

Norepinephrine Induced Takotsubo Cardiomyopathy

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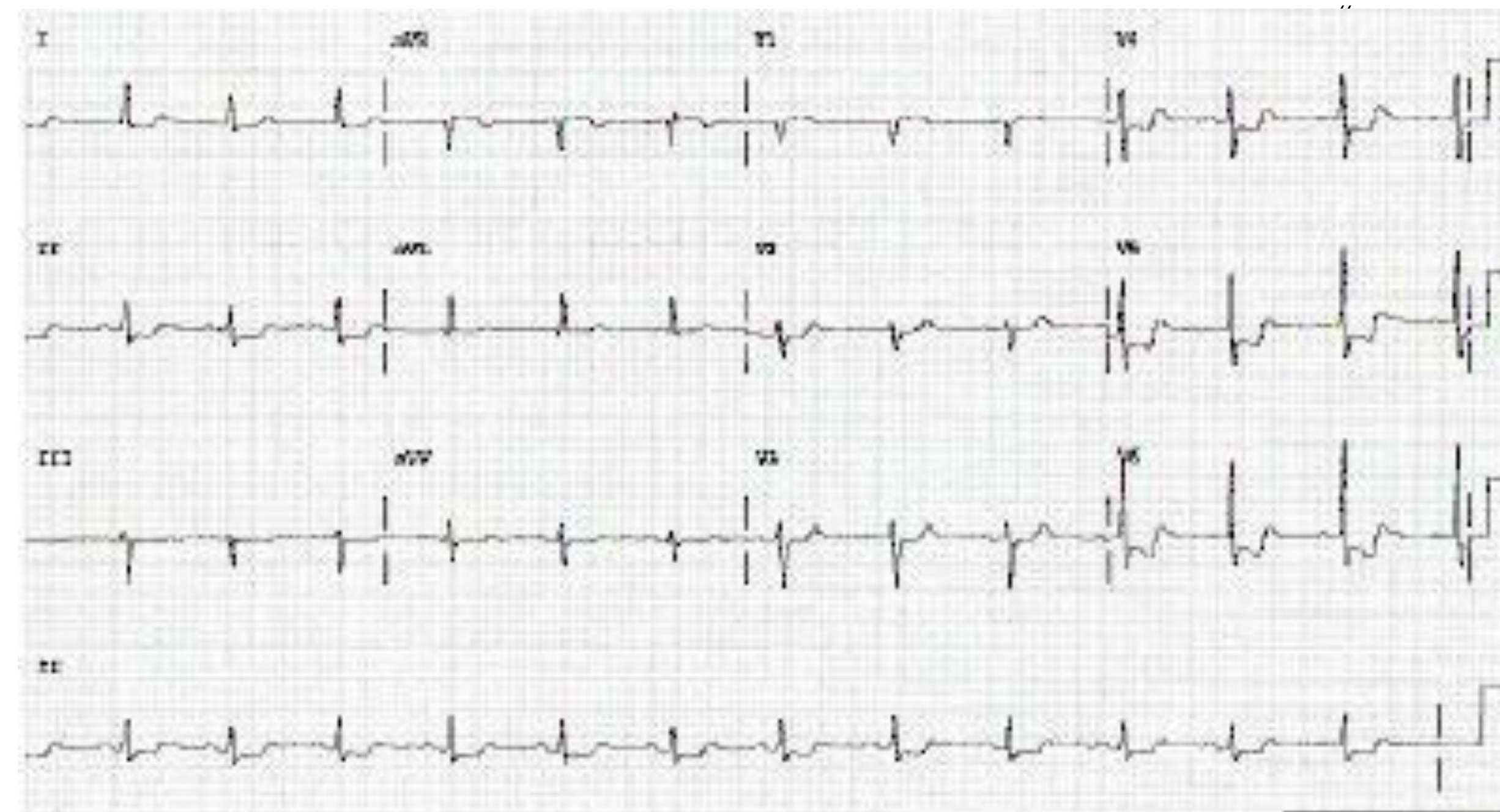
Background

- Stress cardiomyopathy: left ventricular dysfunction that arises after emotional or physical stress due to the release of catecholamines
- Characterized by myocardial hypocontractility
- Ballooning of the apex resembles a tako-tsubo, a pot used by Japanese fishermen to trap octopuses
- KEY distinguishing finding is the lack of evidence of coronary artery disease on an angiogram**
- Mimics physical manifestations of myocardial infarction and heart failure which include:
 - Chest pain
 - Shortness of breath
 - Elevated troponin levels
 - Abnormal LV movement and ballooning

Case

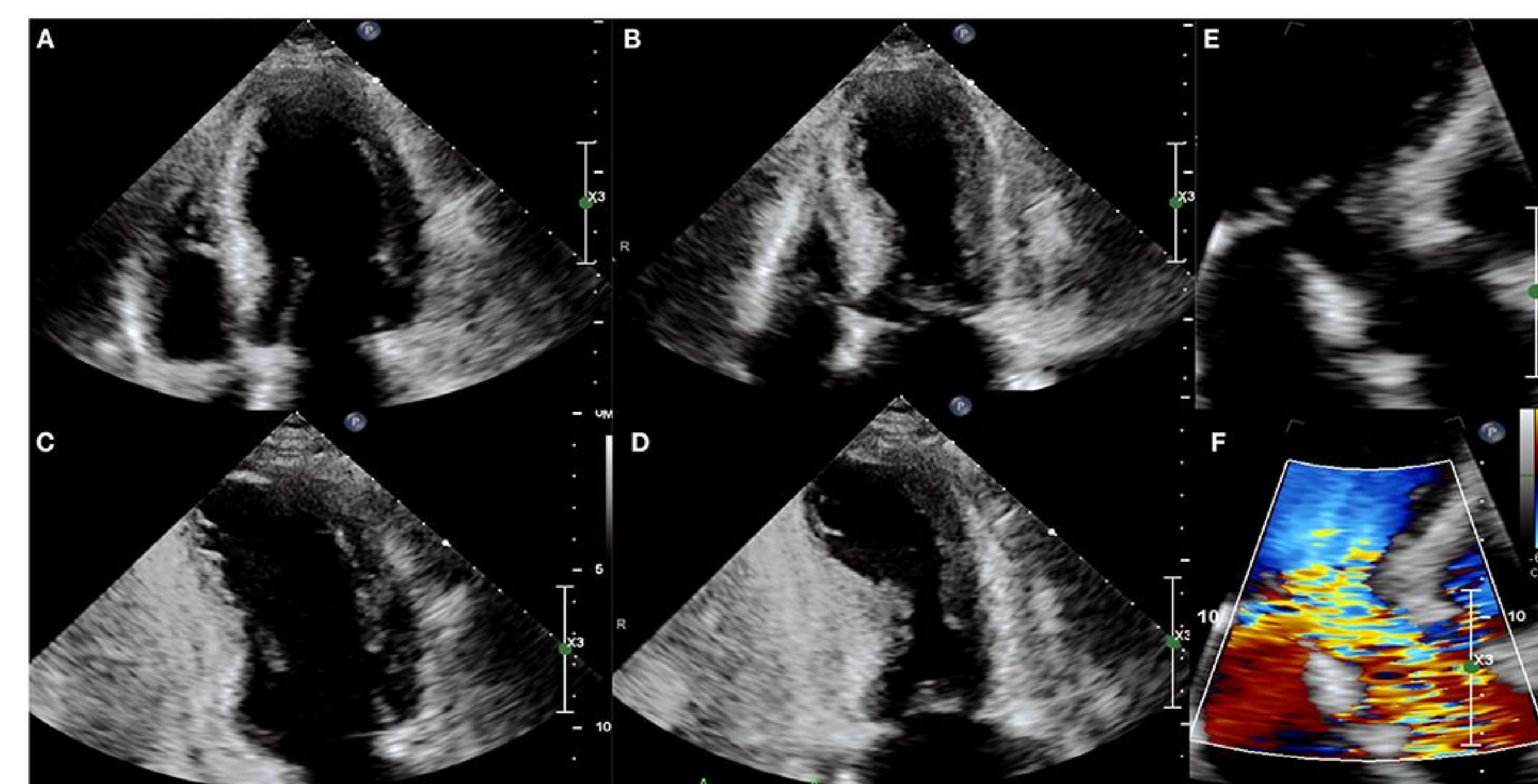
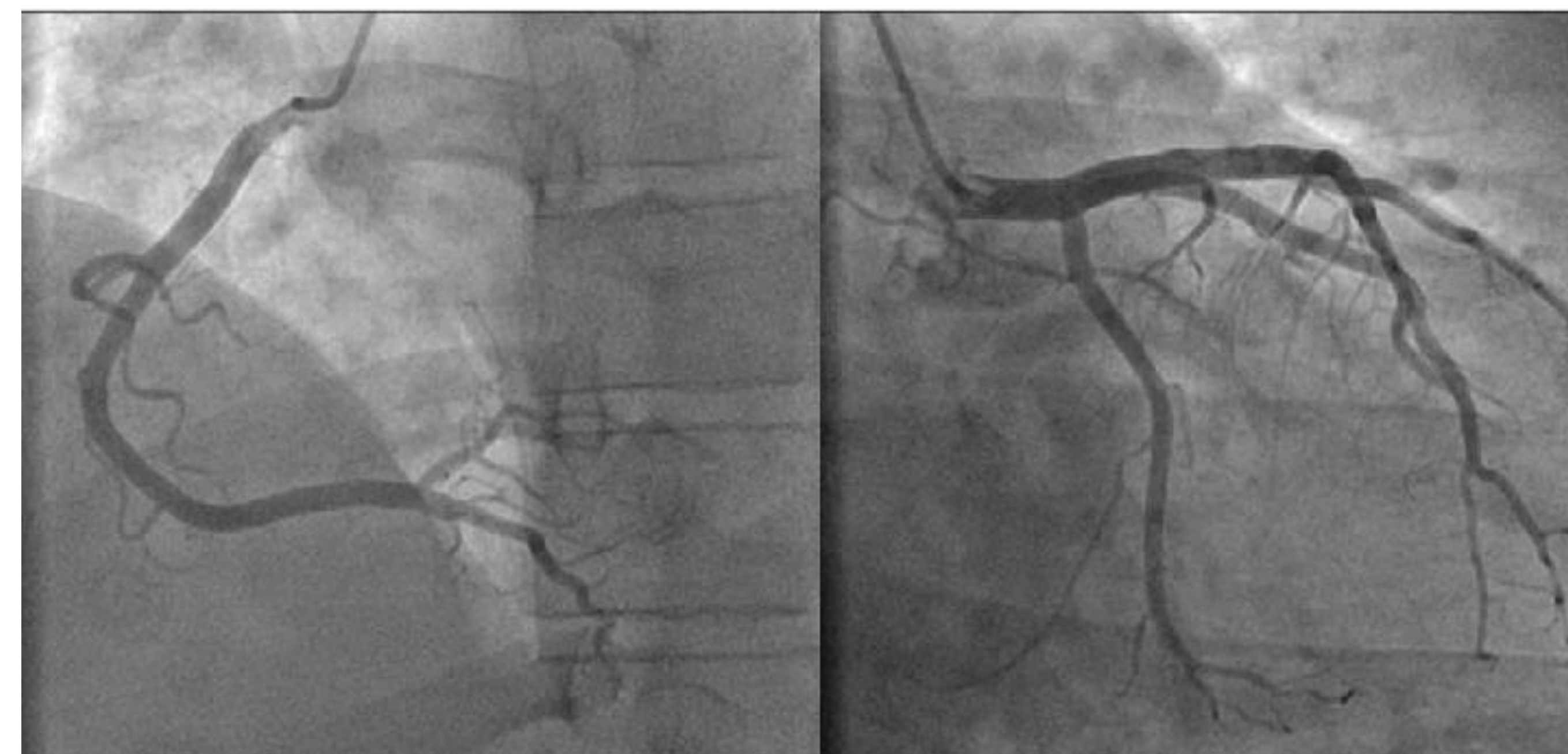
- 57 yo presents to ED with SOB, fever, chills, CP, nausea, and vomiting
- Day 1: Patient was septic and received Levophed
- Day 3:
 - ECG shows severely reduced EF of 30% compared to 4 days ago before the initiation of Levophed
 - Elevated troponin levels

Imaging/Tests

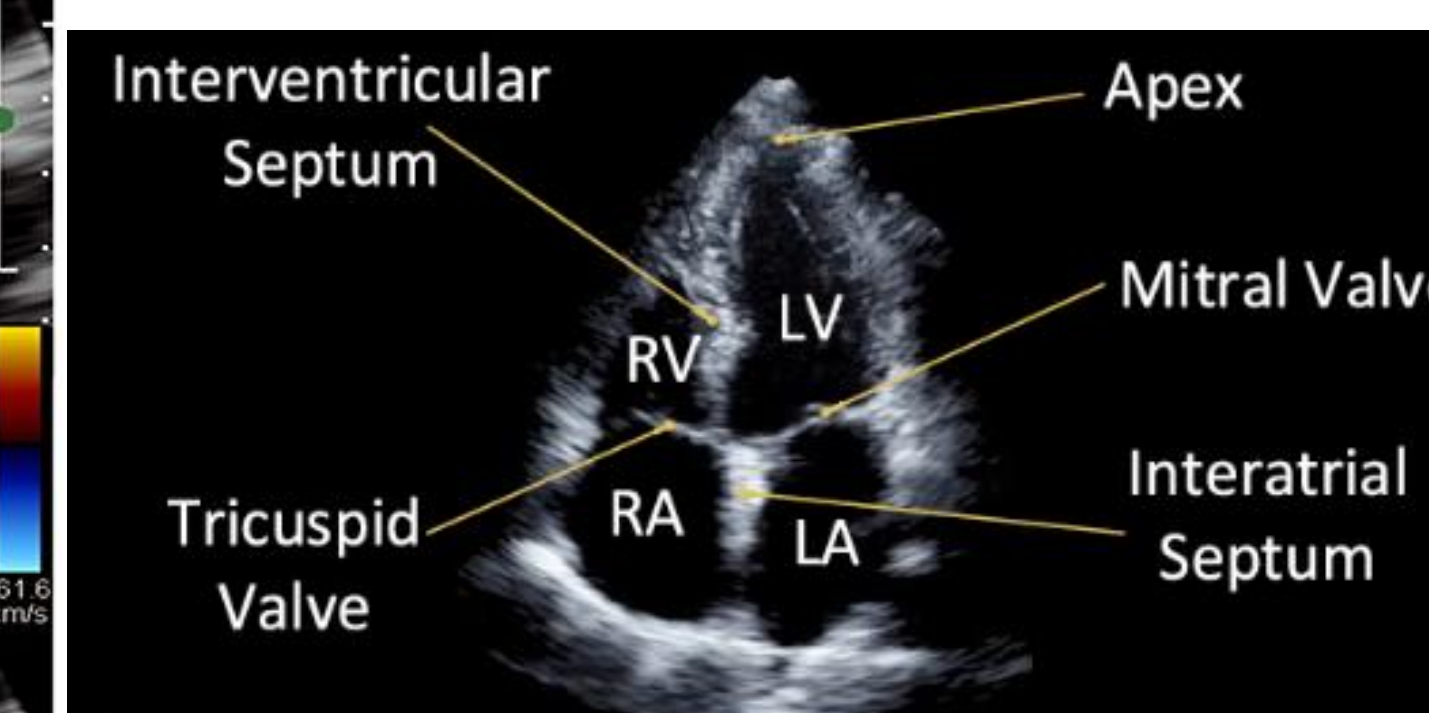


- ECG revealing NSTEMI
- Classically characteristic of a myocardial infarction
- Clinically:** patient was experiencing chest pain and shortness of breath

- CT angiogram revealing the lack of obstruction in her arteries
- Clinically:** Patient was still experiencing signs of MI and heart failure

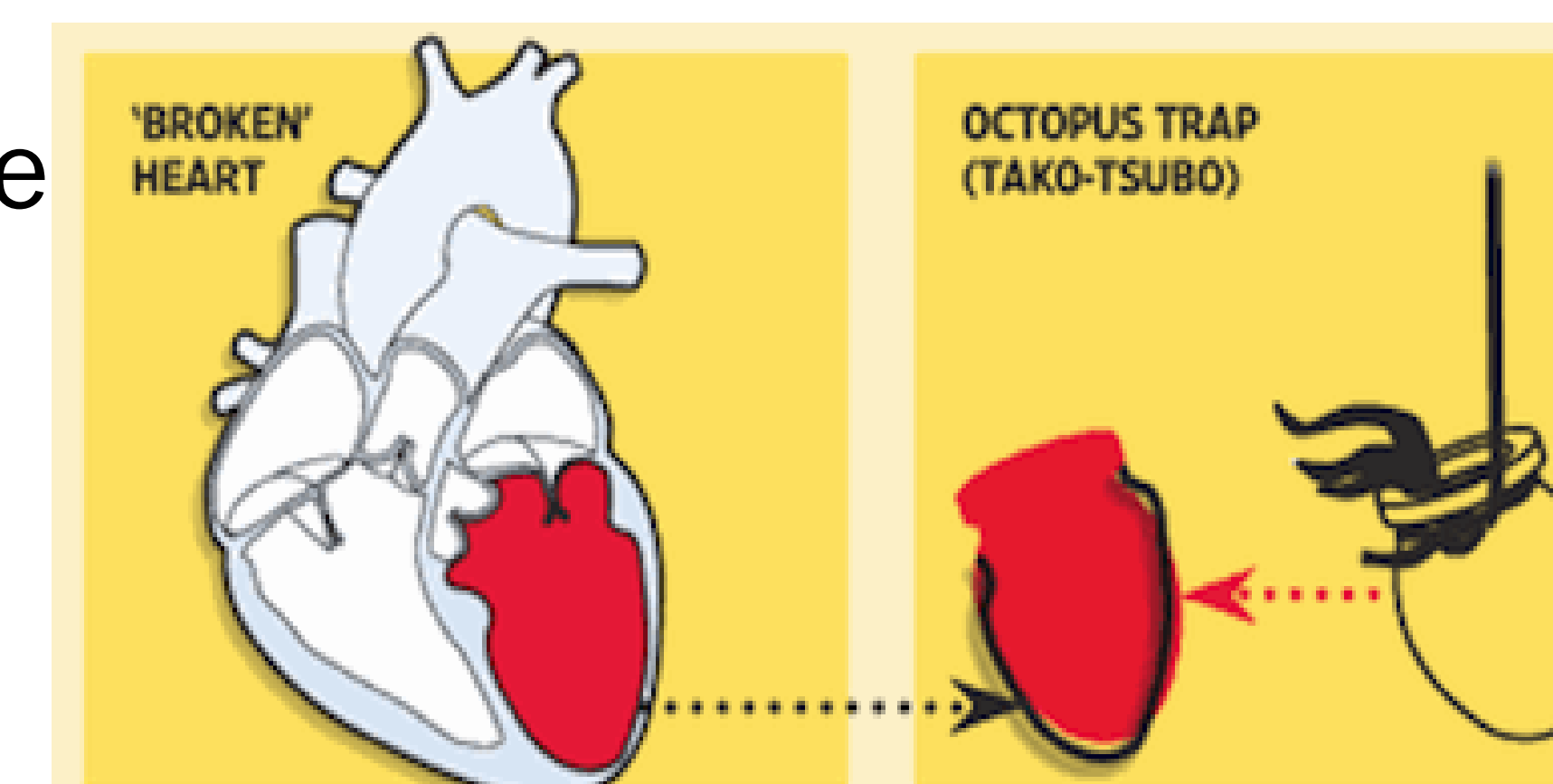


Apical View



Normal echocardiogram

- Echocardiogram revealing ballooning of the left ventricle
- Images in the apical view
- Clinically:** patient had a reduced ejection fraction and symptoms of heart failure



Case (Cont.)

- Patient taken off of Levophed and started on aspirin and a higher dose of Propranolol
- ECG reveals NSTEMI
- Angiogram results: nonobstructive CAD, elevated LVEDP, reduced LV systolic function
- Day 4: Echocardiogram performed following day, EF: 55%, mild LVH, pleural effusion, and no significant pericardial effusion

Discussion

- Patient was initially given Levophed to treat her sepsis
- From literature review, we have **only found two** cases reported in humans of norepinephrine induced takotsubo
- We hypothesize that the patient had Levophed induced Takotsubo.
- Takotsubo cardiomyopathy was reversed when the source of norepinephrine was removed.

Resources

- Ohanyan V, Yin L, Bardakjian R, Kh-yata M, Kolz CL, Enrick M, et al. Catecholamine induced Takotsubo cardiomyopathy: the role of coronary metabolic blood flow regulation in apical ballooning. *FASEB J*. 2016;30(Suppl):948.9. [[Google Scholar](#)]
- Paur H, Wright PT, Sikkel MB, Tranter MH; et al. "High Levels of Circulating Epinephrine Trigger Apical Cardiodepression in a β 2-Adrenergic Receptor/Gi-Dependent Manner: A New Model of Takotsubo Cardiomyopathy." *Circulation*, U.S. National Library of Medicine, 25 June 2012, <https://pubmed.ncbi.nlm.nih.gov/22732314/>.
- Vieira, Alfredo, et al. "Iatrogenic Takotsubo Cardiomyopathy Secondary to Norepinephrine by Continuous Infusion for Shock." *European Journal of Case Reports in Internal Medicine*, SMC Media Srl, 26 July 2018, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6346780/#b4-894-1-5492-1-10-20180427>.