Case of the Month:
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Patient with history of abnormal stress test and subsequent cardiac catheterization presents for follow up imaging

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Patient Presentation

• PMH
  • 75-year-old female with history of abnormal stress test and subsequent cardiac catheterization > 10 years ago
  • Two months ago, patient presented to emergency department with generalized weakness
    • Symptoms at the time: palpitations, lightheadedness, chest pressure, low BP, bradycardia, shortness of breath, tingling in arms bilaterally
    • Found to have third-degree heart block
      • Pacemaker was placed without complication
Patient Presentation At Pacemaker Placement Follow Up Visit

• Vitals
  • BP: 121/56
  • HR: 80 BPM
  • BMI: 34.5 kg/m^2

• Physical Exam
  • Cardiovascular: normal pulses, normal heart sounds, no murmur
  • Pulmonary: normal breath sounds
  • Skin: Pacemaker site well healed
What Imaging Should We Order?
Select the applicable ACR Appropriateness Criteria

### Chronic chest pain; high probability of coronary artery disease. No known ischemic heart disease. Initial imaging.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>Relative Radiation Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>US echocardiography transthoracic stress</td>
<td>Usually Appropriate</td>
<td>0</td>
</tr>
<tr>
<td>Arteriography coronary</td>
<td>Usually Appropriate</td>
<td>4</td>
</tr>
<tr>
<td>CTA coronary arteries with IV contrast</td>
<td>Usually Appropriate</td>
<td>3</td>
</tr>
<tr>
<td>MRI heart function with stress without and with IV contrast</td>
<td>Usually Appropriate</td>
<td>0</td>
</tr>
<tr>
<td>MRI heart function with stress without IV contrast</td>
<td>Usually Appropriate</td>
<td>0</td>
</tr>
<tr>
<td>Rb-82 PET/CT heart</td>
<td>Usually Appropriate</td>
<td>5</td>
</tr>
<tr>
<td>SPECT or SPECT/CT MPI rest and stress</td>
<td>Usually Appropriate</td>
<td>4</td>
</tr>
<tr>
<td>US echocardiography transthoracic resting</td>
<td>May Be Appropriate</td>
<td>0</td>
</tr>
<tr>
<td>CT coronary calcium</td>
<td>May Be Appropriate</td>
<td>3</td>
</tr>
<tr>
<td>MRI heart function and morphology without and with IV contrast</td>
<td>May Be Appropriate</td>
<td>0</td>
</tr>
<tr>
<td>US echocardiography transesophageal</td>
<td>Usually Not Appropriate</td>
<td>0</td>
</tr>
<tr>
<td>CTA chest with IV contrast</td>
<td>Usually Not Appropriate</td>
<td>4</td>
</tr>
<tr>
<td>CTA triple rule out</td>
<td>Usually Not Appropriate</td>
<td>4</td>
</tr>
<tr>
<td>CT heart function and morphology with IV contrast</td>
<td>Usually Not Appropriate</td>
<td>4</td>
</tr>
</tbody>
</table>
Findings (unlabeled)
Findings (labeled)

Potential dilation of the heart apex
Findings (unlabeled)
Findings (labeled)

Dilation of apex during systole
Findings (unlabeled)
Findings (labeled)

Apical ballooning
Final Diagnosis

Stress Induced (Takotsubo) Cardiomyopathy
Case Discussion: Takotsubo Cardiomyopathy

- Takotsubo cardiomyopathy, also called stress-induced cardiomyopathy or broken heart syndrome, is a type of non-ischemic cardiomyopathy
  - Characterized by regional systolic dysfunction of LV
  - Mimics acute MI but with mild release of cardiac enzymes
  - Little angiographic evidence of obstructive CAD or plaque rupture

- Pathophysiology hypotheses
  - Stress induced increase in circulating plasma catecholamines
    - This is the most accepted hypothesis
  - Epicardial coronary vessel spasm
  - Aborted MI
Case Discussion: Takotsubo Cardiomyopathy

• Diagnosis
  • Should be suspected in adults who present with ACS with electrocardiographic findings out of proportion to degree of cardiac biomarker elevation
  • Diagnosis of exclusion
  • Mayo Clinic diagnostic criteria
    • Transient hypokinesis, akinesis, or dyskinesis in LV
    • Single epicardial vascular distribution
    • Absence of obstructive CAD/plaque rupture
    • New ECG abnormalities or elevation in troponin
    • Absence of pheochromocytoma and myocarditis
Case Discussion: Takotsubo Cardiomyopathy

• Treatment
  • Initial management focused on close monitoring at risk for severe complications
    • At risk patients include patients with troponin greater than 10x upper reference limit and EF <45 %
  • Initial treatment is similar to ACS
    • aspirin
    • beta-blockers,
    • Ace-inhibitors,
    • lipid lowering agents,
    • coronary angiography to rule out obstructive CAD
  • Patients with unstable hemodynamics/cardiogenic shock
    • Inotropes typically used
Case Discussion: Takotsubo Cardiomyopathy

- Prognosis
  - Most patients recover
  - Reported mortality ranges from 0-8%
  - Often dependent on underlying trigger
    - Primary causes: emotional/psychological stimuli
    - Secondary causes: due to critical illness
References:

