Broken Heart Syndrome

Takotsubo’s Cardiomyopathy

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Gender differences in heart disease

- Arrhythmias
- Myocardial infarction
- Congestive heart failure, diastolic and systolic
- Stress cardiomyopathy
Myocardial Infarction
Ischemia and anoxia

Cardiomyopathy
Multiple etiologies

Congestive heart failure
Right or left ventricular dysfunction
Systolic or diastolic dysfunction
Can stress cause a heart attack?
Diagnosis of myocardial Infarction

- Blocked surface arteries, atherosclerosis, inflammation
- Enzyme leak, Troponin, CPK, SGOT
- Muscle stunning, hibernation, death
- EKG changes, ST elevation, T waves
- Associated congestive heart failure, right or left ventricular with heart rhythm changes, heart block
Typical atherosclerosis
Angina
History of Broken heart syndrome

- Case reports from Japan throughout the 1990s
- 17 cases at Johns Hopkins
- EKG changes
- Enzyme leaks
- Shock
- Muscle damage
- Congestive heart failure

- BUT NO INFARCTION
Age and gender distribution

![Age cases distribution pattern graph](image)

- **Age intervals:** 16-29, 30-39, 40-49, 50-59, 60-69, 70-79, 80-90
- **Number of cases**
- **Male**
- **Female**
Common link

Stress
What, How and Who?

- In Japanese, “tako-tsubo” means “fishing pot for trapping octopus”
Angiogram
MRI: apical ballooning in systole
Several Theories on HOW

- Stress hormones. Adrenaline, noradrenaline, epinephrine and norepinephrine.
- Associated calcium levels inside heart cells increase.
- Small down stream vessels malfunction and stop carrying oxygenated blood but not consistently reproduced experimentally.
- Some authors consider estrogen an important factor because it changes the $\beta_1:\beta_2$ adrenoreceptor (AR) ratio in favor of the $\beta_2$ AR-Gi protein, which protects the myocardium from catecholamines in stressful situations.
Survival

This is the big difference between Takotsubo’s Cardiomyopathy and Myocardial infarctions.
The Big Difference – A Happy Ending
Questions