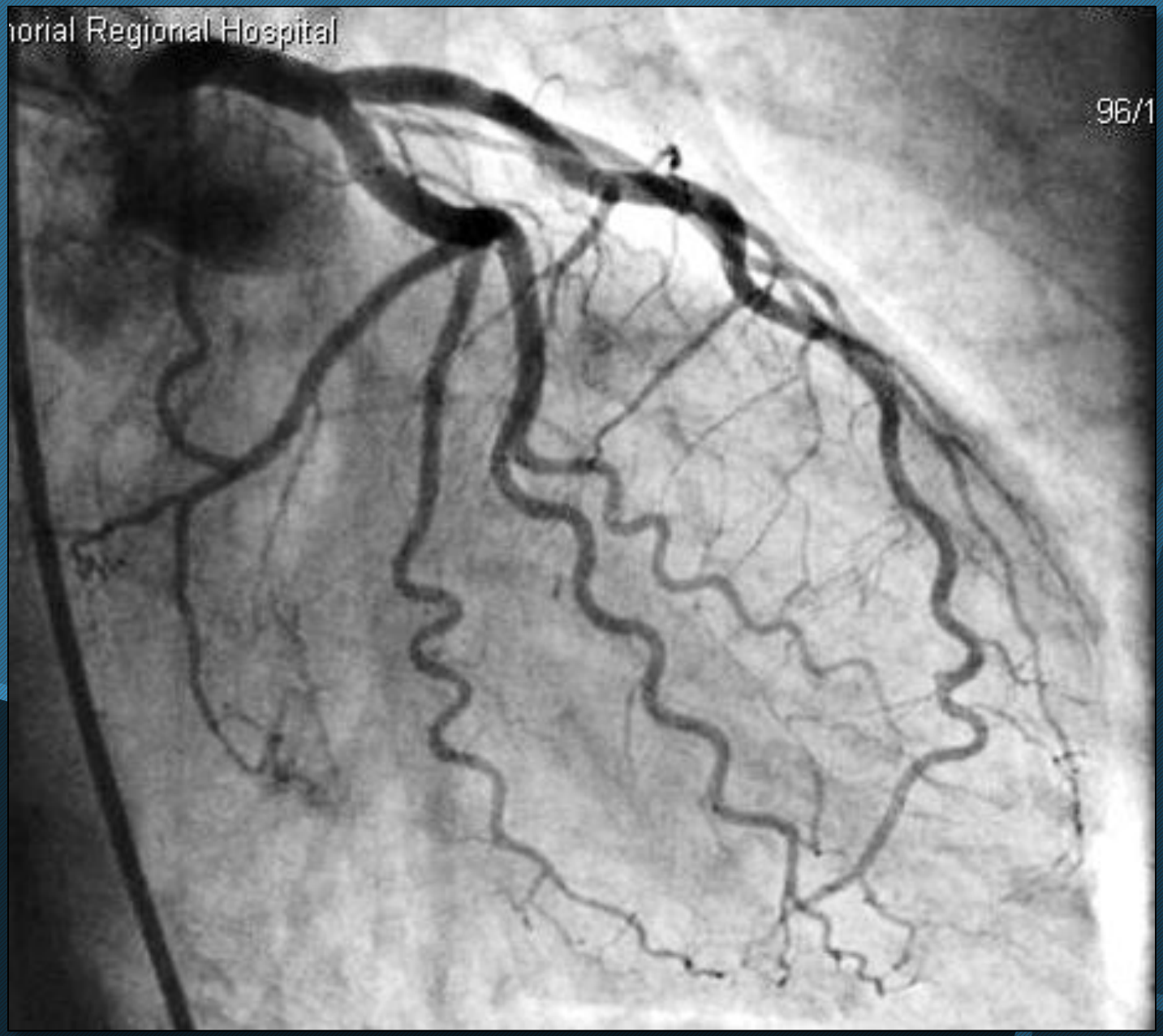


With more experience…….New patterns were identified

80 yr old woman with O_2 dependent COPD admitted with acute pulmonary edema and shock after the death of her daughter.



Trop T	0.1	0.45	0.35
CK	82	92	51
CK-MB	17%	17%	24%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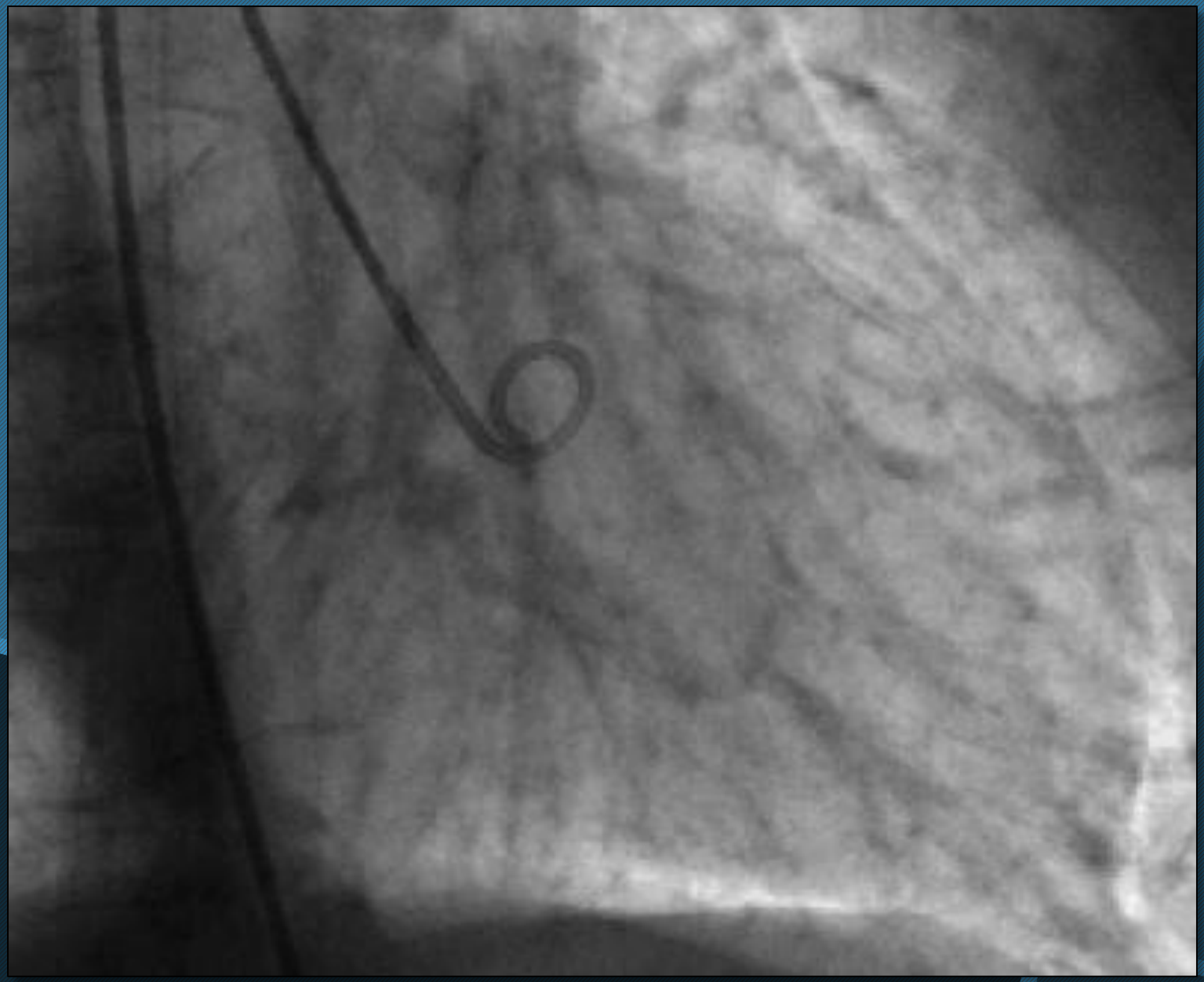
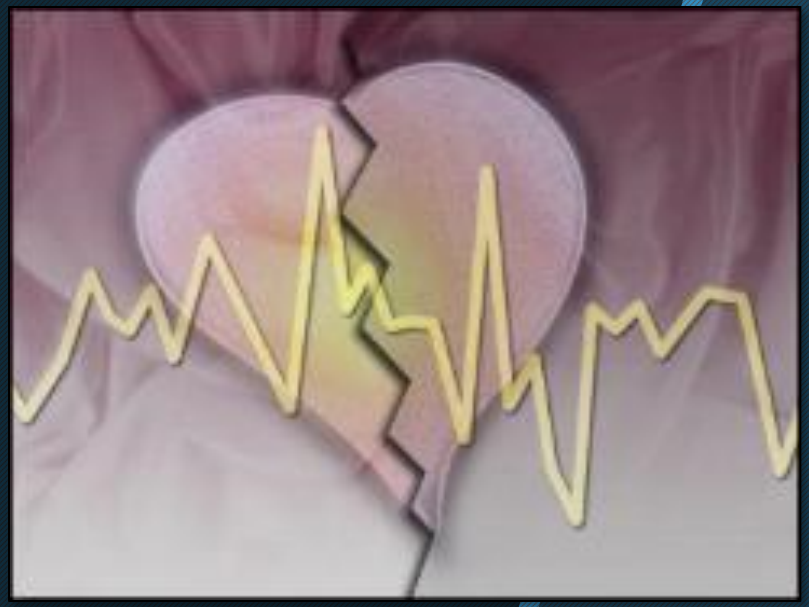


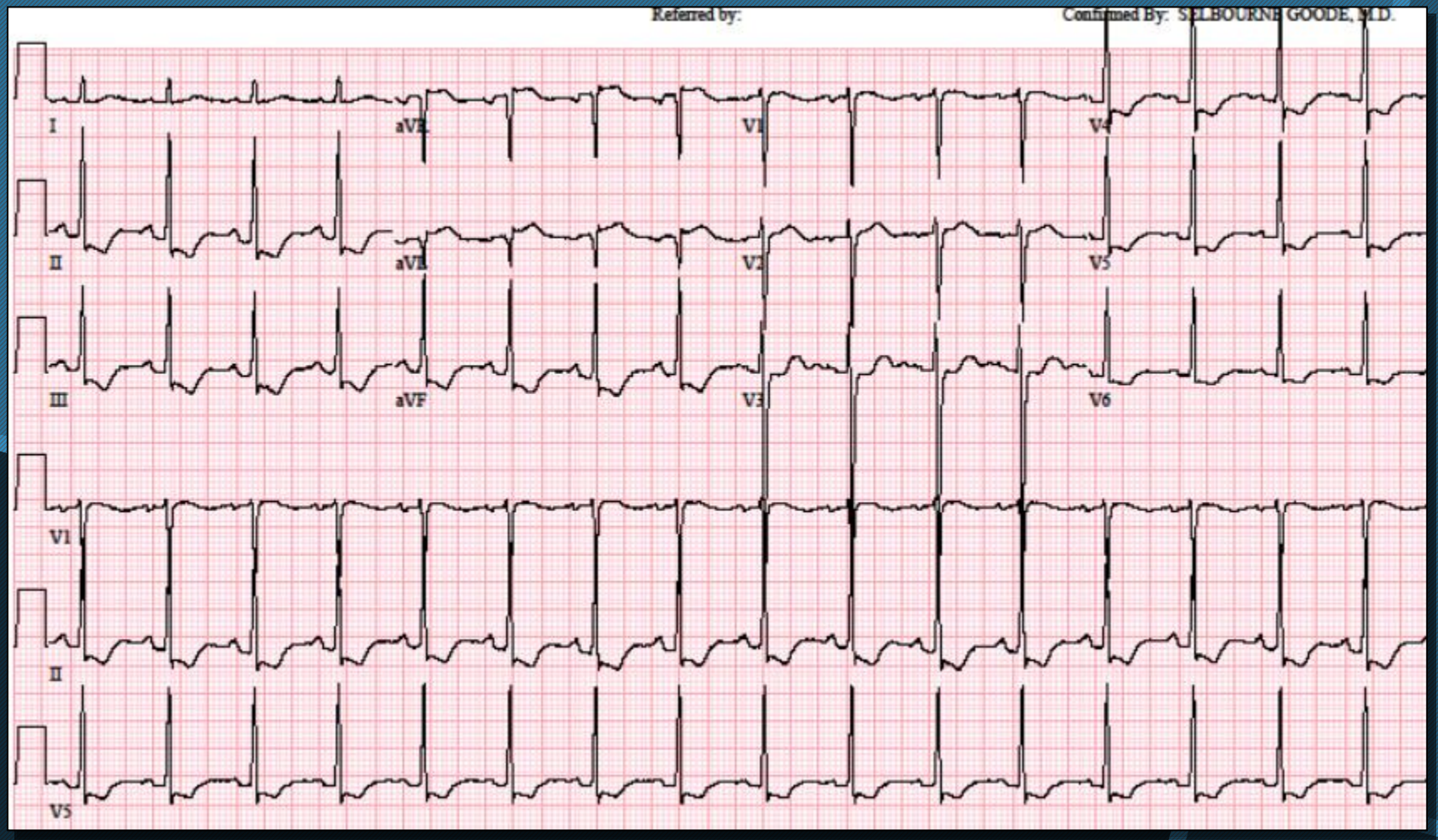
Mid-Ventricular Type

“Broken Heart Syndrome”

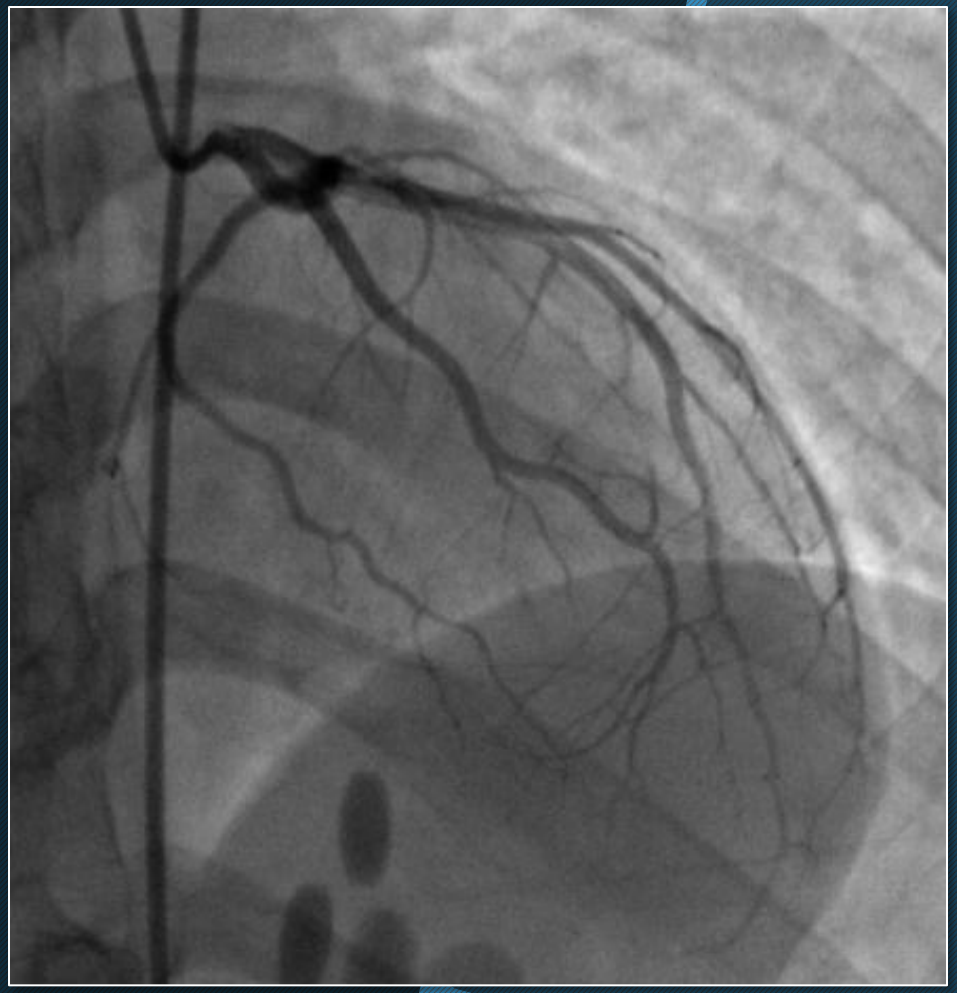


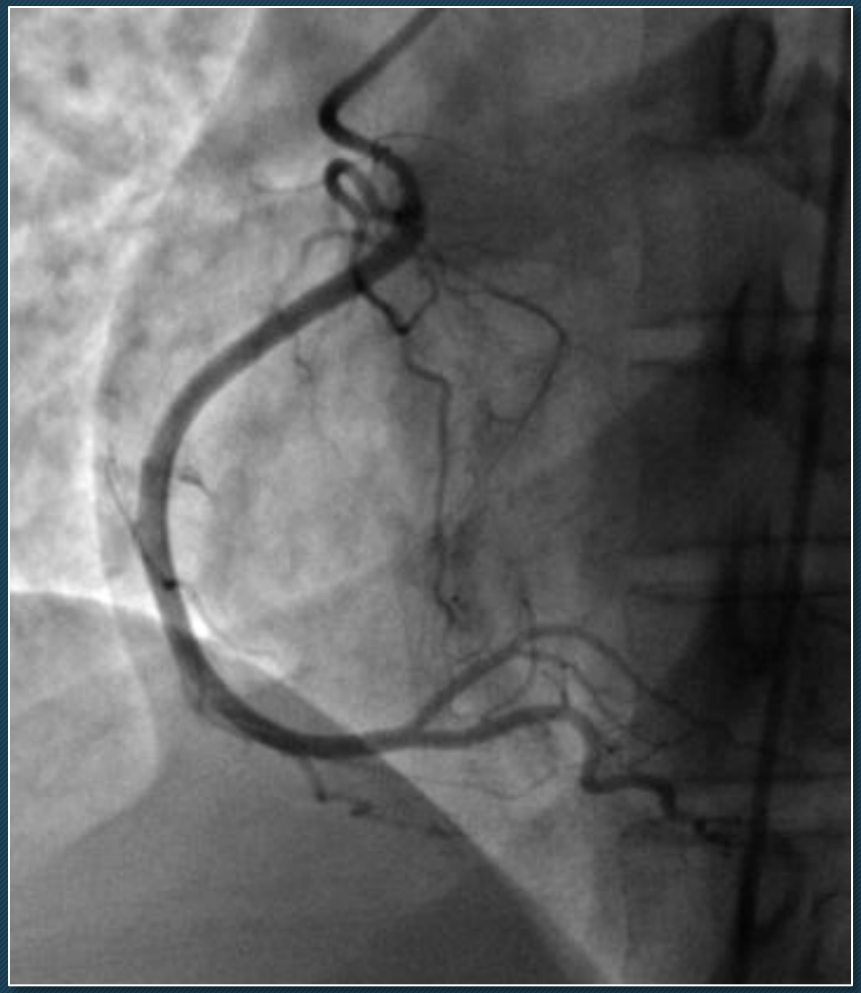
Another fascinating presentation…..

28 yr old comes to ER with rash and itching. Treated with epinephrine SQ and developed chest pain, EKG changes and troponin T 0.21.



Coronary arteries



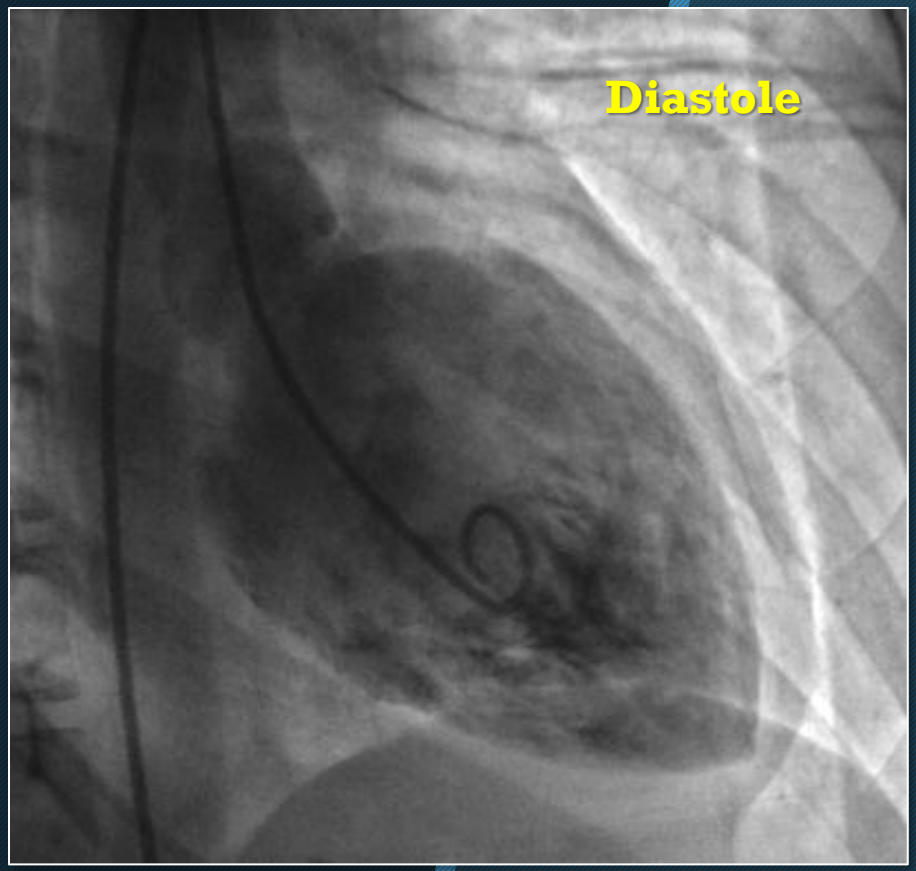


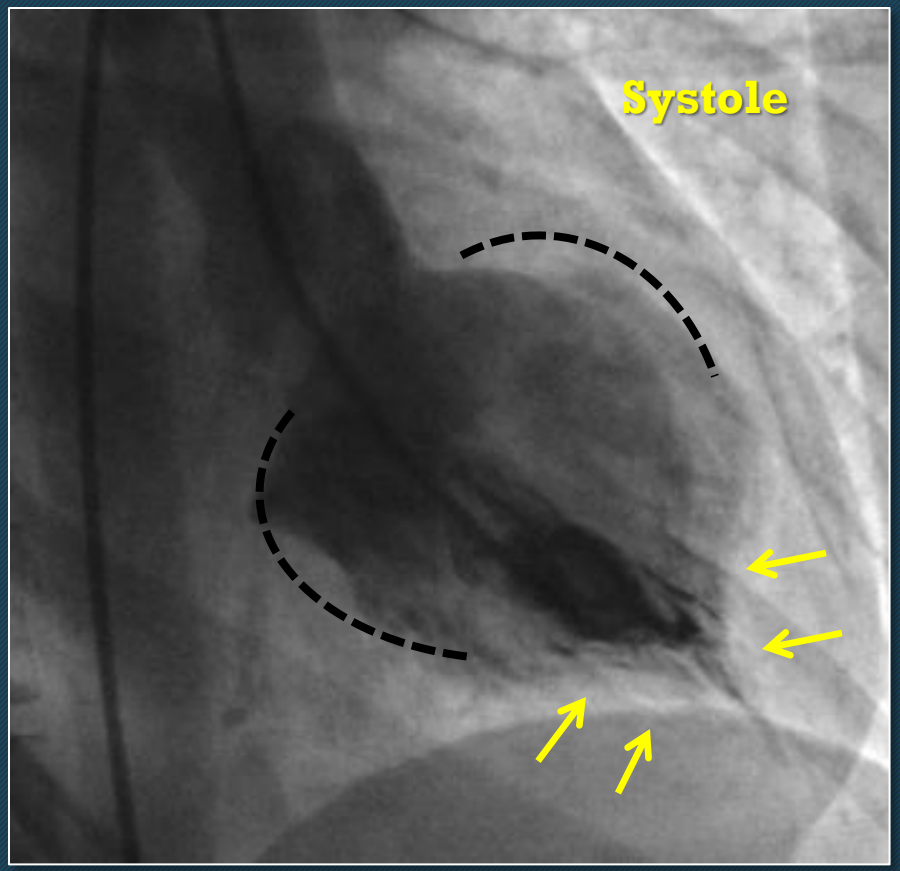
I went to look in the literature……

Physicians of the Mayo Clinic described a basal LV abnormality in 3 young women (30, 32,30): emotional stress, acute flare MS and Metamphetamine use.

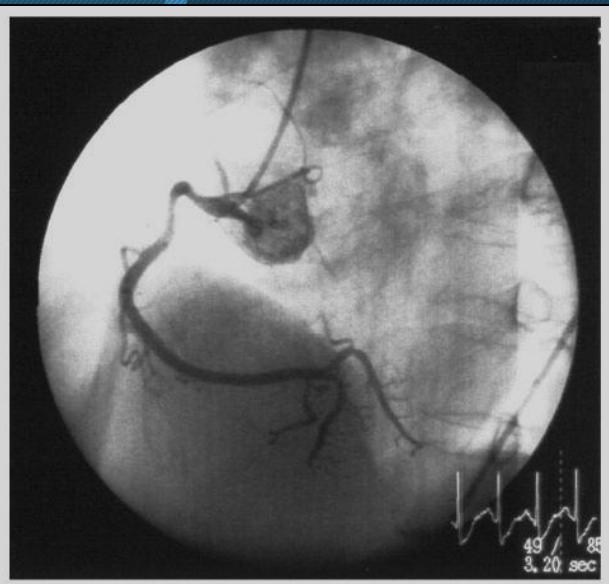
American Journal Cardiology 2007

Basal Type

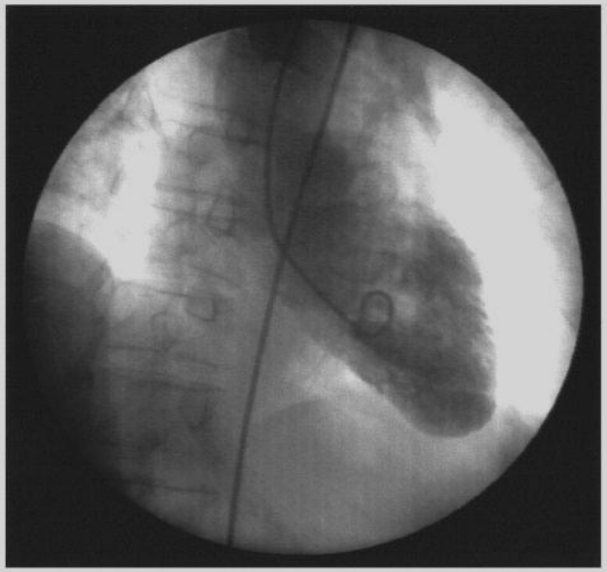




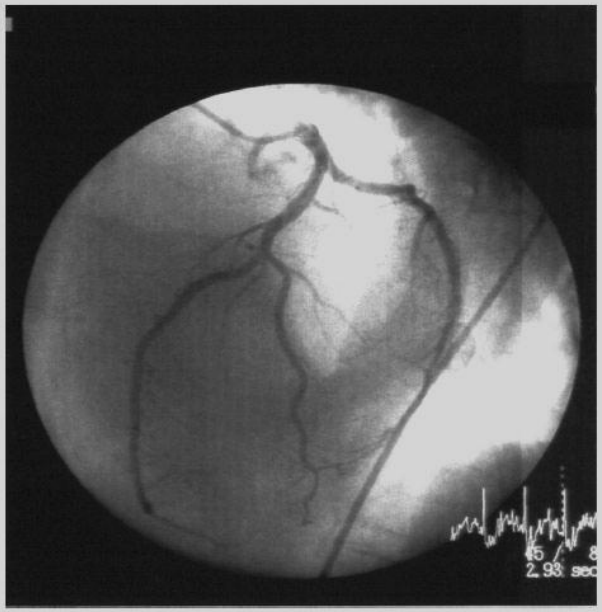
Accidentally I found something very curious in a Cardiology Journal



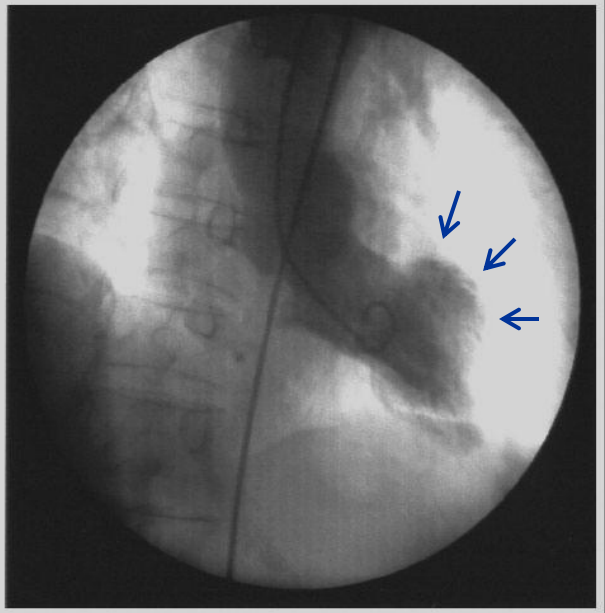
A. Right coronary artery



C. Diastole

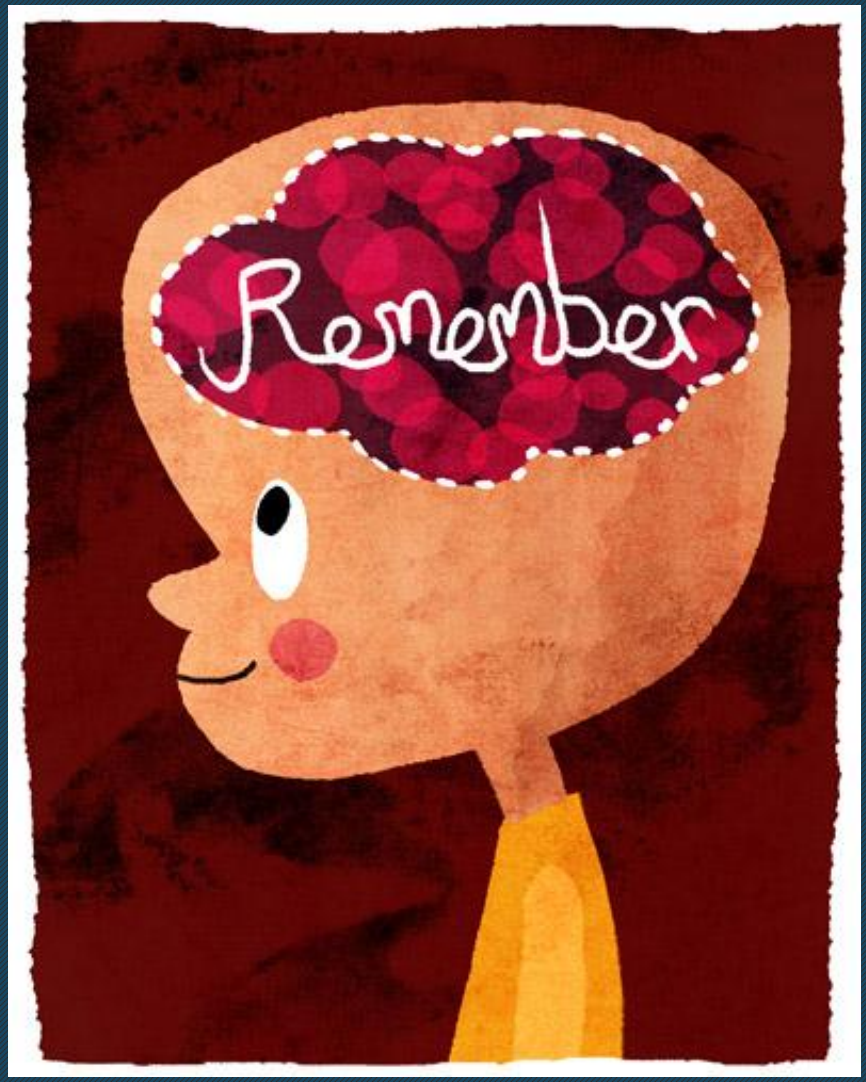


B. Left coronary artery



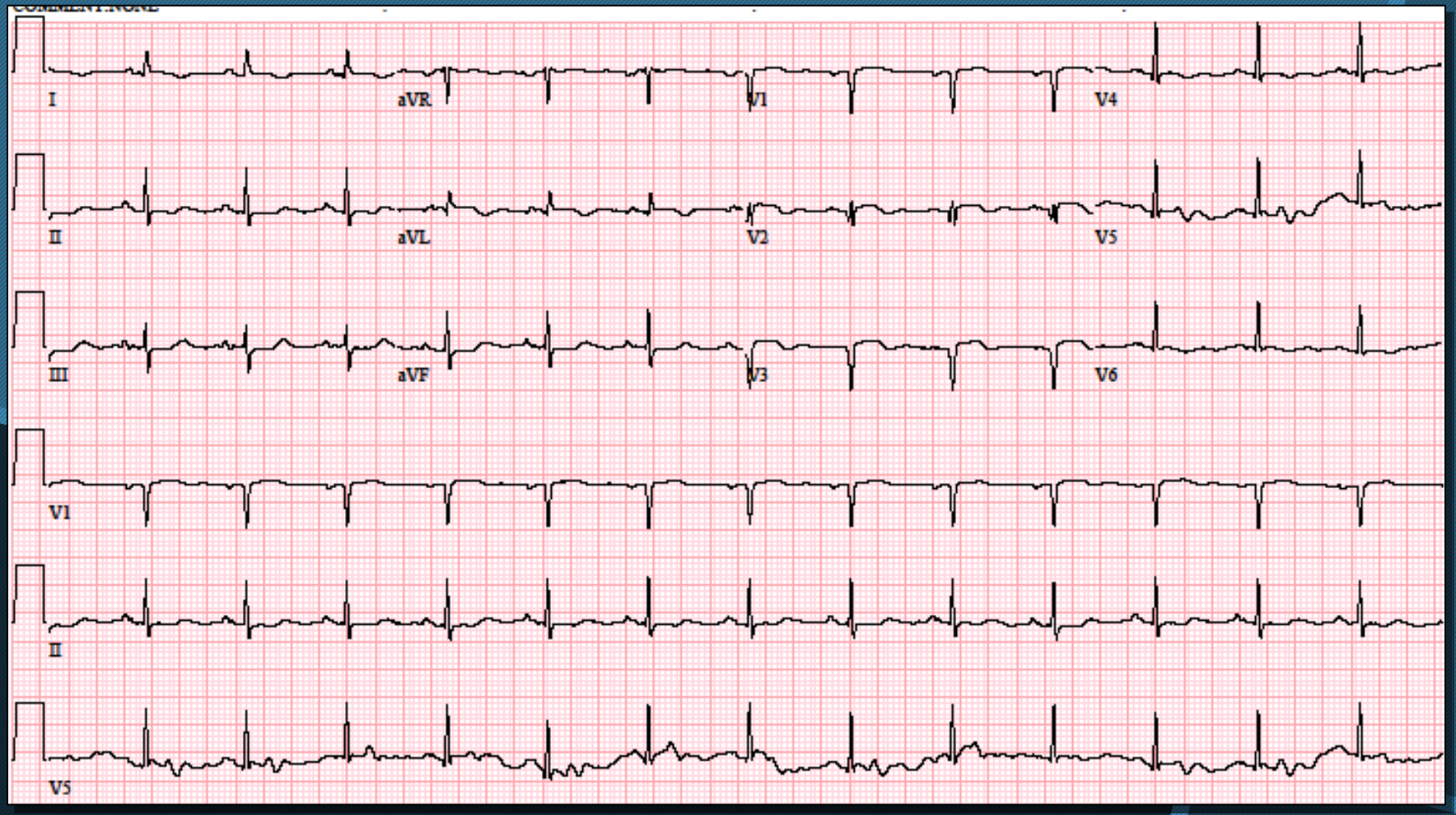
D. Systole

2003

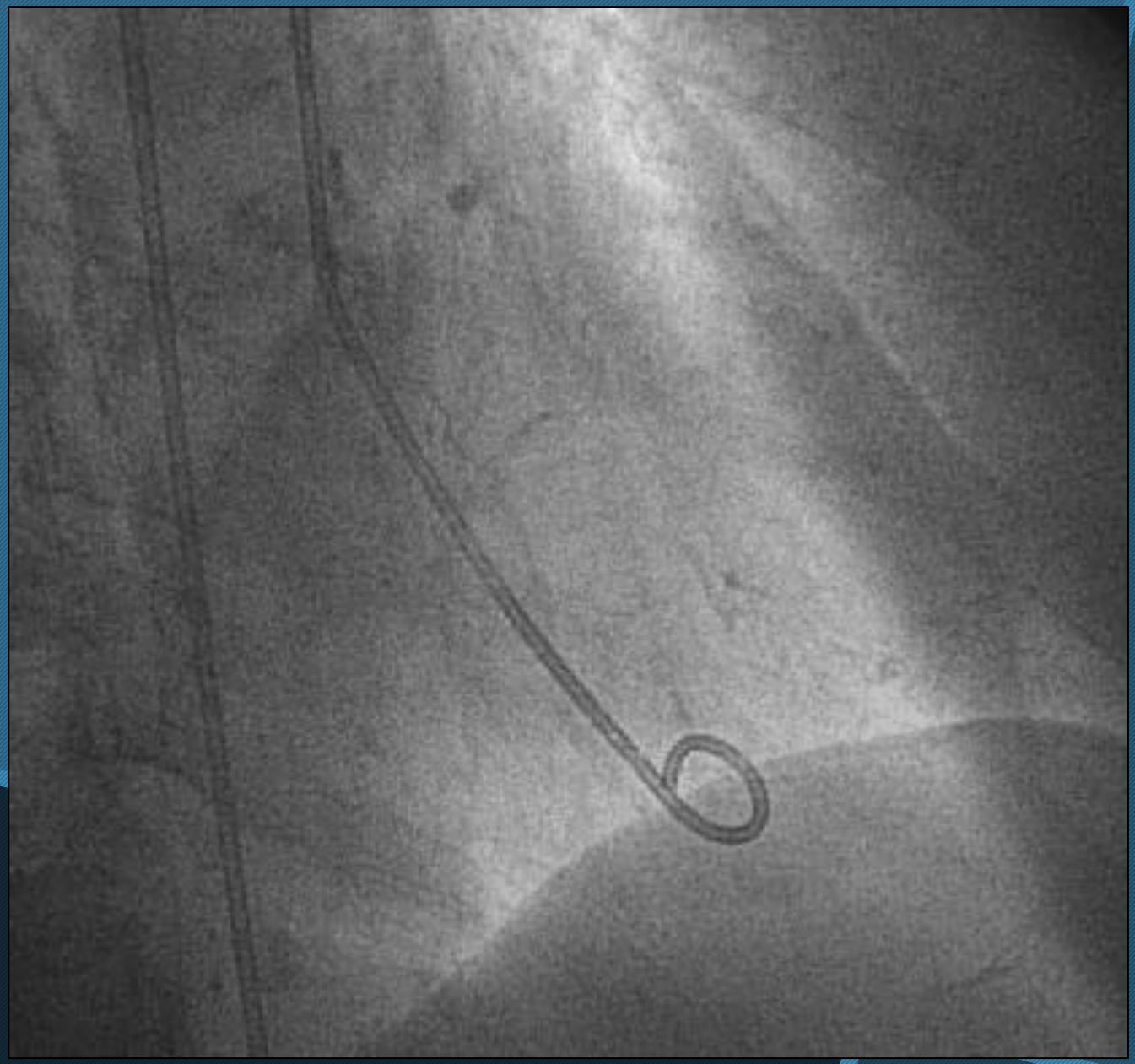


My patient in January 2003

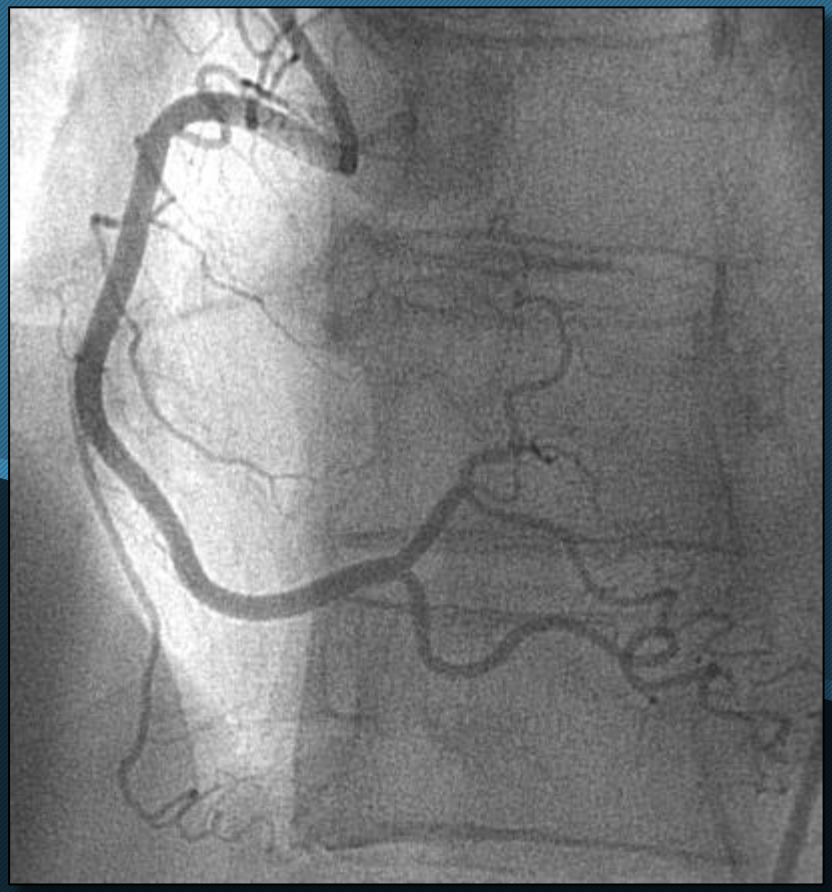
78 yr old with COPD and PVD had an adenosine stress test. Had persistent chest pain with mild ST elevation in anteriorly + I and aVL



LV



No Sig CAD



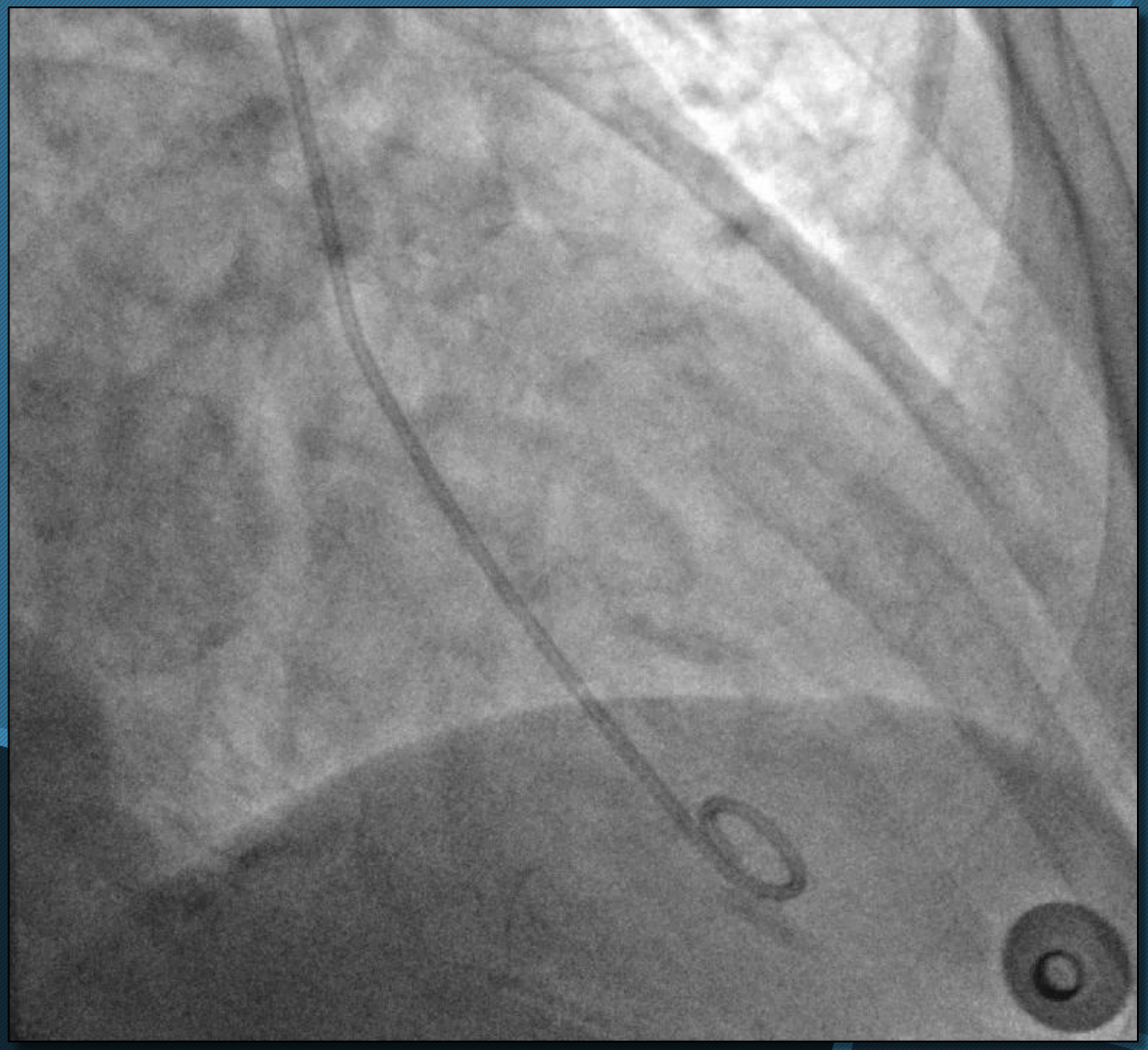
Localized Type: Another case

- 61 yr old woman with h/o HTN and high cholesterol presents with atypical chest and epigastric discomfort.

- Lots of stress but she was not specific.

- Trop 0.08

- Mildly abn EKG.



“You see what you look for and recognize what you know”

Unknown

luistami@comcast.net

Transient LV Dysfunction Syndromes: TYPES

1. Apical Type or "Typical"
2. Midventricular Type or "Atypical"
3. Basal Type
4. Localized: anterior or inferior
5. Diffuse

Transient LV Dysfunction Syndromes: TYPES

1. Apical Type or "Typical"
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* Young women

CLINICAL FEATURES

1. Mimics Acute Myocardial Infarction with STE and/or ischemic appearing ST/T wave abnormalities, QT prolongation. Changes up to several weeks.
2. No significant CAD and typical LV wall motion
3. Frequently precipitated by Stress
4. Postmenopausal women
5. Reversible and full recovery of LV function occurs in 2-4 weeks. Good prognosis after acute phase.
6. Minimal elevation of cardiac enzymes
7. May involve the RV
8. Variable severity of presentation:
    1. Subclinical or incident finding
    2. Acute CHF
    3. Shock
    4. Ventricular arrhythmias or Sudden death
    5. CVA / LV apical clot / ventricular rupture

PRECIPITANT FACTORS

- Emotional Stress ("broken heart syndrome")
- Physical stress: pneumonia, COPD exacerbation, surgery or anesthesia, stroke or intracranial bleeding, brain death
- Automobile accidents
- Exercise or Dobutamine stress test
- Epinephrine or other IV cathecolamines
- Sometimes not obvious

PATHOGENESIS

Cathecolamines play a central role

- -Levels found to be quite higher than in MI
- -Direct cytotoxic effect
- -Microvascular spasm
- -Metabolic cell abnormalities

Postmenopausal hormonal state, estrogen deficiency

- -Demographics
- -Experimental model in rats
- -Increased frequency? Relation with less estrogen replacement therapy (premarin prescriptions)

Viral Infection: Parvovirus, CMV

TREATMENT

1. Conservative: Carvedilol, ACE inh, Diuretics, etc.
2. Consider short term of coumadin in apical type.
3. Consider a life vest in severe cases
4. No ICDs acutely.
5. Follow up evaluation of LVF.

FAQ

- Why the characteristic LV wall motion abnormality?
  - More abundance of adrenergic receptors in the apex.
  - Less noradrenergic nerve endings in the apex may explain less neurally-mediated injury in some patients
- Is it more common? Or more recognized?
  - Premarin prescriptions dropped after the negative large prevention study on estrogen supplementation
  - About 2% emergency caths for STEMI (5-7% among women)

Thank you !!!

Questions?