"Am I having a heart attack?"

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Helen, 60, presents to the ER with chest pain that started one hour before, when she was moving furniture. She describes the pain as feeling like pressure radiating to her left shoulder. She has never had such pain before. She is not experiencing:

- nausea,
- vomiting,
- palpitations,
- dizziness, nor
- syncope with her chest discomfort.

Helen is currently taking the following medications:

- prednisone,
- doxycycline,
- omeprazole,
- hydroxyzine, a combination of
- carbidopa and levodopa and
- fluticasone, along with a combination of
- triamterene and hydrochlorothiazide.

Helen's medical history

Helen is found to have a history of:

- A cold for last few weeks
- Hypertension for the last five years
- Asthma
- Restless leg syndrome
- Gastroesophageal reflux disease
- Cholecystitis
- A longstanding heart murmur
- Diverticulosis
- Arthritis
- Chronic lower back pain
- A ruptured ovarian cyst
- Migraine headaches
- Deep vein thrombosis, 10 years ago and 37 years ago
- A three month history of peptic ulcer disease
- Recent history of skin rash

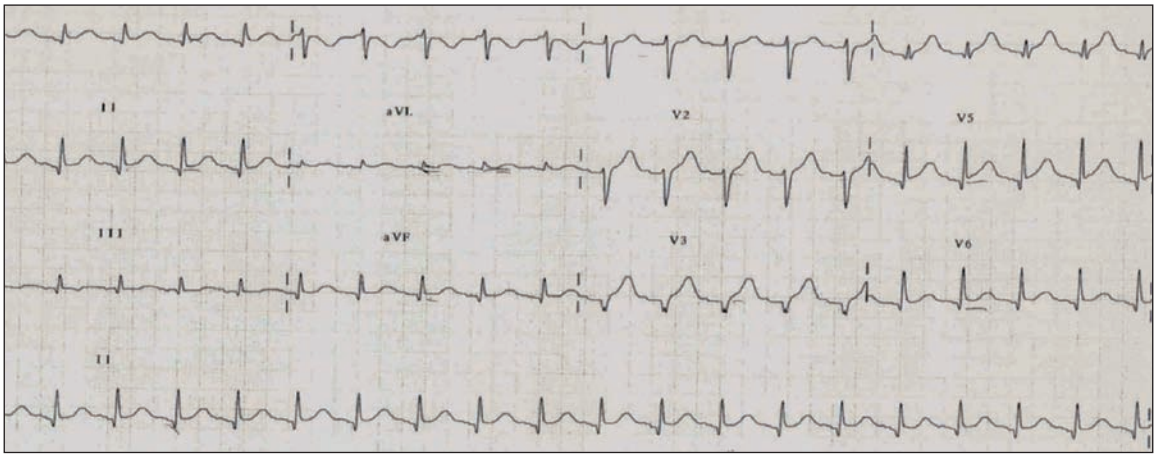

Figure 1. ECG upon admission.

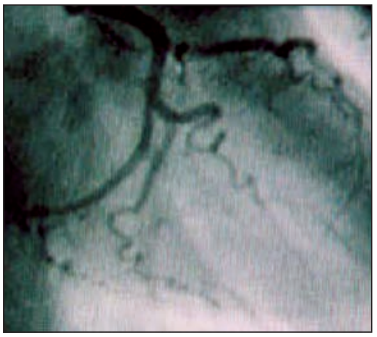

Figure 2. Left coronary artery x-ray.

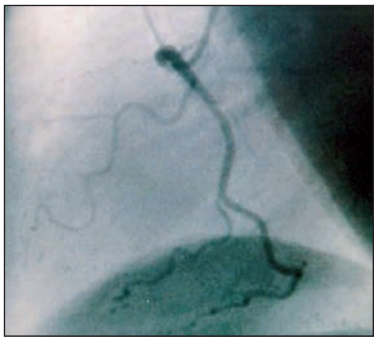

Figure 3. Right coronary artery x-ray.

Physical examination

Helen's physical examination finds the following:

- BP: 110/67 mmHg
- Pulse: 92 bpm
- Respiratory rate: 18 breaths per minute
- Temperature: 2.8 C
- Weight: 77 kg
- Height: 165 cm
- Head and neck are normal
- Chest is clear
- There are normal heart sounds
- There is grade II/VI pansystolic murmur at the apex
- Peripheral pulses are palpable
- There is no edema
- There is no jugular venous pressure
- Her abdomen is soft
- There is no mass
- There is no organomegaly
- Musculoskeletal and neurological are grossly within normal limits

Clinical investigations

Helen's initial ECG shows sinus tachycardia with diffused ST-T elevation involving anterolateral and inferior walls (Figure 1).

Blood work, which is normal, includes:

- complete blood count,
- prothrombin time,
- partial thromboplastin time,
- sodium,
- potassium,
- creatinine,
- liver enzymes,
- amylase,
- glucose: 9.1 mmol/L,
- troponin: 0.73 ug/L,
- creatine kinase (CK): 148 U/L,
- repeat troponin: 4.08 ug/L and
- repeat CK: 207 U/L.

The following urine tests are found to be normal:

- vanilmandelic acid (24 hour urine test): 36 umol/d (normal ranges between 9 umol/d and 34 umol/d),
- epinephrine,
- norepinephrine and
- catecholamines.

Helen's chest x-rays are also normal and cardiac catheterization shows:

- Main left artery: normal
- Left anterior descending artery: mild disease
- Circumflex and right coronary artery: normal with significant mitral regurgitation (Figures 2 and 3)

Left ventriculography shows:

- Akinesis in the apical, diaphragmatic and/or anterolateral segments
- Hyperkinesia in the basal segments (Figures 4 and 5)
- Left ventricular ejection fraction: between 40% and 43%,
- Right ventricle: normal
- A repeat ECG shows improvement in ST-T elevation with ST-T changes

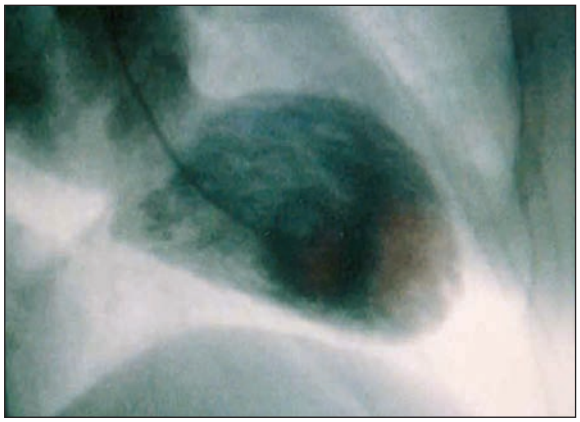

Figure 4. End-diastolic left ventriculogram.

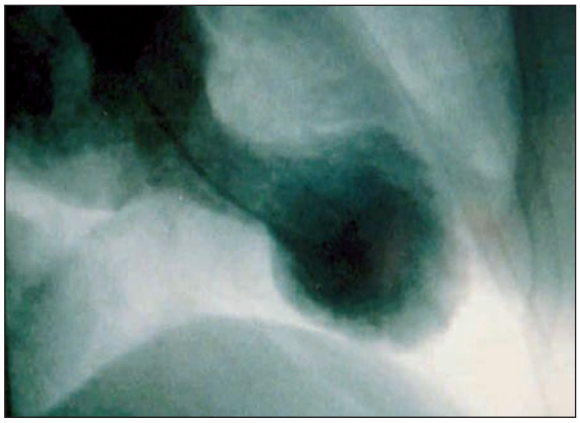

Figure 5. End-systolic left ventriculogram.

What's your diagnosis?

a) MI
b) Takotsubo cardiomyopathy
c) Acute coronary syndrome

Answer:
Takotsubo cardiomyopathy

What is takotsubo cardiomyopathy?

Takotsubo cardiomyopathy is an enigmatic cardiomyopathy, characterized by marked apical asynergy in the absence of significant coronary disease. This syndrome is relatively rare. The average age at onset is 60 years to 75 years and it occurs mostly in post-menopausal women (women are six times to 12 times more likely to be affected than men).

Etiology

The etiology is not known and hypotheses include catecholamine cardiotoxicity and diffuse epicardial, or microvascular coronary spasm. Chest pain is the most frequent symptom of presentation.

ECGs generally show ST segment elevation in several leads, most often in V_4 to V_6 mimicking acute MI and QT prolongation; subsequently T waves become inverted but Q waves rarely develop.

Creatinine kinase and troponin levels often rise slightly. Postulated triggering factors for transient apical ballooning have included onset or exacerbation of systemic disorders. These disorders include:

- cerebrovascular accident,
- asthma,
- acute abdomen,
- common cold and
- extreme emotional distress.

In-hospital mortality rate is < 1% and there is usually complete functional recovery of the left ventricle within a few days or weeks. The two-year recurrence rate is < 3%. The optimal therapy for this condition is unknown.

Resources
1. Lalonde G, Beaulieu Y: Takotsubo cardiomyopathy. Can J Cardiol 2005; 21(13):1213-6.
2. Akashi YJ, Tejima T, Sakurada H, et al: Left ventricular rupture associated with Takotsubo cardiomyopathy. Mayo Clin Proc 2004; 79(6):821-4.

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