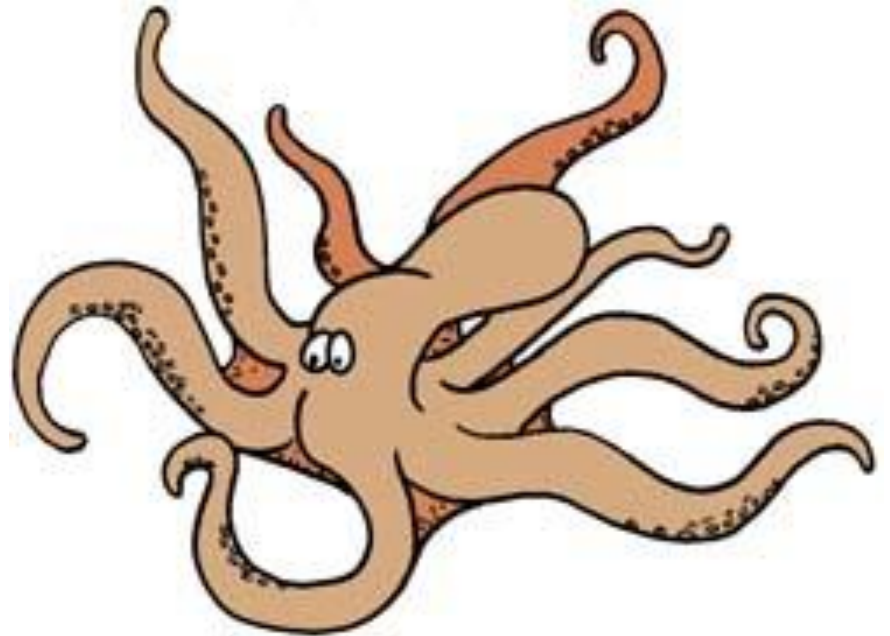


Tako-Tsubo Syndrome





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EMS TRAINING LTD

A broken heart is not just folklore

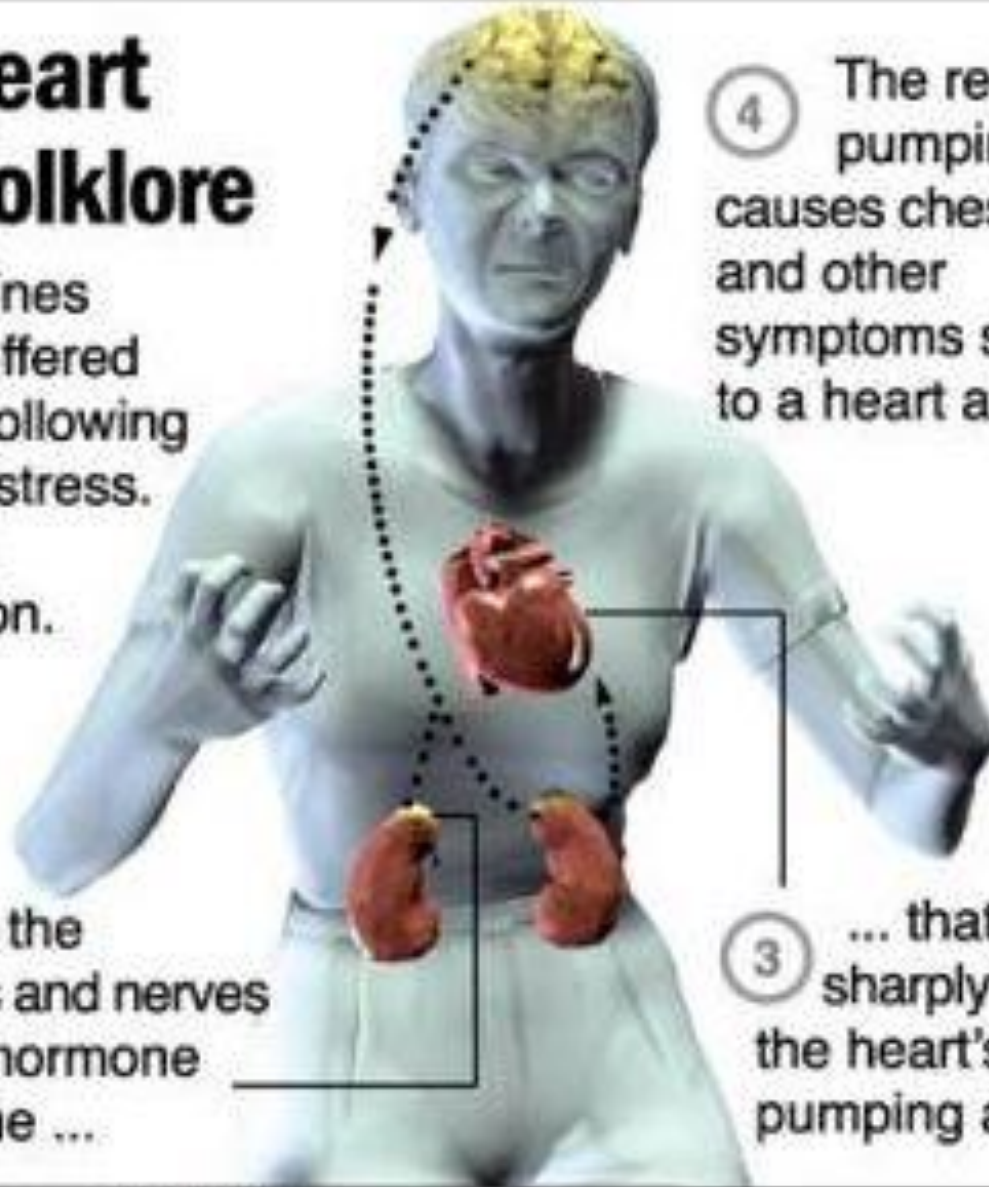
A new study examines 19 patients who suffered cardiac problems following sudden emotional stress. The study offers a possible explanation.

① Grief or fear is experienced ...

② ... stimulating the adrenal glands and nerves to produce stress hormone including adrenaline ...

④ The reduced pumping causes chest pain and other symptoms similar to a heart attack

③ ... that can sharply lower the heart's pumping ability



Tako-Tsubo Syndrome

- *Tako-tsubo*" is the japanese name for an octopus traps



Tako-Tsubo Syndrome



- **Tako-Tsubo Cardiomyopathy** also known as:
 - Stress Cardiomyopathy**
 - Transient (*Catecholaminergic*) Myocardial Stunning**
 - Transient (*neurogenic*) Myocardial Stunning**
- transient left ventricular apical ballooning,
- "ampulla" cardiomyopathy
- **"broken heart syndrome"**.

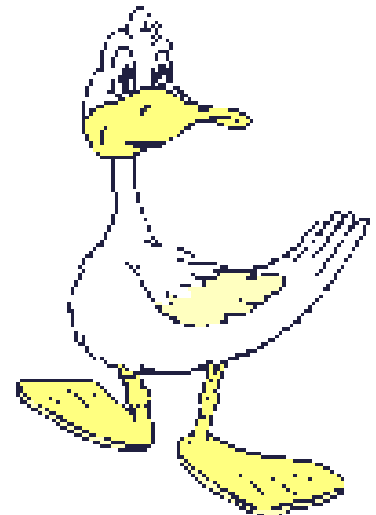




- Tako-Tsubo syndrome thought somewhat rare appears under circumstances of **extreme stress, often associated with anger**
- *About 70-80% of cases of Tako-tsubo Syndrome (TTS) occur in post-menopausal women under some form of extreme stress,...*

Tako-tsubo Syndrome TTS

- The tako-tsubo syndrome is characterized by transient left ventricular dysfunction in the absence of obstructive coronary disease, typically precipitated by severe emotional or physical stress
- In this syndrome, the left ventricle takes the shape of an octopus trap (*tako-tsubo*). During contraction (systole)
- Takotsubo cardiomyopathy mimics ACS/AMI:
 - Clinical presentation; symptoms
 - acute chest pain and dyspnea,
 - ST-segment elevations
 - Cardiogenic dysfunction



Phenomena Noted for Long Time

- **Multi-vessel coronary artery spasm is a possibility**
 - *Dote K, Sato H, Tateishi H, Uchida T, Ishihara M. Myocardial stunning due to simultaneous multivessel coronary spasms: a review of 5 cases. [Article in Japanese] J Cardiol. 1991;21(2):203-14.*
- **Neurogenic cause is quite likely.**
 - *Akashi YJ, Nakazawa K, Sakakibara M, Miyake F, Musha H, Sasaka K.. 123I-MIBG Myocardial Scintigraphy in Patients with “Takotsubo” Cardiomyopathy. J Nucl Med 2004; 45:1121–1127*

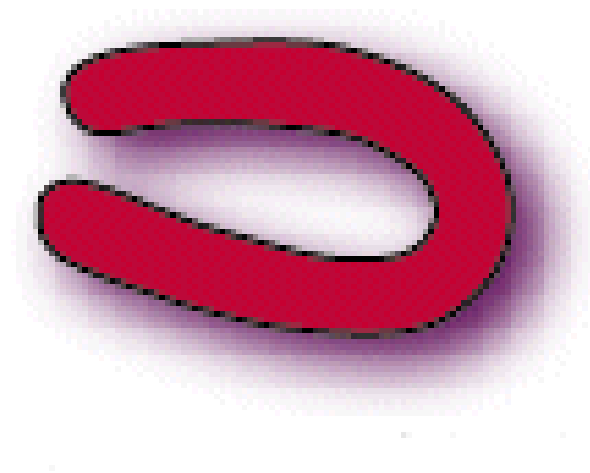
Local Famous Case

- Syndrome seen in Worcester woman for a long time (11 years), multiple acute “heart attacks”,but no damage or ‘culprit vessels”. Reported and named differently.
- "Massive T wave inversion mainly in women, with prognosis independent of ECG changes".
LA Walder and DH Spodick.
- *Global T wave inversion: long-term follow-up. J Am Coll Cardiol, 1993; 21:1652-1656. Division of Cardiology, St. Vincent Hospital, Worcester, Massachusetts*

Answer Found in Full Cardiac Examination

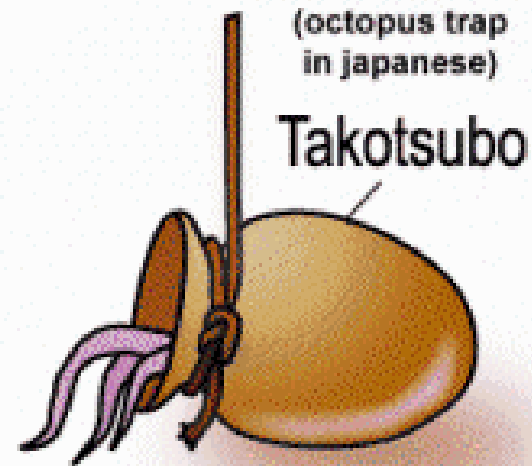
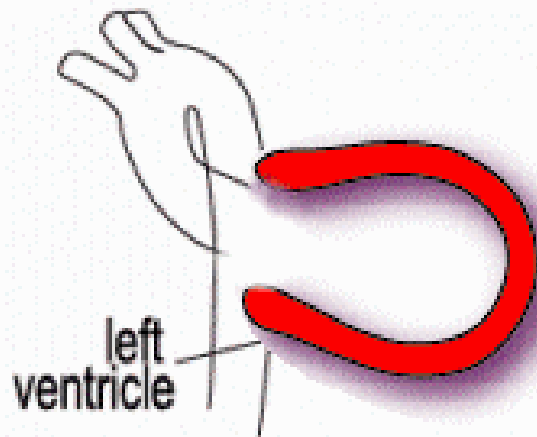
- Echocardiography displays that the left ventricle takes an ampule-like shape (takotsubo shape)
- Nuclear medicine demonstrates that portions of the left ventricle are not contracting equally.
- Some portions are in a state of **complete exhaustion (myocardial stunning)** often the mid-section and apex (tip)
- But angiography showed that the **patients had no significant blockage (stenosis) of their coronary arteries**

- Normal left ventricular contraction

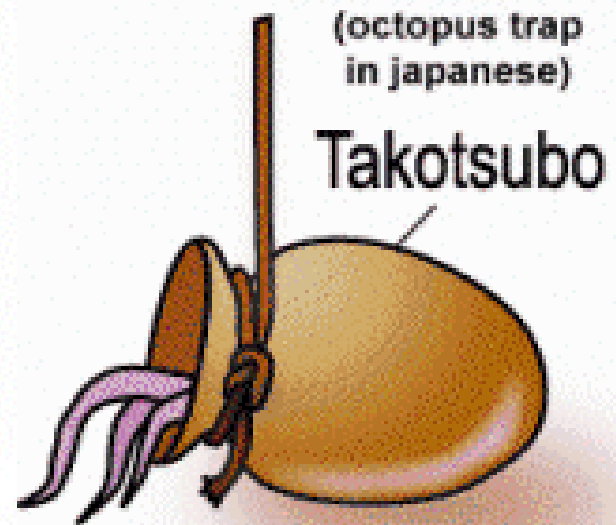
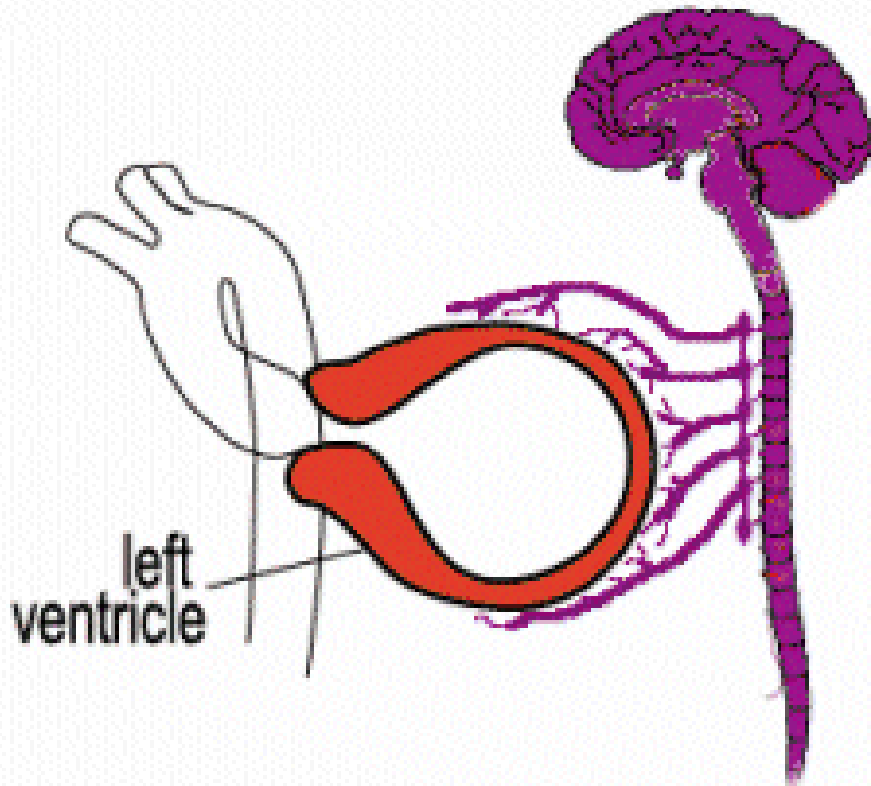


So What's Happened ??

Must Current Theory

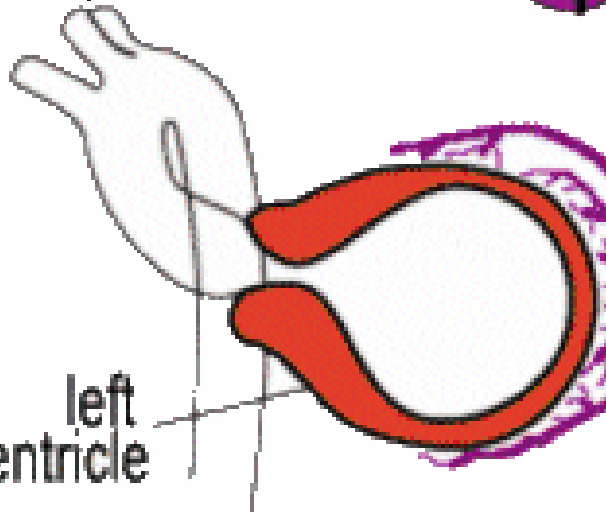
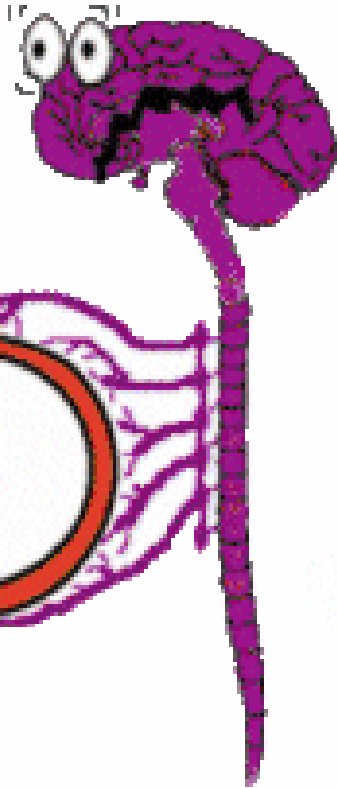


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mental or physical
stress - anger
pain - trauma

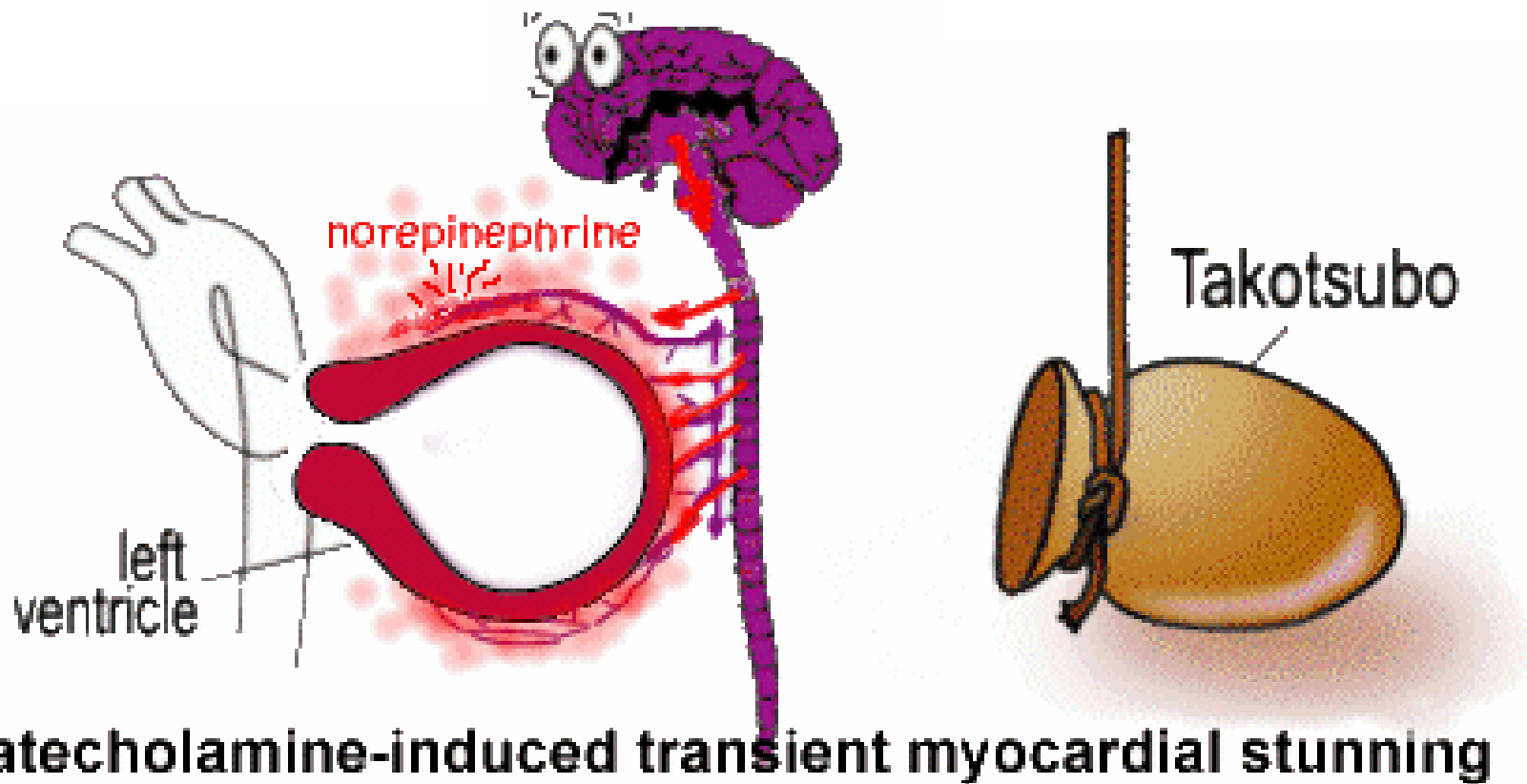


left
ventricle

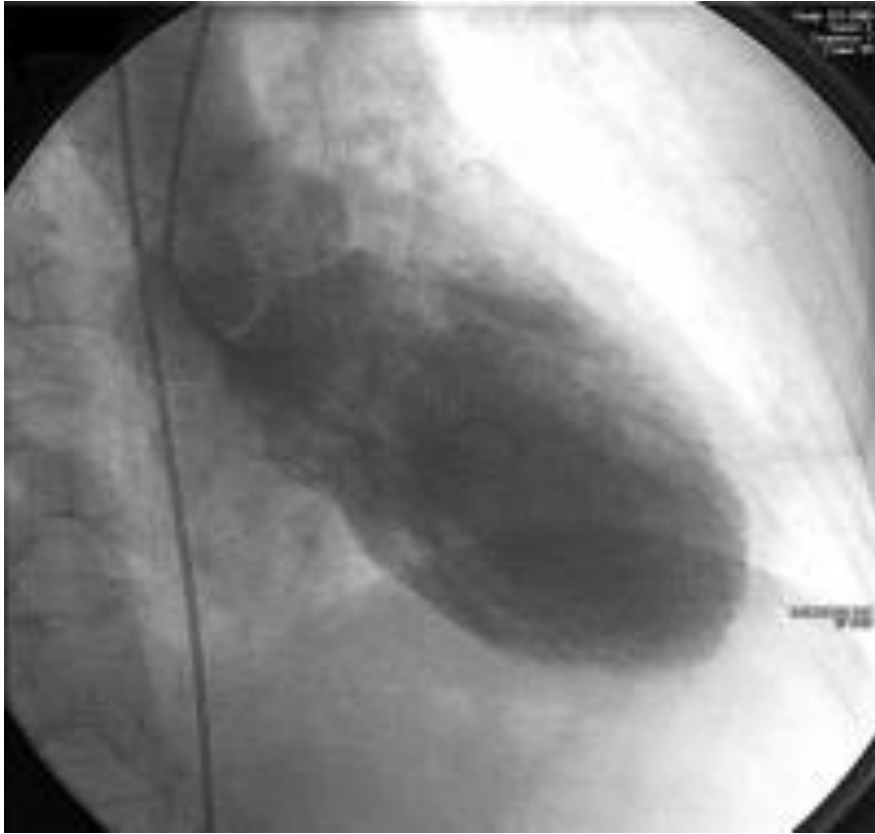
sympathetic
nervous system



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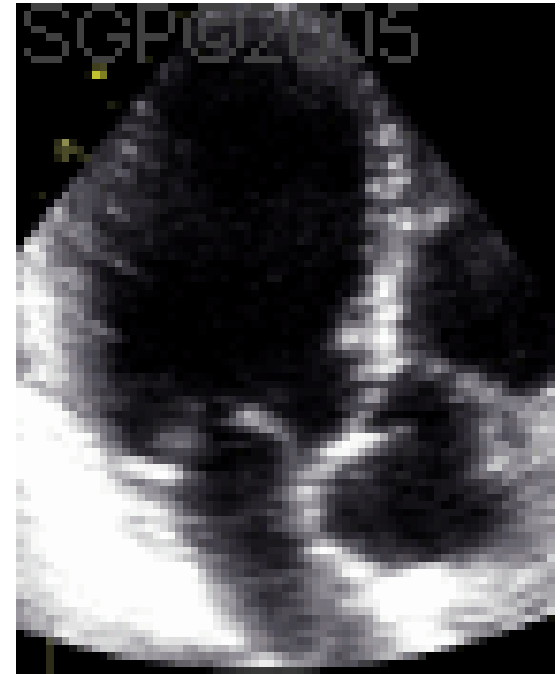




Ventriculogram during diastole in
a patient with takotsubo
cardiomyopathy



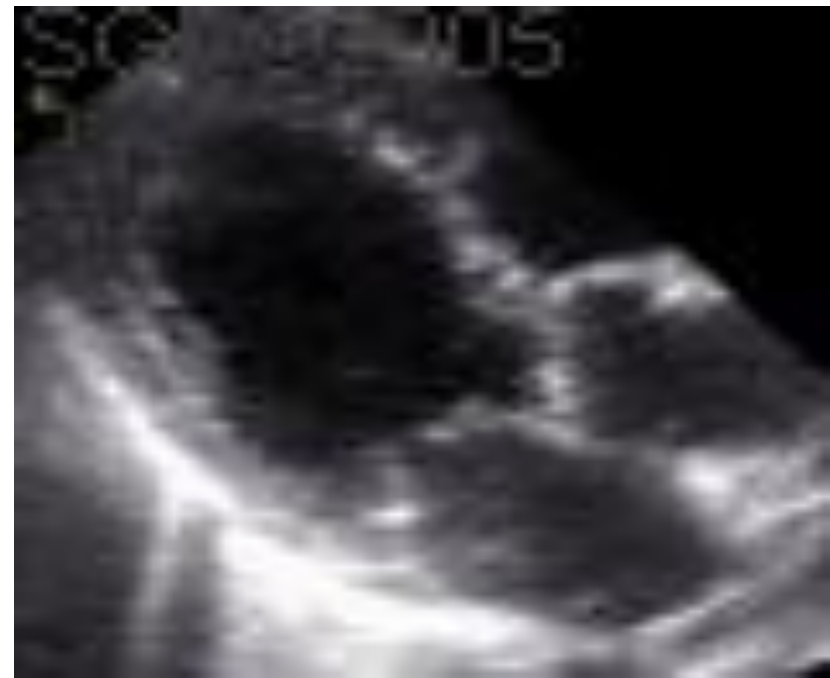
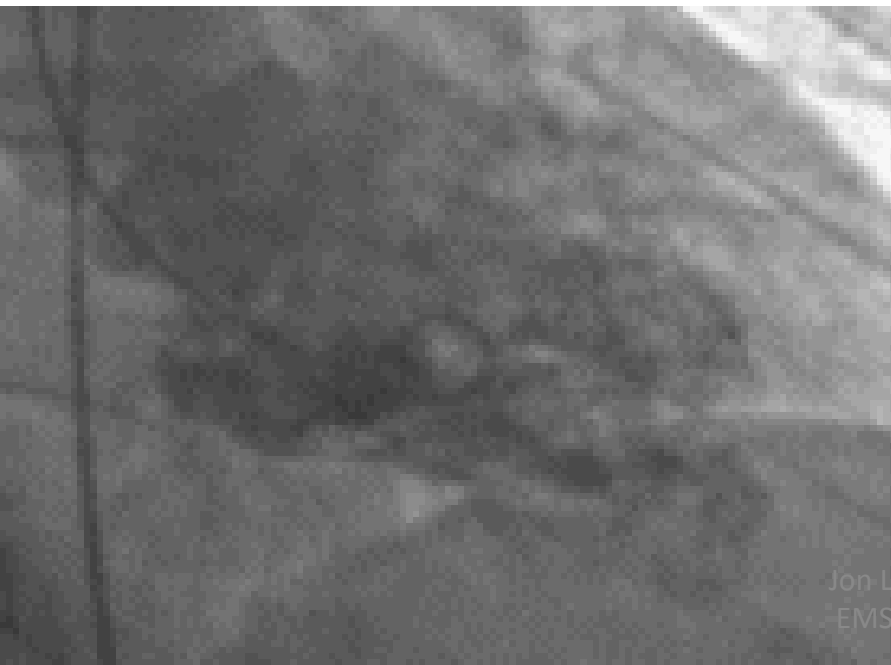
Previous Post-menopausal woman – demonstrating at onset of *tako-tsubo syndrome* again



Same patient, 3 months after the *tako-tsubo* episode: there is full recovery. The tip of the left ventricle contracts normally again



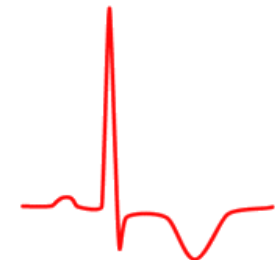
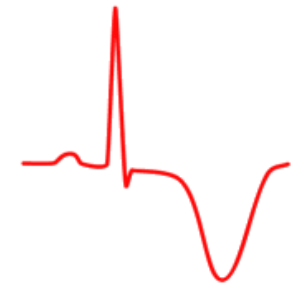
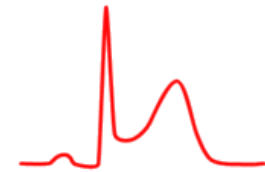
Post-menopausal woman - Cardiac ultrasound
in the E.R. - Day 1 of a *tako-tsubo syndrome*:
the left ventricular tip (apex) is "paralyzed"



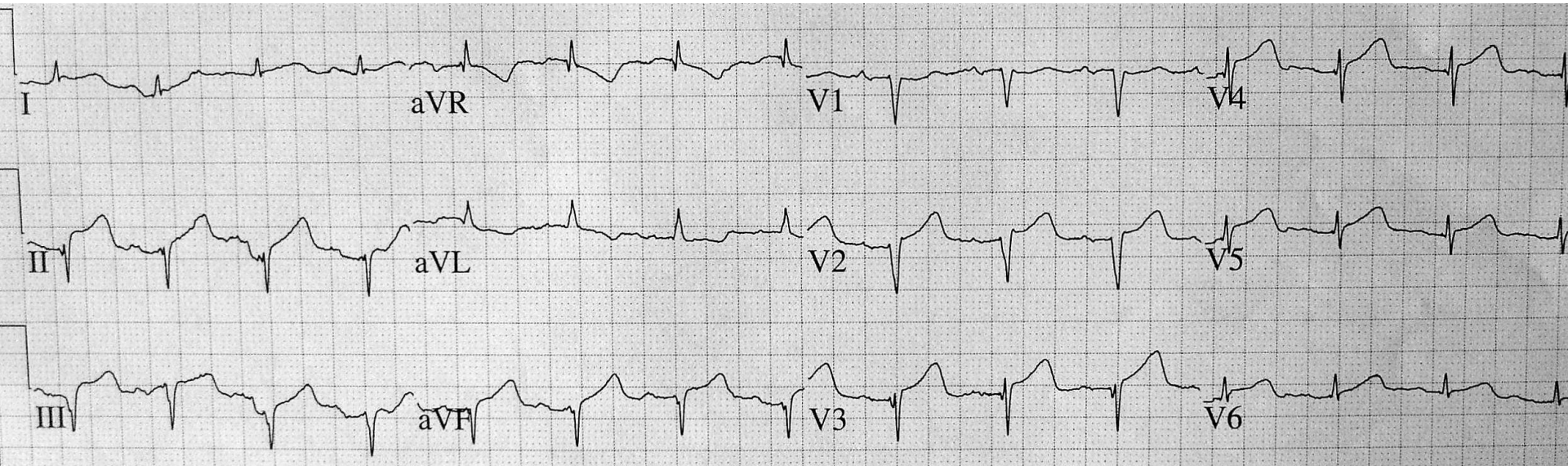
ECG Changes in *Tako-Tsubo*

Cardiomyopathy

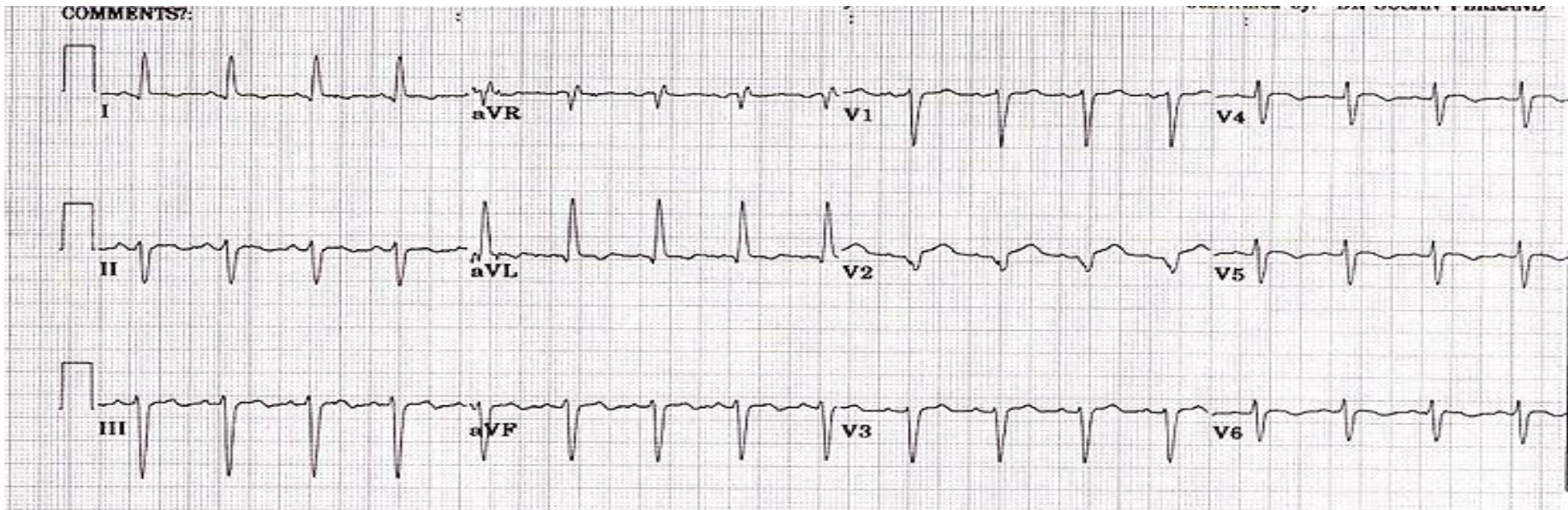
- The electrocardiogram can evolve through 3 stages:
- **Stage 1**: *acute stage*,
This stage lasts only a few hours. Stage of ST elevation and fairly short QT interval. The R wave might be preserved.
- **Stage 2**: *sub acute stage*.
This stage can last days. QT segment prolongation and large and deep negative T waves.
- **Stage 3**: *recovery stage*. Flipped T wave persists for days to weeks, but QT interval is again normal.



Electrocardiogram of a patient with takotsubo cardiomyopathy demonstrating ST-segment elevation in anterior and inferior leads.



- Not always so evident
- ECG showing sinus tachycardia and non-specific ST and T wave changes from a patient with confirmed takotsubo cardiomyopathy.



Management Tako-Tsubo Cardiomyopathy

- *Just like any other possible STEMI*
 - *12 Lead , IV, NTG, O2, ?MS*
 - *Code AMI Notification*
- *Patient will get CLA*
 - *Possible no culprit vessel*
 - *Echo will demonstrate TTS*
 - *But require management for cardiogenic dysfunction*

good news

- **Treatment:** *Tako-tsubo* syndrome is only treated with support measures. Maintenance of cardiac output and reduction of catecholamine effect (B-Blockers etc)
- **Outcome:** Excellent in 95% of cases. Recovery takes place over a few days with full recovery over a few weeks. Recurrence rare /c Rx.

But Complications are Possible

- Complications occur in 20% of takotsubo cardiomyopathy cases and include the following:
 - Left heart failure with and without pulmonary edema
 - Cardiogenic shock
 - Left ventricular outflow obstruction
 - Mitral regurgitation
 - Ventricular arrhythmias
 - Left ventricular mural thrombus formation
 - Left ventricular free-wall rupture
 - Death

Medicolegal Pitfalls

- EMS should be aware of the presentation of takotsubo cardiomyopathy (TCM) because as described above,
 - chest pain after a recent stressor is not necessarily due to anxiety.
 - The chest pain may be more complicated and deteriorate into dysrhythmias and/or shock.
 - Patients with takotsubo cardiomyopathy do not usually have cardiac risk factors, but their pain should be taken seriously.
 - Patients presenting after a natural disaster, MCI or acute stress event should be evaluated for takotsubo cardiomyopathy
 - These patients should be treated as having acute coronary syndrome (ACS), given supportive treatment, and undergo subsequent cardiology evaluation.

Conclusion...

