

Women, Yes Their Hearts Are Different

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Objectives

- **Identify heart disease as a major cause of death for women.**
- **Differentiate presentation of acute coronary syndrome based upon gender.**
- **Discuss risk factors for coronary heart disease.**
- **Verbalize differences in symptom description and prodromal symptoms for acute coronary syndrome in women.**

Statistics

- Coronary Artery Disease is the number one cause of morbidity and mortality
- 2.5 million hospitalizations
- 500,000 deaths
- Exceeds deaths for all other causes combined
- A 50 year old woman has a 46% lifetime probability of developing CHD and a 31% probability of dying of CHD

Cerebrovascular disease

- An important cause of disability and death among older women
- 3rd common cause of death in American women
- Following a heart attack, a woman is more likely than a man to suffer a stroke
- When a woman suffers a stroke she is more likely to be debilitated than a man

Risks for Cardiovascular Disease

- Hypertension
- Cigarette Smoking
- Hypercholesterolemia
- Obesity
- Physical inactivity
- Diabetes

Risk Factors Greater in Women than Men

- Hypertension
- Diabetes
- Hypercholesterolemia
- Family History

Clinical Picture of Coronary Artery Disease is Different in Women

Factors Affecting Women

- Increased Clustering of Risk Factors
- Metabolic Syndrome
- Inadequate Screening
- Lack of evidence based treatment to reduce CAD risks

Metabolic Syndrome

- ≥ 3 or more risk factors
 - Hypertension, $> 130/85$ or on treatment for HTN
 - Elevated triglycerides > 150 mg/dl
 - Low HDL Cholesterol < 40 Women, < 50 Men
 - Elevated glucose > 100
 - Increase waist circumferences > 102 cm Men or > 88 Women
- Associated with increased risk in men and women
 - CAD
 - Diabetes Mellitus II

Family History Risk Factors

- Death 1st degree relative or grandparent
- Sudden death <55 or >65
- History taking screen for risk factors

Risk Factor Reduction

- Risk Factor Identification is key
- Strategies: Lifestyle Modification
- Smoking cessation

Atypical presentations

- Women
- Diabetics
- Elderly



Women and heart disease

- Not typically obstructive, less anatomical evidence
- Preserved systolic function
- More symptoms
- Myocardial ischemia
- Abnormal coronary reactivity, microvascular dysfunction
- Less likely to receive guideline indicated therapies
- Adverse outcomes

Proposed New Term for Heart Disease in Women

Ischemic Heart Disease

Shaw, L, Bugiardini, R., & Merz, C. Women and Ischemic Heart Disease. *J Am Coll Cardiol*, 2009, 54:1561-1575.

Hormones play a role

- Post menopausal



Cardiac X Syndrome

- Recurring, unpredictable chest pain
- Normal coronary arteries by cardiac catheterization
- Persistent CP and ST segment changes

Occurrence of Cardiac X Syndrome

- 70% postmenopausal women
- 10-25% of all patients who have angiography for Chest Pain have clean arteries
- 10% of women with ST segment changes have clean arteries

Potential Causes of Syndrome X

- Coronary endothelial cell dysfunction in microcirculation
- Myocardial ischemia in 25% of patients
- Abnormal pain perception through increased pain sensitivity
- Estrogen deficiency
- Diffuse atherosclerosis
- Increased platelet size
- Systemic inflammation
- Psychological factors

Estrogen deficiency

- Normal menopause
- Surgical removal of ovaries
- Leads to impaired endothelial cell function

Non-modifiable Risk Factors

- Age
- Gender
- Family history
- Race
- Menopause

Modifiable Risk Factors

- Smoking
- Diet
- Weight
- Hypercholesterolemia
- Hypertension
- Inactivity
- Estrogen Deficiency
- Uncontrolled diabetes
- Stress
- Anger
- Alcohol use

Aggressive Lifestyle Modification
is necessary

Presentation

- Syncope
- “Don’t feel well”
- Left hand numbness
- Difficulty with ADLs
- Can have typical chest pain that radiates to neck, jaw, left shoulder, arm or back

Syndrome X Patient Outcomes

- 50% live with significant disease
- 50% unexplained
- 75% continue to see MD for CP
- Many of these patients if they have clean coronary arteries with be falsely told they have a healthy heart and no treatment is needed.

Syndrome X Medications

- Statins
- ACE inhibitors
- Anti-ischemic medications
- Imipramine
- Post-menopausal estrogen replacement- controversial

A Broken Heart: Takotsubo Cardiomyopathy

Broken Heart Syndrome

- Exaggerated sympathetic response to stress that causes severe but reversible left ventricular failure.
- Symptoms mimic acute coronary artery syndrome
 - Chest pain
 - Elevated troponin levels
 - ST-segment elevation

Cardiomyopathy

- Weakening of heart muscle due to abnormality of heart structure
- Reduced ability of heart to pump effectively
 - Ischemic- precipitated by coronary artery disease
 - Non-ischemic
 - Hypertrophic
 - Dilated (congestive)
 - Restrictive
- Heart muscle becomes thick, rigid and scarred
- Progresses to irreversible heart failure

Takotsubo Cardiomyopathy

- Rapid weakness of heart muscle

Treatment

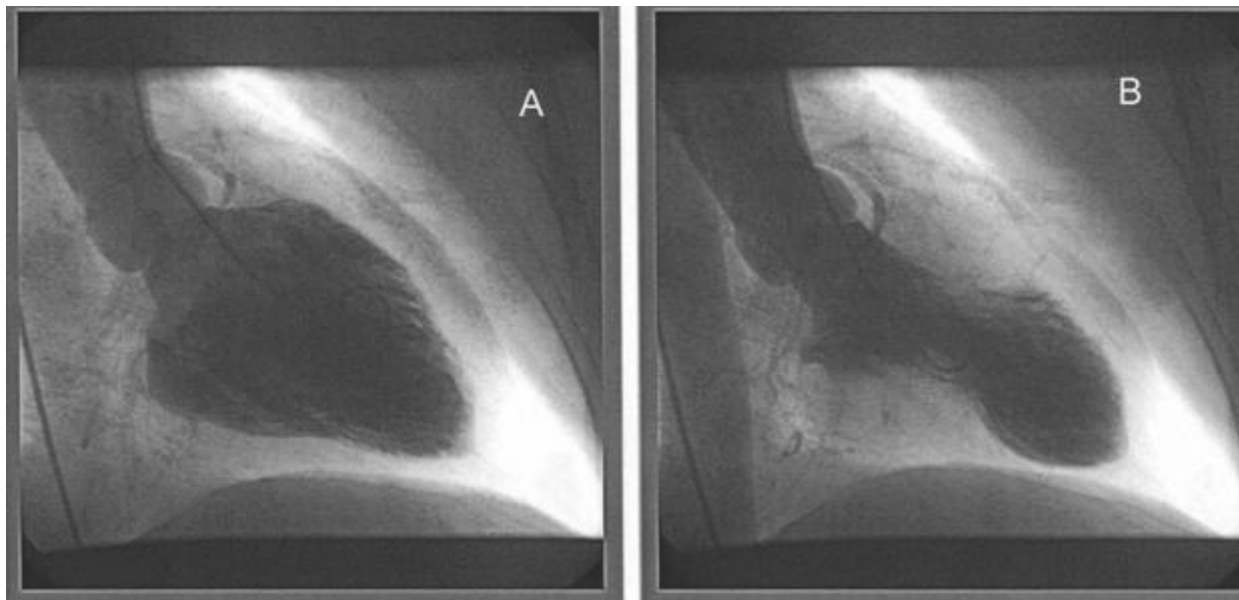
- Medical management
 - Pressor agents
- Intraaortic balloon pump
- Temporary pacer

Historical perspective

- Takotsubo introduced in 1191 by Dote and colleagues to describe the shape of the left ventricle during an acute onset of cardiomyopathy.
- *Tako-tsubo* — Japanese term for narrow-necked fishing pot used to catch octopus



Angiogram



Incidence and mortality

- Large cardiac centers have 1 case per month
- Increased incidence in US, Germany, Japan, Europe, Italy and Belgium
- Improved clinical outcomes with early recognition and prompt treatment.
- Mortality 2-6%
- 37% require acute care and multiple interventions

Typical patient

- Women, rarely in men
- Postmenopausal age
- No history of severe cardiac problems

Typical presentation

- Chest pain
- ST-segment elevation
- Cardiogenic shock
- Stressful event
 - Loss of spouse
 - Catastrophic medical diagnosis- cancer, terminal illness
 - Life changing treatment

Etiology

- Stressors
 - Exacerbation of COPD
 - Domestic abuse
- Triggers
 - Earthquakes
 - Destructive weather conditions
- Other identified stressors
 - Intense emotions during psychotherapy treatment
 - Excessive gambling (CASINO night)
 - Tension related to financial difficulties

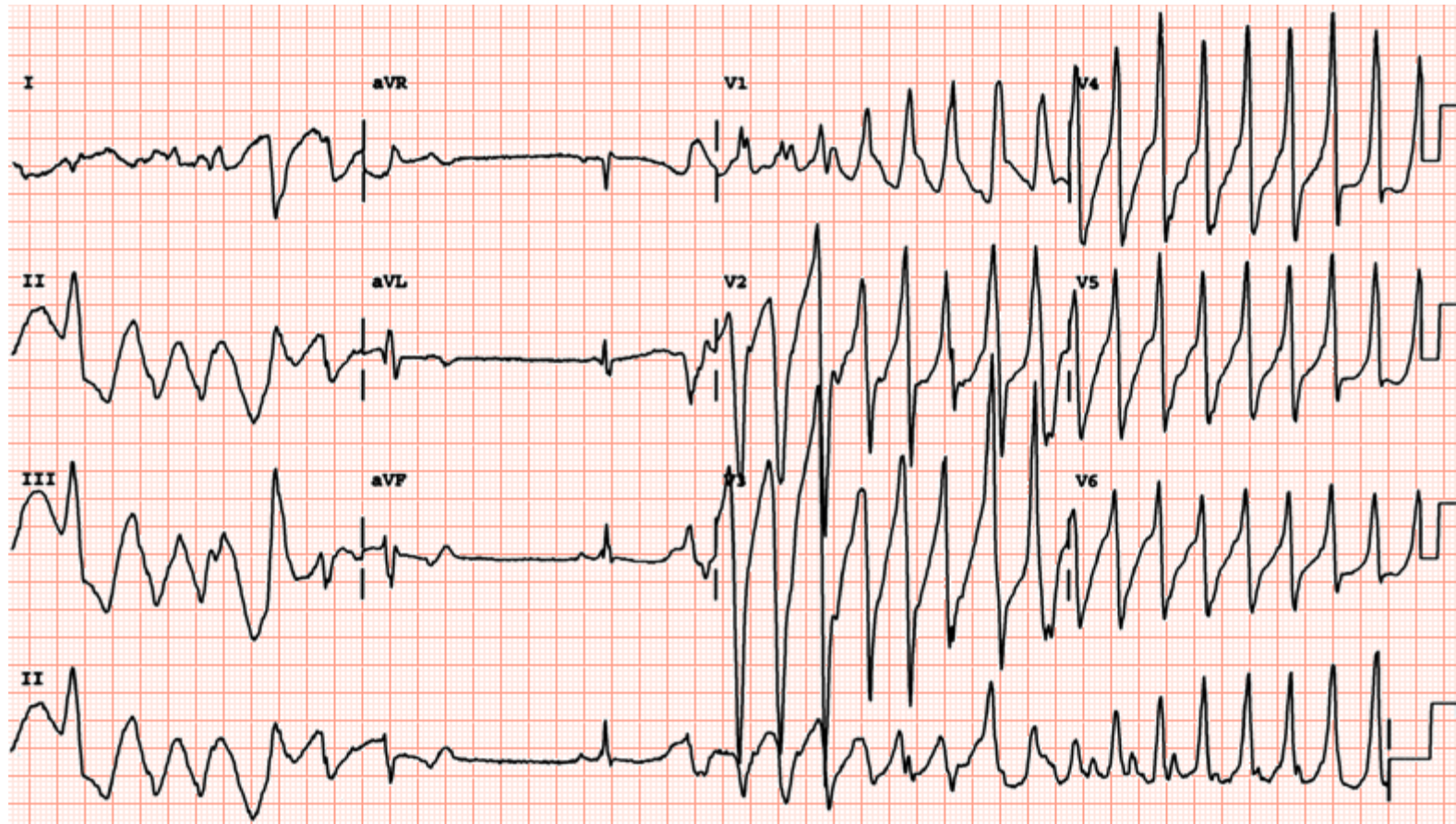
Pathophysiology

- Exact mechanism unknown
- Stress activates class sympathetic response- fight or flight response and catecholamine release
- High circulating catecholamines may produce myocardial stunning and wall motion abnormalities in the heart
- Apex relaxes and dilates- decreased contractility
- The ventricular outflow tract responds to catecholamine overload by narrowing which obstructs blood flow.
- The ventricle does not fully empty, blood pools
- Decreased contractility, decreased cardiac output, increased oxygen demands-> shock

Cathecholamine overload

- Left ventricle spasms
- Blood in ventricles increases risk of clots
- Cardiac necrosis can develop -> VSD or ventricular rupture.
- COPD or enlarged ventricle in area of ballooning have increased risk of cardiac arrhythmias
 - Ventricular tachycardia
 - Torsades de pointes

Torsades de pointes

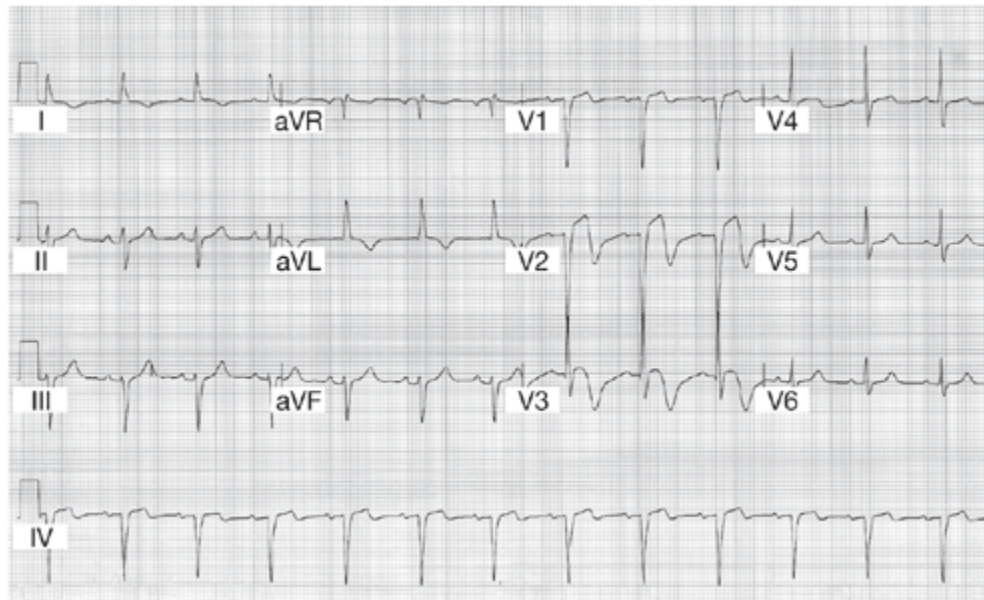


Complications

- 18.4% of cases
- Shock
- Thrombus formation
- Heart failure
- CVA
- Ventricular tachycardia
- Left ventricular rupture
- Ventricular septal rupture

Diagnostic studies

- EKG
 - ST segment elevation and T wave inversion indicate myocardial ischemia
 - Prolonged QTc > 460 ms.



Diagnostics cont.

- Troponin elevated
- Cardiac imaging
 - Transthoracic or transesophageal echo
 - MRI
 - Angiogram

Management

- Use same guidelines as ST elevation acute MI
 - Oxygen
 - Aspirin
 - Nitroglycerin
 - B-blockers
 - Heparin
 - Morphine for pain control
 - Nitrates to vasodilate
 - Inotropes to improve contractility

Special Considerations

- Following deaths
- Major disasters
- Economic downturns
 - Potential refusals
 - Know resources
 - Make referrals

Case studies

Case 1

- 54 year old female cc: chest pain

Pain characteristics

- Left chest
- Intermittent over last 6 hours, escalating, 10 minutes prior to calling rescue
- 7/10
- Numbness left arm
- Nausea

History

- PMH: Diagnosis breast cancer 6 months ago
- PSH: Discharged 7 days ago after left mastectomy for breast cancer
- Family history: Father died following heart attack at age 72
Mother has diabetes

Medications

- Oral chemotherapy med
 - Percocet for surgical incision pain
 - Phenergan nausea
 - Colace
-
- Allergies: none

Physical Exam

- Awake alert, anxious
- Respirations labored 22 bpm
- BLBS=, decreased bases
- Heart rate 92, regular
- BP 156/94
- Skin warm and moist
- PPP x 4
- No edema
- Heart sounds S1S2 regular
- Dressing left anterior chest
- Abdomen soft non-tender

Prehospital management

- O₂
- Cardiac Monitor
- IV
- 12 lead
- Per protocol: ASA, NTG, B-blocker
- Reassurance

Ideas to help community awareness

- Look at your organization
 - Displays
- Red dress program
- CHIP program
- Health awareness
 - Nutrition
 - Exercise
 - Stress reduction



