

## *AIM Exit Examination Question Chronic (2)*

### *Exercise induced syncope*

*A 35 year-old man presented with 2 episodes of syncope last year. These two episodes happened when he was doing exercise in gymnastics room. He also complained of deteriorating exercise tolerance over the past 2 years. He felt dyspnoea and palpitation if walking up one flight of stair. He had no chest pain and ankle swelling. He did not smoke, nor drink alcohol. He had a good past health. He did not have a history of rheumatic fever in childhood.*

*On physical examination, his blood pressure was 110/70 mmHg with the pulse rate at 60 per minute. The apex was displaced, but no thrill was detected. There was an ejection systolic murmur at the aortic area.*

#### ***1. What are the possible diagnoses? And how do you differentiate the possible diagnoses ?***

- Hypertrophic obstructive cardiomyopathy (HOCM), exercise induced arrhythmia, aortic stenosis (AS), coronary artery disease
  - HOCM: the pulse has a normal volume that stops abruptly during mid-systole and the aortic second sound is normal
  - AS: A systolic thrill, slow rising, small volume pulse and soft aortic second heart sound are features of severe aortic stenosis. Displaced apex is a late event in aortic stenosis associated with heart failure.
- Athlete's heart — highly trained athletes can also develop cardiac hypertrophy, resulting in wall thickness measurements in a range that can overlap with those seen in patients with HOCM
  - in individuals with a possible diagnosis of athlete's heart versus HOCM, family history, ECG, and LV cavity dimensions may help distinguish HOCM from cardiovascular adaptation in an athlete.

## ***2. How do you investigate this patient?***

- Diagnostic evaluation should be arranged in order to
  - To establish the diagnosis of HOCM
  - To grade the left ventricular outflow tract (LVOT) obstruction, mitral regurgitation
  - To assess the risk for arrhythmia (both supraventricular and ventricular)
  - To assess overall LV function
- A. ECG [**give attached**] : left ventricular hypertrophy with ST-T changes
- B. Echocardiogram: LVH, septal to posterior wall thickness ratio  $> 1.5$ , systolic anterior movement (SAM) of mitral valve. Doppler to define subaortic gradient.
- C. Holter study
- D. Cardiac MRI: diagnostic purposes in selected patients in whom the diagnosis of HOCM remains uncertain following echocardiography.

## ***3. How do you treat this patient?***

- Medical therapy
  - beta-blocker, calcium channel blocker such as verapamil, anti-arrhythmic agents if associated atrial fibrillation detected
- Non-drug treatment:
  - competitive sports, vigorous exertion should be avoided
  - implantable cardiac defibrillator if significant ventricular arrhythmia is documented
  - dual chamber pacing that alters the septal activation can reduce outflow gradient and may provide symptomatic improvement especially in elderly
  - surgical myomectomy or catheter based alcohol septal ablation to relieve outflow tract obstruction
- Advice to patient:
  - screening for first degree relative
  - HOCM is an autosomal dominant disorder, and most mutations have a high degree of penetrance. As a result, first-degree family members of an affected individual should be evaluated for possible inheritance of the disease.

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